



Primary and secondary equity markets in the EU

Final report

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This study has been conducted by Oxera Consulting LLP in cooperation with national and European trade associations, intermediaries, issuers, investors, financial market infrastructure providers, advisers, governments and the academic community. Assistance has also been provided by staff members of the European Commission, national financial services authorities and regulators, EBRD, ESMA and IOSCO.

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Glossary

APA	approved publication arrangement
BBO	best bid and offer
BCN	broker crossing network
BP	basis points
CAGR	compound annual growth rate
CAL	competent authority for listing
CCP	central clearing counterparty
CLOB	central limit order book
CMU	Capital Markets Union
CSD	central securities depository
CSDR	Central Securities Depositories Regulation
DG ECFIN	Directorate-General for Economic and Financial Affairs
DRSP	Data Reporting Service Provider
DTCC	Depository Trust & Clearing Corporation
DVCM	double volume cap mechanism
EBRD	European Bank for Reconstruction and Development
ECB	European Central Bank
EIF	European Investment Fund
ESMA	European Securities and Markets Authority
ELP	electronic liquidity provider
ESG	environment, social and governance
ETF	exchange traded fund
EU	European Union
EU-27	European Union (excluding UK)
EU-28	European Union (including UK)
FESE	Federation of European Securities Exchanges
FFI	Fidessa Fragmentation Index
FTT	financial transaction tax
GDP	gross domestic product
G-SIBs	Global Systemically Important Financial Institutions
HFT	high-frequency trading
IMF	International Monetary Fund
ICO	initial coin offering
IOSCO	International Organization of Securities Commissions
ISIN	International Securities Identification Number
IPO	initial public offering
LBO	leveraged buyout
LOB	limit order book
LSEG	London Stock Exchange Group
M&As	mergers & acquisitions
MAR	Market Abuse Regulation
MDV	percentage of median daily volume
MiFID I	Market in Financial Instruments Directive

MiFID II	the second Market in Financial Instruments Directive
MiFIR	Markets in Financial Instruments Regulation
MTF	multilateral trading facility
NBBO	National best bid and offer
NCA	national competent authority
NYSE	New York Stock Exchange
NOMAD	nominated adviser
OECD	Organisation for Economic Co-operation and Development
OTC	over the counter
QCA	Quoted Companies Alliance
REIT	real estate investment trust
RM	regulated market
SE	stock exchange
SEC	U.S. Securities and Exchange Commission
SIFMA	Securities Industry and Financial Markets Association
SME	small and medium-sized enterprise
SOR	smart order routing
SI	systematic internaliser
SRSS	Structural Reform Support Service
T2S	TARGET2-Securities
UCITS	undertakings for the collective investment in transferable securities
WFE	World Federation of Exchanges

Abstract

Public equity markets provide substantial social benefits. This study contributes to the evidence base needed to further advance the equity markets in Europe. To assess the functioning of primary and secondary equity markets in the EU, the analysis uses a combination of different research methods, including data collection, structured interviews, and literature review. The data confirms a relative decline of public equity markets in the EU, and the analysis shows that the costs of becoming a public company have risen considerably in recent decades. Although there is room for further modernisation of listing rules, the analysis indicates this is not a primary driver for the decline in listings. Increased M&A activity along with the development of private equity markets are identified as the major driving forces for the decline in listings. The study identifies policies that can help provide a better environment for listing of companies of different sizes, while remaining vigilant to the possibility that private markets could be more efficient in some cases. The analysis also finds that increased competitive pressure since 2009 has led to lower trading costs and more choice for traders and investors, although mostly in larger financial centres. Meanwhile, there is still significant home bias across the markets, and a large share of the cross-border trading activity comes from other EU member states rather than from outside the EU. The study identifies areas aimed at improving liquidity for SMEs and local capital markets, and finishes by assessing the prospects for future market development and the paths that the EU could take to deliver CMU.

Les marchés des actions peuvent contribuer au bien commun de manière substantielle. Cette étude apporte de nouvelles données permettant de faire avancer le débat sur les perspectives de développement des marchés primaires et secondaires des actions en Europe. Afin d'en évaluer le fonctionnement, le présent rapport a collecté et analysé plusieurs sources d'information, dont plusieurs bases de données, des entretiens avec les acteurs du marché et une revue documentaire et littéraire approfondie. Les données collectées confirment un déclin partiel des marchés des actions dans l'UE, et montrent que les coûts d'introduction en bourse ont considérablement augmenté au cours des dernières décennies. Bien qu'il soit possible de moderniser davantage les règles d'introduction en bourse, l'analyse révèle que les obligations réglementaires ne constituent pas la principale cause du déclin des introductions en bourse. L'augmentation des activités de fusion et d'acquisition ainsi que le développement du marché du capital-investissement (*private equity*) sont considérés comme les principaux moteurs du déclin de l'attractivité des bourses. L'étude identifie certains exemples de politiques publiques ayant le potentiel de contribuer à instaurer un environnement plus favorable aux introductions en bourse d'entreprises de toutes tailles, sans négliger pour autant les cas où les marchés non cotés constituent une meilleure alternative. L'analyse révèle également une baisse des coûts de transaction et un choix plus large pour les traders et les investisseurs depuis 2009, du fait d'une pression concurrentielle accrue; mais ces phénomènes concernent surtout les grands centres financiers. Par ailleurs, les entreprises ainsi que les investisseurs font toujours preuve d'une forte préférence nationale dans leurs choix de cotation ou d'investissement, et une grande partie de l'activité transfrontalière provient d'autres États-membres de l'UE, plutôt que de pays tiers. L'étude identifie ensuite plusieurs pistes visant à améliorer la liquidité sur les marchés des actions PME et les marchés de capitaux locaux. L'analyse conclut par une évaluation des perspectives d'avenir des marchés, et une identification des voies que l'UE pourrait emprunter afin de compléter l'Union des Marchés des Capitaux.

Executive summary

Motivation and approach

The European Commission commissioned Oxera Consulting LLP to study the functioning of primary and secondary equity markets in the EU. The main objectives of this study are to contribute to the evidence base needed to further advance the Capital Markets Union (CMU), with policies that provide a better environment for listing of companies of different sizes by addressing potential economic and technical barriers related to the EU primary and secondary equity markets. Moreover, the study assesses the prospects for market development and considers the future architecture of EU equity markets.

For the study, we (Oxera) have collated original data, held and recorded structured interviews with a wide range of relevant stakeholders, analysed this material and identified its implications for a CMU, before developing a set of policy recommendations for the Commission.

Public equity markets provide substantial social benefits, offering an effective way to share risk and allocate capital efficiently between savers and borrowers. They discipline firms' valuations and organisational behaviour. Initial public offerings (IPOs) enable firms to raise funds as they grow, and offer an exit route for early-stage investors.

However, our analysis shows that Europe's public equity markets have fallen behind in global terms. Its markets are much smaller than those in the USA, despite having a similar-sized economy, and are smaller than Asia's markets when measured by market capitalisation relative to gross domestic product (GDP).

Given all this and the relative decline of public equity markets in the EU, we identify policies that can help their development, while remaining vigilant to the possibility that private markets could be more efficient in some cases. Most importantly, we identify the need to develop markets policy in the round rather than issue by issue. This is because measures designed to pursue one goal might impede pursuit of another goal. There are many trade-offs to consider and there are dependencies between primary and secondary markets. After analysing the primary and secondary markets in-depth, we suggest strategic paths for how the Commission might best deliver a CMU.

Primary markets

Primary markets are a type of platform, on which the buyers and sellers are investors and investees in equities. Platforms need to attract buyers and sellers, and succeed as more buyers and more sellers join. Balancing the interests of investors and investees was therefore important in our analysis, which focuses on:

- regulation (section 3);
- reasons for listing and de-listing (section 4);
- economics of listing for small firms (section 5);
- cross-border listing in the EU (section 6);
- reasons why large unlisted firms may not seek to list (section 7);
- the IPO process (section 8).

Our analysis shows that the number of listings in the EU-28 declined by 12%, from 7,392 in 2010 to 6,538 in 2018, while GDP grew by 24% over the same period.¹ Large financial centres (Frankfurt, Paris and London) saw declines in listings. 8,000–17,000 large companies in 14 EU member states are eligible to list but not seeking to do so.² We have been witnessing the partial eclipse of the public corporation.

Key issue 1: what is driving the decline in listings?

The decision to list depends on the net benefits to a firm of going public outweighing any negative impacts. The top benefits to listing identified in our analysis are the exit route for existing shareholders, facilitation of acquisitions, and access to additional equity. Listing also signals commitment to governance standards—hence many Asian and African firms list in the UK or USA.

Feedback from market participants indicates that the initial and ongoing costs of becoming a public company have risen considerably in recent decades, and widened the gap between public and private companies. The costs of listing are direct (fees) and indirect (agency costs, under-pricing, risk management, litigation, and regulation). We estimate the total financial cost to be in the region of 5–15% of gross proceeds, and typically more for those raising smaller sums. These costs matter, as we see in sections 4 and 5.

Increased M&A activity along with the development of private equity markets are identified as the major driving forces for the decline in listings. Data from the major EU exchanges indicates that delistings have predominantly been driven by increased M&A activity. Some of these delistings have been the result of acquisitions by already listed companies. However, there have also been delistings as a result of private equity firms acquiring listed companies and some technical delistings.

Even though regulation is not the primary driver of the decline in listings, there is room for future modernisation and streamlining of the listing rules. The regulatory costs associated with listing are particularly relevant for smaller issuers, for which alternative private funding options may be more readily available.

The main reasons cited in our issuer survey and structured interviews for voluntarily choosing to delist include the challenges associated with meeting regular financial reporting requirements; the time and cost associated with compliance and administration; annual fees paid to advisers, brokers and exchanges; and requirements to disclose sensitive information.

Key issue 2: what can policymakers do to encourage EU listings?

Firms not listing also brings social costs. Public markets exert market discipline on firms' valuations and organisational behaviour. They also support the democratisation of wealth creation; for example, while pension funds and insurers can invest in private companies, the general public typically cannot. As companies, especially in high-growth disruptive industries, choose to stay private for longer, investors limited to public markets miss out on an increasingly large part of the economy. Also, passive investors using indices have access to increasingly fewer companies, and, as a result, see smaller returns on their investments.³ The key policy question is therefore: what can policymakers do to encourage the development of public equity markets in the EU?

First, we note that not all the drivers of the decline in listings are controllable by policymakers, and set these out in the report:

¹ Oxera analysis based on data from stock exchanges—see section 2.3 of the main report.

² Oxera analysis, based on Orbis data—see section 7. The 14 member states are listed in section A1.3. 8,000 excludes unlisted companies owned by corporates.

³ See section 1.2 for more detail.

- readily available private equity funding;
- continuing low interest rates and the availability of low-cost, debt-based finance;
- tax issues, particularly the bias towards debt over equity in many countries;
- the complexity in disclosure documentation that is due to market practice (e.g. advisers trying to mitigate litigation risk) and increases investor search costs.

Key areas for policymakers

The study identifies five key areas for policymakers to consider.

1. **Revisiting the rules around disclosure to reduce the imbalance between private and public companies**—for example, by evaluating the incremental benefits of disclosure requirements for secondary listings, of quarterly and half-yearly reporting requirements, and of the private company exemption from Environmental Social and Governance reporting. As some reporting requirements are imposed by exchanges not by regulators, we note that there is a role for a co-ordinating authority such as the Commission, with the support of others, to ensure that the overall set of requirements is in the public interest. Policies to support the development of SME growth and other junior market segments are also important, as they reduce the minimum efficient scale for listing. We describe some of these in section 5.
2. **Encouraging flexibility in the use of dual-class shares** where national rules or practices prevent this. One approach is to allow dual-class shares on a time-limited basis, through sunset clauses, to encourage more family-owned firms to seek a listing on public markets. Among the 14 EU member states analysed in-depth in the study, 5,000 family-run companies above €50m in size remain unlisted⁴—this could be a significant source of new listings.
3. **Promoting institutional investor participation in IPOs**—by reconsidering regulatory costs or restrictions on pension funds and insurance companies, and possibly other financial firms, investing in public equity markets. The Commission's review of equity capital charges under Solvency II is important here. The Commission could also prompt member states to reconsider national restrictions on pension funds.
4. **Improving corporate governance standards to keep down agency costs.** Here, the appropriate policy response depends on the context. In countries where ownership is fragmented, the aim should be to reduce impediments to blockholder control. In markets where there is already concentrated ownership, the aim should be to prevent exploitation of outside shareholders. It is healthy to have competition between different forms of company ownership in the Single Market—policymakers should not take away all benefits of a family-run business, but should aim to stop expropriation of outside shareholders.
5. **Attracting retail investors, a potentially large source of capital, to invest in public equity markets.** Book-building has reduced the role of retail investors in IPOs, but policymakers could require book-builders to use technology to make a small proportion of allocations directly available to retail investors. This would not compromise price formation as it is driven by institutional investors. For smaller stocks, policymakers could explore whether lighter regulation could catalyse the development of investment vehicles focused on SMEs.

⁴ Oxera analysis, based on Orbis data—see section 7.

Secondary markets

Secondary equity markets are where investors buy and sell shares. A well-functioning equity market provides liquidity and a reliable price-formation process. These market functions allow investors to (re)allocate their asset holdings at low cost, enabling them to manage their financial risks according to their preferences. More efficient secondary markets also lower the cost of raising capital for issuers in the primary markets.

We find the following trends in trading activities in EU equity markets.

- Equity trading in the EU (including the UK) has been fairly stable.
- There is significant home bias in equity trading. A large share of the cross-border trading activity comes from other EU member states.
- Cross-border trading is mostly concentrated among stocks in large financial centres. Consolidation of some exchanges and the growth of alternative trading platforms has mostly occurred in Western Europe, while equity trading in Central and Eastern Europe has remained more independent, with the exception of Nasdaq Baltics.
- Insurers and pension funds account for 30% of domestic investment in large and mid-size financial centres, compared to 9% in small financial centres.

Our analysis indicates that increased competitive pressure has led to the following.

- Lower trading fees
- More choice for traders and investors

The benefits from competition have been felt mainly in the large and well-established financial centres. Smaller financial centres—such as those in Central and Eastern Europe—have not yet seen the benefits from new entry.

Key issue 3: what can policymakers do to encourage EU equity trading?

Given the trends observed in secondary markets, we advise that policymakers embrace the choice and innovation taking place in equity markets, while being mindful of protecting price formation.

Our analysis indicates that, despite an increase in trading fragmentation, implicit costs of trading have not increased (i.e. market liquidity has not decreased). This is because traders have access to the necessary technology to search for the best available option to execute their trade. Although market depth has reduced, traders deal with this in a variety of ways to minimise market impact and implicit costs. However, it remains important to monitor liquidity, using a range of measurements (including implementation shortfall to capture market impact), on a regular basis across EU markets, to establish a well-rounded view of the development.

While there has been an improvement at the aggregate EU level, liquidity is still a major concern for SMEs and small financial centres. Two recent developments have further challenged SME liquidity: new rules on unbundling of trade execution and research fees may have a negative impact on small companies, which generally receive much lower research coverage than large ones; and the increasing popularity of passive investment (specifically ETFs) has benefited liquidity in large-cap stocks rather than small caps.

Local capital markets

Our analysis indicates that most of the competition benefits from MiFID I have been felt in the large financial centres, rather than small financial centres.

The absence of larger pan-European CCPs operating in smaller financial centres makes it commercially less attractive for brokers to trade in stocks domiciled in smaller financial centres and for new trading platforms to enter.

Key areas for policymakers

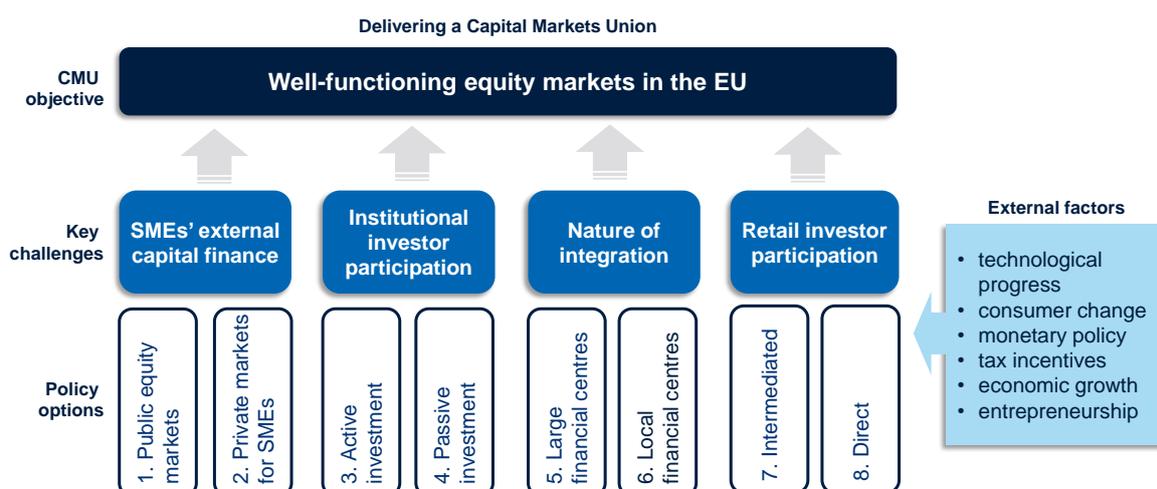
Oxera's study identifies five key areas for policy focus specifically aimed at improving liquidity for SMEs and local capital markets.

1. **Investigating the role of the EIF and/or EBRD to act as an anchor investor to crowd in additional investment in each region**, and supporting the development of the local ecosystem for services, such as fund management, equity research, and IPO advisers.
2. **Attracting more institutional investment into local capital markets**: reviewing restrictions on their ability to invest in equity; investigating the commercial barriers to the adoption of indices in these markets; and requiring classification of the relevant countries as 'emerging' or 'frontier' to enable their inclusion in the relevant indices.
3. **Promoting open access and interoperability links between CCPs, or facilitating cross-border mergers at the market infrastructure level**, and more broadly, supporting the development of pan-European infrastructure and ecosystem.
4. **Encouraging more investment in SMEs**: options include supporting the creation of fund structures to facilitate the investment of diversified pools of SME stocks; policies to promote the provision of equity research; and promoting the use of tax incentives for investing in small stocks.
5. **Strengthening corporate governance** to build public trust in equity markets and raise standards in jurisdictions where local requirements are in practice weaker.

How might the Commission best proceed to deliver a CMU?

We have identified four key challenges to achieving the delivery of a CMU. Each challenge could be addressed in a different way depending on the political direction of the EU. Combining each of the four key challenges with two alternative options for delivering the CMU results in eight possible development paths. Each path has different implications for the prioritisation of policy action, and there are important choices for the Commission to make in terms of which development path, or paths, to follow. This is discussed in detail in section 14. Some policies support more than one development path and may therefore have a high pay-off in terms of developing capital markets. However, it is not certain that these policies will produce the greatest net benefits overall. The Commission should consider the operation of the EU's equity markets in the round, to identify a set of policies that, overall, will produce a successful market design.

Development paths to deliver CMU



Source: Oxera.

Adoption of new technologies can improve market outcomes, and competition is a critical driver of that adoption. Therefore, the Commission's policies need to be tilted towards promoting competition wherever this will not entail major risks. Regulation needs to be flexible enough to allow the industry to benefit from the new technologies, keeping in mind the unique economic features of the market.

Events, such as Brexit and COVID-19, need not distract the EU from achieving its CMU vision. They might necessitate specific market-monitoring, but policymakers need to remain focused on ensuring that equity markets carry out their primary function of providing the finance to enable the European economy to flourish, and to calibrate any response to Brexit and COVID-19 in light of overall market data and other evidence.

The Commission should in any case launch an annual market-monitoring exercise using data on primary markets, SME access to funding, liquidity performance, levels of trading and post-trading integration. The wealth of evidence in this report can be used to select the most useful data. If the data indicates that markets are not growing or integrating, the Commission could launch an in-depth analysis of the relevant markets with a view to enhancing their functioning. In particular, the nascent equity markets in mid-sized and small financial centres would benefit from close monitoring, with high-quality data collected for future policy interventions if required.

1 Introduction

1.1 Objectives and remit

DG FISMA commissioned Oxera to undertake a study on the functioning of primary and secondary equity markets in the European Union (EU). The main objective is to provide a comprehensive analysis of these markets, focusing on listing and delisting decisions and the drivers of liquidity.

This report answers the following key questions.

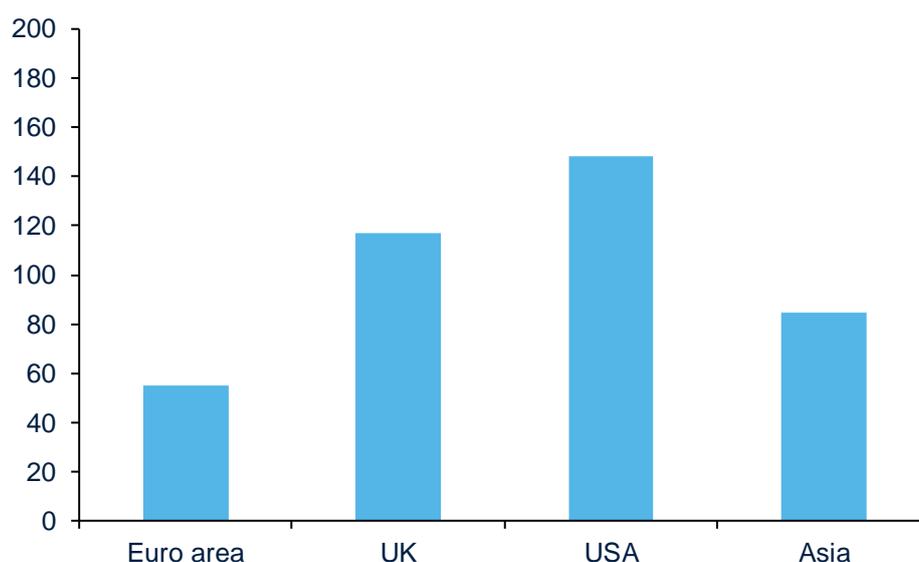
- What are the main reasons for European firms choosing to list or delist? Why do some choose to remain private?
- What drives the choice of listing venues? Why do some issuers choose to list in countries outside the EU?
- Are there any barriers in the IPO process in the EU?
- How has the structure of secondary markets developed across the EU, especially as a result of greater competition among trading venues following MiFID I?
- Has the market structure resulted in greater choice and innovation, and how has this affected investors?
- Has the introduction of competition at the trading level further fragmented trading and liquidity? How have trading costs, both explicit and implicit, evolved across various markets in the EU?
- Are there barriers preventing further development of secondary equity markets in the EU?

This report also considers scenarios for the architecture of equity markets in the EU and the policy measures required to support the European Commission's vision of a Capital Markets Union (CMU).

1.2 Why a study on equity markets now?

Well-functioning public equity markets provide an effective way to share risk, and to allocate capital efficiently between savers and borrowers in an economy. Growing firms use the initial public offering (IPO) market to raise both their funds and their profiles, helping them to scale up; while, perhaps more importantly, for early-stage investors, the IPO market provides liquidity. Public equity markets also exert market discipline on firms' valuations and organisational behaviour.

While equity markets were first developed in the EU, they have become fragmented and, in some cases, are not very well-developed. In global terms the EU has fallen behind—for example, the USA, despite having a similar-sized economy to the EU, has much more active public equity markets (see Figure 1.1 below).

Figure 1.1 Size of public equity markets as % of GDP, 2018

Note: Asia refers to East Asia and the Pacific. World Bank market capitalisation data is not available for the UK, so London Stock Exchange data has been used instead.

Source: World Bank, London Stock Exchange data.

The decline in listings seen in the EU/the euro area is representative of a global trend of declining public equity markets. The average value of listed companies has risen and firms are taking longer to list than before.

An important policy question is what this means for the democratisation of wealth creation and retail participation in stock markets, and what is the impact on the real economy? As companies, especially ones in high-growth disruptive industries, choose to stay private for longer, investors limited to public markets miss out on an increasingly large part of the economy. Also, passive investors using indices have access to increasingly fewer companies, and, as a result, see smaller returns on their investments.⁵

Another major issue is the separation of ownership from control, and the agency costs that arise from the need for investors to monitor the activities and performance of businesses they own but do not control. In addition, being a public corporation comes with additional obligations and responsibilities in terms of disclosure, reporting and public expectations.

There is also a question around the international competitiveness of listings on European stock exchanges, with a number of larger European firms recently seeking to list on exchanges outside of Europe, in the USA or Asia, rather than in Europe.

We have also seen fundamental changes over the past decade in the markets for equity trading and post-trading in Europe, as competition has been introduced and costs have fallen. These have been facilitated by technological developments and regulatory changes.

Policymakers are eager to understand what can be done to reduce the barriers to more firms, particularly small and medium-sized enterprises (SMEs), listing in Europe and to

⁵ For further discussion on the performance of investing in private versus public stocks. See, for example, Harris, R.S., Jenkinson, T.J., and Kaplan S.N. (2014), 'Private equity performance: what do we know?', *Journal of Finance*, **69**:5; Akguc, S. Choi, J. and Kim, S. (2015), 'Do private firms perform better than public firms?', working paper; and Boyer, B. Nadauld, T. Vorkink, K. and Weisbach, M. (2019), 'Private equity indices based on secondary market transactions', working paper; and Korteweg (2019), 'Risk adjustment in private equity returns', *Annual Review of Financial Economics*, **11**, pp. 131–52.

promote more efficient secondary markets. This applies to both financial centres that are more developed and the smaller, local capital markets.

With the exit of the UK from the EU, this is a particularly important time for policymakers to take stock and assess what is working well, and what can be done to further improve the functioning of these markets in Europe.

1.3 Our approach

This study has been prepared in collaboration with Oxera's team of academic equity market advisers and the industry.

We were advised by our team of academics: Professor Marco Becht of Vrije Universiteit Brussel; Professor Álvaro Cartea of the University of Oxford; Professor Luca Enriques of the University of Oxford; Professor Julian Franks of London Business School and Oxera Partner; Professor Tim Jenkinson of University of Oxford and Oxera Partner; Professor Dr Christoph Kaserer of Technical University of Munich; and Professor Philip Maume of Technical University of Munich.

We also hosted a roundtable on the future of equity markets in November 2019 in Brussels, with chief executive officers (CEOs), chief finance officers (CFOs) and Board members of trading venues, brokerage firms, fund management firms and large corporations; and market experts.

For more information on the information sources used for this report, see Appendix A1.

1.4 Structure of the report

This report is structured as follows.

- Section 2 gives an overview of the primary and secondary equity markets of all trading venues, regulated markets and multilateral trading facilities (MTFs).
- Sections 3 to 8 provide in-depth analysis of the primary markets.
- Sections 9 to 13 present in-depth analysis of the secondary markets.
- Section 14 sets out development paths for the architecture of equity markets in the EU and the potential policy mix.

The appendices contain more detailed information on the data sources and additional supporting material used for the analysis.

Section 2 covers analysis of the EU-28 and EU-27,⁶ giving an overview of EU equity markets, while sections 3–13 provide more in-depth analysis on the 14 EU member states set out in the tender for this study (see Table 1.1). The European Commission and Oxera selected these countries with a view to achieving broad coverage of all aspects of the EU-28 economies and capital markets.

⁶ This report provides analysis of the EU-27 as well as the EU-28, given the important role of the UK as the largest European equity market, and the implications of its departure from the EU.

Table 1.1 EU member states for in-depth analysis

Bulgaria	Ireland
Croatia	Italy
Estonia	The Netherlands
France	Poland
Germany	Slovakia
Spain	Sweden
Hungary	The UK

2 An overview of equity markets in the EU

2.1 Introduction

This section gives an overview of primary equity markets in the EU:

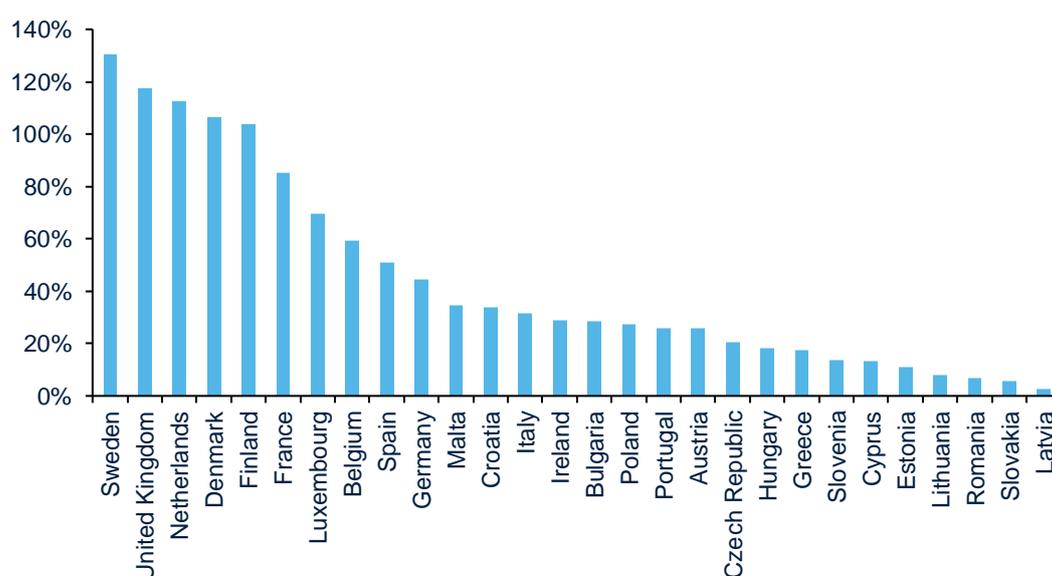
- section 2.2 describes the typical funding mix of companies.
- section 2.3 summarises the main characteristics of listed firms, including the trends in their number and size over time.

2.2 Funding mix of European companies

Firms can fund investment projects through debt or equity. Debt-based finance options include bank loans, bond markets and the private debt markets. Equity fundraising can be done via public equity markets or unlisted shares in private equity markets.

While public equity markets in Europe are on average smaller than in the USA and Asia, there is much variation across EU member states. Figure 2.1 shows the size of public equity markets across the member states, measured by the market capitalisation of companies listed in each country as a percentage of their GDP.

Figure 2.1 Market capitalisation as a % of GDP, 2018



Note: Market capitalisation covers listed domestic companies (and foreign companies with an exclusive listing in that country). Data excludes investment funds, unit trusts and companies for which the only business goal is to hold the shares of other listed companies.

Source: World Bank and Oxera analysis of stock exchange data.

These member states broadly fall into one of four groups:

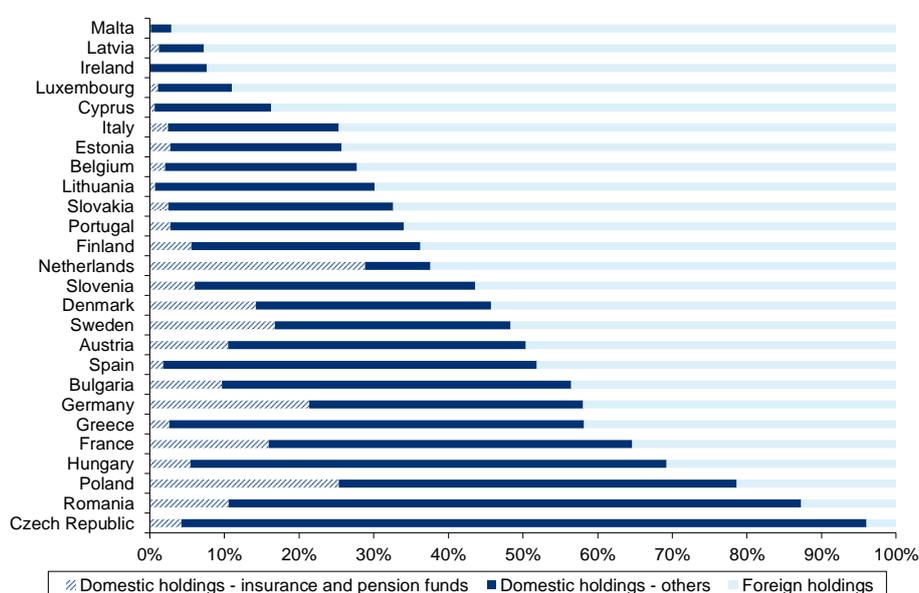
- those with relatively well-developed public equity markets for the size of their economy, which also have well-developed private pension and insurance systems⁷—for example, Denmark, the Netherlands, Sweden and the UK;

⁷ See, for example, Figure 1.3 in OECD (2019), 'Pension Markets in Focus', <https://www.oecd.org/daf/fin/private-pensions/Pension-Markets-in-Focus-2019.pdf>.

- newer member states, where capital markets have developed more recently, and where there are small public equity markets—for example, countries in Central and Eastern Europe;⁸
- those where households typically rely on the state for their pensions.⁹ Combined with a well-known and well-documented home bias¹⁰ in EU pension and insurance investments (see below),¹¹ this reliance affects the amount of money available for investment in public equities—for example, France, Italy, Portugal and Spain;
- those whose corporate sector tends to rely more on bank-based finance than market-based finance—for example, Austria and Germany.

The more developed public equity markets (in the Netherlands, Sweden, and the UK) are in the countries with the largest private pension systems. Most EU markets have significant home bias in EU pension and insurance investment, and this is often at least 50%, if not more: 60% in Spain, 70–75% in Germany, the Netherlands and Austria; and 80% in France (see Figure 2.2).¹² This emphasises the important role of local pension systems in developing equity markets in Europe.

Figure 2.2 Breakdown of investor types in EU equity markets, 2018



Note: Equity refers to both listed and unlisted shares. The residence of each institutional investor is defined according to the economic territory with which it has the strongest economic interest. Our analysis merges two datasets from the International Monetary Fund (IMF) (from the Coordinated Portfolio Investment Survey) and the European Central Bank (ECB) (from the compilation of European sector accounts). This data does not include Croatia and the UK.

Source: Oxera analysis of IMF and ECB data.

For many European member states, the public equity markets are relatively underdeveloped, although there is still a significant amount of equity financing, via unlisted

⁸ See, for example, Baele, L., Bekaert, G. and Schäfer (2015), 'An anatomy of central and eastern European equity markets', EBRD Working Paper, No. 181.

⁹ See, for example, Figure 1.3 in OECD (2019), 'Pension Markets in Focus', <https://www.oecd.org/daf/fin/private-pensions/Pension-Markets-in-Focus-2019.pdf>.

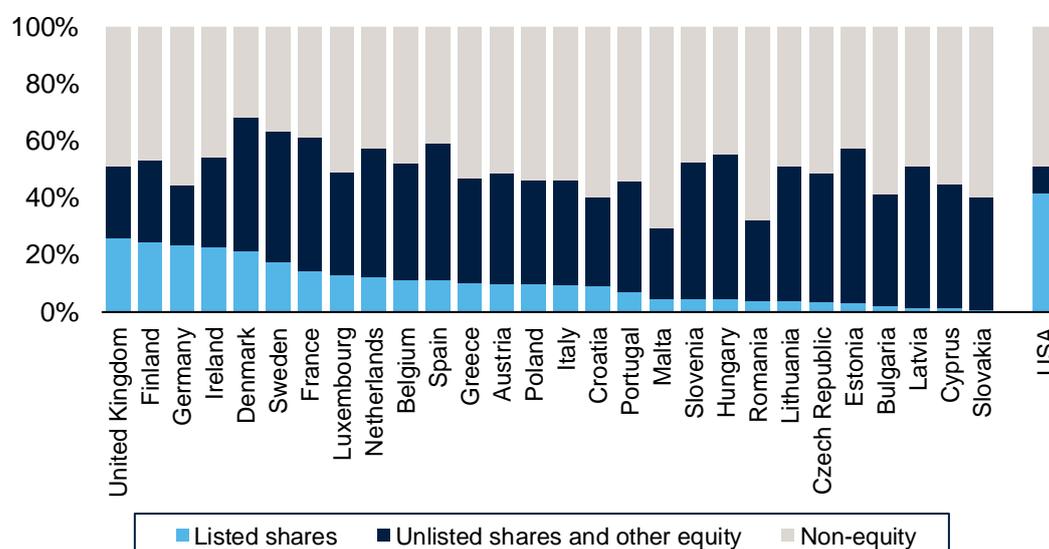
¹⁰ A tendency for investors to hold the majority of their portfolio in domestic equities.

¹¹ See International Monetary Fund (2019), 'A Capital Markets Union for Europe', SDN/19/07; European Central Bank (2018), 'Financial integration in Europe', May; European Commission (2017), 'Impact Assessment on pan-European Personal Pension Product (PEPP)', Staff Working Document, section 2.1.

¹² International Monetary Fund (2019), 'A Capital Markets Union for Europe', SDN/19/07.

shares (see Figure 2.3). While businesses' overall leverage (the debt to equity ratio) is fairly similar between the EU and the USA, there is a much larger share of market-based financing in the USA.

Figure 2.3 Funding mix of European businesses in the EU, 2018



Note: The breakdown shows non-financial corporations' total financial liabilities accounted for by listed shares, unlisted shares and other equity, and non-equity financing respectively. Listed shares are equity securities listed on an exchange, which may be a recognised stock exchange or any other form of secondary market. Unlisted shares are equity securities not listed on an exchange. Other equity comprises all other forms of equity, such as the equity in incorporated partnerships. Non-equity includes all other forms of financial liabilities, such as debt securities, loans, pension entitlements and trade credit.

Source: ECB/Eurostat, Federal Reserve System.

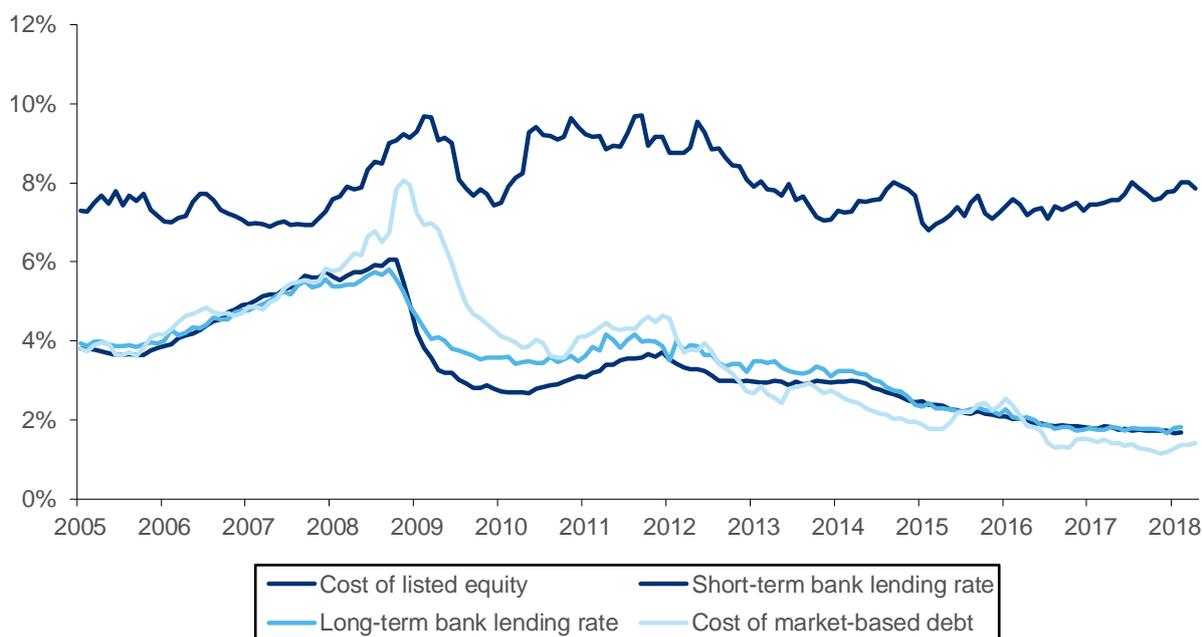
Private capital can be raised by venture capital investors, hedge funds, corporations, and mutual funds. In recent years, there has been a significant increase in mutual funds participating in private markets,¹³ and private equity has become more readily available for mid-sized corporations, with an increase in private equity investment. For example, the ratio of public equity to non-public equity held by euro area investment funds fell from almost 20:1 in 2015 to 6:1 in 2019.¹⁴ Infrastructure financing by direct equity investment in projects in Europe also grew by 58% in 2018, to \$34bn.¹⁵ Furthermore, there has been an emergence of private debt markets, dominated by funds rather than banks. Many large institutional investors increasingly see greater benefits from direct equity ownership and financing of private companies due to greater control and lower demand for liquidity than is typical for public companies (discussed further in section 7). Meanwhile, the cost of borrowing for firms in the euro area has declined to very low levels (see Figure 2.4), making debt-based finance more attractive.

¹³ Kwon, S., Lowry, M. and Qian, Y. (2020), 'Mutual fund investments in private firms', *Journal of Financial Economics*, **136**:2, pp. 407–443.

¹⁴ Oxera analysis of ECB Investment Fund Balance Sheet Statistics.

¹⁵ Based on Prequin data. See, for example, exhibit 1 in McKinsey (2019), 'Private markets come of age'.

Figure 2.4 Nominal external financing costs of non-financial corporations in the euro area, 2005–18

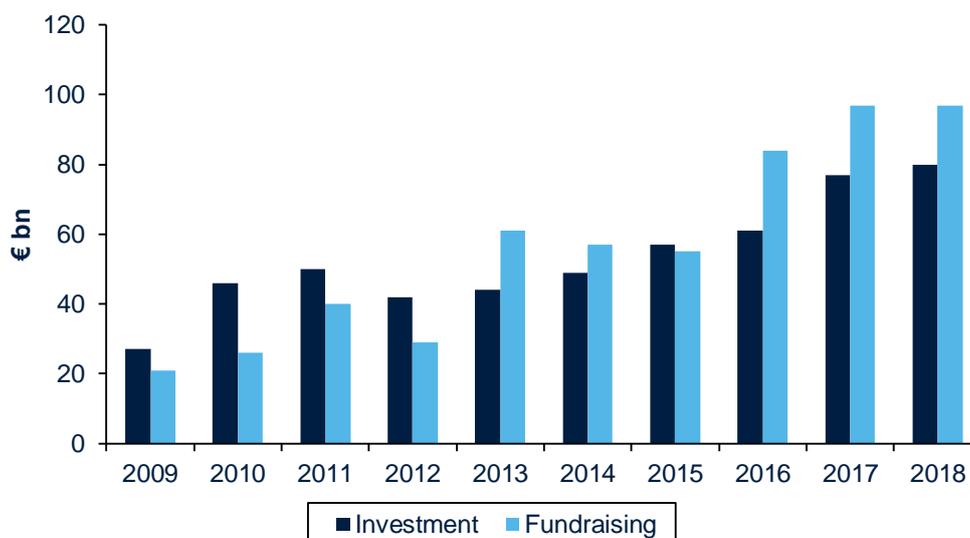


Note: 'Short- and long-term bank lending: February 2018; Cost of listed equity and of market-based debt: March 2018'.

Source: European Central Bank (2018), 'Measuring and interpreting the cost of equity in the euro area', *ECB Economic Bulletin*, Issue 4/2018, https://www.ecb.europa.eu/pub/economic-bulletin/articles/2018/html/ecb.ebart201804_02.en.html#toc3

Although difficult to quantify exactly, the incentives for companies to list and raise funds on public equity markets have clearly significantly reduced in this changed environment. Figure 2.5 shows the increase in private equity investment and fundraising, and thereby gives an indication of the impact.

Figure 2.5 Private equity investment and fundraising by European offices,¹ 2009–18



Note: ¹ The value of investments and fundraising made by the European offices of private equity firms. Included here are private equity funds making direct private equity investments, mezzanine

private equity funds, co-investment funds and rescue/turnaround funds. Excluded from the chart are infrastructure funds, real estate funds, private debt funds, distressed debt funds, primary funds of funds, and secondary funds of funds. Total investment by European private equity offices may differ from the total value of private equity investment in European companies. In particular, this data does not cover investment in European companies by general partners without a European office. Higher levels of fundraising compared to investment imply that private equity firms have increasing levels of unallocated capital, or 'dry powder'. Higher levels of investment compared to fundraising imply that private equity firms are drawing on unallocated capital reserves to fund investments.

Source: Invest Europe.

2.3 Characteristics of public company listings

This section gives an overview of primary equity markets based on new and extensive data collected from EU stock exchanges as part of this study, supported by existing databases. See Appendix A1 for information on the data sources used.¹⁶

2.3.1 Global trends in equity markets

High-level analysis of financial centres across the world highlights the contrasting trajectories of European and Asian public markets. European public markets have shrunk in terms of the number of listed companies since the 1990s, whereas Asian markets have grown.

As shown in Figure 2.6 below, there are important differences in the trends observed in the USA and Europe compared with Asia.¹⁷

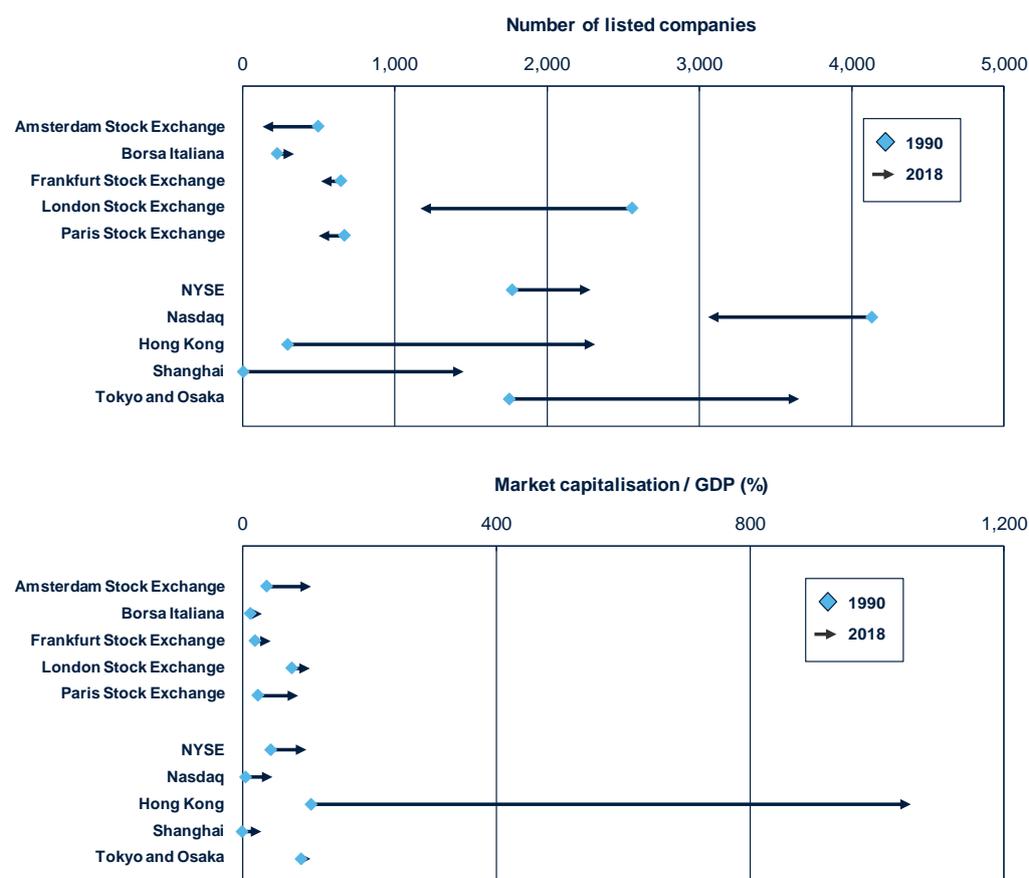
- In the USA and Europe, there has been a significant reduction in the number of listed companies on the largest stock exchanges. The trends in the USA are well-documented in the academic literature. For example, Doidge et al. (2018) report that there were 5,895 public listed US firms in 1989, 7,509 at the peak in 1997, but only 3,618 by the end of 2016.¹⁸ As seen in Figure 2.6, the US trend is driven by Nasdaq, although it has been mitigated by an increase in listings on the New York Stock Exchange (NYSE). We explore the trends in the EU in more detail in the next section.
- In Asia, however, the largest stock exchanges (Hong Kong, Shanghai and Tokyo) have seen a significant increase in the number of listed firms. This partly reflects the growth rate of the Asian economies and the fact that they are starting from a lower base number of listed companies.

¹⁶ The analysis in this section does not distinguish between primary listings—defined in this report as listings on the exchange where the first IPO took place—and secondary listings. There are relatively few dual listings in the EU, and the breakdown between IPOs in the EU and secondary listings is more closely analysed in section 6.

¹⁷ See Appendix 14.7A2.1 for the detailed data.

¹⁸ See, for example, Doidge, C., Kahle, K.M., Karolyi, G.A. and Stulz, R.M. (2018), 'Eclipse of the Public Corporations or Eclipse of the Public Markets?', *Journal of Applied Corporate Finance*, **30**, pp. 8–16.

Figure 2.6 Global trends in the number and market capitalisation of companies listed on the major stock exchanges, 1990–2018



Note: The number of listed companies refers to the number of domestic and foreign listings on each exchange. Market capitalisation refers to the total capitalisation of domestic companies and exclusively listed foreign companies on each exchange.

Source: Oxera analysis of data from stock exchanges factbooks, the World Federation of Exchanges (WFE) and the World Bank.

The overall size of public equity markets has grown in all major stock exchanges since 1990, both in absolute terms and relative to GDP (see the bottom panel of Figure 2.6 and Appendix A2.1 for more detail). Total market capitalisation on the ten largest global stock exchanges combined increased from \$7,789bn at the end of 1990 to \$52,492bn at the end of 2018. This is a compound annual growth rate (CAGR) of 7% per year. It is important to put this growth in the context of a period of general inflation, changes in dividend policy (with more share repurchases), and sustained asset purchases of the central banks in these economies over the same period.

2.3.2 Analysis of European public equity markets

This section gives a more detailed overview of equity markets in the EU, as measured by:

- the number and value (market capitalisation) of listed companies;
- trends in equity issuance (IPO and follow-on);
- the typical company age at the time of the IPO; and
- the volume and value of trading.

Most data in this section was obtained from a data request covering 60 trading venues in the EU, supplemented with data from WFE, the Federation of European Securities Exchanges (FESE) and Bloomberg. Where possible, certain financial vehicles¹⁹ have been removed in order to focus on listed companies that produce goods and services.²⁰

Number of companies listed

Figure 2.7 below shows the change in the number of listed companies between 2010 and 2018. In the EU-27, the total number of listed companies (on both main markets and junior markets) declined from 5,414 in 2010 to 5,024 in 2018. The UK has seen a similar trend, and the decline of listed companies on the EU-28 exchanges (i.e. including the UK) was from 7,392 to 6,538 over the same period.

Over the same period, total market capitalisation on the EU-28 exchanges combined increased from €8,334bn to €10,257bn. This is a CAGR of 2.6% per year,²¹ and compares to an average EU-28 GDP growth rate of around 2.7% per year over the same period.

There has been some variation in trends across member states and exchanges.

- Italy and Sweden have witnessed a large increase in listings, specifically on AIM Italia, the Nasdaq First North market and Nordic Growth Market's Nordic MTF. One success factor for these exchanges has been the tax incentives (discussed further in section 5).
- Poland has also seen a large increase in the number of listings, supported by favourable economic conditions, but has also experienced a small decline in total market size (in terms of market capitalisation) over the same period. This reflects a large number of small companies seeking to list on the Warsaw Stock Exchange.
- Germany and the UK have seen large reductions in the number of listings—on both the main and junior markets of Deutsche Börse and the London Stock Exchange. The same holds in France, albeit to a lesser extent, which has seen slight increases in the number of listings on Euronext Growth, but a large reduction on Euronext Access.
- There has also been a decline in the number of listed companies in many of the smaller Central and Eastern European financial centres and all three Baltic exchanges.

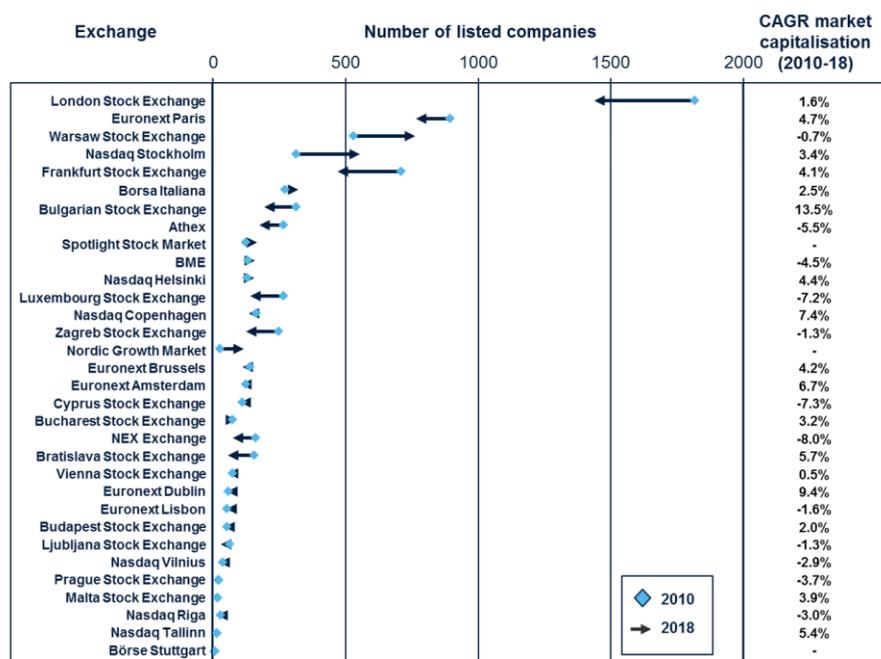
¹⁹ Namely, investment funds, investment trusts, exchange-traded funds, venture capital trusts, real estate investment trusts (REITs) and special-purpose acquisition companies.

²⁰ More detail on the data collection and cleaning process is set out in Appendix A1.2.

²⁰ See Appendix 14.7A2.1 for the detailed data.

²¹ Table A2.4 shows the change in market capitalisation of listed companies across EU stock exchanges since 2010.

Figure 2.7 Number of listed companies and changes to market capitalisation in Europe, by exchange, 2010–18



Note: See Appendix A2.2 for the data.

Source: Oxera analysis of stock exchange data; WFE.

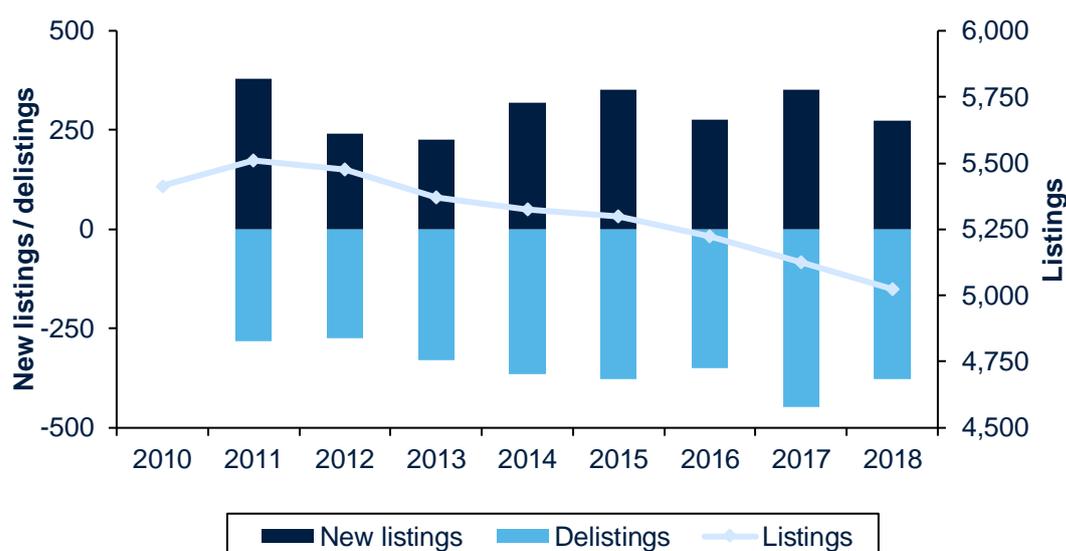
What is driving the reduction in listings?

For the number of listed firms to decline, firms must be leaving public stock exchanges more quickly than others are entering. New listings in Europe have been extremely low over the last decade. From 2014 to 2018, the average annual number of new listings was 437, according to our dataset.²² In contrast, the average number of new listings between 1995 and 2005 was 554 on the major European exchanges.²³

The lower panel of Figure 2.8 below shows that this gradual decline has occurred as new listings in EU-27 markets have failed to keep pace with a steady flow of delistings. Delistings can occur due to merger and acquisition (M&A) activity, bankruptcy and/or strategic decisions by the company owners to become private (for more detail, see section 7).

²² New listings are defined mathematically—i.e. inferred from the differences between years in the panel.

²³ Based on WFE data on new listings (domestic and foreign) for Borsa Italiana, Deutsche Börse, Euronext Amsterdam and Euronext Paris, and the London Stock Exchange.

Figure 2.8 Number of listed companies in the EU-27, 2010–18

Note: Due to missing data, delisting numbers for Deutsche Börse Scale are imputed using the number of existing listings and the number of new listings.

Source: Oxera analysis of stock exchange data; WFE.

Behind the EU-level trend of a gradual decline in listings, there is significant variation across markets and member states. Figure 2.9 below shows the net change in listings across member states. Sweden and Poland partially offset a broader decline across other member states. Some of this variation can be readily explained. If a country has relatively immature capital markets, the rate of growth should also be expected to be higher. Former Communist countries did not have capital markets in 1990, so these countries have started from a zero base. The stock market in Poland is a good example of this.

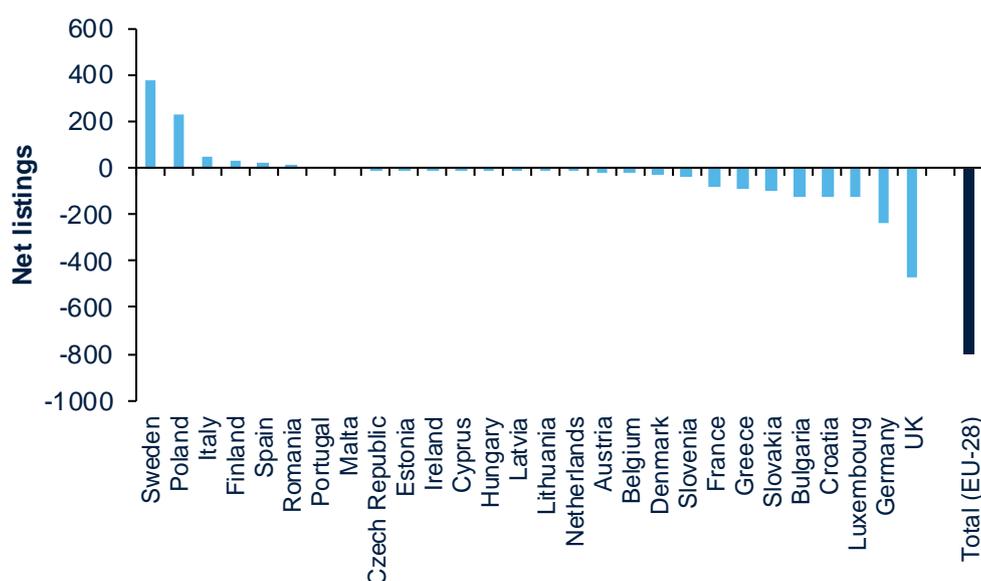
Furthermore, higher economic growth and stock market expansion are related. Some of the economies that have grown (e.g. Poland) also have stock markets that have experienced strong levels of growth over the same period. On the other hand, other stock markets, such as Spain, experienced sustained and significant expansion in listed stocks before the financial crisis in 2008, but this trend has tailed off as growth has declined.

Other markets have been either fairly flat or in a long-term decline for a sustained period. This is the case for France, Germany, the Netherlands and the UK.

Analysis of recent delistings from the main markets in the UK, France and Italy (where the most complete delisting information is available) indicates that most delistings were either voluntary (i.e. companies choosing to go private) or due to acquisition (discussed further in section 4.5).

More broadly, while there is significant variation in the net decline of listings across member states, it is important to note that the UK and Germany remain significant financial centres in Europe, despite experiencing a larger absolute reduction in the number of listings.²⁴ The UK's departure from the EU will mean a large reduction in the number of EU listings, although only a small number of EU-27 firms seek to list in the UK, as discussed further in section 6.6.2.

²⁴ In addition, many of the larger EU-27 IPOs are managed out of London. See Jenkinson, T, Jones, H. and Suntheim, F. (2018), 'Quid Pro Quo? What Factors Influence IPO Allocations to Investors?', *The Journal of Finance*, **73**:5, pp. 2303–2341.

Figure 2.9 New listings net of delistings in the EU-28, 2010–18

Note: Calculated as the number of listings in 2018 minus the number of listings in 2010. See note to Figure 2.8.

Source: Oxera analysis of stock exchange data; WFE.

Trends in equity issuance (IPOs and follow-on)

Figure 2.10 below shows the value of new equity issuance on EU exchanges. The low issuance in 2012 coincides with the height of the euro area financial crisis. The peak value in 2015 was driven by several large IPOs, including Aena (on BME), ABN Amro (on Euronext Amsterdam) and Worldpay (on the London Stock Exchange).

Figure 2.10 Primary and follow-on equity issuance on EU-28 exchanges, 2010–19

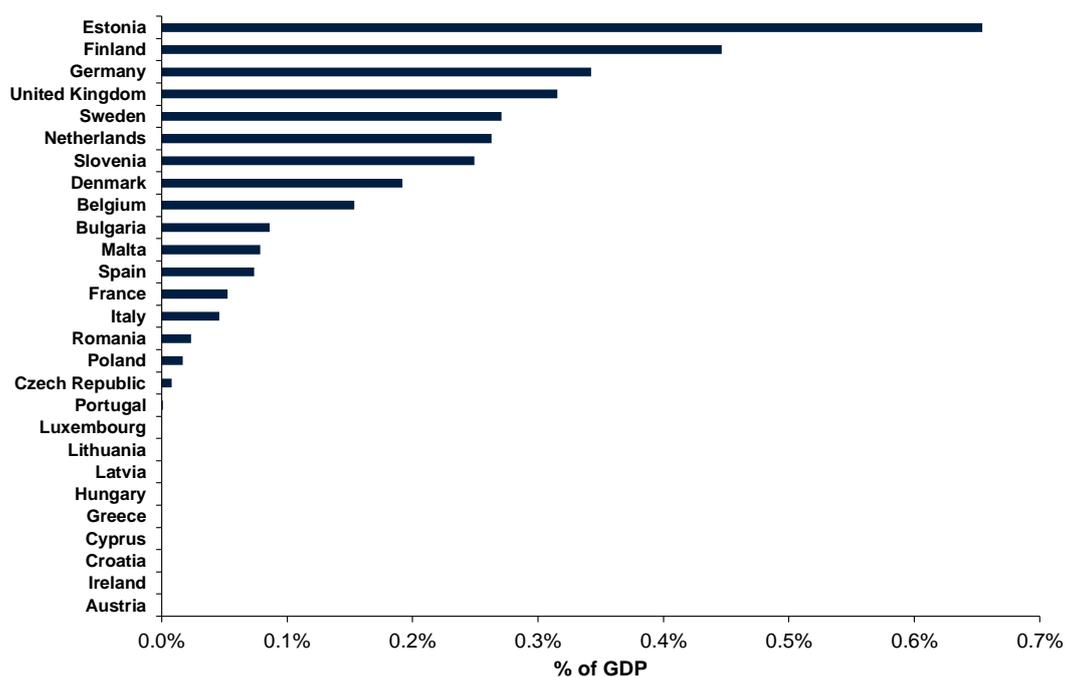
Note: Data covers Dealogic deals categorised as 'ECM-FO' or 'ECM-IPO' with a Deal Subregion or Exchange Subregion of the EU-28. Excludes money raised by certain investment funds and REITs. Data converted from \$ to € using year-average ECB rates.

Source: Dealogic.

Figure 2.11 below presents the value of IPO equity underwriting on stock exchanges in different member states in 2018 as a proportion of GDP. The country-level data shows the following.

- The large volume in Estonia was driven by the IPO of the Port of Tallinn, which raised €147m in 2018—the largest IPO in Estonia for more than 12 years. (See Box 4.5 in section 4 for more detail on this IPO.)
- In Finland, although trends generally follow the larger adjacent markets, the high level of issuance activity in 2018 was supported by an improved economic situation and a new wave of start-ups and innovation, alongside a strongly performing domestic stock market (Nasdaq Helsinki).
- IPO equity underwriting on German and UK exchanges combined exceeded €16bn in 2018. The high level of German IPO activity was driven by the two largest European IPOs taking place on Deutsche Börse (Knorr–Bremse and Siemens Healthineers). London IPO equity underwriting volumes were driven by the IPOs of UK-based car manufacturer, Aston Martin Lagonda; Czech-based cybersecurity firm, Avast (one of the largest technology IPOs in London); and the pan-African distributor of Royal Dutch Shell brands, Vivo Energy (a dual IPO on the London Stock Exchange and Johannesburg Stock Exchange).
- Several member states recorded minimal or no IPO equity underwriting activity on their exchange. Some of them also saw no follow-on equity underwriting in 2018.

Figure 2.11 IPO equity issuance as a % of GDP, by member state, 2018



Note: Data covers Dealogic deals categorised as 'ECM-IPO' with a Deal Subregion or Exchange Subregion of the EU-28. Excludes money raised by certain investment funds and REITs. Data converted from \$ to € using year-average ECB rates.

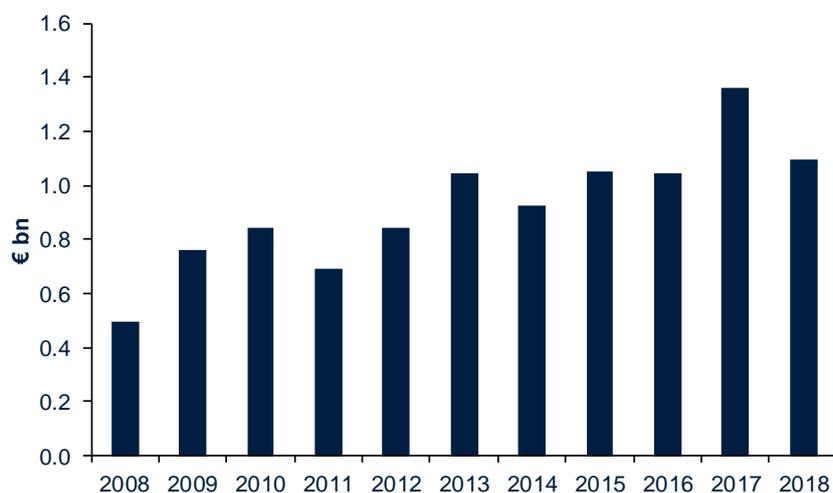
Source: Dealogic.

Average size of listed company

As noted above, the overall trend in Europe has been a decrease in the number of listings and an increase in market capitalisation. Naturally, this implies an increase in the average size of listed company.

Figure 2.12 provides an estimate for the average (mean) size of listed companies on major European exchanges, based on WFE data. It shows a gradual increase in the average company size across most EU-28 exchanges. This increase has been driven mainly by the volume of M&A activity in public markets (section 4 analyses why delistings have occurred), as well as secondary raisings in equity markets (see Figure 2.10).

Figure 2.12 Average size of listed companies, 2008–18



Note: Data covers Athex, BME, Borsa Italiana, Bucharest Stock Exchange, Budapest Stock Exchange, Cyprus Stock Exchange, Deutsche Börse, Euronext, Ljubljana Stock Exchange, London Stock Exchange, Luxembourg Stock Exchange, Malta Stock Exchange, Nasdaq, Vienna Stock Exchange, Warsaw Stock Exchange and Zagreb Stock Exchange. Average size calculated as (domestic) market capitalisation divided by the number of listed (domestic) companies. WFE defines domestic companies as those incorporated in the same country where the exchange is located; or elsewhere, but listed only on the exchange in question.

Source: WFE.

Where possible, we have also analysed the size distribution of listed companies using company-level data provided by the individual stock exchanges. For example, Appendix A2 shows the distribution of market capitalisation on the Borsa Italiana and Euronext Paris main markets.²⁵ In particular, the data shows that:

- the distributions of total market capitalisation on these markets are highly unequal, with Gini coefficients of over 0.8.²⁶ This unequal distribution is primarily driven by a few very large companies;
- the relative distributions of company sizes have largely remained unchanged in recent years.

Age at IPO

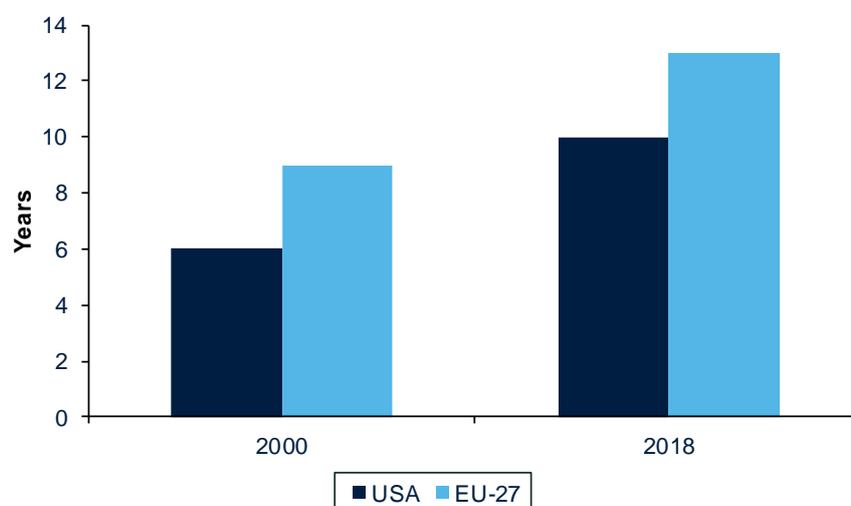
There is some evidence that companies are seeking to list at a later stage than they did previously. Figure 2.13 shows an estimate of the typical age of a company at IPO in Europe in 2000 compared with 2018, based on a random sample of IPOs. These estimates follow a pattern similar to that observed for US IPOs in previous studies. Although we observe

²⁵ Both of these markets have relatively complete market capitalisation data.

²⁶ A Gini coefficient is a measure of statistical dispersion. A Gini coefficient of 0 indicates perfect equality of the distribution, meaning that all values are the same; a Gini coefficient of 1 shows maximum inequality among the values.

that the average age of a company listing in the USA is lower than in Europe, it is not clear whether this difference is significant—these estimates are indicative only.

Figure 2.13 Median age at IPO, 2000 and 2018



Source: EU-27: Oxera estimate, based on a random sample of 40 IPOs taken from Dealogic. USA: Ritter, J.R. (2019), 'Initial Public Offerings: Median Age of IPOs Through 2018', <https://site.warrington.ufl.edu/ritter/ipo-data/>.

2.4 Overview of secondary markets

This section gives a short introduction of our study of secondary equity markets.

Equity trading in the EU has been fairly stable in recent years, based on volume and value traded. In 2018, 2,535bn shares were traded in the EU, at a value of €20,160bn. Table 2.1 and Table 2.2 below show the total value and volume of shares traded on EU stock exchanges, respectively. The data shows that:

- trading activity is concentrated in the larger markets. In 2018, the top six exchanges accounted for 94% of the total value traded and 94% of the total number of shares traded;
- while we observe wide variations in size and growth rates across individual exchanges, there is still a significant gap between average size of large (mostly in Western Europe) and smaller markets (in Central and Eastern Europe);
- the total number of shares traded has declined in most European exchanges, with the exception of Budapest Stock Exchange, Deutsche Börse, Luxembourg SE, Nasdaq Copenhagen, and Prague Stock Exchange.

Table 2.1 Total value of equity value traded on 24 exchanges, 2013 and 2018 (ranked by total value in 2018)

Exchange	End 2013 (€bn)	End 2018 (€bn)	CAGR, 2013–18
Euronext	1,516	1,875	4%
Deutsche Börse Group	1,038	1,542	7%
London Stock Exchange	2,065	1,312	-7%
Borsa Italiana	574	618	1%
BME	691	570	-3%
Nasdaq Stockholm	350	429	3%
Nasdaq Copenhagen	95	186	12%

Exchange	End 2013 (€bn)	End 2018 (€bn)	CAGR, 2013–18
Nasdaq Helsinki	95	136	6%
Warsaw Stock Exchange	56	48	-2%
Vienna	19	36	11%
Athens	19	14	-5%
Budapest Stock Exchange	8	9	2%
Prague	7	6	-3%
Bucharest Stock Exchange	2	2	0%
Ljubljana Stock Exchange	0.3	0.3	2%
Nasdaq Tallinn	0.2	0.2	3%
Zagreb Stock Exchange	n.a.	0.2	n.a.
Bulgaria Stock Exchange	0.7	0.2	-19%
Cyprus Stock Exchange	0.0	0.1	17%
Nasdaq Vilnius	0.1	0.1	-1%
Malta Stock Exchange	0.1	0.1	-4%
Luxembourg Stock Exchange	0.1	0.1	-3%
Nasdaq Riga	0.0	0.0	-1%
Bratislava Stock Exchange	0.0	0.0	-26%

Note: Euronext aggregates Euronext Amsterdam, Brussels, Dublin, Lisbon and Paris together with Euronext APA, Euronext MTF, Euronext Block and Euronext Access. DB Group includes DB APA, Frankfurt SE, Tradegate, Xetra and Xetra int market. BME includes Spain: BME APA, MCE, and Spanish Regionals. The London Stock Exchange does not include Turquoise. The annual total value traded is obtained as the sum of the total monthly value traded across all trading protocols. The numbers have been sorted by total turnover at the end of 2018. The timeframe has been set between 2013 and 2018 in order to exclude the effects of the global financial crisis and the euro area crisis, and on the basis of data availability.

Source: Oxera analysis of Refinitiv data.

Table 2.2 Total number of shares traded on European exchanges, 2013 and 2018 (ranked by number of shares traded in 2018)

	End 2013 (bn)	End 2018 (bn)	CAGR 2013–18
Borsa Italiana	794	565	-6%
London Stock Exchange	1,545	463	-18%
BME	343	302	-2%
Euronext	354	218	-8%
Deutsche Börse	100	129	4%
Nasdaq Stockholm	129	115	-2%
Nasdaq Helsinki	34	33	-1%
Warsaw Stock Exchange	64	27	-13%
Athens	23	19	-4%
Bucharest Stock Exchange	23	15	-7%
Nasdaq Copenhagen	11	13	2%
Budapest Stock Exchange	2	3	4%
Vienna	3	3	0%
Prague	1	1	6%
Cyprus Stock Exchange	1	1	-4%
Bulgaria Stock Exchange	1	0.4	-15%
Nasdaq Vilnius	0.3	0.2	-4%
Nasdaq Tallinn	0.2	0.2	-1%
Malta Stock Exchange	0.3	0.1	-12%
Zagreb Stock Exchange	n.a.	0.1	n.a.

	End 2013 (bn)	End 2018 (bn)	CAGR 2013–18
Luxembourg Stock Exchange	0.0	0.0	4%
Ljubljana Stock Exchange	0.0	0.0	-9%
Nasdaq Riga	0.0	0.0	-11%
Bratislava Stock Exchange	0.0	0.0	-33%

Note: Euronext aggregates Euronext Amsterdam, Brussels, Dublin, Lisbon, Paris together with Euronext APA, Euronext MTF, Euronext Block and Euronext Access. DB Group includes Frankfurt SE, Xetra, Tradegate, DB APA, Xetra int market. BME includes Spain—MCE, BME APA, Spanish Regionals. The London Stock Exchange does not include Turquoise. The total number of shares traded is obtained as the sum of the total monthly value traded across all trading protocols. The numbers have been sorted by total turnover at the end of 2018. The timeframe has been set between 2013 and 2018 in order to exclude the effects of the global financial crisis and the euro area crisis, and on the basis of data availability.

Source: Oxera analysis of Refinitiv data.

Similar to the analysis of primary equity markets, this report presents the results of our in-depth study of the trends in trading activities, alternative trading mechanisms, and liquidity across different financial markets in the EU. While the figures reported here are at the stock exchange level, to illustrate the variation in size across the EU, the rest of the secondary market analysis presented is based on the country of domicile of the securities (see Part II: Secondary Markets). We also discuss our findings in the context of recent regulations and new technology, consider the implications of these trends for further market integration and development, and highlight key areas for policy focus.

The empirical analysis of liquidity trends in section 12 also makes the following unique contributions to the literature.

- This is the first report to conduct a comprehensive analysis of liquidity trends across most EU markets, including securities domiciled in both large and small financial centres. The analysis also covers a decade, from 2009 to 2019, allowing us to observe both long-term and more recent trends in these markets following significant regulatory changes and market developments. This is in contrast to the data used in most of the existing literature, which falls into one of three categories: i) covering a 4- to 5-year time window, primarily from around 2004 to 2009; ii) presenting very detailed order-level data, but for only a short time window ranging to one month to one year; or iii) covering a few major stock indices.
- In addition, diverging trends in large versus smaller caps, where relevant, are identified, instead of focusing only on major indices that would feature heavily large caps, for example.
- Finally, we consider implementation shortfall to be a more comprehensive measure of liquidity, which captures the actual costs of trading for end-investors, including the prevailing spreads and price impacts of executing the trades. Another special feature of this implementation shortfall variable from the Virtu Global Peer database is that it covers within its client-trading activities all trading venues and mechanisms for stocks from a given country. This coverage is especially important in the discussion of market fragmentation, as the liquidity metric here reflects actual trading costs aggregated across all available venues in a fragmented market.

These elements of our analysis, combined with insights from the interviews with market participants, provide a well-rounded and consistent view of the current direction of travel for secondary equity markets in the EU. This in turn serves as a strong evidence base for the policy recommendations presented in section 14.

PART I: PRIMARY MARKETS

3 Regulation of primary markets

Key messages

- Although there is room for further modernisation and streamlining of the listing rules, the key message of this section is that regulation is not a primary driver of the decline in listings. Nevertheless, the costs associated with listing rules are relevant for smaller issuers, where they make up a larger share of the issuance size than for the larger issuers.
- The regulatory regime for primary markets in the EU is complex, featuring a variety of EU regulations and national provisions.
- To instil confidence in public markets, a strong regulatory framework is important. The listing system imposes requirements on issuers to protect investors in those securities. This protection fosters market confidence, to the benefit of both investors and issuers. In recent decades, the regulatory approach has put emphasis on disclosure. While regulation can help to instil confidence in public markets, it also results in compliance costs.
- Listing rules have become largely harmonised in EU legislation over time, based on the regimes that had worked well previously. Differences across markets remain, including in relation to the requirements on free float, working capital, track records, when a prospectus is needed, and when major shareholders need to disclose information.
- There is choice and flexibility in listing requirements. Firms can pick the regime that best fits their needs, and exchanges can optimise their listing rules to attract new potential issuers and investor demand. Many exchanges have introduced listing segments with less onerous eligibility requirements in order to broaden the catchment of potential issuers willing to list on the public markets.
- Our analysis and interviews suggest that:
 - listing rules are not a primary factor for the decision on whether to list, with one potential exception being the corporate governance standards on voting in some markets (see the third bullet below);
 - while differences in listing rules can influence the listing location, other factors (such as the locality of the investor demand and liquidity) are much more important. Issuers prefer to list in countries where the listing authority has a clear, timely and smooth process, and a good understanding of the firm's language (which results in a home bias), specific needs, and expertise;
 - the willingness to list depends in part on the associated incremental governance arrangements, relative to private company status. A number of experts consider that some more (well-designed) flexibility in the rules around voting obligations for listed companies might encourage more firms to list (see section 7 for more detail on barriers to listing).

3.1 Introduction

This section reviews the regulatory regime for primary markets, to understand the extent to which the existing regulatory environment and market practices are influencing firms' decisions to list and/or delist; and to identify best practices in some countries that could be applied in other countries. Much of the detailed analysis underpinning this section is included in Appendix A3.

- Section 3.2 describes the main differences in listing rules across member states, with a focus on exchange-specific listing rules, the application of EU law by member states and national laws, and corporate governance and company law requirements. The role of the listing authority in the regulation of primary markets is also outlined.
- Section 3.3 presents observations regarding differences in listing rules across member states, and the impact of the regulatory regime on firms' decision to list and/or delist.

3.2 Differences in listing rules across member states

To instil confidence in public markets, a strong regulatory framework is important. The listing system imposes requirements on issuers to protect investors in those securities. This protection fosters market confidence, to the benefit of both investors and issuers. In recent decades, the regulatory approach has put emphasis on disclosure, both at the time of listing and on a continuous basis.

The regulatory framework applicable to issuers seeking to list in the EU has the following layers:

- **EU legislation**, which includes the Listing Directive, Transparency Directive, Prospectus Regulation, Market Abuse Regulation (MAR), and Shareholder Rights Directive II. (For more detail on the specific requirements, see Appendix A3.2.);
- **country-specific legislation**, which includes company law, tax policies, and, for certain market segments, stricter regulation within the jurisdiction of the member state;
- **exchange-specific rules**, which firms must abide by in order to be eligible to list on a given market. These can involve requirements in addition to those set out in legislation.

Furthermore, codes, recommendations and standards (e.g. relating to corporate governance) may include additional requirements or principles. (For more detail on the differences across member states, see Appendix A3.4). These may be voluntary, such that firms can choose to adopt them as a signal of high standards.

Over time, listing rules have become largely harmonised in EU legislation, based on the regimes that had worked well previously. The requirements across member states tend to be fairly similar, although some variation in exchange rule books remains, mainly because of country- and/or exchange-specific rules that are outside the scope of EU regulation (as we explore next).

3.2.1 Differences in listing rules between exchanges

Table 3.1 below shows some of the main differences in listing rules across EU stock exchanges.

Table 3.1 Differences in listing rules, as at 2019

Exchange (member state)	Market	Free-float requirement (%)	Market cap requirement (€m)	Operating history required (no. of years)	Operating history audited	Revenue earnings requirement	Working capital and assets requirement
Bulgarian Stock Exchange (Bulgaria)	Premium equities market ¹	25	25	5	✓	×	×
	Standard equities market ¹	×	×	×	×	×	×
Zagrebacka Burza (Croatia)	Prime market ¹	35	68	×	×	×	×
	Regular market ¹	25	×	×	×	×	×
	Official market ¹	15	1	×	×	×	×
Euronext (France, Belgium, Netherlands, Ireland, Portugal)	Euronext compartment A ¹	25 or €5m ²	1,000	3	✓	×	×
	Euronext compartment B ¹	25 or €5m ²	150	3	✓	×	×
	Euronext compartment C ¹	25 or €5m ²	×	3	✓	×	×
	Euronext growth ³	€2.5m	×	2	✓	×	×
	Euronext access ³	×	×	2	×	×	×
	Euronext access+ ³	€1m	×	2	✓ (1 yr)	×	×
Frankfurt Stock Exchange (Germany)	General standard ¹	25	1.25	3	✓	×	×
	Prime standard ¹	25	1.25	3	✓	×	×
	Open market ³	20 or €1m minimum	0.75	2	✓	×	×
Budapest Stock Exchange (Hungary)	Equities prime market ¹	25	15 ⁵	3	✓	×	×
	Equities standard market ¹	10	×	1	✓	×	×
	Xtend market ³	×	×	×	×	×	×
Borsa Italiana, part of the London Stock Exchange Group (LSEG) (Italy)	MTA ¹	25	40	3	✓	×	×
	STAR ¹	35	40 ($<1,000$)	3	✓	×	×
	AIM Italia ³	10	×	1	✓	×	×
London Stock Exchange, part of LSEG (UK)	Premium ¹	25	0.8 ⁵	3	✓	✓ ⁶	✓ ⁷
	Standard ¹	25	0.8 ⁵	3 ⁸	✓	×	✓ ⁷
	High growth segment ¹	10 ⁹	×	3 ⁸	✓	✓ ¹⁰	✓ ⁷
	AIM ³	11	11	3 ⁸	✓	×	✓ ⁷
Nasdaq (Denmark, Sweden, Finland, Iceland, Estonia, Latvia, Lithuania)	Nordic main market and Baltic main market ¹	25	1 ¹²	3	✓	×	✓ ⁷
	First north ³	10	×	×	×	×	×
	First north premier ³	25	10	×	×	×	×
Warsaw Stock Exchange (Poland)	GPW main market ¹	25	15	3	✓	×	✓ ⁷
	New connect ³	15	×	×	×	×	×
Bolsa de Madrid (Spain)	Main market ¹	25	1.2 ¹³	×	×	×	×
Bratislava Stock Exchange (Slovakia)	Main listed market ¹	25	15	3	✓	×	×
	Parallel listed market ¹	25	3	3	✓	×	×
	Regulated free market ³	25	×	3	✓	×	×

Note: ¹ Regulated market. ² €1m for Dublin. ³ Multi-trading facility. ⁴ €5m for Dublin. ⁵ Converted into euros at the exchange rate on 8 November 2019. ⁶ 75% of applicant's business supported by three-year earnings record. ⁷ Sufficient working capital for at least the next 12 working months. ⁸ Or such shorter period that the issuer has been in operation. ⁹ Minimum value of £30m. ¹⁰ 20%

CAGR in revenues over three-year historical period. ¹¹Assessment of appropriateness. ¹² Large cap, 1,000; mid cap, 150; small cap, <150. ¹³ Excluding individual stakes of over 25%.

Source: Oxera, based on information from exchange websites.

- **Market capitalisation**—to list on some markets, a firm has to meet a market capitalisation threshold, which is typically denoted in the local currency and varies significantly across exchanges and member states. Listing on ‘premium’ or ‘prime’ markets typically requires a higher market capitalisation than the EU minimum; for example, Euronext Amsterdam AEX and Euronext Paris Segment A: €1bn; Budapest Stock Exchange Prime: HUF5bn (€14m). For standard market listings and listings on growth sub-markets, such as the AIM segment of the London Stock Exchange and Borsa Italiana, the market capitalisation requirements are much lower.
- **Free float**—the requirement for a minimum number of shares to be held in public hands varies across market segments and trading venues. For the ‘premium’ market segments, the most common free-float requirement is that at least 25% of the capital value of the shares must be in public hands; for STAR in Borsa Italiana and the Official Market in Zagrebacka Burza, it is 35%. There are generally lower (or sometimes no) free-float requirements on the lower-tier market segments; for example, there is no such requirement to list on the Xtend Market of the Budapest Stock Exchange or the standard segment of the Bulgarian Stock Exchange. To encourage more listings, it may make more sense for the listing authority to tailor the requirement by the size of issue (e.g. smaller percentage for larger issues). Free-float requirements are still useful to ensure that sufficient stock is available for trading at a given time.
- **Operating history, income and working capital requirements** (relating to financial track record)—firms are normally required to have a certified track record of their historical performance and to meet certain profitability and liquidity requirements. For the operating history requirement, they have to demonstrate that they have operated continuously for a certain number of years prior to listing. In some cases, they need to publish or submit (sometimes audited) annual accounts for these years. Firms that have made major acquisitions are sometimes required to file information about the acquired businesses before and after their acquisition. The working capital requirements are in order to demonstrate that the issuer has sufficient funds to meet its current needs.

Some member states apply additional listing rules. For example, the UK Listing Authority requires companies applying for a ‘premium listing’ to provide historical financial information covering at least three years, to comply with requirements pertaining to related parties and significant transactions, and to obtain a listing sponsor.

In terms of the ongoing obligations, as well as the requirements to continually meet the minimum eligibility requirements, all exchanges require their issuers to comply with the MAR. However, key differences can arise (see also Table 3.2 below), due to:

- the frequency of reporting requirements—for example, quarterly reporting is required for listings on the Frankfurt Stock Exchange Prime Standard Market, Warsaw Stock Exchange Main Market and New Connect markets, while only annual reporting is required on the Bolsa de Madrid Main Market;
- the notification of major shareholdings—for example, the Frankfurt Stock Exchange, London Stock Exchange and Euronext all have listing rules around the notifications of major holdings. There are no such requirements on many of the smaller exchanges;
- the corporate governance requirements—for more detail, see Appendix A3.4.

Table 3.2 Differences in ongoing obligations, as at 2019

Exchange (member state)	Market	Maintenance of eligibility requirements	Market abuse regime	Corporate governance standards	Annual financial report	Financial reporting (half-yearly)	Financial reporting (quarterly)	Notification of major holdings
Bulgarian Stock Exchange (Bulgaria)	Premium equities market ¹	✓	✓	✓	×	×	×	×
	Standard equities market ¹	✓	✓	×	×	×	×	×
Zagrebacka Burza (Croatia)	Prime market ¹	✓	✓	×	×	×	×	×
	Regular market ¹	✓	✓	×	×	×	×	×
	Official market ¹	✓	✓	×	×	×	×	×
Euronext (France, Belgium, Netherlands, Ireland, Portugal)	Euronext compartment A ¹	✓	✓	✓	✓	✓	×	✓
	Euronext compartment B ¹	✓	✓	✓	✓	✓	×	✓
	Euronext compartment C ¹	✓	✓	✓	✓	✓	×	✓
	Euronext growth ²	✓	✓	×	✓	✓	×	✓
	Euronext access ²	✓	✓	×	✓	✓	×	×
	Euronext access+ ²	✓	✓	×	✓	✓	×	×
Frankfurt Stock Exchange (Germany)	General standard ¹	✓	✓	✓	✓	✓	✓	✓
	Prime standard ¹	✓	✓	✓	✓	✓	×	✓
	Open market ²	✓	✓	×	✓	✓	×	✓
Budapest Stock Exchange (Hungary)	Equities prime market ¹	✓	✓	×	✓	×	×	×
	Equities standard market ¹	✓	✓	×	✓	×	×	×
	Xtend market ²	✓	✓	×	✓	×	×	×
Borsa Italiana, part of LSEG (Italy)	MTA ¹	✓	✓	✓	✓	✓	×	×
	STAR ¹	✓	✓	✓	✓	✓	×	×
	AIM Italia ²	✓	✓	×	✓	✓	×	×
London Stock Exchange, part of LSEG (UK)	Premium ¹	✓	✓	✓	✓	✓	×	✓
	Standard ¹	✓	✓	×	✓	✓	×	✓
	High growth segment ¹	✓	✓	×	✓	✓	×	✓
	AIM ²	✓	✓	×	✓	✓	×	✓
Nasdaq (Denmark, Sweden, Finland, Iceland, Estonia, Latvia, Lithuania)	Nordic main market and Baltic main market ¹	✓	✓	✓	✓	✓	×	×
	First north ²	✓	✓	×	✓	✓	×	×
	First north premier ²	✓	✓	×	✓	✓	×	×
Warsaw Stock Exchange (Poland)	GPW main market ¹	✓	✓	×	✓	×	✓	×
	New connect ²	✓	✓	×	✓	×	✓	×
Bolsa de Madrid (Spain)	Main market ¹	✓	✓	×	✓	×	×	×
Bratislava Stock Exchange (Slovakia)	Main listed market ¹	✓	✓	×	✓	✓	×	×
	Parallel listed market ¹	✓	✓	×	✓	✓	×	×
	Regulated free market ²	✓	✓	×	✓	✓	×	×

Note: ¹ Regulated market. ² MTF. Some exchanges also require business, management or interim reports. For more detail on the corporate governance requirements across member states, see section 3.2.3 and Appendix A3.

Source: Oxera, based on information from exchange websites.

The administrative burden associated with meeting both initial and ongoing regulatory requirements is an indirect cost of listing, and one that can be particularly acute for SMEs. These indirect costs are discussed further in section 7.

Corporate governance standards, particularly the role of control-enhancing mechanisms such as dual-class shares, are discussed further in section 3.2.3. The interview analysis suggests that these requirements are particularly relevant for some larger companies deciding to stay private (also see section 7).

3.2.2 National law and the application of EU law by member states

Some differences also result from the different applications of national law, as follows.

- **Thresholds for producing a prospectus**—while the EU Prospectus Regulation harmonises many of the rules relating to the prospectus, differences remain across member states. The Prospectus Regulation sets a threshold of €8m below which member states can decide whether a prospectus is required—some have made use of this exemption.²⁷ Some smaller financial centres have adopted lower thresholds in order to reflect the smaller size of listed companies in those markets. There are some additional exemptions from the publication of a prospectus in individual jurisdictions.

During the structured interviews, a number of stakeholders noted differences in requirements across member states for producing a prospectus. While these rules should now be fully harmonised under the recent Prospectus Regulation, there may be different interpretations in how to apply them at the national level. Therefore, more detailed guidance from the European Commission or the European Securities and Markets Authority (ESMA) might help in this regard.

- **Delisting rules**—the rules governing delisting are not harmonised at the EU level. While the Takeover Bids Directive sets out some general principles applicable to delistings, more stringent measures can be imposed, if desired. For example, some member states require the mandatory offer price in a takeover to be subject to a fairness review by an independent expert, while others impose an additional threshold based on a weighted average exchange price over a previous period. Furthermore, not all of the general principles within the Directive have been fully translated into rules. For example, member states can opt out of the rules relating to frustrating action and multiple voting rights.²⁸

Company law is another dimension to country-specific rules. It is less relevant for cross-border listings because companies in all member states (and in most third countries) will retain their legal nature, and thus their internal company law rules. However, aspects of company law that are important in the context of this study include the rules around directors' liabilities, delistings, and voting rights (discussed in the next section). Companies have some degree of flexibility to disassociate their place of incorporation, headquarters and the listing location in the EU. For example, in February 2020 the Campari Group moved its seat of incorporation to the Netherlands to take advantage of more control-enhancing mechanisms than were allowed under Italian corporate law, while keeping its main business operations, tax residence status and listing in Italy. Campari

²⁷ See European Securities and Markets Authority (2019), 'National thresholds below which the obligation to publish a prospectus does not apply', 2 December, https://www.esma.europa.eu/sites/default/files/library/esma31-62-1193_prospectus_thresholds.pdf.

²⁸ For more detail on public takeover rules across European countries, see Maume, P. (2015), 'The Parting of the Ways: Delisting Under German and UK Law'; and BonelliErede, Bredin Prat, De Brauw, Hengeler Mueller, Slaughter and May, and Uría Menéndez (2017), 'Guide to Public Takeovers in Europe', https://www.uria.com/documentos/publicaciones/5539/documento/Guide_to_Public_Takeovers_in_Europe2016-2017.PDF?id=7386.

shares are listed solely on Borsa Italiana.²⁹ This flexibility is positive for issuers and the success of the Single Market. However, if minimum standards were not in place at the EU level, this might raise concerns of a 'race to the bottom' from an investor perspective. (See Appendix A3 for more detail on the EU's minimum standards for shareholder rights.)

3.2.3 Corporate governance and company law requirements

Most member states have their own national corporate governance codes in addition to those required at the EU level. To list on most of the main 'premium' market segments, firms are required to comply with these additional corporate governance requirements. For example, domestic firms that list on Nasdaq Stockholm have to comply with the Swedish Code of Corporate Governance or otherwise explain any deviations. This Code sets specific rules with respect to shareholder meetings, the Board's organisation and composition, executive compensation, and additional disclosure requirements. Nasdaq Stockholm's 'Rule Book for Issuers' also contains continuing disclosure obligations. Similar requirements apply in other countries (see Appendix A3.4).

Based on our analysis of listing trends over recent decades and from conversations with equity market experts, it appears that companies adhering to Anglo-Saxon corporate governance codes are more likely to go public. The strong corporate governance codes in the UK and Sweden were driven primarily by the demands of large institutional investors.

There is an open question about whether some of these requirements have become too burdensome and may be deterring some companies (e.g. family-owned ones) from listing on these public markets.

Table 3.3 summarises company laws on voting rights across financial centres. We observe diverse practices across countries. Multiple voting rights are allowed in Denmark, Finland, France, Italy, Ireland and Sweden, but are not allowed in Germany, Portugal and Spain. In a number of countries, including the UK, while such rights are allowed, institutional investors will typically buy a stock only if 'one share one vote' applies to it. The USA, on the other hand, has attracted a number of high-profile listings in recent years due to its flexibility on multiple voting rights.

Table 3.3 Rules on share class structure by country, as at 2019

Country	Limited voting rights allowed	No voting rights allowed	Multiple voting rights allowed
EU			
Austria	✓	✓	×
Belgium	✓	✓ (up to 1/3 of total shares)	×
Denmark	✓	✓	✓
Finland	✓	✓	✓
France	✓ (up to 1/2 of total shares)	✓ (up to 1/4 of total shares)	✓ (Loi Florange, 2x voting on shares with holding >2 years)
Germany	✓	✓ (up to 1/2 of total shares; must have preferential rights to dividends)	×
Ireland	✓	✓	✓
Italy	×	✓ (up to 1/2 of total shares)	✓ (loyalty shares, 2x voting on shares with holding >2 years)

²⁹ Campari Group (2020), 'Campari Group announces the transfer of registered office of Davide Campari-Milano S.P.A to the Netherlands', press release, accessed 27 March 2020, <https://www.camparigroup.com/en/campari-group-announces-transfer-registered-office-davide-campari-milano-spa-netherlands>.

Country	Limited voting rights allowed	No voting rights allowed	Multiple voting rights allowed
Netherlands	✓	×	
Portugal	✓	✓ (up to 1/2 of total shares)	×
Spain	✓	✓ (up to 1/2 of total shares; must have preferential rights to dividends)	×
Sweden	✓	×	✓ (up to 1/10 of total shares)
UK	✓	✓	✓
Other major financial centres			
Japan	✓ (up to 1/2 of total shares)	✓ (up to 1/2 of total shares)	×
Hong Kong	✓ (but listing rules impose 'one-share, one-vote')	✓	×
Singapore	×	×	×
Switzerland	✓	✓ (must have preferential rights to dividends)	✓
USA	✓	✓	✓

Source: OECD (2019), 'Corporate Governance Factbook 2019', <https://www.oecd.org/corporate/Corporate-Governance-Factbook.pdf>.

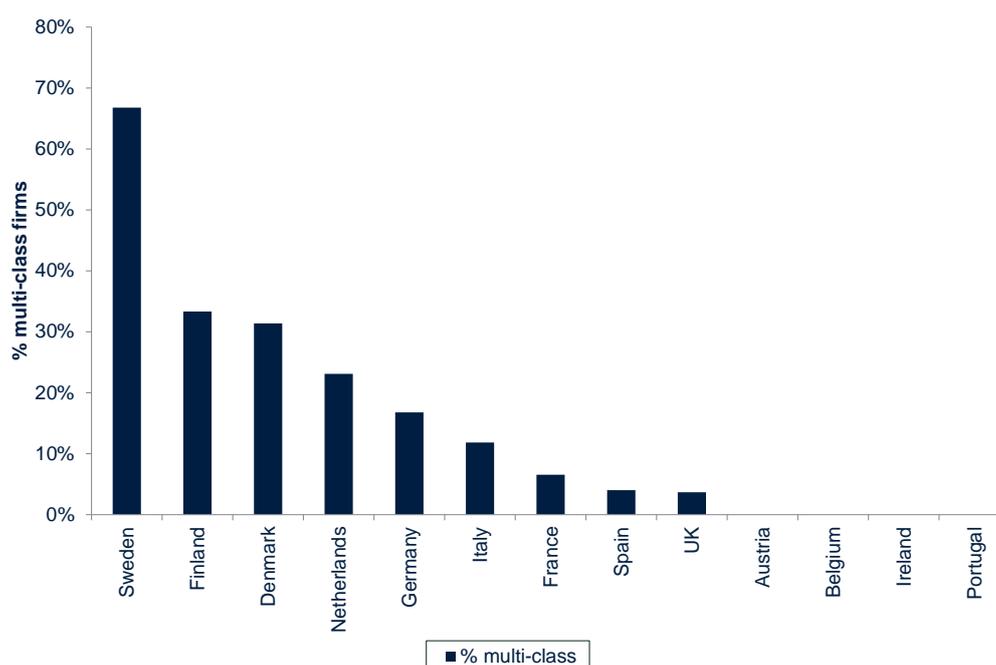
Index providers also play an important role. As many investors follow an index or use it as a benchmark, and therefore generally have to buy stocks in the index,³⁰ it is important for existing and potential issuers to meet the eligibility requirements of index providers, which vary by provider. FTSE Russell (the main index provider of UK stocks) requires its index constituents to have minimum voting rights of 5% in the hands of free-float shareholders,³¹ while S&P Dow Jones indices no longer add multi-class companies to the S&P 500, S&P MidCap 400 and S&P SmallCap 600. In contrast, MSCI allows multi-share class companies in its indices. The relative importance of a given index provider across member states will therefore be a key factor in the issuer's decision on whether to adopt dual-class shares.

Figure 3.1 below provides some data on the use of multi-class shares across a sample of EU companies in 2016. There is a clear difference in the use of multiple voting rights in Sweden compared with other countries in the EU.³²

³⁰ Technically, indexing theory does not require investors to buy all stocks in an equity index. Instead, the investor can buy a representative portfolio of constituent stocks (an approach known as 'optimisation'). However, tracking error increases with optimisation, so there are incentives to replicate rather than optimise. See Blume, M. and Edelen, R. (2004), 'S&P 500 Indexers, Tracking Errors, and Liquidity—A Complex Answer to Profiting', *Journal of Portfolio Management*, **3**:37, pp. 37–46.

³¹ FTSE Russell (2017), 'Voting rights consultation—Next steps', July, https://research.ftserussell.com/products/downloads/FTSE_Russell_Voting_Rights_Consultation_Next_Steps.pdf.

³² For a detailed study on previous changes to voting rights rules in Italy and the impact on listings, see: Assonime (2015), 'Le azioni a voto plurimo e a voto maggiorato', *Circolare N.10*, April.

Figure 3.1 Multi-class share firms in the EU, 2016 data

Note: The data comprises share classes and votes per share for publicly listed firms in the EU that were part of the MSCI All Country World Index in 2016, with total book assets above \$100m. The data collection approach means that firms adopting a loyalty share structure may not be counted as multi-class share firms. These structures are particularly common in France.

Source: Kim, J., Matos, P. and Xu, T. (2018), 'Multi-Class Shares Around the World: The Role of Institutional Investors', https://ecgi.global/sites/default/files/multi-class_shares_around_the_world.pdf.

Another country where there has been increased use of multiple voting rights is the USA, with a rise in listed companies using dual-class share structures. Over 2008–13, there was a steep increase, from 2.8% of listed companies in 1985 to 16.5% of IPOs and 34.1% of IPO funds raised.³³ The use of dual-class shares has been more common in the technology, communications and information services sectors (see Figure 3.2 below), and less common in traditional industries, such as machinery, retail and agriculture.³⁴ This may be because technology companies tend to be newer companies run by entrepreneurs who wish to retain control and investors are more willing to buy shares for fear of missing the opportunity to invest in 'the next Google'.

Dual-class shares are much less prevalent in the Asia-Pacific region, although this is changing rapidly. In Singapore, losing out on the IPO of Manchester United Football Club in 2012 led the government to review its listing rules to allow dual-class shares.³⁵ As a result, the Singapore Stock Exchange now permits companies with dual-class share structures to list, as long as they already have primary listings on a 'developed market', such as NYSE or Nasdaq. In April 2018, the Hong Kong Stock Exchange introduced measures to allow dual-class share structures in order to attract new companies (particularly technology companies) to list.

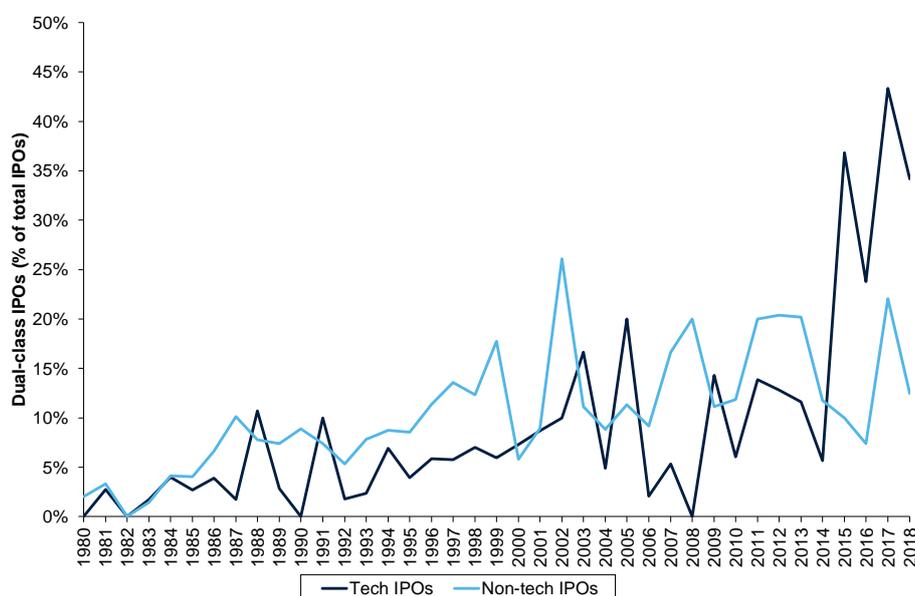
³³ Howell, J.W. (2017), 'The survival of the US dual class share structure', *Journal of Corporate Finance*, **44**, pp. 440–450.

³⁴ Arugaslan, O., Cook, D.O. and Kieschnick, R. (2010), 'On the decision to go public with dual class stock', *Journal of Corporate Finance*, **16**:2, pp. 170–181.

³⁵ Ministry of Finance and Accounting and Corporate Regulatory Authority (2012), 'Ministry of Finance's Responses to the Report of the Steering Committee for Review of the Companies Act', 3 October, https://www.mof.gov.sg/portals/0/Public%20Consultation/AnnexA_SC_RCA.pdf.

Based on the lessons learned from some countries that have attracted more listings in recent years (e.g. Hong Kong, Italy, Singapore, Sweden and the USA), our analysis indicates that increased flexibility (both in terms of legislation and market practice) in the use of dual-class shares (on a time-limited basis) could encourage more family-owned firms to seek a listing on public markets in Europe. This is discussed further in section 7.4.

Figure 3.2 Dual-class shares in the USA, 1980–2018



Notes: IPOs with an offer price of at least \$5.00, excluding American depository receipts, unit offers, closed-end funds, REITs, natural resource limited partnerships, small best efforts offers, banks and savings and loans associations, and stocks not listed on the CRSP (CRSP includes Amex, NYSE and NASDAQ stocks).

Source: Ritter, J.R. (2019), 'Initial Public Offerings: Dual Class IPOs', <https://site.warrington.ufl.edu/ritter/ipo-data/>.

Tenure voting (loyalty shares with tenure voting) has also become popular in many EU countries. This provides shareholders with multiple voting rights as a function of the holding period.³⁶ In France and Italy, for example, tenured voting rights have been adopted in law to encourage long-termism in investors. In practice, these rights are also particularly popular with family-owned companies as a control-enhancing mechanism.³⁷

3.2.4 The role of the listing authority

The listing authority develops listing rules, including the conditions for listing and continuing obligations on issuers. The EU Listing Directive sets out the framework designating the listing authority for primary exchanges. In some cases, member states have designated the listing authority to be the market regulator; in other cases, the primary exchange is the listing authority (see Table 3.4).

³⁶ These rules are anchored in the corporate charter or corporate law, and do not change the capital structure. Tenure voting treats all shareholders equally, at least in legal terms, and it is therefore less controversial than dual-class shares. See Berger, D.J., Davidoff Solomon, S. and Benjamin, A. (2017), 'Tenure Voting and the U.S. Public Company', *Business Lawyer*, **2**:72, pp. 295–324.

³⁷ See Bebchuk, L. and Kastiel, K. (2017), 'The Untenable Case for Perpetual Dual-Class Stock', Harvard Law School.

The listing authority also reviews and approves the issuer's prospectus, and, once it is satisfied that the issuer complies with all the eligibility criteria, admits those securities to listing.

Table 3.4 Main European listing authorities

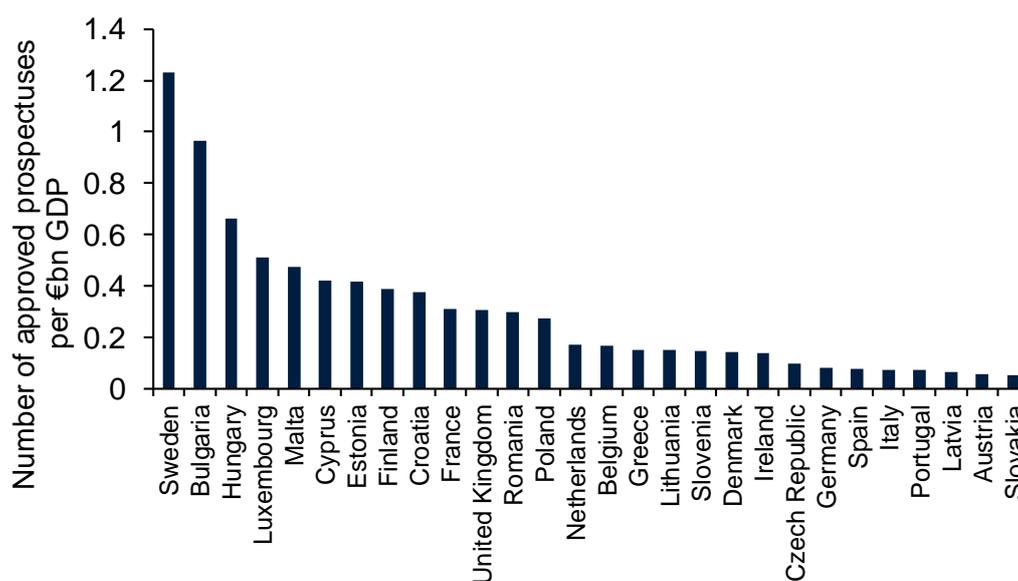
Regulatory authority	Exchange
Financial Market Authority (Austria) ¹	Frankfurt Stock Exchange and other regulated markets in Germany ²
Financial Services and Markets Authority (Belgium) ¹	Euronext Brussels ²
Financial Supervision Commission (Bulgaria) ¹	Euronext Dublin ²
The Croatian Financial Services Supervisory Agency and Croatian National Bank ¹	Euronext Paris ²
Czech National Bank ¹	Euronext Amsterdam ³
The Cyprus Securities & Exchange Commission ¹	Euronext Portugal ³
Financial Supervisory Authority (Denmark) ¹	London Stock Exchange Group ³
Financial Supervision and Resolution Authority and Financial Intelligence Unit (Estonia) ¹	Nasdaq Nordic ³
FIN-FSA (Finland) ¹	Bulgarian Stock Exchange ³
Hellenic Capital Market Commission ¹	Zagreb Burza ³
Central Bank of Hungary ¹	Budapest Stock Exchange ³
CONSOB (Italy) ¹	Warsaw Stock Exchange ³
Commission for the Supervision of the Financial sector (Luxembourg) ¹	Bolsa de Madrid ³
Financial and Capital Market Commission (Latvia) ¹	Bratislava Stock Exchange ³
Malta Financial Services Authority ¹	
Netherlands Authority for the Financial Markets and Dutch Central Bank/Prudential Regulator ¹	
Polish Financial Supervision Authority ¹	
Portuguese Securities Market Commission ¹	
Financial Supervisory	

Note: ¹ Body responsible for listing on regulated markets. ² Body responsible for listing on both regulated markets and MTFs. ³ Body responsible for listing on MTFs.

Source: ESMA and Oxera (based on stakeholder interviews).

Listing is more time- and cost-efficient (and numerous) in member states where the regulator has strong expertise and close professional relationships with the main intermediaries, including brokers and the listing venue in particular. However, this is not necessarily related to the independence of the listing authority. The typical time taken to list across financial centres is discussed in more detail in section 8.3.3.

Feedback from the interviews suggests that non-EU issuers typically seek to list first in London or Amsterdam. Sweden is also seen as an attractive place to list due to a smooth IPO process and the ability to access local pension fund money, as reflected in the relatively large number of prospectuses approved in Sweden in recent years (see Figure 3.3 below).

Figure 3.3 Equity prospectus approvals in the EU-28, 2015–18

Note: GDP is converted to € using the year-average ECB reference rate.

Source: Oxera analysis based on data from ESMA.

The EU Prospectus Regulation now sets a timeline of ten working days for the regulator to review the prospectus, with the possibility of extending to 20 working days if needed. As these requirements are implemented and enforced, this timeline may become further streamlined.³⁸ The longer deadline of 20 working days can apply if the issuer has not issued securities to the public before, as in the case of an IPO.

Another important area is enforcement, both public (by regulators) and private (litigation by market participants).³⁹ While there is a strong line of research suggesting that effective enforcement is key to market development,⁴⁰ there is still a lack of robust research comparing the different enforcement frameworks in the member states. The debate has mostly been driven by research focusing on quantitative analyses (such as case numbers, enforcement actions, resources), but these metrics may not fully capture the particularities of the respective legal systems. A few European papers focusing on the enforcement

³⁸ See Article 20(2) of the Prospectus Regulation.

³⁹ This mechanism was also pointed out in the Larosière-Report in 2009, highlighting that the complementary aspects of private and public enforcement had not been sufficiently carried out in the past. See The de Larosière Group (2009), 'The High-Level Group on Financial Supervision in the EU', 25 February, p. 16, https://ec.europa.eu/economy_finance/publications/pages/publication14527_en.pdf.

⁴⁰ See, for example, Coffee, J. (2007), 'Law and the Market: The Impact of Enforcement', *University of Pennsylvania Law Review*, **156**:2, pp. 229–311; Jackson, H.E. and Roe, M. (2009), 'Public and Private Enforcement of Securities Law: Resource-Based Evidence', *Journal of Financial Economics*, **93**, pp. 207–238; La Porta, R., Lopez de Silanes, F. and Shleifer, A. (2006), 'What Works in Securities Laws', *Journal of Finance*, **61**:1, pp. 1–32; Maume, P. and Walker, G. (2013), 'Enforcing financial markets law in New Zealand', *New Zealand Law Review*, pp. 263–300.

situations in Germany,⁴¹ Italy⁴² and the UK⁴³ find evidence that poor outcomes stem from poor enforcement (e.g. limited or late intervention) rather than inadequate rules.

A related issue is the structure and funding of the national market regulator. Regulators with more resource and expertise are likely to be able to set up a fully fledged market supervision/enforcement structure. There are economies of scale and scope to monitoring and supervision, such as with respect to gathering and use of know-how in specialist areas and to the development and improvement of supervisory methods. These would support models of integrated supervision, particularly for smaller economies where resources may be more constrained, and more coordination at the EU level. Analysis by the World Bank considered the experience of Sweden and Denmark and found significant benefits from the integration of supervisory expertise and resources within one institution in these countries.⁴⁴ The Swedish experience is explored in Box 3.1, followed by other examples of best practice set out in Box 3.2.

Box 3.1 Best practice: case study of the Swedish IPO market

From the interviews, we identified best practice in Sweden, as follows.

Since the mid-1990s, there have been positive developments in the Swedish IPO market, with an 80% increase in the number of listings on Swedish exchanges since 2010. In 2017, across Sweden's four exchanges (First North Sweden, Nordic MTF, OMX Stockholm, and Spotlight), there were 115 IPOs. Although Sweden is a relatively small market, it ranks in the top five EU member states in terms of the number of prospectuses produced. While this success is due to various factors, the ease and attractiveness of listing publicly in Sweden play an important part, in particular with regard to the process, experience of the regulator, quality of disclosure, and understanding and sophistication of the buy side. For example, certain stakeholders in Sweden believe that the listing process could be completed within 8–10 weeks. Issuers want a quick and reliable process to minimise the time taken out from the core running of their business.

In general, it is the relevant exchange, not the Finansinspektionen (the Swedish financial supervisory authority) that approves a listing. While the Finansinspektionen approves the Swedish exchanges' listing rules and supervises them, the exchanges are responsible for listing and admission to trading. The Finansinspektionen does, however, approve prospectuses where this is a regulatory requirement, in which case it follows a clear and specific timeline—something that financial and legal advisers greatly appreciate. However, in many cases, its approval is not required, and it is the exchange that requires a 'mini-prospectus' (which does not require regulatory approval).

In general, there is a good relationship between the regulator, exchanges and advisers, and they are in broad agreement that the Swedish IPO process is working well. Greater transparency is commonly viewed as a benefit rather than a burden. This close relationship is likely to be related to Sweden's strong equity culture. This is partly because Sweden introduced the 'investeringsparkonto' in 2012 (a type of savings account) to promote households' savings and investments in stocks/securities and to simplify taxation around this. The tax applied to investeringsparkonto is automatic,

⁴¹ Maume, P. (2016), 'Staatliche Rechtsdurchsetzung im deutschen Kapitalmarktrecht: eine kritische Bestandsaufnahme', *Zeitschrift für das gesamte Handelsrecht und Wirtschaftsrecht*, **180**, pp. 358–395.

⁴² Ferrarini, G. and Giudici, P. (2005), 'Financial Scandals and the Role of Private Enforcement: The Parmalat Case', ECGI – Law Working Paper No. 40/2005.

⁴³ Armour, J., Black, B.S., Cheffins, B.R. and Nolan, R. (2009), 'Private Enforcement of Corporate Law: An Empirical Comparison of the United Kingdom and the United States', **6:4**, *Journal of Empirical Legal Studies*, pp. 687–722.

⁴⁴ For further detail on the small-country rationale for more consolidated supervision and enforcement teams, see, for example, Taylor, M. and Fleming, A. (1999), 'Integrated Financial Supervision – Lessons from the Northern European Experience', World Bank Policy Research Paper No 2223, November; Abrams, R. and Taylor, M. (2000), 'Issues in the Unification of Financial Sector Supervision', IMF Working Paper No 00/213.

calculated quarterly on the value of holdings—there is no tax on profits, interest or dividends. This makes it simple for Swedish households to invest in securities.

There is also likely to be a positive feedback loop where policy changes have prompted more IPOs, which have allowed the regulator to develop a streamlined process, which in turn facilitates more IPOs.

Source: Oxera, based on feedback from structured interviews.

Box 3.2 Best practice: other examples

Our analysis and interviews have identified the following examples of best practice.

The UK Listing Authority helpdesk

The UK Listing Authority has set up a helpdesk for issuers, enabling complex issues to be discussed and agreed prior to submission of documents, or in relation to significant transactions. The helpdesk can respond to enquiries from issuers, directors, former directors or sponsors (or, where appropriate, agents on their behalf) about any matter relating to the listing rules, by providing individual guidance over the phone.

The Progress Market (regional listing process in Croatia and Slovenia)

With the support of the EBRD, the Zagreb Stock Exchange has set up a regional SME growth market spanning the Croatian and Slovenian markets to help SMEs seeking to list in the region. Under the model, authorised advisers guide potential issuers through the listing process and help them meet the necessary requirements. The first issuer entered the Progress Market in 2018. In total there were 21 authorised advisers: 13 for the Croatian market and 8 for the Slovenian market in 2018.⁴⁵ This appears to be a useful model for how small countries can work together to smooth the listing process for potential issuers in the region.

Waivers

A number of exchanges have agreements in place with other stock exchanges to limit the obligations on issuers. For example, companies with a primary listing on Oslo Børs receive a waiver of additional obligations when obtaining a secondary listing on the SGX.

Best-practice guide

GPW (the Warsaw Stock Exchange) has developed a best-practice guide⁴⁶ in coordination with market experts and the Polish Financial Supervision Authority (KNF). Its aim is to support listed companies to develop tools for efficient management and communications with retail investors. The guide presents a series of recommendations and practical steps to ensure that retail investors have the same access to information as institutions.

Sources: Oxera; UK Financial Conduct Authority (FCA) website; EBRD.

3.3 Impact of regulation on listing decision

Based on our analysis and interview feedback, listing rules in general do not appear to be a primary driver of whether to list. However, they can influence the decision of where to list to some extent. In general, issuers prefer to list in countries where the listing authority has a clear, timely and smooth process, and a good understanding of the firm's language (which supports a home bias), specific needs, and expertise.

⁴⁵ Zagreb Stock Exchange website, 'Progress market registered as an SME growth market', <https://zse.hr/default.aspx?id=89530>

⁴⁶ GPW website, 'Best practice', <https://www.gpw.pl/best-practice>.

The EU listing rules are largely harmonised and, at a high level, other factors are considered more important when an issuer is deciding where to list. There is some variation around free-float requirements. Our analysis, based on interviews with issuers and market practitioners, suggests that flexibility around these requirements may encourage some additional listings. As discussed, in addition to the listing rules, there are other requirements for public companies, such as corporate governance standards and other (non-listing) rules.

The most relevant regulatory factors that may be deterring companies from listing in the EU appear to be elements of the corporate governance requirements (for example, voting requirements, restrictions on large shareholder blocking requirements), and the fines (or, more specifically, the proportionality in the levels applicable to different contexts) set out in the EU MAR. Feedback from the interviews regarding the lack of proportionality of fines was particularly prevalent among practitioners in Central and Eastern Europe, who indicated that the levels of the potential fines are a significant deterrent for small issuers in the region.

Firms seeking to list need to carefully assess their ability to meet the relevant listing requirements, whether these relate to the financial track record, the free float, meeting the minimum market capitalisation, or the other points noted above. Some requirements will be more relevant to some firms than others, depending on their circumstances. For example, an early-stage technology company in the product development phase might be more likely to satisfy requirements on exchanges that offer financial requirements based on an asset test, rather than a track record of profitability.

The next few sections set out in more detail the key factors influencing the listing decision from the issuer's perspective.

4 Reasons for listing and delisting

Key messages

- This section explores why firms may seek a listing, and investigates the drivers behind the current trend of delistings outweighing new listing activity in most EU markets.
- From a firm's perspective, the decision to list depends on the net benefits of going public outweighing any negative impacts. The top benefits to listing are to provide an exit route for existing shareholders, to facilitate an acquisition strategy, and to access additional equity finance. Listing is also a way to pre-commit to minimum governance standards, which explains why many firms based in Asia and Africa seek to list in the UK or the USA, given also the further benefits in terms of status and prestige.
- To identify the main reasons for the decline in listings in recent years, we have analysed data from all EU stock exchanges, interviewed a large number of market participants, and conducted a survey of issuers. Feedback from market participants suggests that, for most firms, the costs of listing do not outweigh the benefits relative to the alternative of private markets. Relative to public markets, private markets have become significantly more attractive in recent decades. We investigate in section 7 why firms may want to remain private.
- The costs of listing are both direct (fees) and indirect (agency costs, under-pricing, compliance costs and litigation risks associated with reporting). We estimate that the total (direct and indirect) financial costs of an IPO range on average from 5% to 15% of gross proceeds.⁴⁷ This percentage can be higher for those raising smaller sums, with the fixed costs of listing having a greater effect on smaller companies (as discussed further in section 5). For example, the median reported cost for all listings on AIM Italia in 2019 was 18% of gross proceeds.
- Feedback from market participants indicates that the costs of becoming a public company have risen considerably in recent decades. The initial and ongoing costs of listing appear to have widened the gap between public and private companies. While regulation may not be a primary driver for the decline in listings, the regulatory costs associated with listing are particularly relevant for smaller issuers, for which alternative private funding options may be more readily available.
- Data from the major EU exchanges indicate that delistings have predominantly been driven by increased M&A activity (e.g. approximately one-third of identified delistings from the main and junior markets of Paris, London and Milan were due to M&A activity)⁴⁸ and existing owners' strategic decisions to delist. Some of these delistings have been the result of acquisitions by already listed companies. However, there have also been delistings as a result of private equity firms acquiring listed companies and some technical delistings.
- The main reasons cited in our issuer survey and structured interviews for voluntarily choosing to delist include: the challenges associated with meeting regular financial reporting requirements; the time and cost associated with compliance and administration; annual fees paid to advisers, brokers and exchanges; and requirements to disclose sensitive information.

⁴⁷ Some other sources have suggested a wider range for these costs, including a lower bound for the largest issuers. Based on our analysis, we deduce that the lower estimates may account for direct costs only; for example, our analysis of under-pricing (an indirect cost) indicates a lower-end cost of around 5% of gross proceeds for the largest issuers.

⁴⁸ See section 4.5.

- To reduce this imbalance, policy options that the Commission could consider would require either lessening the burden on public companies or reviewing the governance arrangements and reporting requirement for private companies. For example, the Commission may want to revisit the rules around disclosure on listed firms and/or review the merits of applying some improved governance arrangements (e.g. audit standards, and national registries) for some large unlisted firms, to enhance the market discipline on the governance of those firms. Other policy options are discussed in sections 5, 7 and 8.

4.1 Introduction

This section summarises our analysis of the reasons for listing and delisting, in order to:

- understand the main benefits of going public that encourage companies to seek a listing;
- examine the triggers that prompt companies to contemplate listing;
- identify the direct and indirect costs of being listed that discourage companies from going public and drive others to delist.

Ultimately, the choice to list is a function of the benefits and costs of listing relative to alternative sources of finance and governance models. The owners of the firm will choose to list if the benefits of listing outweigh the costs. These costs and benefits are case-specific and can change over time for a given firm.⁴⁹

To inform this analysis, we conducted an extensive data collection exercise from all of the EU stock exchanges;⁵⁰ interviews with a range of stakeholders; and a bespoke online survey of key financial decision-makers. For more information on the approach to this information collection, see Appendix A1.

The section is structured as follows:

- sections 4.2 and 4.3 outline the main benefits and costs of listing;
- section 4.4 examines some of the triggers that prompt companies to seek a listing;
- section 4.5 presents the main reasons why companies delist.

4.2 Benefits of listing

The academic literature identifies various motivations for a firm to go public, including the following.

- **Providing an exit route for existing shareholders**—IPOs provide owners of private companies (e.g. founders, family owners or private equity funds) with an important exit route, or allow them to diversify their own portfolios.⁵¹ Listing can provide an exit

⁴⁹ A firm may choose to list at one point in time based on one set of facts, and then choose to delist at a later point if the costs start to exceed the benefits of being listed. There may be some inertia that prevents public companies from delisting even when the relative costs and benefits shift—for example, securities regulation can make it harder to delist than to become listed in the first place (which is sometimes referred to as a ‘lobster trap’.)

⁵⁰ Although data on the reasons for listings and delistings is quite sparse, insightful information was received from some of the larger markets.

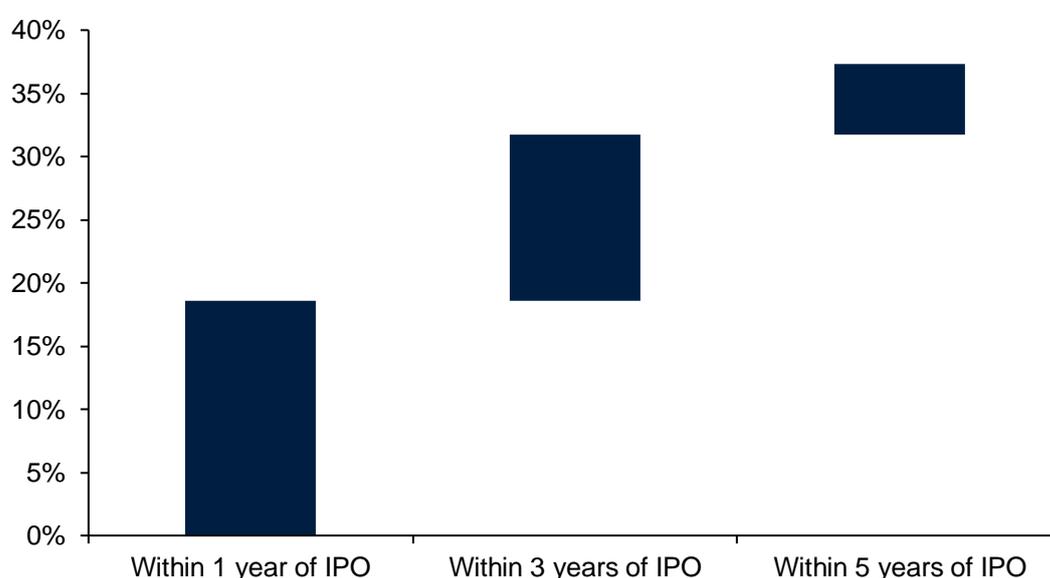
⁵¹ Providing some supporting empirical evidence is a paper by Bodnaruk et al. (2008) examining Swedish IPOs between 1995 and 2001. The authors find that private firms held by less-diversified controlling shareholders are more likely to go public, and that less-diversified shareholders sell more of their shares at the IPO. See Bodnaruk K.E., Massa, M. and Simonov, A. (2008), ‘Shareholder Diversification and the Decision to Go Public’, *The Review of Financial Studies*, **21**:6, pp. 2779–2824.

directly (if secondary shares are included in the IPO⁵²) or indirectly (by establishing a market price prior to subsequent sale⁵³).

- **Facilitating an acquisition strategy**—listed shares can make it easier for a public company to conduct acquisitions.⁵⁴ Empirical evidence suggests that public companies are more active acquirers than their unlisted counterparts.⁵⁵
- **Providing access to additional equity finance**—listing on public markets provides companies with access to a large-scale source of permanent risk capital. There may be a ‘wealth constraint’ that prevents the current owner(s) from financing a project. Equity financing does not require guaranteed repayment, and is therefore robust to economic cycles. Listed companies may also have the option to conduct further fundraising at a lower incremental cost.

Follow-on offerings are relatively common. Analysis of Dealogic data shows that more than 35% of firms that conducted an IPO in the EU between 2000 and 2013 conducted a follow-on offering within five years (see Figure 4.1 below).

Figure 4.1 Proportion of IPOs that conduct a follow-on offering, by IPO year



Note: Data covers Dealogic deals categorised as ‘ECM-IPO’. Excludes funds raised by certain investment funds and real estate investment vehicles. Total sample consists of firms within the Dealogic database that conducted an IPO between 2000 and 2013 on an EU exchange. Data in each

⁵² Kim and Weisbach (2005) analysed a sample of European IPOs from 1990 to 2003 and found that over 30% of proceeds were attributable to secondary shares. Kim, W. and Weisbach, M. (2005), ‘Motivations for public equity offers: An international perspective’, *Journal of Financial Economics*, **87**, pp. 281–307.

⁵³ See Zingales, L. (1995), ‘Insider Ownership and the Decision to Go Public’, *Review of Economic Studies*, **62**, pp. 425–448; or Mello, A. and Parsons, J. (1995), ‘Going public and the ownership structure of the firm’, *Journal of Financial Economics*, **49**, pp. 79–109.

⁵⁴ Share-financed acquisitions do not require companies to use up cash reserves and can be more attractive to owners of the target company. See Brau, J., Francis, B. and Kohers, N. (2003), ‘The choice of IPO versus Takeover: Empirical evidence’, *The Journal of Business*, **76**, pp. 583–612.

⁵⁵ Bartholdy and Olson (2017) found that companies listed in Europe engage in more acquisitions than unlisted companies, even after controlling for factors such as industry and firm size. Bartholdy, J. and Olson, D. (2017), ‘Why are firms listed in one country and private in other countries? The role of industry structure, banking sector and legal system’, *Journal of Corporate Finance*, **43**, pp. 480–499. Celikyurt, U., Sevilir, M. and Shivdasani, A. (2010), ‘Going public to acquire? The acquisition motive in IPOs’, *Journal of Financial Economics*, **96**, pp. 345–363.

category is cumulative—i.e. 'Within 5 years of IPO' covers companies that conducted a follow-on offering 'Within 3 years of IPO', and so on.

Source: Dealogic.

- **Reduced cost of capital**—theoretically, the lower cost of capital from public equity markets (compared to private equity) derives from the diversification benefits⁵⁶ to the investor base and the reduced transaction costs⁵⁷ of trading the stock. As investors of private companies now have relatively well-diversified portfolios, diversification benefits are less significant and the illiquidity premia have become the more relevant factor. Investors will need to be compensated with a higher expected return in the private markets to compensate them for incurring higher risk and transaction costs. Empirical evidence of a sample of 45 countries, including 16 in the EU, between 1990 and 2011 estimated an average risk-adjusted monthly premium of 0.45% for illiquid portfolios of stocks over liquid ones, after controlling for other factors, including size effects.⁵⁸

The benefit has reduced in recent years as private markets have become relatively more liquid and the investor base in many countries, particularly with active private equity funds and venture capital networks, has become more diversified.

- **Access to debt finance on better terms**—for some firms, public listing can allow them to access debt finance on better terms, by increasing their bargaining power relative to their creditors or by reducing information asymmetry with creditors.⁵⁹
- **Greater visibility and prestige (for example, to boost brand awareness and attract talent)**—the increased visibility and reputation associated with being a public company has been cited in academic surveys as a potential benefit.⁶⁰ This increased visibility might be associated with inclusion in an equity index,⁶¹ publicity surrounding

⁵⁶ One of the main lessons from portfolio theory is that risk reduction due to diversification lowers the risk (and required return) for stocks. This will not work if the owner of the firm has a large undiversified stake. The risk of the private firm can be much higher than that of the marginal investors who form part of a well-diversified portfolio.

⁵⁷ See Amihud, Y. and Mendelson, H. (1986), 'Asset pricing and the bid-ask spread', *Journal of Financial Economics*, **17**, pp. 223–249.

⁵⁸ For more detail, and country-specific estimates, see Table A.2. in Amihud, Y., Hameed, A., Kang, W. and Zhang, H. (2015), 'The Illiquidity Premium: International Evidence', *Journal of Financial Economics*, **117**: 2.

⁵⁹ For a discussion of relative bargaining power with creditors, see Rajan, R. (1992), 'Insiders and outsiders: The choice between informed and arm's-length debt', *The Journal of Finance*, **47**, pp. 1367–1400. Pagano, Panetta and Zingales (1998) examined the debt financing hypothesis using a sample of Italian firms. The authors found that while listed firms do experience a reduction in the cost of bank credit post-IPO, firms' pre-IPO interest rate and credit concentration are not significant determinants for the decision to go public. Pagano, M., Panetta, F. and Zingales, L. (1998), 'Why do companies go public? An empirical analysis', *The Journal of Finance*, **53**.

⁶⁰ For a key academic study, see Bancel, F. and Mittoo, U. (2008), 'Why European firms go public?', *European Financial Management*, **15**, pp. 844–884. A more recent study of SMEs in Germany found that increased visibility and the opportunity for follow-on financing were important advantages. See Deutsches Aktieninstituts (2018), 'Börsengang und börsennotiz aus sicht kleiner und mittlerer unternehmen', March, https://www.dai.de/files/dai_usercontent/dokumente/studien/2018-03-01%20Boersengang%20und%20Boersennotierung%20KMUs.pdf.

⁶¹ An FCA review into the UK primary market found that equity index inclusion was an important part of the attractiveness of the UK premium listing segment. See Financial Conduct Authority (2017), 'Review of the Effectiveness of Primary Markets: The UK Primary Markets Landscape', Discussion Paper, <https://www.fca.org.uk/publication/discussion/dp17-02.pdf>.

the IPO process itself,⁶² or positive analyst coverage.⁶³ Many firms also choose to be listed to help them attract and retain talent.

Other reasons for listing cited in the literature, and noted in the interview feedback, include:

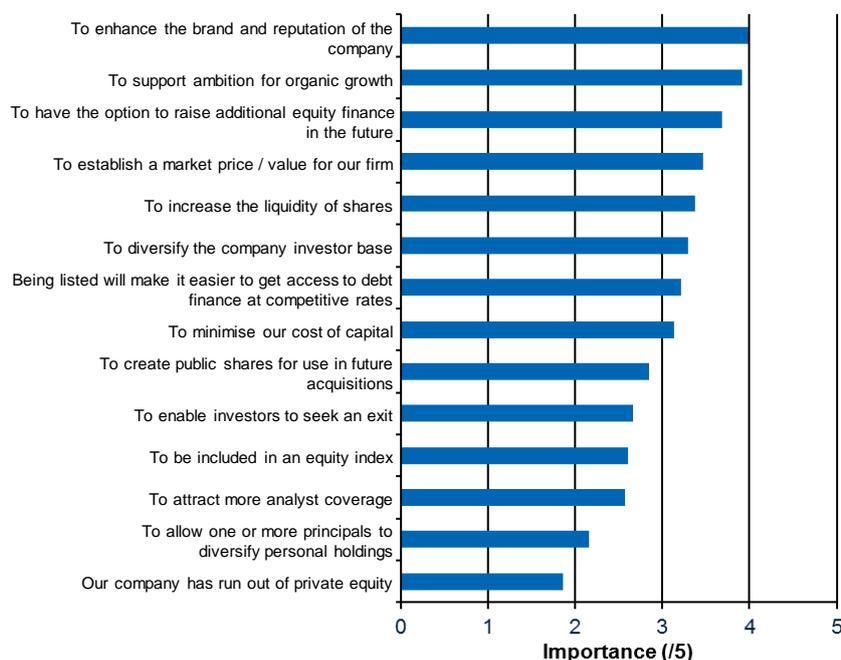
- shifting monitoring costs from private lenders to the securities market regulators, who may reveal information to the market through repeated interactions with the issuer during the listing process.⁶⁴ This works if the costs of registration, filing, etc. are outweighed by the benefits;
- learning from the information contained in stock price movements to aid the efficient flow of capital between productive and unproductive investment opportunities;
- using the information contained in stock price movements to facilitate equity-based compensation of staff. Public equity prices can be useful for incentive compensation for employees and feedback on management decisions. This price-revelation process can be particularly informative for large firms as a disciplinary force on their actions.

We ran an online survey to existing and potential issuers across Europe on their reasons for listing and the importance of those factors in driving the listing decision. Figure 4.2 illustrates the average importance assigned to a range of motivations for seeking a listing.

⁶² Maksimovic and Pichler (2001) presented a model in which the media attention associated with an IPO can provide firms in niche industries with a form of first-mover advantage. See Maksimovic, V. and Pichler, P. (2001), 'Technological innovation and initial public offerings', *The Review of Financial Studies*, **14**, pp. 459–494. Demers and Lewellen (2003) found that the under-pricing of an IPO could itself serve as a mechanism for generating interest in a company. See Demers, E. and Lewellen, K. (2003), 'The marketing roles of IPOs: evidence from internet stocks', *Journal of Financial Economics*, **68**, pp. 413–437.

⁶³ See, for example, Bradley, D., Jordan, B. and Ritter, J. (2003), 'The quiet period goes out with a bang', *The Journal of Finance*, **58**, pp. 1–36.

⁶⁴ See, for example, Lowry, M., Michaely, R. and Volkova, E. (2019), 'Information revelation through regulatory process: Interactions between the SEC and companies ahead of the IPO', *Swiss Finance Institute Research Paper Series*, **19-47**.

Figure 4.2 Motivations for listing—survey results

Note: Respondents were asked: 'How important were the following motivations for considering a listing? Please use a scale from 1 to 5, where 1 is Not Important and 5 is Very Important.' The chart presents the simple average for each attribute, and includes responses from representatives of listed companies only. N=50

Source: Oxera primary market survey.

The following observations stand out:

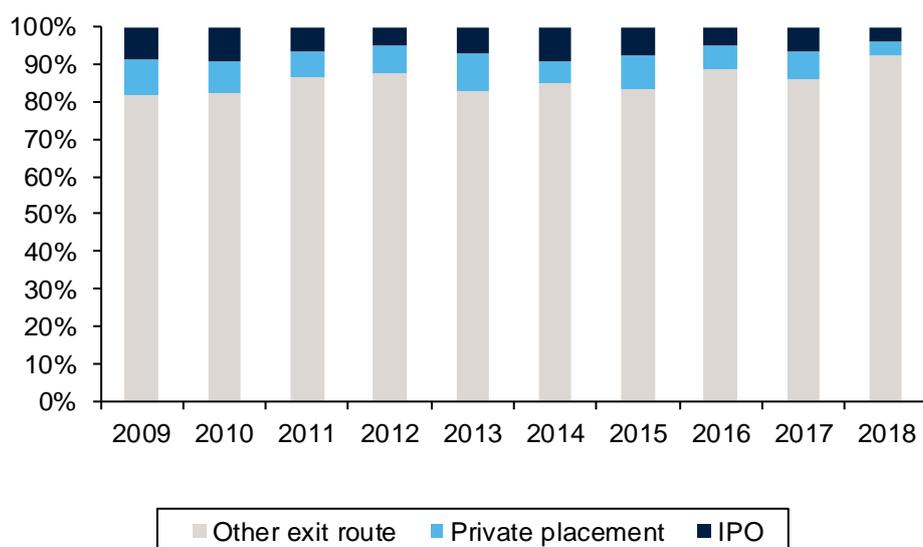
- the most important reason to seek an IPO is to boost the firm's reputation and profile;
- the ability of an IPO to support the firm's growth ambitions and reduce its cost of capital are also important factors;
- lack of availability of private equity funding is the least important factor cited by firms.

These observations are consistent with the results of previous surveys conducted in the USA and Europe (see Box 4.1 below).

As the secondary markets for private equity have grown and developed in recent years, the IPO exit route has been less common. Recent data shows that European (EU and non-EU) private equity IPO values in 2019 (29 exits worth €20.4bn) were the lowest figures since 2012.⁶⁵ The same data shows that the fall in IPO exits has been offset by an increase in private equity sales to corporates, which accounted for the largest proportion of private equity exits (ahead of sales to other private equity funds).

Figure 4.3 shows that this trend is global and has occurred in many financial centres.

⁶⁵ Pitchbook (2020), 'European PE breakdown: 2019 Annual', https://files.pitchbook.com/website/files/pdf/PitchBook_2019_Annual_European_PE_Breakdown.pdf.

Figure 4.3 Number of exits by buyout funds worldwide, by type, 2009–18

Note: 'IPO' and 'private placement' are both forms of exit that involve the company seeking a listing. 'Other exit route' refers to exits that do not involve a listing and includes trade sales, sales to general partner, restructuring, mergers, and sales to management.

Source: Preqin.

Box 4.1 Reasons for listing, as cited in the literature**Academic literature**

Brau and Fawcett (2006) and Bancel and Mittoo (2009) are two key papers in the academic literature.⁶⁶ The former presents a survey of US CFOs and the latter is focused on EU issuers. Key findings from these surveys include:

- in the EU survey, CFOs identified enhanced visibility and prestige, and financing for growth as the most important benefits of an IPO. In the US survey, listing to facilitate an acquisition strategy was cited as the single most important reason for going public;
- in the EU survey, large firms considered enhanced external monitoring as the most important benefit (seen as a major cost in the USA), while small firms went public primarily to raise capital for growth. Family-controlled firms saw the IPO as a vehicle to strengthen their bargaining power with creditors without relinquishing control;
- in the EU survey, firms domiciled in countries using an English legal system considered increased share liquidity as the most important benefit, whereas Italian firms (civil law) cited the reduction in the cost of capital.

Policy literature

A 2013 survey of UK listed mid-sized businesses provided the following insights.⁶⁷

- The vast majority of companies surveyed sought a listing to raise funds for investment, such as strategic (often overseas) acquisitions, R&D and restructuring (buying out existing private investors).
- Companies also listed in order to raise profile, enhance their brand and increase market credibility worldwide.
- In most cases, companies expected to retain their listing because of the option to raise funds, if needed. In a minority of cases, the company indicated that it would be unlikely to raise further funds, but that ongoing listing raised the profile of the business, provided credibility in the M&A market, and assisted in raising cheaper finance from bank debt finance sources.
- The most frequently cited reasons for potentially delisting were a private buyout or if the exchange became too onerous and expensive to remain on.
- The high volume of delistings was driven by liquidations and business failures where the only route to survival was likely to be a buyout.

A 2018 survey of German SMEs highlighted that:⁶⁸

- an increase in visibility and reputation, as well as the opportunity for follow-up financing, were important advantages of listing;
- a majority of surveyed companies had been able to increase revenue by at least half, and 42% had increased their number of employees by at least half post-IPO;
- low secondary market liquidity was the biggest challenge for listed SMEs (chosen by more than half of the respondents). Other challenges included lack of investors with appropriate industry expertise.

We have also conducted a number of case studies, and observe the following.

- The benefits of boosting the brand and profile from an IPO appear most common among retail businesses. For example, when Danish jewellery maker, Pandora, listed on Nasdaq

Copenhagen in 2010, the company described the listing as 'providing a strong platform for future growth by enhancing the visibility of Pandora'.⁶⁹ Prior to its UK listing, the UK transport booking app, Trainline, noted that a listing would 'further support the Group's growth plans by increasing the Group's public profile and brand awareness'.⁷⁰ Box 4.2 provides an additional example of Roche Bobois. Allowing retail investors to participate in IPOs can be one way in which issuers seek to boost their profile. For example, in their IPOs, luxury car manufacturers Ferrari and Aston Martin allowed individuals who owned their cars to subscribe to the offering.⁷¹

- There are other cases (e.g. Box 4.3 describes Adyen's listing on Euronext in 2018) where the company makes it clear that it does not want to undertake any profile-raising activities such as a big opening ceremony.⁷² This shows the case-specific nature of profile-raising as a reason to (or not to) list.
- Some firms use the IPO process to attract new customers. For example, property website and app, Zoopla, offered shares to member estate agents at a discount, using the IPO as a marketing exercise.⁷³
- A number of very-high-growth firms seek an IPO because the private markets are unable to provide them with the scale of capital that they seek to meet their growth ambitions. For example, Moncler, an Italian clothes retailer, listed on Borsa Italiana in 2013 to fund product expansion and enter new markets in Russia and the USA.⁷⁴
- The ability to seek additional equity funding via follow-on offerings is also very important to firms seeking growth opportunities. For example, Cellnex, the Spanish telecoms infrastructure operator, announced its intention to undertake a large rights issue, worth €4bn in July 2020, in order to fund a pipeline of acquisitions. This followed two previous capital increases in 2019.⁷⁵

⁶⁶ Brau, J.C. and Fawcett, S.E. (2006), 'Initial Public Offerings: An Analysis of Theory and Practice', *The Journal of Finance*, **61**, pp. 399–436; Bancel, F. and Mittoo, U.R. (2009), 'Why Do European Firms Go Public?', *European Financial Management*, **15**, pp. 844–884.

⁶⁷ Department for Business Innovation and Skills (2013), 'Investigation into the motivations behind the listing decisions of UK companies', BIS Research Paper 126, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/232087/bis-13-1130-investigation-into-the-motivations-behind-the-listing-decisions-of-uk-companies.pdf.

⁶⁸ Deutsches Aktieninstitut (2018), 'Börsengang und börsennotiz aus sicht kleiner und mittlerer unternehmen', March, https://www.dai.de/files/dai_usercontent/dokumente/studien/2018-03-01%20Boersengang%20und%20Boersennotierung%20KMUs.pdf.

⁶⁹ Pandora (2010), 'Pandora publishes offering circular and sets indicative price range for its initial public offering', 20 September, press release, <https://investor.pandoragroup.com/static-files/66a5afcb-fee7-4488-b292-4769980c29e7>.

⁷⁰ See the Trainline IPO prospectus, <https://investors.thetrainline.com/investors/ipo-documentation>

⁷¹ See *Financial Times* (2018), 'Aston Martin seeks valuation of up to £5bn in London IPO', September, <https://www.ft.com/content/3c1794c6-bc9b-11e8-94b2-17176bf93f5>; Reuters (2015), 'Ferrari faithful rev IPO price to top of range', October, <https://www.reuters.com/article/us-ferrari-ipo/ferrari-faithful-rev-ipo-price-to-top-of-range-idUSKCN0SE23S20151021>.

⁷² Bloomberg (2019), 'Can Europe's latest tech darling keep it up?' February, <https://www.bloomberg.com/news/articles/2019-02-14/can-adyen-one-of-europe-s-hottest-tech-companies-keep-it-up>.

⁷³ Proactive Investors, 'Zoopla makes IPO available to estate agents but not retail investors', <https://www.proactiveinvestors.co.uk/companies/news/58461/zoopla-makes-ipo-available-to-estate-agents-but-not-retail-investors-68744.html>.

⁷⁴ Moncler (2014), 'Full Year 2013 Preliminary Results Conference Call', 24 February, https://www.monclergroup.com/wp-content/uploads/2016/07/2014-02-24_Moncler-FY-2013-Prel_Transcript.pdf.

⁷⁵ Cellnex (2020), 'Cellnex to increase its share capital by €4 billion', press release, <https://www.celnextelecom.com/content/uploads/2020/07/Cellnex-to-increase-its-share-capital-by-%E2%82%AC-4-billion.pdf>.

- The willingness of the existing shareholders to exit some of their investment is often a strong reason to seek an IPO. This was one of the main reasons for Adyen's listing on Euronext in 2018 (see Box 4.3).⁷⁶

Box 4.2 Reasons for listing: case study of Roche Bobois

Roche Bobois SA, a French family business founded in 1960, operates in 54 countries and, as at 31 December 2017, had a network of 329 owned stores and franchises marketing its two brands: Roche Bobois, a high-end furniture brand with a strong international presence, and Cuir Center, positioned in the mid-range market segment with an essentially French customer base.

In July 2018 the company listed its stock for the first time on Euronext Paris. Commenting on the IPO, Gilles Bonan, Chairman of the Board, said 'it will help the Roche Bobois Group to bolster its reputation, visibility and standing in France and abroad, undoubtedly enabling us to attract new talent'.

The existing shareholders (the Chouchan family, via Familiale J-E.L.C. and Mr Jean-Éric Chouchan, and TXR S.r.l.) sold 987,521 existing shares under the transaction, for €19.8m gross.

Source: Roche Bobois (2018), 'Roche Bobois: Successful IPO on Euronext Paris', press release, Paris, 9 July, https://www.actusnews.com/documents_communique/ACTUS-0-55086-pr_rochebobois_ipo_success_va.pdf.

Box 4.3 Reasons for listing: Adyen case study

Founded in 2006, global payments technology company, Adyen, had over 1,000 employees as at 2019, with an H1 2019 net revenue of €221.1m. With headquarters in the Netherlands, it has 21 offices globally and its business operations are geographically diverse. Europe made up 65% of its H1 2019 net revenues, followed by North America (15%), Latin America (10%), and Asia-Pacific (9%). In June 2018, Adyen conducted an IPO on Euronext Amsterdam. The IPO valued the company at approximately €7.1bn. Unlike many technology IPOs, Adyen had been profitable for several years before its IPO, recording a net income of €71.3m in 2017.

The amount of shares offered in the IPO was relatively low (12% free float) and they were all secondary shares, with no new capital raised. One of the largest single existing shareholders, Index Ventures, reduced its shareholding from 17% to 15% as part of the IPO. The secondary shares were sold to a small group of specialised institutional investors. 5% of these shares were offered to eBay, a key corporate partner of Adyen. Adyen did not undertake any profile-raising activities and very little was communicated externally or internally regarding the IPO.

Source: Euronext.

4.3 The costs of listing

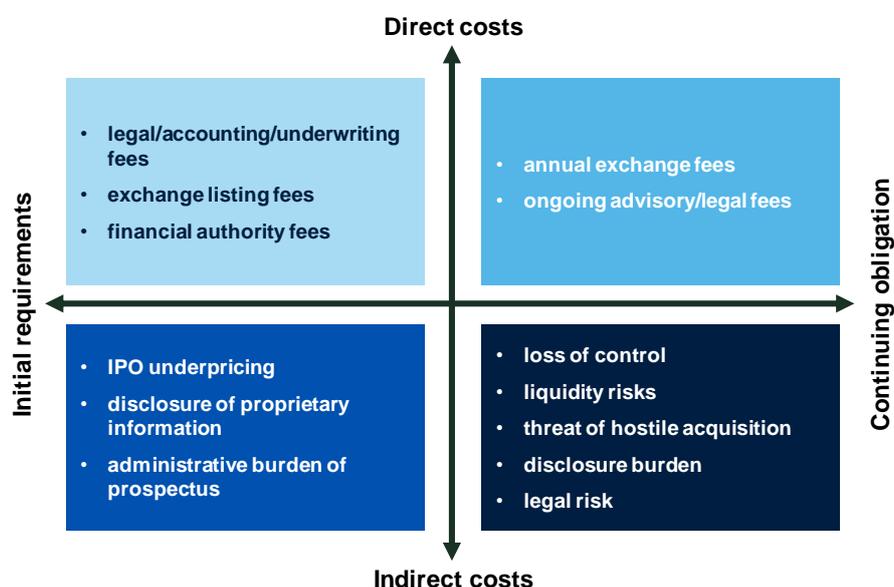
According to one recent global study, 36% of executives cited the costs of going and being public as a cause of the decline in popularity of equity markets.⁷⁷ The costs of listing have

⁷⁶ Adyen (2018), 'Adyen IPO priced at €240 per share', <https://www.adyen.com/press-and-media/2018/adyen-ipo-priced-at-240-per-share>.

⁷⁷ PwC and Economist Intelligence Unit (2019), 'Capital markets in 2030: the future of capital markets', <https://www.pwc.com/gx/en/audit-services/capital-market/publications/capital-markets-2030.pdf>.

also been widely described in the academic and policy literature, and can be grouped into direct and indirect costs, as well as initial and ongoing requirements (see Figure 4.4).

Figure 4.4 The costs of listing



Source: Oxera.

The direct costs associated with an IPO are generally considered to be lower than the indirect costs, and not particularly burdensome for large issuers. However, they can have a larger impact on smaller issuers (as discussed in more detail in section 5).

Most estimates suggest that the initial costs of an IPO can be up to around 15% of gross proceeds.⁷⁸ FESE has estimated the costs to be approximately 10–15% of the amount raised from an IPO of less than €6m; 6–10% for an IPO of less than €50m; 5–8% for an IPO of between €50m and €100m; and 3–7.5% for an IPO of more than €100m.⁷⁹

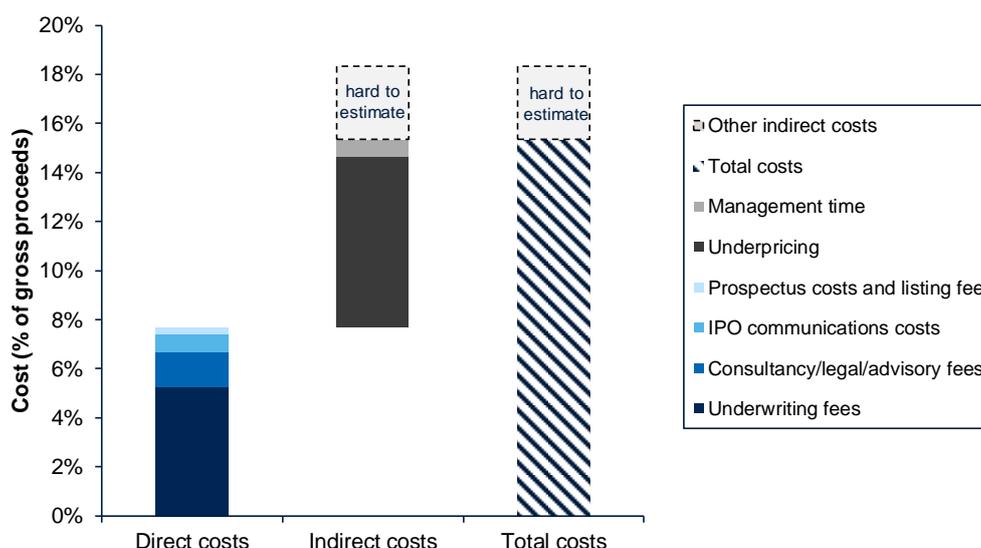
Figure 4.5 gives an estimated breakdown of the common direct and indirect costs associated with an IPO (based on an assumed gross deal value of €60m).

Underwriting fees and under-pricing are two important components of total IPO costs. Our empirical analysis suggests that these costs have been relatively stable over time (see section 8.3). Interview feedback suggests that legal and advisory fees have also remained broadly stable. Several interviewees suggested that management time and other indirect costs associated with an IPO have increased over time.

Based on the analysis in this report, we estimate the total financial cost of an IPO to be in the region of 5% to 15% of gross proceeds, although this can be higher for those raising smaller sums, as shown in Figure 4.5.

⁷⁸ See, for example, Wegmann, J. (2013), 'Cost of an IPO', ipoBOX; European IPO Task Force (2020), 'European IPO Report 2020; Euronext (2019), 'The listing venue of choice for tech companies'.

⁷⁹ European IPO Task Force (2020), 'European IPO Report 2020', <https://fese.eu/app/uploads/2020/03/European-IPO-Report-2020.pdf>.

Figure 4.5 Estimated direct and indirect costs of an IPO

Note: Other indirect costs include disclosure of proprietary information, and the opportunity cost of management time.

Source: Oxera analysis based on interviews with market practitioners; Dealogic; Wegmann, J. (2013), 'Cost of an IPO', ipoBOX, <https://www.ipobox-online.de/erlose-und-kosten-bei-einem-ipo/5-2-kosten-eines-ipos>.

Below, we examine the direct costs and indirect costs in turn.

4.3.1 Direct costs

Direct costs are the monetary costs associated with a listing—which we refer to as initial direct costs—and the ongoing costs associated with remaining listed.

Initial direct costs

The initial direct costs mostly derive from fees paid to parties involved in supporting a company through the listing process. These include fees paid to:

- underwriters/bookrunners involved in the IPO process;
- accountants, legal counsel and other IPO advisers;
- the listing venue;
- market regulators.

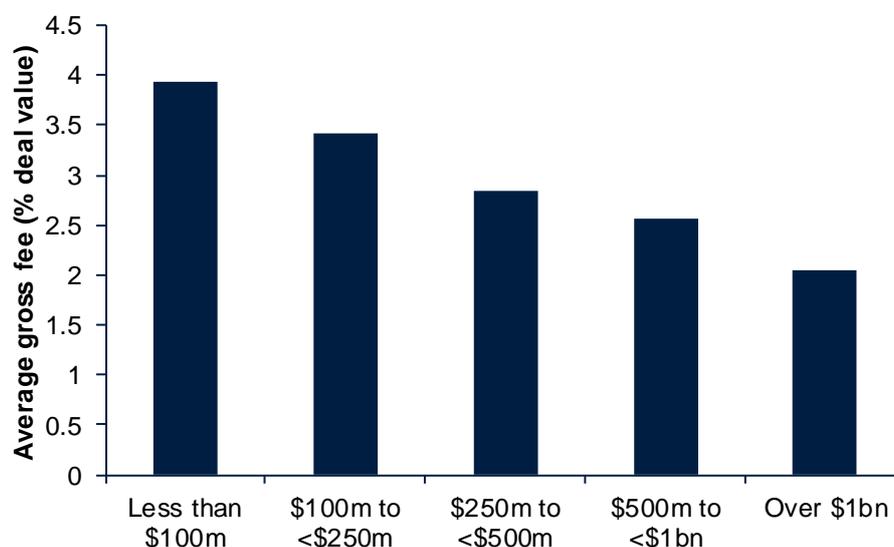
Fees to underwriters/bookrunners

Underwriting fees are paid to the investment bank (or a syndicate of banks) that manages the IPO. This process usually involves:

- producing the prospectus;
- advising the company on a price range within which to offer the shares;
- introducing the company to analysts and investors to stimulate interest in the IPO;
- recording orders directly from investors ('book-building');
- advising the issuer on the final offer price and allocation.

Figure 4.6 shows the average gross fee paid to underwriters and advisers as a percentage of IPO value for different deal sizes in the EU-28.

Figure 4.6 Average gross fees by deal size, 2000–19



Note: Data calculated using the Dealogic 'Gross Fee % (All)' field. Gross fees in Dealogic include legal, printing, underwriting and market listing fees. Figures converted to euros using mean annual exchange rates from the ECB.

Source: Dealogic.

Fees to accountants, lawyers, and other capital market advisers

In addition to hiring underwriters, companies seeking a listing typically also hire other third-party advisers, such as:

- accountants—for example, to audit the financial statements;
- lawyers—for example, to interact with the listing authorities and help draft the prospectus and disclosure documentation;
- capital market advisory firms—for example, to assist the company with investor roadshows, the selection and management of the underwriting syndicate, and education and advice regarding the listing requirements.⁸⁰

As an example, the listing of Adyen on Euronext in 2018 involved the following advisers:⁸¹

- legal advisers to the company—Clifford Chance;
- lead advisers (global coordinators)—Morgan Stanley, and JP Morgan;
- bookrunners—ABN Amro Bank, Bank of America Merrill Lynch, and Citigroup;

⁸⁰ Some listing authorities (e.g. the FCA) and listing venues (e.g. AIM, Deutsche Börse Scale, Euronext Growth) impose a requirement for listed companies to appoint a capital markets advisory firm. See 'The role and responsibilities of a Sponsor', <https://www.fca.org.uk/markets/sponsor-regime/role-and-responsibilities-sponsor>.

⁸¹ See p. 367 of the Adyen IPO prospectus, <https://www.adyen.com/dam/jcr:ab990e2d-7911-44b7-8932-bee4809eba/Adyen%2520Prospectus.pdf>.

- legal advisers to underwriters—Stibbe N.V., and Latham & Watkins LLP;
- independent auditors—PwC;
- listing and paying agent—ABN AMRO Bank N.V.

According to the IPO prospectus, the total direct cost of the Adyen IPO was approximately €26.9m, of which €25.2m was attributable to underwriter fees, and €1.7m to listing fees, legal and administrative expenses, publication costs and taxes (among other costs).⁸² The total direct cost of €26.9m represented 3.2% of the total value of the offering (€849m⁸³). The €1.7m costs not connected to underwriting fees accounted for 0.2% of the offering value.

Previous analysis by Oxera of the costs of listing on major European and US markets found that the combined cost of legal, accounting and advisory fees accounted for approximately 3–6% of the funds raised for a typical issuer.^{84 85} The same research also noted a perception among market participants that professional fees in London tended to be higher than in Frankfurt and Paris, but not as high as in New York. Feedback from our stakeholder interviews undertaken for this present study suggests that this cost range remains broadly similar.

Exchange fees

The listing venue is responsible for admitting the company's shares onto its market. The activities of the stock exchange include:

- verifying the information provided by the company, including assessing whether the listing rules have been met (a legal requirement—see section 3.2.1);
- marketing and raising the profile of the capital-raising;
- establishing the market technology and infrastructure to allow market participants to trade shares in the newly listed company.

The price profile of listing fees varies between exchanges and market segments. This may be driven by differences in the costs associated with admitting issuers or in the 'value-add' services provided to issuers.

For most companies, the listing fees are minor compared with the other costs of raising capital. In general, larger companies are charged more in absolute terms, but less as a proportion of the sum raised.

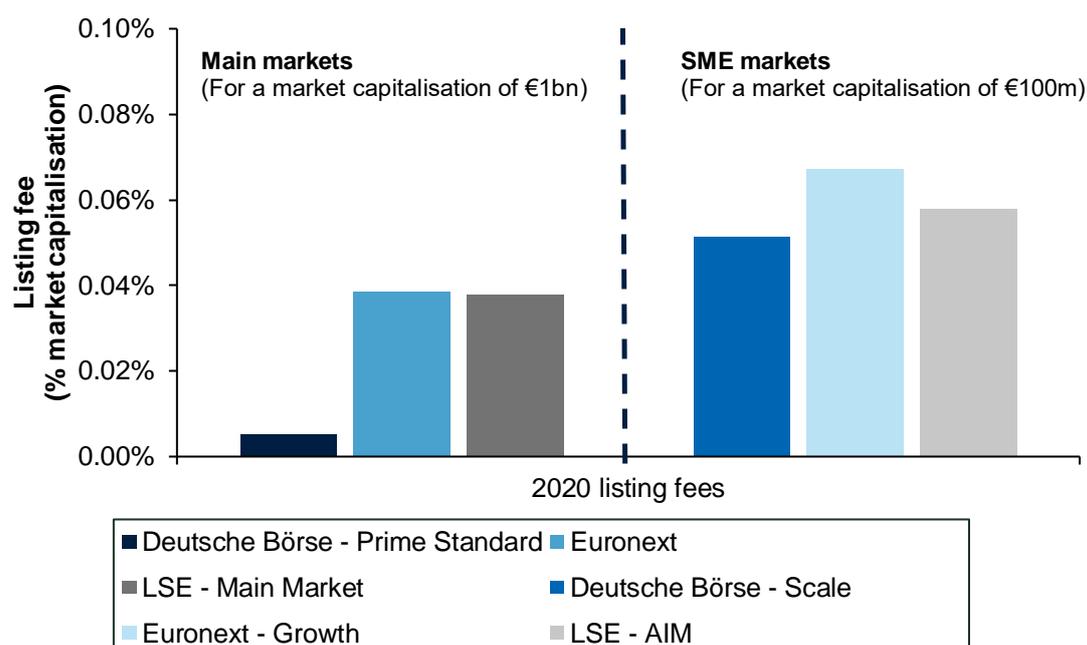
Figure 4.7 shows estimated listing fees in 2019 on the main and junior markets of Deutsche Börse, Euronext and the London Stock Exchange. As an illustration, to account for different sizes of typical issuers on each market segment, the listing fee for a €100m company on the junior market segments and that for a €1bn company on the main market segments have been estimated. While listing fees are generally higher on the main market segments, they are higher as a proportion of market capitalisation for the smaller issuers.

⁸² See p. 14 of the Adyen IPO prospectus, <https://www.adyen.com/dam/jcr:ab990e2d-7911-44b7-8932-bee4809eba/Adyen%2520Prospectus.pdf>.

⁸³ Euronext cash market statistics

⁸⁴ Oxera (2006), 'The cost of capital: an international comparison', June, <https://www.oxera.com/publications/the-cost-of-capital-an-international-comparison/>

⁸⁵ This total comprised financial adviser costs (1–2%), legal expenses (1–2%), accounting and auditing fees (0.5–1.5%), and other printing, PR expenses, etc. (<0.5%).

Figure 4.7 Stock exchange listing fees, 2020

Note: Fees as at January 2020. Fees for Deutsche Börse Prime Standard, Euronext and LSE Main Market are for an assumed €1bn initial market capitalisation. Fees for Deutsche Börse Scale, Euronext Growth and LSE AIM are for an assumed €100m initial market capitalisation. The London Stock Exchange fees exclude VAT.

Source: Oxera analysis of stock exchange price schedules.

Fees to market regulators

Companies may also have to pay fees to the national supervisory authority to cover the cost of reviewing and authorising the listing application and prospectus document. In general, these fees are negligible compared with the other fees associated with listing. For example, the FCA charges between £2,000 and £15,000 for new applications to the UK Listing Authority.⁸⁶

IPOs on SME-focused MTFs are not subject to listing approval, and therefore avoid these fees and the scrutiny that accompanies admission to a regulated market.

Ongoing direct costs

In addition to the initial direct costs, there are ongoing direct costs. These typically include the ongoing fees paid to the listing venue(s), advisory firm(s) or sponsor, and the auditor(s).

Data on ongoing fees paid to advisers and auditors is more limited. Research on audit fees paid by UK listed companies in 2017 found that the average (mean) audit fees were £6.4m for FTSE 100 companies, £774,000 for FTSE 250 companies, and £202,000 for AIM100

⁸⁶ See 'FEES 3 Annex 12 UKLA transaction fees', <https://www.handbook.fca.org.uk/handbook/FEES/3/Annex12.html>.

companies.⁸⁷ Another study estimated the EU average audit fee for listed companies at just over €1m.⁸⁸

For most large companies, the ongoing fees are not seen as a huge burden. However, a few large issuers have publicly cited the cumulative costs of multiple exchange fees as a reason for discontinuing multiple listings, and some of the smaller issuers interviewed cited these costs as being significant.⁸⁹

4.3.2 Indirect costs

Alongside fees, issuers seeking a listing face a range of indirect (non-monetary) costs associated with listing on public markets. These are the second column of costs in Figure 4.5.

The **initial indirect costs** include:

- the under-pricing associated with the IPO (see section 8.2 for more detail);⁹⁰
- the costs associated with the disclosure of proprietary information through the prospectus;
- the management time and regulatory burden of conducting the IPO itself.

Several industry practitioners have highlighted the efforts required to comply with the regulatory requirements associated with the listing process, and the litigation risk that could emerge, as the most significant indirect costs of listing. In particular, many issuers stressed, as a high and growing cost to listing, the increased length and complexity of the prospectus documentation, often driven by the evolution of market practice (and risk-averse legal advisers and senior management) rather than the regulatory requirements.

Analysis conducted by Assonime of recent IPO prospectuses in a range of EU member states (see Table 4.1 below) highlights that:

- prospectus length varies by member state—for example, the median prospectus length was around 800 pages in Italy compared with around 400 pages in Germany. Interviews with stakeholders suggest that this variation is driven primarily by market practice and legal prudence on the part of the advisory community;
- prospectus length is not proportionate to market capitalisation—the average prospectus length for a company valued at less than €150m was only a third shorter than that for one valued at more than €1bn.

⁸⁷ Accountancy (2017), 'FTSE & AIM auditor survey 2017-18', March, https://www.accountancydaily.co/sites/default/files/accountancy_ftse_aim_auditors_2017_2018_0.pdf.

⁸⁸ Willekens, M., Dekeyser, S. and Simac, I. (2019), 'EU Statutory Audit Reform: Impact on costs, concentration and competition', [https://www.europarl.europa.eu/RegData/etudes/STUD/2019/631057/IPOL_STU\(2019\)631057_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/631057/IPOL_STU(2019)631057_EN.pdf).

⁸⁹ For example, in 2019, Eli Lilly voluntarily delisted its shares from Euronext Paris, citing low trading volume, costs and administrative expenses. See Eli Lilly (2019), 'Lilly announces voluntary delisting from Euronext Paris', <http://lilly.mediaroom.com/2019-10-03-Lilly-Announces-Voluntary-Delisting-from-Euronext-Paris>. Also see Box 6.6 for a case study of Daimler.

⁹⁰ Under-pricing is the increase in price between the initial offer price and subsequent market price (usually the first-day closing price). It is interpreted as a cost to issuers because under-pricing implies that the company sold its shares at a price lower than the true value.

Table 4.1 Average length (number of pages) of prospectus document, March 2019

	Total sample			Mean, by market capitalisation		
	Median	Min.	Max.	<€150m	€150m–€1bn	>€1bn
France	447	217	683	376	368	668
Germany	390	183	591	296	392	468
Italy	807	563	1,367	818	831	839
Netherlands	266	105	389	192	249	280
Spain	481	216	674	266	517	500
Total	400	105	1,367	342	577	514

Note: Analysis of most recent ten IPOs in each respective member state as at March 2019.

Source: Assonime (2019), 'Osservazioni di Assonime e Confindustria al documento di consultazione Consob per l'adeguamento al Regolamento (UE) 2017/1129, relativo al prospetto', March, http://www.assonime.it/_layouts/15/Assonime.CustomAction/GetPdfToUrl.aspx?PathPdf=http://www.assonime.it/attivita-editoriale/interventi/Documents/consultazioni%203-2019A.pdf.

For SMEs, the EU Growth Prospectus does allow for lighter disclosure, particularly for information on the development of the issuer's business; investments; capital resources; R&D; patents and licences; corporate governance arrangements; and employees' and historical financial information. As this development is relatively recent, there is limited data available to assess whether the policy has affected the average length of prospectuses for SMEs. However, feedback from market participants indicates that there has not been a substantial decrease in the length of documents submitted after July 2019. One reason may be that, although the number of sections that form part of the EU Growth Prospectus has been reduced compared to a normal prospectus, the number of elements included in each section has increased.⁹¹

Feedback from our interviews indicates that senior management of firms seeking to list now spend a significantly higher proportion of their time on the listing process than before—between 30% and 50% of CEO and CFO time in the six months prior to listing.⁹²

The risk of litigation is seen as a major concern by many senior managers (see Box 4.4 below).

Box 4.4 Class action lawsuits

The legal environment for companies going public varies considerably around the world. Securities class action lawsuits are one of the main legal concerns for firms seeking to list. Class action lawsuits can be both costly and damaging to an issuer's reputation. There are ongoing legal risks associated with being listed, but the risk can be particularly acute during the IPO process as disclosures are made for the first time.

The majority of securities litigation happens in the USA. According to a Stanford Law School assessment,⁹³ on average each year from 2001 to 2018 approximately 5.5% of S&P 500 companies, or about 1 in 18, were subject to a core filing; and 9.4% of S&P

⁹¹ Our high-level analysis of IPO prospectuses on Euronext Growth and AIM Italia since the Growth Prospectus regime came into effect in July 2019 identified only two prospectuses that had been filed and approved in accordance with the regime. The combined lengths of the registration document, securities note and summary for these two IPOs were 202 pages and 221 pages.

⁹² Based on insights from structured interviews with market participants.

⁹³ Cornerstone Research (2019), 'Securities Class Action Filings – 2019 Midyear Assessment', <http://securities.stanford.edu/research-reports/1996-2019/Cornerstone-Research-Securities-Class-Action-Filings-2019-MYA.pdf>.

500 companies were subject to a new securities class action filing in federal courts in 2019.

Despite there been far fewer securities settlements outside the USA, securities litigation is increasingly becoming a global phenomenon. According to a study in 2006,⁹⁴ changes in European Commission competition law have encouraged private action for breaches, with investors having obtained settlements reaching US\$100m in Canada and Australia. Other countries where there have been class action lawsuits are Germany, Israel, Italy, the Netherlands, South Korea, and Sweden.

Some stakeholders have suggested that the listing process gives companies a realistic preparation for the ongoing administrative burden associated with being listed. In this case, policymakers might need to focus not on reducing the initial hurdle of going public, but on lessening the ongoing burden of being public.

The **indirect ongoing costs** of being listed are often cited as having the most significant impact on the decision to seek a listing, or, indeed, deciding to delist. In broad terms, these ongoing costs are driven by:

- the administrative burden associated with ongoing regular reporting and disclosure—these have generally increased in breadth and frequency;
- control issues—when economic and voting rights are commensurate, firms cannot conduct an IPO without ceding some control. This is particularly relevant for European family-owned firms;
- the agency costs associated with being a public corporation.

Each of these points is discussed in more detail in section 7.

Feedback from the stakeholder interviews emphasised that these costs have widened the gap between public and private companies. Policy options that the European Commission could consider reducing this imbalance would require either lessening the burden on public companies or reviewing the governance arrangements and reporting requirement for private companies.

The Commission may want to revisit some of the rules around disclosure on listed firms. Alternatively, it could consider reviewing the merits of applying some improved governance arrangements for some large unlisted firms, to enhance the market discipline on the governance of firms. This could include the audit standards for private companies and the information that must be submitted to national registries of private companies.

4.4 Triggers for listing

A number of natural triggers can prompt companies to consider a listing. There is an extensive academic literature on these, and on IPO timing more broadly.⁹⁵ Several theories have been proposed to explain the timing of IPOs, and these can be grouped according to whether they involve market-, industry- or firm-specific factors.

Important factors that influence the timing of an IPO include:

⁹⁴ Ernst & Young (2009), 'IPO insights: Comparing global stock exchanges', [https://www.ey.com/Publication/vwLUAssets/IPO_Insights:_Comparing_global_stock_exchanges/\\$FILE/IPO_comparingglobalstockexchanges.pdf](https://www.ey.com/Publication/vwLUAssets/IPO_Insights:_Comparing_global_stock_exchanges/$FILE/IPO_comparingglobalstockexchanges.pdf).

⁹⁵ Ibbotson and Jaffe (1975) and Ritter (1980) are two seminal papers examining IPO 'waves'. Ibbotson, R. and Jaffe, J. (1975), "'Hot Issue' markets", *The Journal of Finance*, **30**, pp. 1027–1042; and Ritter, J. (1980), 'The "Hot Issue" market of 1980', *The Journal of Business*, **57**, pp. 215–240.

- overall stock market conditions—some papers suggest that managers time their IPO to take advantage of strong stock market performance.⁹⁶ This allows them to sell shares at the highest price;
- IPO market attractiveness—successful financial performance of other firms going public or recent IPOs of successful firms can induce managers to conduct an IPO;⁹⁷
- industry performance—managers may use an IPO to take advantage of the strong performance of their firms in their industry;⁹⁸
- firm-specific factors, which could include:
 - privatisation—for example, the Port of Tallinn in Estonia (see Box 4.5), Royal Mail in the UK, and Telia in Sweden;
 - family-succession issues;
 - existing investor(s) facing liquidity demand—for example, Levi Strauss (see Box 4.6);
 - private equity fund horizon—for example, Pandora’s listing on Nasdaq Nordic in 2019 to enable the existing private equity owners (Axcel) and some family owners to exit positions;⁹⁹
 - investment opportunities that need immediate external equity funding.

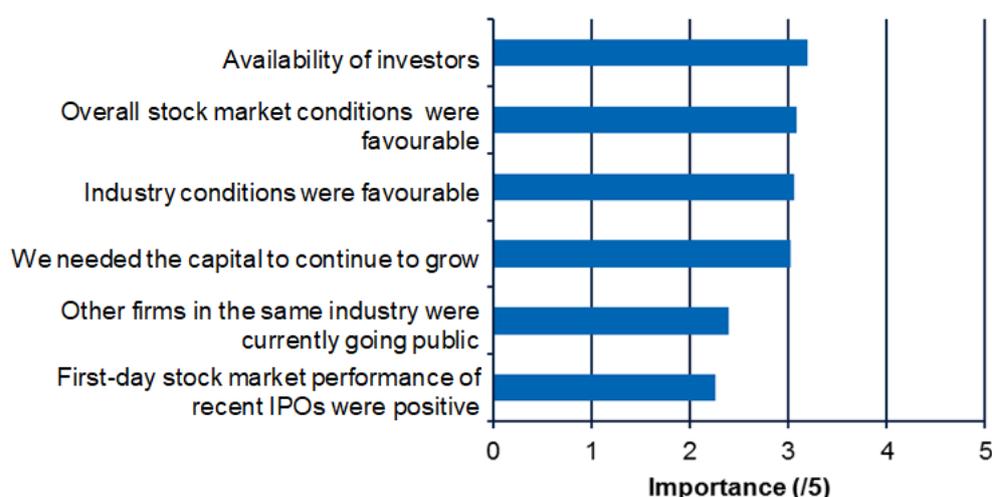
As part of our survey, respondents were asked what prompted their decision to list (i.e. focusing on the timing of the decision, rather than the motivation for listing, as referred to in Figure 4.2). This is in line with previous academic surveys. Figure 4.8 shows the average importance assigned to a range of triggers for seeking a listing.

⁹⁶ See, for example, Ritter, J. (1991), ‘The long-run performance of initial public offerings’, *The Journal of Finance*, **46**, pp. 3–27; and Loughran, T. and Ritter, J. (1995), ‘The new issues puzzle’, *The Journal of Finance*, **50**, pp. 23–51.

⁹⁷ See, for example, Lucas, D. and McDonald, R. (1990), ‘Equity issues and stock price dynamics’, *The Journal of Finance*, **45**, pp. 1019–1043.

⁹⁸ See, for example, Pagano, M., Panetta, F. and Zingales, L. (1998), ‘Why do companies go public? An empirical analysis’, *The Journal of Finance*, **53**; and Lowry, M. and Schwert, G. (2002), ‘IPO market cycles: Bubbles or sequential learning?’, *The Journal of Finance*, **57**, pp. 1171–1200.

⁹⁹ Pandora (2010), ‘Pandora prices its initial public offering at DKK 210 per share’, <https://investor.pandora.net/static-files/566fc83e-1911-45b0-9ca3-8e320d7ccc5c>.

Figure 4.8 Timing of listing: survey results

Note: Respondents were asked: 'To what extent did the following influence the timing of your company listing? Please use a scale from 1 to 5, where 1 is Not Important and 5 is Very Important.' The chart presents the simple average for each attribute. N=50

Source: Oxera primary market survey.

The following observations stand out from the survey:

- there is not one clear trigger for IPOs. This suggests that the IPO timing decision is highly idiosyncratic to the firm;¹⁰⁰
- favourable industry conditions and the availability of investors were the top triggers for seeking a listing;
- the first-day stock market performance of recent IPOs and the behaviour of peer group firms were less important.

We have also conducted a number of case studies, and found the following:

- IPOs triggered by privatisation tend to have higher levels of retail participation (for example, the IPOs of the Port of Tallinn in Estonia in 2018 and Royal Mail in the UK in 2013);¹⁰¹
- succession and issues around family wealth are a common trigger for founder-controlled firms listing;

¹⁰⁰ Two-thirds of respondents assigned a score of 4–5 to at least one of the specified options. Respondents were given the opportunity to provide their own trigger, but very few respondents did so.

¹⁰¹ According to the Myners Review, most of the large and high-profile privatisations of the 1980s and 1990s had a significant retail component, for both financial and policy reasons. As well as offering an additional pool of investors, there was often an objective to broaden public participation. Given that the assets being sold were public and were also often household names, it was felt that the shares being sold should be made available to the public. See the panel chaired by Lord Myners, CBE (2014), 'An independent review for the Secretary of State for Business, Innovation and Skills: IPOs and Bookbuilding in Future HM Government Primary Share Disposals,' 16 December, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/388660/bis-14-1300-myners-independent-review-for-secretary-of-state-for-business-ipos-and-bookbuilding-in-future-hm-government-primary-share-disposals.pdf.

- IPOs tend to occur in clusters and waves, around the time when the sector, and/or the market in general, is hot. For example, the USA experienced a wave of new technology company listings in 2019, including Lyft, Uber, Slack, Pinterest and Postmates.¹⁰²

Box 4.5 and Box 4.6 give some examples of triggers for listing.

Box 4.5 Triggers for listing: Port of Tallinn case study

Port of Tallinn is the fourth-largest port operator in Northern Europe, with 10.6m passengers in 2017. The Group has a diversified portfolio of infrastructure operations, including passenger and cruise ship harbours, cargo harbours and a domestic ferry service.

The key trigger for the IPO was the decision by the Estonian government to sell a minority state (33%) in the state-owned assets. It was felt that privatisation through a public listing would help to strengthen the port's reputation, especially outside Estonia, and enable the government to use the money for further investment.

The Port of Tallinn IPO was the largest in Estonia for over 12 years, raising €128m for the Estonian government and being seen as a great success. The company is now listed on the Nasdaq Tallinn Stock Exchange.

More than 100 investors from 22 countries placed orders in the book. The offering received support from close to 14,000 retail investors (c. 1% of the Estonian population), which accounted for 23% of the total demand. The book ended up with a split of 75% to long and pension funds, 21% to retail investors, and 4% to hedge funds. The Estonian government maintains a 67% majority stake. The EBRD acquired 3.6%.

Sources: European Bank for Reconstruction and Development (2018), 'Port of Tallinn Initial Public Offering', <https://www.ebrd.com/work-with-us/projects/psd/port-of-tallinn-initial-public-offering.html>; STJ Advisors (2018), 'Port of Tallinn €147m IPO, Estonia – East Capital best IPO award winner 2018', <http://www.stjadvisors.com/transactions/port-of-tallinn-147m-initial-public-offering-estonia>; ERR (2016), 'Port of Tallinn: Privatization would help improve company's image abroad', <https://news.err.ee/119756/port-of-tallinn-privatization-would-help-improve-company-s-image-abroad>; European Bank for Reconstruction and Development (2018), 'EBRD acquires minority shareholding in IPO of AS Tallinna Sadam', <https://www.ebrd.com/news/2018/ebrd-acquires-minority-shareholding-in-ipo-of-as-tallinna-sadam.html>

Box 4.6 Triggers for listing: Levi Strauss case study

Levi Strauss designs and markets jeans, casual wear and related accessories. Its products are sold in 110 countries worldwide in approximately 3,000 brand-dedicated retail stores. In March 2019, the company launched an IPO on the New York Stock Exchange using a dual-class share structure, with Class B shareholders getting ten votes for every Class A vote. This listing came 48 years after the first flotation of Levi Strauss in 1971, which was then taken private in 1985 by the Haas family.

Market commentators indicated that a key trigger for the IPO in 2019 was a demand for some liquidity from the existing Haas family shareholders, who also did not want to lose control of the business. Due to the dual-class share structure, the Haas family still held nearly 81% of the total shareholder voting power after the IPO.

In an interview with the *Financial Times*, the CEO of Levi remarked that: 'With more than 100 family shareholders, some wanting to cash out, there was a certain amount of

¹⁰² Benninga, S., Helmantel, M. and Sarig, O. (2005), 'The timing of initial public offerings', *Journal of Financial Economics*, **75**:1, pp. 115–132; Batnini, F. and Hammami, M. (2015), 'IPO waves: How market performances influence the market timing of IPO?', *Journal of Applied Business Research*, **31**, pp. 1679–1692.

inevitability [to the listing].’ If Levi had stayed private as the family tree grew, ‘you [would] get to a point where you’ve got 250 shareholders and nobody holds more than 2 per cent. And how do you govern a company like that? It’s impossible.’ These comments suggest that the benefits of concentrated family ownership for Levi Strauss were diminishing.

In its prospectus filed with the U.S. Securities Exchange Commission (SEC), Levi Strauss stated its main purpose for going public as being ‘to increase our financial flexibility and create a public market for our class A common stock.’

Source: Reagan, C. and Picker, L. (2019), ‘Here’s why Levi Strauss is going public’, CNBC, <https://www.cnbc.com/2019/03/19/why-levi-strauss-the-worlds-biggest-denim-brand-is-going-public.html>; Edgecliffe-Johnson, A. (2019), ‘Levi Strauss bets moral mission can survive public markets’, *Financial Times*, <https://www.ft.com/content/bf77cf2e-e8a6-11e9-a240-3b065ef5fc55>.

Box 4.7 Triggers for listing: Focusrite

Focusrite, a UK manufacturer of audio hardware and software for musicians, listed on AIM in December 2014 through a private placing that allowed insiders to sell £22.4m of existing shares. At the time of listing, Focusrite had annual revenues of £41m, a global customer base with a distribution network covering approximately 160 territories and approximately 140 employees.

Founder, Phil Dudderidge, served as CEO from 1989 and has been Executive Chairman since 2012. Following the listing, market commentary noted that the decision to seek a listing was prompted by a desire to reduce the family ownership stake to allow him to pass on family wealth.

As at August 2019, Focusrite’s annual revenues were £84.7m and the company had over 300 employees.

Source: Focusrite plc (2014), ‘Placing and Admission to trading on AIM’, 5 December, <https://s3-eu-west-1.amazonaws.com/focusriteplc/Focusrite+Plc+Admission+Document.pdf>.

4.5 Reasons for delisting

Broadly speaking, there are five types of delisting:

- i. involuntary—when the company is obliged to delist by the trading venue. This is often caused by financial distress or failure to meet the listing requirements;
- ii. strategic—undertaken at the firm’s initiative and can take a variety of forms, such as a leveraged buy-out or squeeze-out;
- iii. merger with or acquisition of another listed firm—when the company is acquired by or merges with another listed company and ceases to exist as an independent company;
- iv. acquisition by a private company—when the company is acquired by a private equity firm;
- v. transfers—where a company moves to a different trading venue, often from a junior market to a main market, or vice versa.

These reasons can overlap and delistings can be motivated by multiple drivers. The academic literature tends to distinguish between involuntary and voluntary delistings.¹⁰³

¹⁰³ For a detailed and comprehensive review of the academic literature on delisting, see Martinez, I., Serve, S. and Djama, C. (2015), ‘Reasons for delisting and consequences: A literature review and research agenda’, *SSRN Electronic Journal*.

Voluntary, or strategic, delistings are driven by the same cost–benefit decision as described above for firms seeking to list.

From a public policy perspective, it is strategic delistings that are of most interest. Transfers are not pure delistings, as companies stay listed but on a different market. The outcome of an M&A delisting depends on whether the acquirer is listed or unlisted. If the acquirer is listed, the assets still remain on public markets, albeit as part of a larger listed company; if they are acquired by an unlisted company, this is not the case.

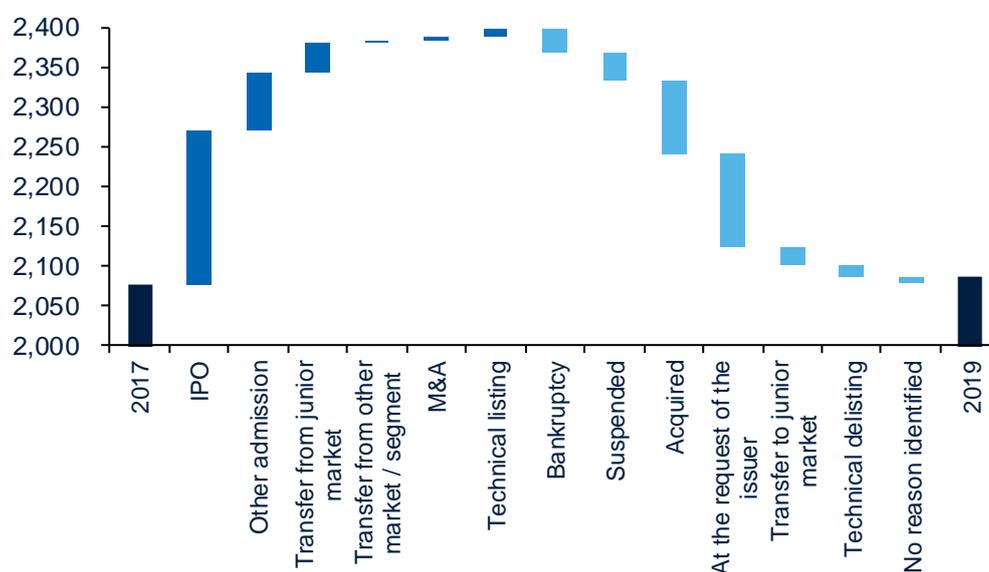
Delisting data

Data on delistings is quite sparse. It is also quite challenging to distinguish between some of the types of delisting.¹⁰⁴ We have collected data from the European stock exchanges, which provides some insights.

Figure 4.9 below shows the full breakdown of listings and delistings from Borsa Italiana, Euronext, London Stock Exchange, and Nasdaq Stockholm main markets since 2017. Of the 320 identified delistings between 2017 and 2019 on these markets:

- 94 were acquired or subject to a reverse takeover;
- 117 chose to delist (i.e. voluntary delistings);
- 64 were forced to delist or were in financial distress;
- 22 transferred down to the junior market (AIM UK, AIM Italia, Euronext Growth Paris);
- 14 were identified as technical delistings (see note to Figure 4.9);
- 9 provided no reason.

Figure 4.9 Selected main market net new admissions and departures, 2017–19



Note: Within the panel sample, technical delisting includes companies that, due to restructuring, undertake a name change, cancel their existing equity ISIN and create a new equity ISIN within a given year. Other admission refers to listings that have not been identified by the stock exchange as IPOs or transfers, such as direct listings, reverse takeovers and introductions. London Stock

¹⁰⁴ For example, it is hard to distinguish between M&A-driven and strategic delistings if the firm has been acquired by a financial vehicle due to a private equity buyout.

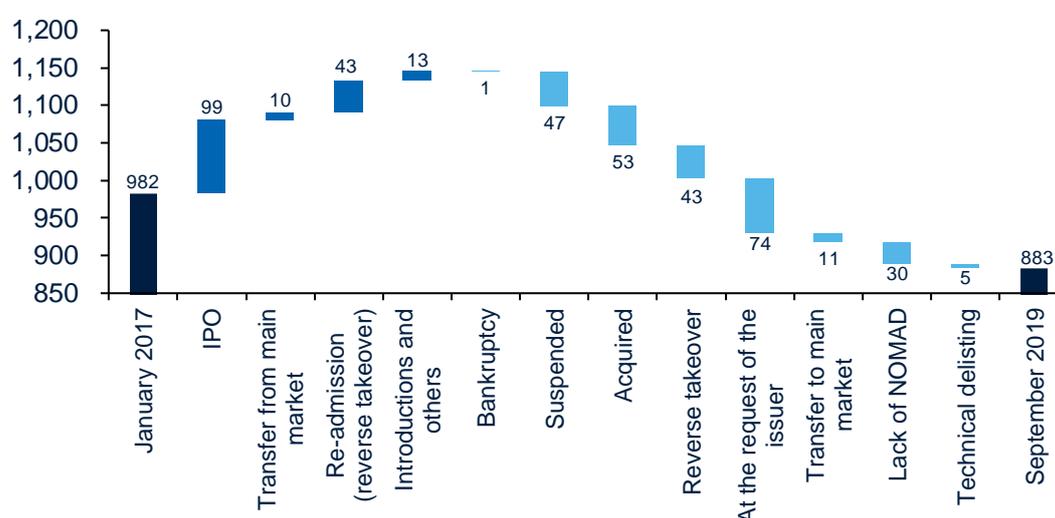
Exchange Group data covers January 2017 to end-September 2019. Borsa Italiana data covers January 2017 to end-June 2019. Euronext data covers January to end-November 2019. Nasdaq data covers January 2017 to end-October 2019.

Source: Oxera analysis of London Stock Exchange Group, Borsa Italiana, Euronext and Nasdaq data.

Figure 4.10 below shows the full breakdown of listings and delistings on the UK AIM market between 2017 and September 2019. Of the 264 delistings:

- 96 were acquired or subject to a reverse takeover;
- 74 chose to delist (i.e. voluntary delistings);
- 48 were forced to delist or were in financial distress;
- 30 were unable to find a nominated adviser (NOMAD);¹⁰⁵
- 11 transferred up to the main London Stock Exchange market;
- 5 redomiciled.

Figure 4.10 AIM UK net new admissions and departures, 2017–19



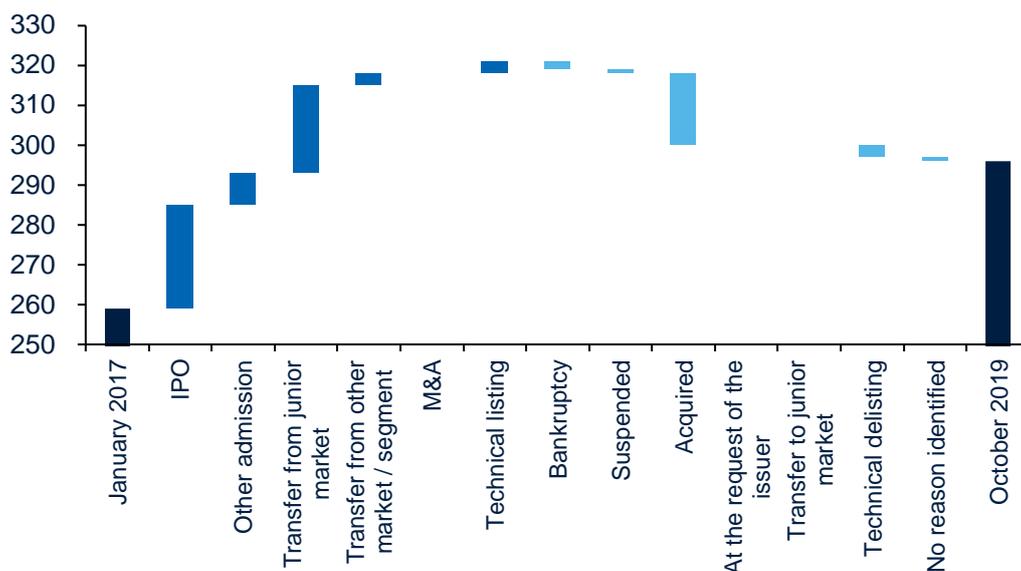
Note: Data is calculated using LSE AIM new listing and delisting data. Re-admission refers to new listings via reverse takeovers. All transfers to AIM came from LSE main market. All transfers from AIM went to LSE main market.

Source: Oxera analysis of London Stock Exchange Group data.

Delistings on the Nasdaq Nordic main and junior (i.e. Nasdaq First North) markets over the same period show a fairly similar pattern. Figure 4.11 and Figure 4.12 below present a breakdown of new listings and delistings on the Nasdaq Nordic main markets and First North markets between 2017 and 2019. The most commonly cited reason for delisting on the Nasdaq main markets was acquisition by another company via a public offer. The majority of delistings on Nasdaq First North were due to transfers (up to the Nasdaq Main Market). 13% of delistings on First North were associated with breaches of exchange listing requirements.

¹⁰⁵ See London Stock Exchange website, 'Nominated Advisers', <https://www.londonstockexchange.com/companies-and-advisors/aim/advisors/advisers.htm>.

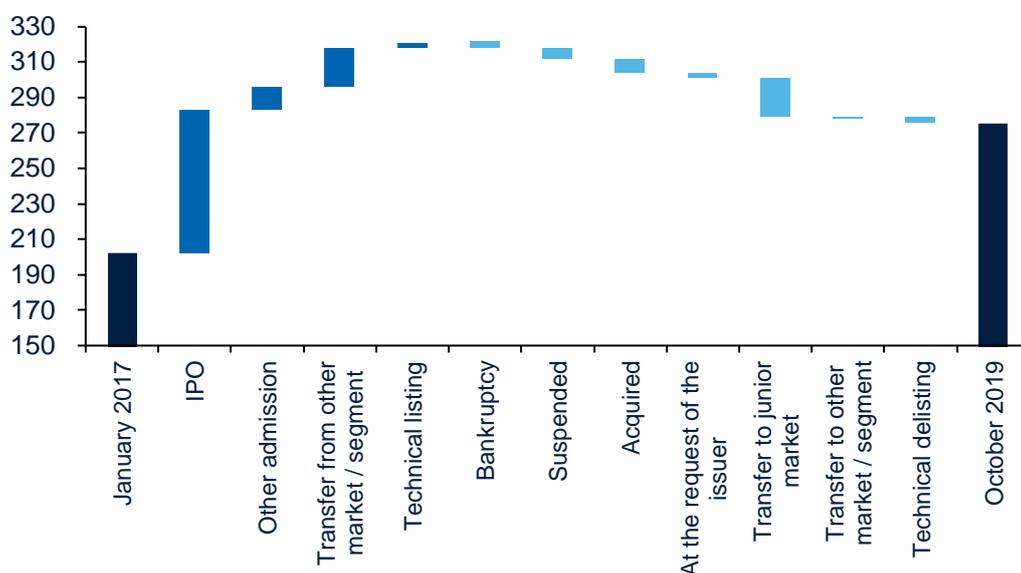
Figure 4.11 Delisting from Nasdaq Nordic Main Markets, 2017–19



Note: Within the panel sample, technical delisting includes companies that, due to restructuring, undertake a name change, cancel their existing equity ISIN and create a new equity ISIN within a given year.

Source: Oxera analysis of Nasdaq data.

Figure 4.12 Delisting from Nasdaq First North, 2017–19



Note: Within the panel sample, technical delisting includes companies that, due to restructuring, undertake a name change, cancel their existing equity ISIN and create a new equity ISIN within a given year. The single recorded transfer to other market/segment was to Spotlight.

Source: Oxera analysis of Nasdaq data.

From our empirical and interview-based analysis, we make the following observations.

- M&A activity has been a significant driver of delistings around the world.¹⁰⁶ Achieving scale quickly has become increasingly important for many firms, which has led to a large number of small firms technically delisting and then being acquired by larger firms.¹⁰⁷
- A number of the delistings are driven by technical conditions, such as transfers between market segments. Further empirical analysis on such transfers is provided in Appendix 4.1.
- Despite the technical and involuntary delistings, there are still a significant number of strategic delistings where large firms are voluntarily choosing to go private (see below for further discussion). Some of them choose to delist due to the market pressures of the public markets (negative reasons, less of an active choice), while others are proactive in choosing to go private due to the agency costs and regulatory burden, for example. These factors are discussed in more detail in section 7.

As noted above, differentiating types of acquisition-driven delistings using stock exchange data can often be difficult.¹⁰⁸ However, these distinctions can be important. For example, if the acquirer is another listed company, the acquired company's assets remain on public markets. Moreover, if the acquirer is an investment vehicle, such as an LBO fund, acquisition could actually be considered a strategic delisting.

Of the 76 acquisition-driven delistings on the London, Milan and Paris main markets identified in Figure 4.9:¹⁰⁹

- 51% were due to M&A activity with another listed company;
- 26% were acquired by an investment vehicle, private equity fund, holding company, or as part of an LBO;
- 17% were due to M&A activity with another unlisted company;
- 6% were acquired as part of an internal restructuring.¹¹⁰

Voluntary delisting

This category of delistings is likely to be of particular interest from a public policy perspective, as these firms are making proactive decisions not to remain a public company. What is driving them to become private companies? The academic literature highlights the following reasons for a voluntary delisting.

- Poor financial performance—several papers have found that delisted firms experienced a lower margin and return on their assets than listed counterparts.¹¹¹ Poor financial

¹⁰⁶ For example, Doidge, Karolyi and Stulz (2017) is a seminal paper covering the US context. Here, the authors estimate a 'listing gap', which they attribute to a historically high level of acquisitions of US-listed companies. See Doidge, C., Karolyi, G. and Stulz, R. (2017), 'The U.S. listing gap', *Journal of Financial Economics*, **123**:3, pp. 464–487.

¹⁰⁷ See Ritter, J., Signori, A. and Vismara, S. (2013), 'Economies of scope and IPO activity in Europe', pp. 11–34 in M. Levis and S. Vismara (eds), *Handbook of Research on IPOs*, Edward Elgar Publishing.

¹⁰⁸ Most stock exchanges do not collect detailed delisting information, such as the identity of the acquirer or the motivation behind a voluntary delisting.

¹⁰⁹ See Figure 4.9. Percentages are calculated based on the delistings categorised as 'acquired', for which further information could be collected.

¹¹⁰ These were situations in which the acquirer was another legal entity belonging to the same corporate group.

¹¹¹ See Thomsen, S. and Vinten, F. (2014), 'Delistings and the costs of governance: Study of European stock exchanges 1996-2004', *Journal of Management & Governance*, **18**, pp. 793–833. See also Kashefi Pour, E. and Lasfer, M. (2013), 'Why do companies delist voluntarily from the stock market?', *Journal of Banking & Finance*, **37**, pp. 4850–4860.

performance has also been linked to firms choosing to list down from main markets to junior markets.¹¹²

- Lower financial visibility—firms might delist if they can no longer attract sufficient levels of investor interest or analyst coverage.¹¹³
- Insufficient liquidity—several papers have argued that insufficient liquidity and trading volume is a prompt for firms to delist.¹¹⁴ This is often the case for smaller companies.
- Cost of compliance with regulation—compliance-related delistings have been studied extensively in a US context.¹¹⁵ Although fewer studies have focused on Europe, Thomsen and Vinten (2014) find a positive empirical relationship between the strength of minority investor protection and delisting frequency.

Results from our survey are broadly consistent with the findings in the academic literature. The key reasons cited for voluntary delistings include the challenges associated with meeting regular financial reporting requirements; the time and cost associated with compliance and administration; annual fees paid to advisers, brokers and exchanges; and requirements to disclose sensitive information.

Feedback from our interviews with issuers also suggests that a company might delist voluntarily in order to become a more attractive target for acquisition. If potential buyers wish to avoid the administrative burden associated with taking over a listed company, voluntarily delisting might facilitate a sale.

¹¹² Jenkinson, T. and Ramadorai, T. (2013), 'Does one size fit all? The consequences of switching markets with different regulatory standards', *European Financial Management*, **19**:5, pp. 852–886

¹¹³ See Mehran, H. and Peristiani, S. (2010), 'Financial visibility and the decision to go private', *The Review of Financial Studies*, **23**, pp. 519–547.

¹¹⁴ See, for example, Kashefi Pour and Lasfer (2013), *op. cit.*; and Martinez, I. and Serve, S. (2011), 'The delisting decision: the case of buyout offer with squeeze-out', *International Review of Law and Economics*, **31**, pp. 229–239.

¹¹⁵ Marosi and Massoud (2007) and Leuz (2007) both analyse the impact of the Sarbanes–Oxley implementation on delisting in the USA. See Marosi, A. and Massoud, N. (2007), 'Why do firms go dark?', *The Journal of Financial and Quantitative Analysis*, **42**, pp. 421–442; and Leuz, C. (2007), 'Was the Sarbanes–Oxley Act of 2002 really this costly? A discussion of evidence from event returns and going-private decisions', *Journal of Accounting & Economics*, **44**.

5 Economics of small-cap listings

Key messages

- This section analyses the unique challenges to SMEs seeking to list on public markets, and identifies some policy suggestions to further develop access to public equity markets for SMEs.
- SMEs are a key part of the EU economy, contributing 85% of total job creation and representing 99.8% of all enterprises in the EU.¹¹⁶ As SMEs in Europe are unable to access bond markets, access to public equity markets is an important policy issue. Yet, in recent years, there has been a sharp decline in the number of IPOs of SMEs and an increase in the minimum efficient scale for accessing public markets.
- Small companies face unique challenges to list on public markets: the fixed costs of listings affect those raising smaller amounts to a larger extent; small stocks tend to be less liquid; and the incentives for the advisory ecosystem to support SME IPOs are limited—most prefer to work with large issuers, where the expected revenues are much higher. The balance of regulation typically focuses on large caps but is then also applied to SMEs and not sufficiently tailored.
- Policymakers have recognised that the level of regulation applied to the main market is often not appropriate for SMEs. The ability of SMEs to damage market confidence is relatively low and investors in them are likely to have a higher risk appetite than those who invest in large companies. If the same standards were applied, very few SMEs would be able to afford either the time or resources to comply.
- MiFID II introduced the concept of a 'SME growth market' as a new class of MTF, with the aim of attracting more SMEs to list on junior markets. Although it is too early to assess its full impact, uptake was initially slow, with only two markets initially registering, although there are now 16 SME growth markets operating in the EU (including AIM).
- AIM Italia, Nasdaq First North, and AIM are often seen as successes. Other SME-focused markets have attracted fewer listings, perhaps due to having more stringent listing requirements. A common feature of the more successful SME-focused markets is the tax incentives for investors; however, there are other factors that may explain the success of these venues such as listing fees and flexibility with future equity financing.
- There is a wide consensus among market practitioners that, if the EU wants to promote more listings on this market segment, policymakers need to go further in reducing the compliance costs, which are particularly acute for issuers seeking to list on SME growth markets. Policymakers could consider redesigning disclosure rules for SMEs, to reflect more closely the limited externalities of failure.
- Policy initiatives to increase the attractiveness of SME listings include promoting aggregation structures such as SME ETFs and introducing a faster-track listing process for SME stocks. Investor appetite for investing in the IPOs of SMEs would be boosted by policy initiatives that seek to: i) reduce the search costs of conducting due diligence on these types of transactions; ii) promote fiscal incentives to invest in SME stocks;

¹¹⁶ A study by the European Commission reported that SMEs accounted for 85% of job creation in the EU between 2002 and 2010, See European Commission (2012), 'Small companies create 85% of new jobs', press release, https://ec.europa.eu/commission/presscorner/detail/en/IP_12_20. Eurostat (2017), 'Annual enterprise statistics by size class for special aggregates of activities', https://ec.europa.eu/eurostat/web/products-datasets/product?code=sbs_sc_sca_r2.

and iii) deploy the SME growth market concept in the regulatory framework applicable to the investor base.

5.1 Introduction

This section focuses on the specific challenges for SMEs to list on public markets and the regulatory landscape that has been developed to encourage such firms to list.

SMEs make up the majority of the European economy¹¹⁷ and have limited ability to access capital markets directly. This is why access to public equity markets for SMEs is an important policy issue.

The section is structured as follows:

- section 5.2 analyses the unique challenges to SMEs seeking to list on public markets;
- section 5.3 sets out some policy suggestions to help reduce the barriers to further development of SME listings.

To inform the policy suggestions discussed at the end of this section, we examined recent developments in SME-focused markets. We also held structured interviews with a range of stakeholders (issuers, SME-focused advisers, market infrastructure providers and regulators) to identify barriers to further development of SME growth markets. The findings of this analysis are presented in Appendix A4.

5.2 Unique challenges to SMEs seeking to list

SMEs face a number of challenges in raising funding on public markets, many of which are unique to them (or at least not faced to the same extent by large companies). Two important examples are as follows.

- Investor due diligence is more challenging for companies with a shorter track record. Appraising an investment in a small company can take an investor a significant amount of time. The due diligence required is often quite similar to that required to invest in a large company, while the pay-offs due to the amounts that can be invested are typically smaller.
- The fixed costs of listing have a bigger impact on smaller firms. While some fee components are charged as a percentage of the size of the issuer (e.g. according to their market capitalisation) or issuance, the proportional cost decreases as the size of the fundraising increases. Figure 5.1 below shows that, for EU-27 IPOs, the typical gross fees paid as a portion of the funds raised for the smallest firms (<€100m market capitalisation) were approximately 1.5 percentage points higher than for the largest firms (>=€5bn market capitalisation).

¹¹⁷ A study by the European Commission reported that SMEs accounted for 85% of job creation in the EU between 2002 and 2010, See European Commission (2012), 'Small companies create 85% of new jobs', press release, https://ec.europa.eu/commission/presscorner/detail/en/IP_12_20. Eurostat data also shows that SMEs represented 99.8% of all enterprises in the EU-28. See https://ec.europa.eu/eurostat/web/products-datasets/product?code=sbs_sc_sca_r2.

Figure 5.1 IPO fees for large-, mid- and small-cap firms (by initial market capitalisation), 2016–19

Note: Includes underwriting, listing, legal, and management fees.

Source: Oxera analysis of Dealogic data.

In France, based on interviews with small issuers, the estimated direct costs of being listed for small issuers in 2019 are around €600,000 a year. Another (earlier) piece of analysis focusing on Germany estimated the direct costs of being listed for an SME issuer as €400,000 a year. Table 5.1 gives a breakdown of this estimate.

Table 5.1 Estimated ongoing costs of listing for a mid-sized issuer in Germany, 2012

Item	Estimated cost
Listing fees	€7,500
Designated sponsor	€35,000
Listing partner	€15,000
Quarterly and annual reports	€40,000
Annual audit	€100,000
Roadshows and analyst meetings	€50,000
Annual general meeting costs	€60,000
Investor relations costs	€60,000
Information and publication requirements	€20,000
Total	€387,500

Note: Estimates for a mid-cap issuer with a 45% free float.

Source: Wegmann, J. (2013), 'Cost of an IPO', ipoBOX, <https://www.ipobox-online.de/erlose-und-kosten-bei-einem-ipo/5-2-kosten-eines-ipos>.

In the UK, the Quoted Companies Alliance stated in 2015 that the average direct cost to maintain a listing on the UK's AIM was around £220,000 a year, with much higher indirect costs.¹¹⁸ Once the costs of attracting and retaining high-quality executive and non-

¹¹⁸ Quoted Companies Alliance (2015), 'Companies urged to reap full benefits of AIM', 30 March, press release, <https://www.theqca.com/news/press-releases/100806/companies-urged-to-reap-full-benefits-of-aim.shtml>.

executive directors are taken into account, BDO and the Alliance estimated that the total cost in 2015 was more in the region of £500,000 a year. More recently, in 2018, the Alliance estimated that the cost of listing on AIM lies between £420,000 and £800,000. This estimate does not include broker commission, estimated to be 3–4% of funds raised. Table 5.2 provides some updated estimates.

Table 5.2 Estimated costs of listing on AIM

Item	Estimated cost
Reporting accountants	£100,000–£120,000
Company lawyers	£120,000–£180,000
NOMAD fee	£40,000–£60,000
NOMAD's lawyers	£100,000–£250,000
Broker commission	3–4% of funds raised, or 0.5–1% of funds not raised
Printing	£10,000
Registrars	£4,000–£5,000 (minimum annual charge)
Public relations	£36,000–£72,000
AIM admission fees	£11,250–£126,000
Total (excluding broker commission)	£420,000–£823,000

Note: The AIM admission fees are for 2020. The other fees are estimates provided by the Quoted Companies Alliance in 2018. AIM admission fees do not include VAT.

Source: Oxera analysis, based on estimates provided by the Quoted Companies Alliance and London Stock Exchange's AIM listing fees. See London Stock Exchange (2020), 'AIM: Fees for companies and nominated advisers', <https://www.londonstockexchange.com/companies-and-advisors/aim/publications/aim-fees-for-issuers.pdf>.

Similar analysis from Euronext estimates the cost of an IPO for SMEs at between €650,000 (for an IPO raising €5m) and €1m (for an IPO raising €70m).¹¹⁹

Although comparable estimates are hard to obtain for other member states, our analysis of prospectuses from IPOs on AIM Italia suggests that SMEs in Italy also face relatively high listing costs. Based on a sample of 17 IPOs in 2019 (for which sufficient information was available), the median reported cost of listing was €890,000, which represented 18% of gross proceeds.

Small companies continue to face the challenge of liquidity after listing on public markets. The nature of small companies means that their stocks tend to be hard to trade and relatively illiquid. This is because there is often less free float available to trade, due to the small size of the stock and the nature of the investor base (small stocks often have a larger share of family, strategic, non-tradable holdings, etc.).

Institutional investors have a preference that there is sufficient liquidity in a stock so they can react to events that may be out of their control. Where they cannot be sure that the stock will have sufficient liquidity, they are less likely to buy that stock. At the IPO, the investor may therefore wait for evidence of success in the secondary market before committing time to perform due diligence.

From a trading venue perspective, the illiquid nature of small-cap stock trading may mean that order-driven trading systems need to be supported by other models of trading (for example, auctions, market-maker liquidity provision) that help to concentrate the liquidity available.

¹¹⁹ Euronext (2019), 'The listing venue of choice for tech companies'.

Policy suggestions to improve SME liquidity are discussed in section 5.3. General issues regarding liquidity are covered in more detail in sections 12 and 13.

A number of trends have made it more challenging for SMEs to seek listings on public markets, as follows.

- There has been a reduction in advisers servicing SMEs in some markets.

Brokers, auditors, consultants and exchanges make much smaller margins from advising/supporting small caps than large caps. As these service providers have come under pressure, there has been a withdrawal in the service offering to the smaller issuers seeking to list. For example, on Deutsche Börse Scale, the number of advisers decreased from 87 in 2014 to 69 in 2019. Similarly, in France the number of Euronext Listing Sponsors has fallen from over 100 to 60 since 2018. A lack of adviser is also directly cited as a reason for some SME delistings. As noted in section 4.5, the lack of NOMAD advisers represented 11% of the delistings on UK AIM. On AIM Italia, where the number of NOMAD advisers has been largely stable,¹²⁰ there were three delistings attributed to a lack of NOMAD adviser between 2017 and 2019. For some firms, the commercial benefits are now no longer commensurate with the risks, particularly if serving SMEs is not a core part of the firm's offering.

- There has been a reduction in the coverage of independent research on SMEs. It is well understood that equity research is an important element for developing a healthy ecosystem for SMEs' equity finance, which has been further challenged by the new rules on unbundling of trade execution and research fees (as discussed in section 13.2.1).

Empirical analysis confirms that there has been a reduction in independent research for several years, and particularly since the introduction of the MiFID II unbundling rules, that may deter brokers from providing research coverage. For example, a recent paper concludes that the reduction in research coverage has been more pronounced for small-cap stocks, documenting 334 SMEs losing their analyst coverage entirely.¹²¹ Similarly, data published by Reuters indicates a clear reduction in the number of analysts per company following the major European MSCI small-cap indices.¹²² Survey evidence of buy-side perceptions is more mixed, suggesting that individual firms have had different experiences.¹²³ Some papers have found that the decline in research coverage is a longer-term trend, and that the introduction of MiFID II only exacerbated the decrease.¹²⁴

- There has been a rise in passive investment, focused on stocks included in the main indices. This has led to an increase in the demand for large-cap stocks over small-cap

¹²⁰ The number of NOMADs operating on AIM Italia was 18 at the end of 2015 and 21 at the end of 2019, according to data provided by Borsa Italiana.

¹²¹ Fang, B., Hope, O.-K., Huang, Z. and Moldovan, R. (2020), 'The Effects of MiFID II on Sell-Side Analysts, Buy-Side Analysts, and Firms', Rotman School of Management Working Paper No. 3422155. There is some debate over the distributional impact of MiFID II unbundling. Fang et al. (2020) find that the post-MiFID II reduction in research coverage has been more pronounced for small-cap stocks. However, Guo and Mota (2020) argue that the decline in research coverage after MiFID II has been concentrated among larger firms. See: Fang, B., Hope, O.-K., Huang, Z. and Moldovan, R. (2020), 'The Effects of MiFID II on Sell-Side Analysts, Buy-Side Analysts, and Firms', Rotman School of Management Working Paper No. 3422155; Guo, Y. and Mota, L. (2020), 'Should information be sold separately? Evidence from MiFID II', working paper.

¹²² Pal, A. (2018), 'UK stocks coverage shrinks after new research rules', Reuters, 29 June.

¹²³ An FCA survey of fund management firms in the UK suggests that only a few had seen a reduction in research on SMEs, while the majority had not. Another survey found that 62% of fund managers believe that less research is being produced on SMEs since MiFID II came into effect. See Financial Conduct Authority (2019), 'Implementing MiFID II – multi-firm review of research unbundling reforms', 19 September; Quoted Companies Alliance/Peel Hunt (2019), 'MiFID II: The Search for Research, Mid and Small-Cap Investor Survey', February.

¹²⁴ See, for example, Eli-Namer, J. and Giami, T. (2020), 'Reviving research in the wake of MiFID II: Observations, issues and recommendations', January, <https://www.amf-france.org/sites/default/files/2020-02/20200124-rapport-mission-recherche-projet-va-pm.pdf>.

ones. The lack of a strong index benchmarking culture on small-cap stocks (coupled with the fact that the majority of small companies are private and not on public markets) also means that there is limited passive investment in smaller companies.

Technological development may improve the economics of capital-raising for SMEs and trading on SME stocks (see Box 5.1 for some recent initiatives). For this to happen, incentives need to be in place (e.g. there need to be sufficient potential revenue streams) to attract entrepreneurs to invest in the technological solutions, and competition in the relevant markets needs to be working effectively (to enable entry).

Box 5.1 Technology and equity research

For equity markets to function effectively, market participants need access to accurate and timely information. Conducting due diligence on investments can be costly for investors. The market for research has evolved to reduce search costs and help facilitate this process.

As SME stocks are traded less actively, there is less incentive for research providers to produce research on small-cap stocks. Increased pressure on asset managers to justify the cost of their spending on research has intensified competition in the market for equity research, which has led to a reduction in the amount of coverage on smaller stocks (see section 13.2.1 for more detail).

Technology can provide cost-efficient solutions to improve the provision of equity research on small companies. By automating some stages of the information production process, the cost of producing research decreases.

New players have entered the market to provide equity research for companies of all sizes, using advanced machine-learning techniques and AI-driven company analytics. For example, Fregnan¹²⁵ uses these technological advancements to create data-driven forecasts and equity research coverage that is unique to each company. The Fregnan technology solution can be uniquely set up for each research provider, enabling a combination of unbiased machine-learning models with human insight and experience. The human element remains vitally important in the research production, and research providers can still compete on providing the most insightful research to their clients.

This cost efficiency can help facilitate the provision of equity research for SMEs. Asset managers should benefit from the lower cost of research production and can use the analytical insights to support their investment decision-making, making it less costly (from a due-diligence perspective) for them to invest in SMEs.

Source: Oxera.

5.3 Policy ideas to boost SME listings

Based on our analysis and interviews, we have identified policy options to increase SME listings without jeopardising other regulatory objectives of ensuring financial stability and efficient equity markets. Our analysis shows that an effective market design for SME listings depends on addressing the three drivers of low levels of listing (issuer costs, lack of attractiveness to intermediaries, and investor appetite), while ensuring that the underlying market failure remains sufficiently corrected by regulation.

It is important to note that the underlying market failure that a listing regime seeks to address is information asymmetry. However, for SME listings, the additional market failure of negative externalities (for example, the effect of firm failure on market confidence) is

¹²⁵ Fregnan (<https://www.fregnan.com/>) uses advanced machine-learning techniques to support unbiased, high-quality equity research for investors and fund managers.

lower than for large corporations. As a result, the justification for regulatory intervention is smaller for SMEs, and an SME listing regime can allow a greater probability of firm failure.

It also follows that the listing regime for SMEs need not be based on the standard listing regime. Indeed, our overarching recommendation is that the listing regime for SMEs be built from the ground up. There is a risk that starting with the standard regime and scaling back will leave in place provisions that look attractive because they were valuable in their original context, but which in reality are net costly for SMEs.

The policy options are organised under the three drivers of low levels of SME listing noted above. Some options address more than one of the drivers, and not all options listed may be needed to deal with a particular driver. The choice of which options to pick should be determined by rigorous cost–benefit testing. The most radical options are at the bottom of each of the three lists.

The effectiveness and feasibility of the policy options set out here are discussed further in section 10.

5.3.1 Reducing SME issuer costs

Policy options include the following.

- Redesign disclosure rules for small listed companies, to reflect more closely the more limited externalities of failure (compared to large companies).

The calibration should be considered in light of the trade-offs to be made and, as above, not starting with the standard disclosure regime. Specifically, consider SMEs' willingness and ability to meet compliance costs, the level of regulatory risk and obligation imposed on their advisers/brokers, and the economic growth opportunities that disappear when SMEs choose not to list (all costs) against the benefits to the buy side of being better informed about (possibly safer) investments.

To do this, the Commission may want to launch a holistic, bottom-up review of its approach to SME listing, involving ESMA, the NCAs, and the finance ministries of member states, to reflect on the objectives and effects of the regime.¹²⁶ One way to frame this might be to ask: 'what can SMEs be reasonably expected to do to meet public policy goals with respect to investors without foreclosing the market to much of its potential supply?' This would need to balance the requirements of investors with attractiveness to issuers. The temporary disclosure relief provided by many financial market supervisors due to COVID-19 may provide additional insights into the importance of the different elements.¹²⁷

- Focus the regulatory objective on enabling investors to price this asset class more appropriately—i.e. to achieve 'investor enablement', rather than 'investor protection' (see Box 5.2). The Commission could set up a bottom-up exercise with the investor community to identify the minimum standard to mandate. This should also be covered in the review noted above. The bottom-up exercise could be informed by both behavioural science and very practical feedback from informed investors involved in pricing stocks. Behavioural science can offer insight into the use of information in asset pricing. Consumer groups, such as Better Finance and European Investors, are well-

¹²⁶ It is important to note that the key objectives of NCAs and finance ministries may not be fully aligned. Any review should balance the CMU vision with these objectives, and ensure that all parties are considered.

¹²⁷ For example, the Australian Securities & Investments Commission is helping listed companies in Australia raise capital quickly by giving temporary relief to enable certain 'low doc' offers to be made to investors, even if they do not meet all the normal requirements. See <https://asic.gov.au/about-asic/news-centre/find-a-media-release/2020-releases/20-075mr-facilitating-capital-raising-during-covid-19-period/>.

placed to offer the perspective of retail investors. Asset pricing experts could set out what data points they need/want in order to price SME stocks effectively (possibly grouped into 'must haves', 'nice to haves', and 'of limited use'), and the most effective form for that information transfer to take place (e.g. via data transfer, in a report, etc).

- Set a page limit on the total length of the prospectus, and/or limit the number of key risk factors that can be included among the 'top risks' in the summary.¹²⁸ As a first step, we would recommend that the Commission runs a pilot programme to inform the calibration. It would be worth involving some behavioural scientists and marketing experts to help design the pilot, with an objective of promoting public equity markets, and then to test the results on a sample of the investor and issuer community.
- Exempt listed companies from securities class action lawsuits (or, as a less extreme option, only exempt the prospectus summary), and raise the bar for submitting shareholder proposals at general meetings. We understand that the SEC have been considering these options.

Box 5.2 Investor enablement—how can regulators attract investors to public equity markets?

One way to attract more investment in public equity markets in the EU would be to completely change the mindset of the regulatory approach, from one focused on investor 'protection' to one focused on investor 'enablement'.

When regulating listing markets more broadly, policymakers have sought the right balance between regulatory burden and investor protection. The aim has been to avoid investors losing money as a result of wrongdoings by SMEs that could have been avoided by effective regulation.¹²⁹ This in fact is a rather high standard. For example, in the very important and sensitive context of prudential supervision of banks, regulators are usually careful to make clear that they are not attempting to operate a system of zero failure.

The present regime aims to provide most or all the information and assurance that an investor might require, almost as though private information and caveat emptor are assumed away. However, it is debatable whether the costs of such extreme protection are justified when SMEs' ability to damage market confidence and create serious negative externalities is limited.

A more effective model to promote further listings might be to focus on investor enablement rather than investor protection. One way to conceptualise the enablement idea is to give assurance that investors are not being misled by issuers, by setting out excessively harsh penalties for issuers who lie or cheat and then letting the information market flourish with very limited regulatory interference (i.e. reducing information overload on potential investors). It would be important to enforce such penalties in practice.

Source: Oxera.

¹²⁸ The current Prospectus Regulation sets a limit of 15 risk factors. Previous guidance contained no upper limit, although issuers were advised to include only key risk factors. Feedback from our structured interviews suggested that it has become slightly harder for more time-constrained investors to identify the key (e.g. top 3) risks.

¹²⁹ See, for example, Friedman, F. and Grose, C. (2006), 'Promoting access to primary equity markets: a legal and regulatory approach', World Bank Policy Research Paper No.3892. In this paper, the authors argue that the International Organization of Securities Commission (IOSCO) principles of disclosure go further than is necessary, and (in a developing country context) distinguish the necessary from the nice to have.

5.3.2 Increasing the attractiveness of SME listings to intermediaries

Policy options include the following.

- Support the liquidity of SME stocks (as discussed further in sections 12 and 13)—for example, by:
 - promoting aggregation structures (e.g. SME ETFs and SME Fund of Funds), which allow investors to gain exposure to this asset class with the benefit of diversification. This could be facilitated through support for fund managers of these types of funds by the European Investment Fund (EIF). The Commission could direct the EIF to develop SME fund management teams, in a similar way to the EIF's current support for venture capital and private equity;¹³⁰ European Commission President Ursula von der Leyen has announced an intention to 'create a private-public fund specialising in Initial Public Offerings of SMEs', which could provide a similar mechanism for increasing SME stock liquidity.¹³¹
 - scrapping the financial transaction tax (FTT) on SME share transactions for the first x years on an exchange. This would reduce the cost of capital for SMEs.¹³² The tax revenue loss would be small in the context of the expected yield of the tax, and there would be no material distortion of the competition for funds since SMEs are small relative to large issuers and, given their rather different patterns of pay-off and failure, are almost in a separate market;
 - reintroducing some delay in trading on markets for small-cap companies, to make the provision of liquidity on SME stocks more commercially attractive for market-makers.¹³³ This could be an area for the Commission to consult on as part of its broader review of MiFID II.
- Create a faster-track listing process for SME stock—for example, by introducing listing helpdesks and exploring the possible benefits of listing sandboxes. The Commission could require ESMA to ask NCAs to set up listing sandboxes and a simulation exercise among listing authorities to share best practice.

5.3.3 Increasing investor appetite for SMEs

Policy options include the following.

- Create fiscal incentives—encouraging member states to promote the use of targeted tax incentives to encourage investments in stocks on SME growth markets, learning from the successes of AIM, AIM Italia, and Nasdaq First North Stockholm (see Appendix A4.2 for further discussion of these markets). Although fiscal policy is the competence of member states and there are limited policy levers available to the Commission, interview feedback from senior stakeholders across the larger member states expressed a strong desire for the Commission to support this (for example, through a Commission Communication). While it is recognised that fiscal incentives are a scarce resource, the

¹³⁰ See European Investment Fund website, https://www.eif.org/what_we_do/index.htm.

¹³¹ von der Leyen, U. (2019), 'A Union that strives for more: My agenda for Europe', https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf.

¹³² A securities transaction tax such as FTT lowers the expected net (post-transaction cost) return to investors; investors will demand a higher gross return on capital, which increases the cost of capital for companies. See Oxera (2012), 'What would be the economic impact on the EU of the proposed financial transaction tax?', June, <https://www.oxera.com/wp-content/uploads/2018/07/Oxera-Financial-Transaction-Tax-report.pdf>.

¹³³ Another option could be to implement measures that concentrate liquidity for less traded securities. For example, evidence from Tel Aviv Stock Exchange suggests that intraday auctions may be associated with increased liquidity. See: Amihud, Y., Mendelson, H. and Lauterbach, B. (1997), 'Market microstructure and securities values: Evidence from the Tel Aviv Stock Exchange', *Journal of Financial Economics*, **45**:3, pp. 365–390.

economic growth associated with SMEs makes a strong case for them here. The Commission could publish a recommendation to member states on the use of tax incentives for investing in small-cap stocks.

- Deploy the SME growth market concept in the regulatory framework applicable to the investor base. For example, the Undertakings for the Collective Investment in Transferable Securities (UCITS) regime places restrictions on the types of securities and eligible markets in which UCITS funds can invest.¹³⁴ To enhance the depth of liquidity in SME growth markets, the Commission could make UCITS funds eligible for investment in all SME growth markets (rather than making determinations based on specific markets). It is worth considering the merits of creating a different class of fund, with lower liquidity expectations. While it is standard practice for regulators to allow mutual funds, pension schemes and insurance companies to invest in financial instruments listed on regulated markets, restrictions often apply for non-listed shares—a category that is open to the interpretation of national regulators, and some may include within this category financial instruments traded on non-regulated markets, such as MTFs. It is also worth exploring with the fund industry if targeted changes to the regulatory framework for European Long Term Investment Funds might support more investment in small stocks.
- Facilitate the introduction of a centralised machine-readable database for prospectus and consensus analyst ratios. A platform that could distribute the consensus of research EBIT and EBITDA ratios, as well as the full reports, would make it easier for potential investors, who could hook in via an API (application programming interface) and quickly assess whether they want to be part of the IPO. It may also be helpful to collate the extensive array of key risk factors usually observed in a prospectus into a simple fan chart summarising their potential effects on earnings. This would reduce the search costs of investing in SME IPOs. This service would ideally be delivered by the private sector, but could be boosted by the Commission launching a grant through a competition and/or an auction for rights to provide a service with pan-European coverage.
- Use behavioural economics insights and nudges to simplify the disclosure documentation. Other financial market regulators across the world are beginning to adopt this kind of approach to disclosure regulation.¹³⁵ The Commission could launch a programme of behavioural research to investigate the most effective and efficient use of disclosure for investors in the context of an equity-raising. It is well-recognised in the behavioural economics literature that most users find mandated regulatory disclosures complex, obscure and dull.¹³⁶ Standard practices that have worked well in other similar contexts include using simple language and less of it; chunking together thematic information; and using visuals including graphs. More innovative practices could include, for example, separating company-specific content from generic content; providing benchmarks for performance; presenting events across time in linear form; and enhancing the salience of long-term performance information. This is an area that could benefit from some behavioural experiments to test what might work best in this policy

¹³⁴ This idea was first suggested by the London Stock Exchange Group: 'LSEG response to the European Commission consultation on building a proportionate regulatory environment to support SME listing', 23 January 2018, https://www.lseg.com/sites/default/files/content/documents/Regulatory/2018/February/LSEG_Response_to_the_European_Commission_Consultation_on_Building_a_Proportionate_Regulatory_Environment_to_Support_SME_Listing.pdf.

¹³⁵ See, for example, Ontario Securities Commission (2017) 'Behavioural insights: key concepts, applications and regulatory considerations,' https://www.osc.gov.on.ca/documents/en/Securities-Category1/sn_20170329_11-778_behavioural-insights.pdf; and Financial Conduct Authority (2016) 'Full disclosure: a round up of FCA experimental research into giving information', Occasional Paper 23, <https://www.fca.org.uk/publication/occasional-papers/op16-23.pdf>.

¹³⁶ See, for example, Ben-Shahar, O. and Schneider, C. (2014), *More than you wanted to know: the failure of mandated disclosure*, Princeton Press.

context.¹³⁷ There is a cost to, but no benefit in, providing information that will not be read or understood.

¹³⁷ For more information, see, for example, BeWorks (2019), 'Behavioural Economics (BE) Applied to Financial Disclosure', a report submitted to the Investment Funds Institute of Canada (IFIC), February, <https://www.ific.ca/wp-content/uploads/2019/03/Behavioural-Economics-Applied-to-Enhance-Disclosure-Practices-and-Investor-Outcomes-February-2019-FINAL.pdf/21963/>.

6 Cross-border listing

Key messages

- There is a strong home bias in listings, both within the EU-27 and globally. In 2018, 86% of listings on EU stock exchanges were of companies domiciled in the same country.¹³⁸ Since 2000, there have been fewer than ten cross-border IPOs per year within the EU, which have been in the main between member states that share a geographic border.^{139 140}
- The benefits of cross-border listing have significantly reduced due to market integration and globalisation. Historically, maintaining different listings might have provided access to different groups of institutional investors, but this is no longer the case for most of Europe. There is now more overlap, and each pool of capital that companies can access (particularly in Western Europe) is deep enough. Large international institutional investors can access companies listed on a range of markets, although this is less the case for small and independent financial centres (as discussed further in section 10).
- This has important implications for policymaking:
 - the limited number of cross-border listings does not necessarily reflect a lack of market integration; rather, investors are able to access companies listed on a range of markets, meaning that there is less need for a cross-border listing;
 - aiming for more cross-border listing activity may not be necessary to achieve the CMU vision if markets are sufficiently integrated on the investor side;
 - cross-border listing may be most relevant for issuers located in smaller financial centres with more segmented pools of capital.
- Another concern for EU policymakers has been the rise in EU companies seeking to list outside the EU. Since 2010, there have been 40 IPOs of EU-27 companies in the USA compared to only one US firm conducting an IPO on an EU-27 exchange. There have also been some highly publicised examples of EU-27 companies seeking direct listings on US exchanges, such as Spotify in 2018.
- Firms based outside the EU may choose to list on an exchange in the EU to pre-commit to a level of governance if the issuer is looking for high-quality regulation and the associated benefits. Many firms domiciled in Africa, parts of Asia, and the Middle East have sought listings in major financial centres in the EU for this reason. Some firms domiciled in Eastern Europe have also sought listings in the UK for this reason. These case studies support the premise that high-quality regulation is an important prerequisite for the global competitiveness of EU listing venues.
- The departure of the UK from the EU is likely to have limited impact on cross-border listings in the EU. Although London is a large financial centre, and many of the bookrunners for European IPOs are based in the UK (as discussed further in section 8), a limited number of firms based in the EU-27 seek to list in the UK.¹⁴¹ One disadvantage of the UK (and some major EU) listing venue(s) is the limited flexibility

¹³⁸ See section 6.4.

¹³⁹ Oxera analysis of Dealogic data.

¹⁴⁰ Their key reasons for seeking a cross-border listing were to further raise their profile in the neighbouring country (where the firm might have operations and/or many customers) and/or to be covered in an important stock index in that neighbouring country.

¹⁴¹ See Figure 6.5 and Figure 6.6.

around dual-class shares on their premium market segments (which the large international issuers want to sign up to, for the reasons set out in the previous bullet). This has led to some recent high-profile issuers seeking to list in the USA and Asia instead.¹⁴²

6.1 Introduction

This section summarises our analysis of the obstacles to cross-border listings and the reasons for EU issuers to list in the UK or third countries. It is structured as follows:

- section 6.2 defines cross-border listing for the purpose of this study;
- section 6.3 analyses why firms might seek a cross-border listing, while section 6.4 looks at some trends in cross-border listings;
- section 6.5 explores potential barriers to cross-border listing within the EU-27;
- section 6.6 examines why EU-27 issuers might seek to list in the UK or third countries (and vice versa).

6.2 What is cross-border listing?

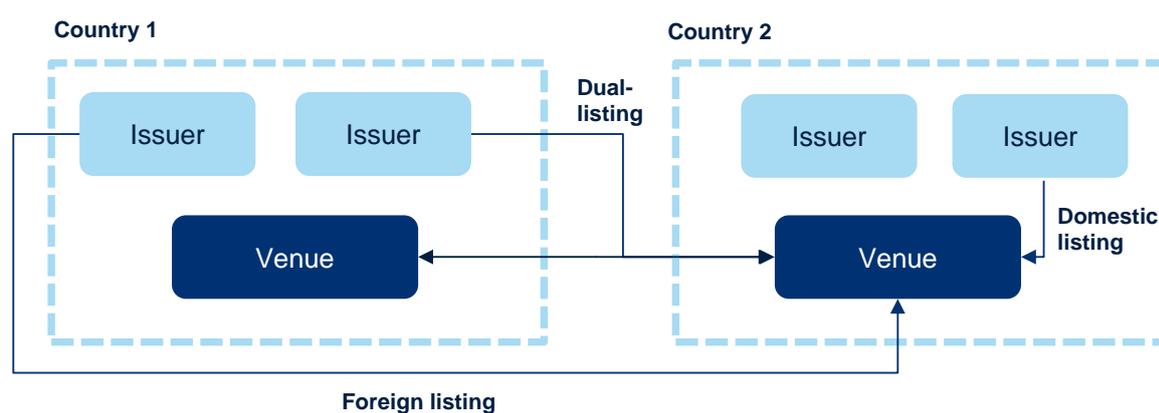
Cross-border listing usually refers to a company seeking to list in a country other than its country of domicile, and this is how it is used in the report.¹⁴³ The term cross-border listing includes:

- foreign listings—when a company seeks a listing on a venue located in another country without a listing on a domestic venue;
- cross-listings—when a company lists on a venue (or several venues) located in another country as well as on a domestic venue. This is also referred to as dual- or multiple-listing.

As shown in Figure 6.1 below, cross-border listings can vary according to the number of countries where a company is listed, and whether the company is also listed on its domestic market.

¹⁴² See Figure 6.7 and Box 6.9-Box 6.11 for examples.

¹⁴³ See, for example, Karolyi, G. (2006), 'The world of cross-listings and cross-listings of the world: challenging conventional wisdom', *Review of Finance*, **10**:1, pp. 99–152; Bancel, F. and Mittoo, C. (2002), 'European managerial perceptions of the net benefits of foreign stock listings', *European Financial Management*, **7**:2, pp. 213–236; and Dodd, O. (2013), 'Why do firms cross-list their shares on foreign exchanges? A review of cross-listing theories and empirical evidence', *Review of Behavioral Finance*, **5**:1, pp. 77–99. Much of the academic literature is focused on cross-listings; some papers use the terms 'cross-border listing', 'foreign listing' and 'cross-listing' interchangeably. See Appendix A1.

Figure 6.1 Taxonomy of cross-border listing activity

Source: Oxera.

Two challenges arise when analysing cross-border listings: the concept of a 'country of domicile' varies across legal systems,¹⁴⁴ and data providers have different definitions of company nationality.¹⁴⁵

The Commission's tender requirements for this study place emphasis on the firm's 'principal place of doing business', so this concept is adopted for the purpose of our study.

6.3 Why do companies cross-border list?

There are several reasons to seek a cross-border listing,¹⁴⁶ including the following.

- Overcoming market segmentation—firms list in other countries to overcome frictions, such as regulatory restrictions on investment choices or taxes that prevent integration of global capital markets on the demand side.
- Increasing liquidity—cross-border listing may increase the liquidity of a company's shares.
- Greater investor recognition—cross-border listing may increase the number of investors that are aware of a company's stock, which can bring diversification benefits.¹⁴⁷
- Benchmarking—a company may list in the same country as its industry peers or as sector-specific analysts to achieve a better valuation.
- Reducing agency costs—cross-border listing is associated with meeting the different disclosure and investor protection requirements of the host country. A company may

¹⁴⁴ Some legal systems base domicile on the country of incorporation, while others rely on the country in which the company's 'central administration' or 'principal place of business' is located (also known as the 'real seat'). Country of incorporation is relatively straightforward to define for a given company; however, there is no consensus on the exact definition of 'principal place of business', which is often interpreted as the country in which the Board of directors, head office or management is located.

¹⁴⁵ Some (e.g. MSCI and WFE) include listing venue in their definition of company nationality. See Appendix A1 for a brief description of the definition used in different data sources.

¹⁴⁶ For literature reviews of the motivations behind cross-border listing, see Phylaktis, K. and O'Connor, T. (2013), 'Cross-Listing Behaviour', pp. 248–274 in H. Baker and L.A. Riddick (eds.), *International Finance: A Survey*, Oxford University Press, USA; and Dodd, O. (2013), 'Why do firms cross-list their shares on foreign exchanges? A review of cross-listing theories and empirical evidence', *Review of Behavioral Finance*, **5**:1, pp. 77–99.

¹⁴⁷ See Merton, R.C. (1987), 'A simple model of capital market equilibrium with incomplete information', *Journal of Finance*, **42**:3, pp. 483–510.

choose to cross-border list to tie itself to a higher level of disclosure and corporate governance, so as to reduce agency costs.¹⁴⁸

- Business strategy—cross-border listing is part of a firm’s broader corporate strategy. A company may choose to cross-border list for a range of reasons, such as to align its investor base with its geographical profile from an operational perspective; to position itself closer to export or growth markets; to facilitate M&A activity; or as a sign of prestige.¹⁴⁹
- Index inclusion—firms may choose to list on different markets to be included on certain indices, and then benefit from passive investment in that index.

Some of these benefits may be less relevant in an intra-EU context (see section 6.5.2), but still apply to some smaller financial centres and issuers outside the EU.

Box 6.1 summarises some of the most important and recent academic papers that discuss cross-border listing in the context of agency costs. Box 6.2 presents a case study highlighting how cross-border listing does not entirely resolve agency costs.

Box 6.1 Academic literature: agency costs and bonding

- Coffee (1999, 2002) and Stulz (1999) are the first papers to suggest that a cross-border listing in a country with superior investor protection can prevent managers from extracting excessive private benefits, thus reducing the cost of capital.¹⁵⁰ Coffee emphasises mechanisms for ‘bonding’ foreign companies that seek a US listing: SEC enforcement; investors’ ability to launch class-action lawsuits; disclosure requirements; and ‘reputational intermediaries’ such as underwriters and auditors.
- Doidge, Karolyi and Stulz (2004) is a key empirical paper. Here, the authors find a ‘cross-listing’ valuation premium, which is largest for issuers from countries with low investor protection. Reduced agency costs associated with cross-border listing may not be limited to equity cost of capital. For example, Ball, Hail and Vasvari (2018) find evidence that non-US firms issue more debt (at lower yields) following a US equity listing, which the authors attribute to greater monitoring and transparency.
- There is limited empirical evidence for European cross-border listings. Doidge, Karolyi and Stulz (2009) find no evidence of a valuation premium for cross-border listings in London. Roosenboom and Van Dijk (2009) report that legal bonding is associated with a positive market reaction to cross-listing in the US and UK markets, but not in continental European or Japanese markets.
- Several papers have criticised the agency cost theories of cross-border listing, for example by arguing that the scope of legal enforcement towards foreign companies

¹⁴⁸ For further discussion, see, for example, Chemmanur, T. and Fulghieri, P. (2006), ‘Competition and cooperation among exchanges: a theory of cross-listing and endogenous listing standards’, *Journal of Financial Economics*, **82**:2, pp. 455–489; Fernandes, N. and Giannetti, M. (2013), ‘On the fortunes of stock exchanges and their reversals: Evidence from foreign listings’, *ECB Working Paper No 1585*; Doidge, C., Karolyi, G. and Stulz, R.M. (2004), ‘Why are foreign firms listed in the US worth more?’, *Journal of Financial Economics*, **71**:2, pp. 205–238. Stulz, R.M. (1999), ‘Globalization, Corporate Finance, and the Cost of Capital’, *Journal of Applied Corporate Finance*, **26**, pp. 3–28.

¹⁴⁹ Bancel and Mittoo (2001) is a key paper. The authors survey managers of European companies and find that having increased prestige and visibility is a key benefit of cross-border listing. Some of their findings are replicated in a global study: see PwC/Baker & McKenzie (2012), ‘Equity sans frontières: trends in cross-border IPOs and an outlook for the future’, <https://www.pwc.com/gx/en/audit-services/ipo-centre/assets/pwc-cross-border-ipo-trends.pdf>.

¹⁵⁰ Coffee, J.C. (1999), ‘The Future as History: The Prospects for Global Convergence in Corporate Governance and Its Implications’, *Northwestern University Law Review*, **93**:3, pp. 641–708; Coffee, J.C. (2002), ‘Racing Towards the Top?: The Impact of Cross-Listings and Stock Market Competition on International Corporate Governance’, Columbia University Center for Law and Economic Studies Working Paper No. 205; and Stulz, R.M. (1999), ‘Globalization, Corporate Finance, and the Cost of Capital’, *Journal of Applied Corporate Finance*, **26**, pp. 3–28.

is in reality very limited. Silvers (2020) shows that the degree of regulatory cooperation between 'home' and 'host' country can have a significant impact on liquidity of cross-listed company shares.

Source: Ball, R.T., Hail, L. and Vasvari, F.P. (2018), 'Equity cross-listings in the US and the price of debt', *Review of Accounting Studies*, **23**:2, pp. 385–421. Doidge, C., Karolyi, G. and Stulz, R.M. (2004), 'Why are foreign firms listed in the US worth more?', *Journal of Financial Economics*, **71**:2, pp. 205–238. Roosenboom, P. and Van Dijk, M. (2009), 'The market reaction to cross-listings: does the destination market matter?', *Journal of Banking & Finance*, **33**:10, pp. 1898–1908. Silvers, R. (2020), 'Cross-border cooperation between securities regulators', *Journal of Accounting and Economics*, forthcoming

Box 6.2 Reasons for cross-border listing: case study of Bumi plc

In July 2010, Vallar, Nat Rothschild's £700m investment vehicle, listed on the London Stock Exchange. In November of the same year, Vallar acquired 25% of Bumi Resources, owned by the Bakrie family, and 75% of Berau Coal Energy, owned by entrepreneur Rosan Roeslani, both companies being Indonesian coal assets. Following a reverse takeover, the Bakrie family became the largest shareholder in Vallar, followed by Roeslani and Rothschild.

In June 2011 Vallar was renamed Bumi plc and the firm's shares in both Bumi Resources and Berau were increased, with the Bakrie family now holding a 47% stake in Bumi plc. Bumi plc then held an IPO on the London Stock Exchange, stating in its prospectus under the 'Corporate Governance' sub-title: 'The Company intends to observe best practice on corporate governance, and the Board has adopted the Model Code on a voluntary basis and is in compliance with the provisions of the UK Corporate Governance Code.'

In November 2011 the Bakrie family sold half of its stake in Bumi plc for \$1bn to Samin Tan, an Indonesian billionaire, to resolve some financing issues. In the same month, Rothschild called, in a leaked letter, for a 'radical cleaning up' of Bumi Resources, criticising the firm's corporate governance.

Shares in Bumi plc then fell after it was announced that 'potential financial and other irregularities' had been discovered at Bumi Resources in September 2012. The Bakrie family and Rothschild both then sought to cut ties, with the latter resigning from the Bumi plc Board in October of the same year, claiming that minority shareholders were not being protected.

In March 2014 a restructuring saw the Bakrie family exit the company, which was renamed Asia Resource Minerals. Finally, in June 2015, Rothschild announced that his firm would sell its shares to a rival, stating that Bumi would be his 'first and last investment in Indonesia's coal sector', going on to say 'there's no way, shape or form you can control what's going on. Indonesia is ungovernable.' This highlights issues over cross-border listing from a less governed nation to one with far more tests and governance requirements.

Source: Aglionby, J. and Wilson, J. (2015), 'Nat Rothschild sells Asia Resource Minerals stake', *Financial Times*, <https://www.ft.com/content/f710e518-0da6-11e5-9a65-00144feabdc0>.

The decision to cross-border list will depend on the relative benefit of listing in a different country compared with the home country; and/or the incremental benefit of listing in another country over the domestic listing.

Box 6.3 and Box 6.4 provide some examples of EU-27 firms' cross-border listings and the motivations behind their decisions.

Box 6.3 Reasons for cross-border listing: Aperam case study

Aperam opted for a cross-listing in Belgium to align its shareholder profile with its geographic operational profile.

Aperam is the second-largest steel producer in Europe, and is incorporated in Luxembourg with production facilities in Brazil, Belgium and France.

In 2018, 26% of its sales revenue came from the Americas, 67% from Europe (Germany being the single biggest destination) and 7% from Asia & Africa.¹⁵¹

The company was created in 2011 as a spin-off from ArcelorMittal (itself listed on BME, Euronext Amsterdam, Euronext Paris, and the Luxembourg Stock Exchange). The stated objective of the spin-off was to enable the stainless and speciality steels businesses in the ArcelorMittal Group in order to 'benefit from greater market visibility by pursuing a growth strategy focused on emerging markets and speciality products, including electrical steel.'¹⁵²

In January 2011 the ordinary shares were listed on the regulated market of the Luxembourg Stock Exchange, Euronext Amsterdam and Euronext Paris. Aperam is traded on the OTC market in New York via New York Registry Shares. Within the Euronext single order book, Amsterdam is the market of reference. In 2017, the company also chose to cross-list its shares on Euronext Brussels. No new shares were issued in this cross-listing.¹⁵³

In its press release announcing the dual-listing on Euronext Brussels, the company stated:¹⁵⁴

Listing on Euronext Brussels underlines the strategic value of having a Belgium footprint for Aperam with a clear signal towards its Belgian stakeholders of its ambition to be a sustainable industrial partner in Belgium. In addition, with this listing on Euronext Brussels Aperam expects to increase its visibility, reputation, brand and employer-branding awareness by further improved analyst coverage and press coverage in the Belgian market.

Box 6.4 Reasons for cross-border listing: FNG case study

FNG sought an additional listing in Brussels alongside moving its headquarters to Belgium.

FNG N.V. is a Belgian fashion company that operates across Belgium, France, the Netherlands, Luxembourg, France, Spain and Germany. Founded in 2003, FNG first went public through an IPO on the Euronext Brussels Free Market segment in 2008.

FNG indirectly obtained a listing on Euronext Amsterdam in 2016, through a reverse IPO in which the company was acquired by an already listed company, Dico International.¹⁵⁵ Through the reverse takeover, FNG delisted from the Brussels Free Market. According

¹⁵¹ Aperam (2019), 'Annual report 2018', <https://www.aperam.com/sites/default/files/documents/2019-02/Annual%20Report%202018.pdf>.

¹⁵² Aperam (2010), 'Prospectus dated December 15, 2010', <https://www.aperam.com/sites/default/files/documents/2018-05/European%20listing%20prospectus%20for%20APERAM.PDF>.

¹⁵³ Aperam (2019), 'Share listing', <https://www.aperam.com/share-listing>.

¹⁵⁴ Aperam (2017), 'Aperam applies for a listing on Euronext Brussels', https://www.aperam.com/sites/default/files/documents/2018-04/AperamannouncesapplicationlistingEuronextBrussels_EN.pdf.

¹⁵⁵ Retail Detail (2016), 'FNG Group seeks IPO on Amsterdam stock exchange through R&S retail', <https://www.retaildetail.eu/en/news/fng-group-seeks-ipo-amsterdam-stock-exchange-through-rs-retail>.

to contemporary reports, the choice to list in Amsterdam was linked to the company strengthening its product market business in the Netherlands.¹⁵⁶

In 2018, the company conducted a secondary listing on Euronext Brussels, in addition to its primary listing on Euronext Amsterdam. The company also changed its market of reference to Euronext Brussels. According to the CEO: 'We have a lot of business in the Netherlands. But the management, the founders and the majority of our shareholders are based in Belgium.' Alongside the dual listing, the company moved its headquarters from Zoetermeer (Netherlands) to Mechelen (Belgium).¹⁵⁷

These benefits often derive from overcoming frictions in cross-border capital markets, such as:

- regulatory barriers—for example, regulatory restrictions on institutional investors (e.g. pension funds and insurance companies) can limit companies' ability to invest in certain markets. Previous analysis suggests that specific geographical restrictions on investments within the EU are minimal and are not the main factor limiting cross-border investment.¹⁵⁸ Restrictions on foreign exchange exposure may still limit the extent to which pension funds can invest in foreign-denominated equities.¹⁵⁹ Cross-border listings can help to overcome this;
- informational frictions—for example, cross-border listing may help to reduce search costs for foreign investors, who may be less aware of the stocks on the domestic market;
- transaction costs—for example, firms may seek a cross-border listing to improve the liquidity of their stock.

6.4 Trends in cross-border listing in Europe

As capital market integration has improved over time, the benefits of cross-border listing appear to have significantly reduced for many European companies, as confirmed through our interviews with a range of issuers and investors.

This section presents some statistics on cross-border listings in the EU, the overall number of which is quite low. Figure 6.2 presents the number of IPOs on EU-28 exchanges between 2000 and 2019, and shows that the majority of EU IPOs since 2000 have been domestic companies. Most European firms have a single listing in their home country.¹⁶⁰ This home bias can also be seen in the stock of listed companies. In 2018, 86% of the listings on EU-27 exchanges were domestic and only 14% were foreign.¹⁶¹ The low volume of intra-EU cross-border IPOs also suggests that the impact of the UK's departure from the EU (from a listing perspective) will be limited if secondary markets remain largely integrated.

¹⁵⁶ Merodis (2017), 'Finger on the trigger', Equity Research Report, <https://www.fng.eu/wp/wp-content/uploads/2017/09/FNG-Equity-Research-Report-Merodis-1.pdf>.

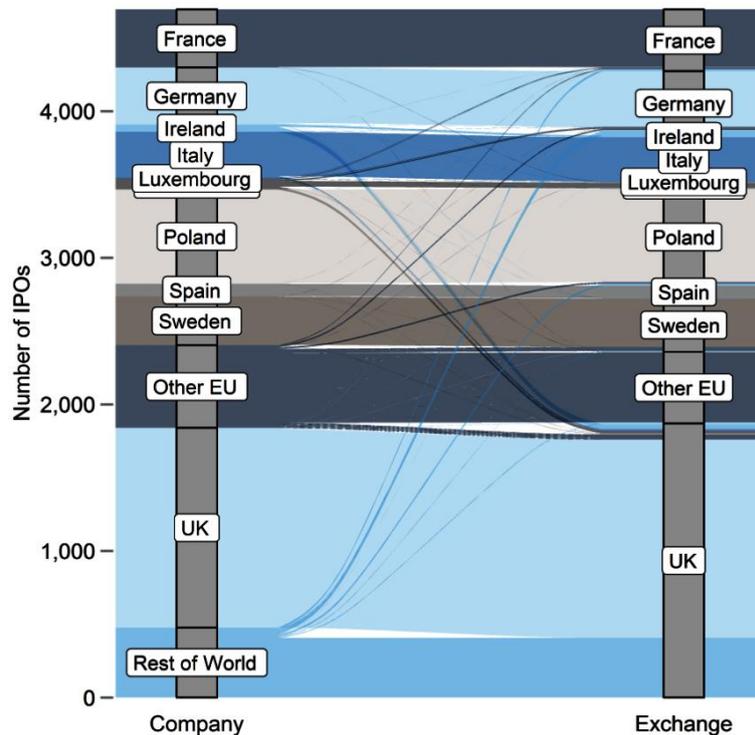
¹⁵⁷ De Preter, W. and Rousseau, S. (2018), 'FNG op weg naar Belgische beurs', De Tijd, March, <https://www.tijd.be/ondernemen/retail/FNG-op-weg-naar-Belgische-beurs/9992013>.

¹⁵⁸ European Commission (2017), 'Accelerating the capital markets union: addressing national barriers to capital flows', Report from the Commission to the Council and the European Parliament, https://ec.europa.eu/info/sites/info/files/170227-report-capital-barriers_en.pdf.

¹⁵⁹ For a detailed analysis of pension fund investment regulation, see OECD (2019), 'Annual survey of investment regulation of pension funds 2019', <http://www.oecd.org/daf/fin/private-pensions/2019-Survey-Investment-Regulation-Pension-Funds.pdf>

¹⁶⁰ This home bias has also been discussed by EU competition authorities. See European Commission (2012), 'Commission Decision of 1.2.2012 addressed to: Deutsche Börse AG and NYSE Euronext, Case No COMP/M.6166 - Deutsche Börse/Nyse Euronext, https://ec.europa.eu/competition/mergers/cases/decisions/m6166_20120201_20610_2711467_EN.pdf.

¹⁶¹ Oxera analysis of stock exchange data.

Figure 6.2 IPOs on EU-28 exchanges by company nationality, 2000–19

Note: Data covers Dealogic deals categorised as 'ECM-IPO'. Excludes funds raised by certain investment funds and REITs. 2019 data as at November 2019. The height of the boxes and the width of the flow arrows are proportionally scaled to the number of IPOs.

Source: Dealogic.

Table 6.1 shows the number (stock) of cross-border listings by companies domiciled in 13 of the 14 member states studied in-depth in this report (excluding the UK) between 2013 and 2018. From this, the following can be observed:

- the number of cross-border listings has been relatively stable over the past five years;
- cross-border listings were particularly common for companies domiciled in the Netherlands and France (many of these involve intra-Euronext dual- and foreign listings);
- cross-border listings were relatively rare for companies domiciled in small financial centres and some major financial centres (e.g. Ireland and Spain).

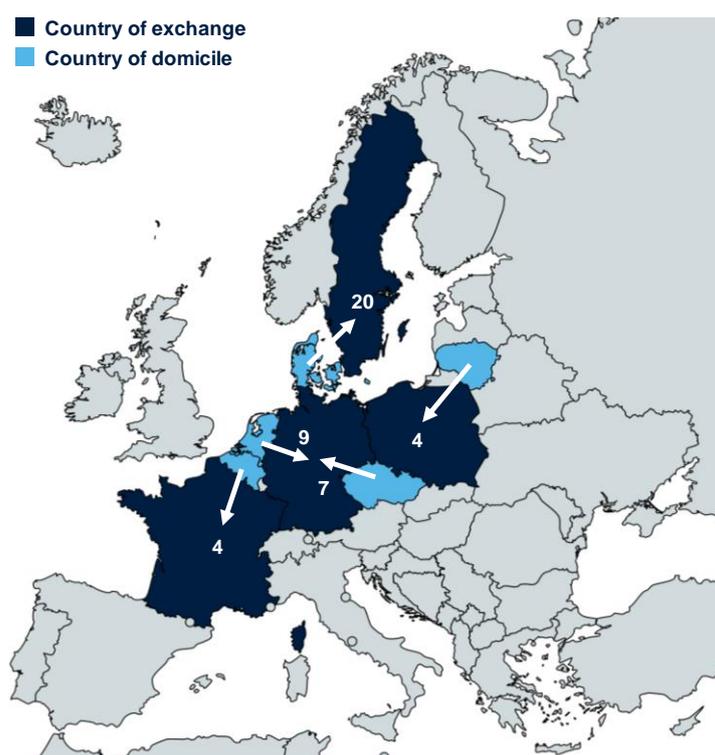
Table 6.1 EU-27 cross-border listings by company domicile, 2013–18

Company country of domicile	Number of listings on other EU-27 exchanges					
	2013	2014	2015	2016	2017	2018
Major financial centres						
France	16	18	17	16	15	16
Germany	4	9	12	12	13	12
Ireland	0	1	1	1	1	2
Italy	9	11	12	11	8	9
Netherlands	27	32	33	39	40	37
Spain	5	6	6	7	7	6
Sweden	6	9	10	10	10	9
Small financial centres						
Bulgaria	4	4	4	4	4	4
Croatia	0	0	0	0	0	0
Estonia	3	3	4	3	2	5
Hungary	3	3	4	4	4	3
Poland	1	1	1	2	2	2
Slovakia	3	3	3	3	2	2

Note: Company domicile based on ISIN code country identifier. Numbers represent a stock variable, i.e. the number of active listings in a given year, not the number of new listings. As multiple cross-border listings for the same company are counted separately, this may not always equal the number of companies that have cross-border listings.

Source: Oxera analysis of stock exchange data.

Figure 6.3 below shows the most common five flows of cross-border listings since 2000. France, Germany, Poland and Sweden were the most frequent host member states of cross-border IPOs over the period.

Figure 6.3 Common EU-27 cross-border listing flows, 2000–19

Note: Chart shows the five most common member state pairs by total number of cross-border IPOs between 2000 and 2019. Numbers represent the total number of IPOs for each given country of exchange and country of company domicile in 2000–19.

Source: Dealogic.

A number of public corporations that previously had multiple foreign listings have also withdrawn them in recent years as a consequence of market integration (Box 6.6 below provides the case study of Daimler AG).¹⁶²

6.5 Why do we not see more cross-border listings in the EU-27?

As discussed in section 6.3, the main benefit of cross-border listing is to attract investors and thus achieve a lower cost of capital.

6.5.1 Conceptual framework

In a fully integrated capital market with a single pool of liquidity, there would be no real benefit to cross-border listings—cross-border listings become relevant in a world with multiple pools of capital.

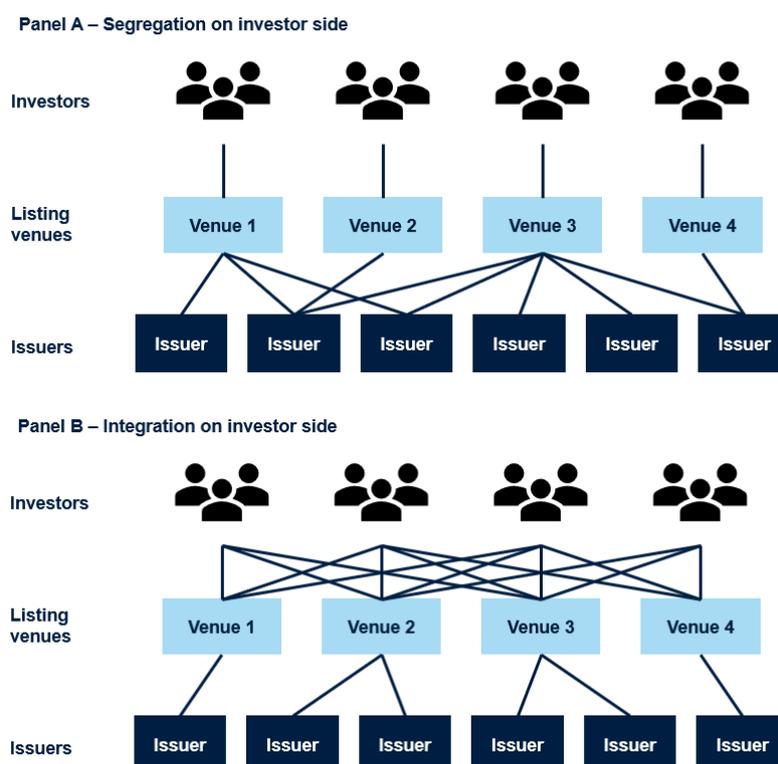
The benefit of cross-border listings is that they help integrate pools of capital between investors and owners of companies (issuers). From a policy perspective, this is beneficial as it reduces frictions in financial markets.

¹⁶² Some academic papers and reports provide evidence for this. Dodd and Louca (2012) find no significant valuation effects stemming from cross-listings within continental Europe, which the authors attribute to a highly integrated financial market compared to the rest of the world. See Dodd, O and Louca, C. (2012), 'International cross-listing and shareholders' wealth', *Multinational Finance Journal*, **16**:1–2, pp. 49–86. Analysis by McKinsey in 2008 provides similar findings in a global context: 'Why cross-listing shares doesn't create value', November, <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/why-cross-listing-shares-doesnt-create-value>.

If there were only one trading venue in the market, by definition there would be only one pool of liquidity, and the justification for cross-border listings disappears. This might explain why some commentators have called for a single listing authority in the EU. However, there are other ways to pool capital—for example, pools of capital can be integrated via the:

- issuers—by listing stock on multiple venues, to access different pools of liquidity (i.e. issuer multi-homing,¹⁶³ see Panel A in Figure 6.4);
- investors—if, for example, they are members of multiple trading venues (i.e. investor multi-homing, see Panel B).

Figure 6.4 Integrating pools of capital



Source: Oxera.

Given this, one might expect cross-border listing activity:

- to be limited in member states with a listing venue that is sufficiently integrated on the investor side;
- to occur as companies seek to access pools of capital that are more localised (e.g. large institutional investors whose investment mandates limit them to investing in stocks listed on their local stock market), or as they seek to access a larger integrated financial centre;
- to be most relevant to issuers located in smaller financial centres that are not particularly integrated on the investor side.

In practice, different pools of liquidity remain in the EU.

¹⁶³ Multi-homing is where users can use more than one platform simultaneously.

Despite increased multi-homing of international investors, which has perhaps led to a reduction in cross-border listings overall, local investors still have a significant home bias (see Box 6.5).

6.5.2 Barriers to cross-border listings

As discussed above, investors' ability to multi-home means that barriers to cross-border listing are potentially less problematic. Our analysis (based on feedback from interviews with market participants, legal advisers, national and international regulators and policymakers) identifies several barriers relevant to the EU context, including:

- **home bias of investors**—a company will not cross-border list if it cannot attract sufficient investor interest from investors on the overseas exchange. Investors may be reluctant to hold shares in overseas-domiciled companies for a range of reasons;¹⁶⁴
- **direct costs of listings**—many of the costs (e.g. listing fees) are incremental, which particularly discourages dual-listing, as discussed in section 7;
- **indirect costs of listings**—these costs can be higher for cross-border listings if there are frictions associated with language barriers and different reporting standards, for example;
- **tax issues**—tax and cross-border investing is discussed further in section 13.3.8;
- **the role of the local ecosystem**—if a company cannot access global underwriters with the relevant expertise, this prevents them from cross-border listing;
- **post-trade barriers**—equity issuance practices vary across member states.¹⁶⁵ New initiatives/regulations, such as Target2-Securities (T2S) and the Central Securities Depositories Regulation (CSDR), have simplified processes by allowing companies to issue securities in any central securities depository (CSD). Post-trading is discussed further in section 9;
- **saturated listing venue market**—each member state has at least one exchange offering listing services, making it uneconomic for listing venues in another member state to compete for listings;
- **lack of commercial incentives to support SME listings**—attracting SME listings is often not commercially attractive for listing venues, advisers and intermediaries, as discussed in section 5. This limits the appeal of competing for SME listings in other member states.

These barriers have a direct link to cross-border listing. However, other factors might indirectly affect cross-border listing activity through their impact on secondary markets and liquidity (as discussed further in section 12).

As noted in section 6.5.1, these barriers are not the primary driver of low cross-border listing activity within the EU, which is mainly a result of increased secondary market integration.

Investor home bias

¹⁶⁴ See Grinblatt, M. and Keloharju, M. (2001), 'How distance, language and culture influence stockholdings and trades', *Journal of Finance*, **56**:3, pp. 1053–1073; Lindblom, T., Mavruk, T. and Sjögren, S. (2018), 'East or west, home is best: The birthplace bias of individual investors', *Journal of Banking & Finance*, **92**, pp. 323–339; Kho, B-C., Stulz, R. and Warnock, F. (2009), 'Financial globalization, governance, and the evolution of the home bias', *Journal of Accounting Research*, **47**:2, pp. 597–635.

¹⁶⁵ European Post Trade Forum (2017), 'EPTF Report – Annex 3 Detailed analysis of the European Post Trade Landscape 15th May 2017', https://ec.europa.eu/info/sites/info/files/170515-eptf-report-annex-3_en.pdf.

Investor home bias is driven by a variety of factors (see Box 6.5), some of which will not be overcome by cross-border listing.

Box 6.5 Home equity bias

Equity home bias refers to the observed phenomenon that investors persistently hold only small amounts of foreign equity, contrary to the predictions of standard finance theory. Armour, Bengtzen and Enriques (2018) identify various factors that explain why home bias persists.

- Information markets are not yet fully global, meaning that local investors may find it easier to procure accurate information, understand the language of issuers' disclosures, or assess the reputation and credibility of directors.
- Less-than-full liberalisation may prevent foreign investors from entering certain equity markets, make entry more expensive through tax laws, or be denied full exit from a domestic regime by way of prudential regulation.
- National law requiring securities to be cleared, settled, or held with local organisations may make the administration of a global portfolio expensive (linked to institutionalisation).
- Investors may want to avoid exchange rate exposure that foreign investment brings, or prefer local securities for their superior ability to hedge against local risk factors.
- Cultural factors may influence the extent to which investors confidently invest overseas.
- In countries where corporate insiders or the government can appropriate value from outside investors, large local shareholders may be the optimal way to control agency costs.

Source: Enriques, L., Armour, J. and Bengtzen, M. (2018), 'Globalization', in M. Fox et al. (eds), *Securities Markets Issues for the 21st Century* (e-book), https://www.law.columbia.edu/sites/default/files/microsites/capital-markets/securities_market_issues_for_the_21st_century.pdf.

The costs of cross-border listings

Our analysis has also highlighted that the direct (e.g. annual fees) and indirect (e.g. administrative burden) ongoing costs of listing can be an obstacle to cross-border listing, particularly for multiple listings, where the costs are incremental.¹⁶⁶ These costs have also been a driver of cross-border delistings (i.e. delisting from foreign exchanges and retaining only a single domestic listing), even for the largest companies (see Box 6.6 below).

Box 6.6 Cross-border delistings: case study of Daimler AG

Over time, Daimler has gradually reduced its number of international cross-listings, noting that international investors can easily trade Daimler shares in Germany.

Daimler AG, a German automobile manufacturer headquartered in Stuttgart, is one of the largest listed German companies and is a component of the DAX 30 and the Euro

¹⁶⁶ To the extent that rules for listed companies are harmonised, the incremental administrative burden associated with an additional listing will be limited, and the relative administrative burden of a listing across member states will be the same. See section 3.2 for a mapping of the regulations across the EU-28.

Stoxx 50. Historically, Daimler undertook multiple domestic and cross-border listings. At the peak of this listing activity, Daimler maintained:

- multiple domestic listings on all major German stock exchanges (Berlin-Bremen, Dusseldorf, Frankfurt, Hamburg-Hannover, Munich, and Stuttgart);
- an EU-27 cross-border listing on Euronext Paris;
- cross-border listings on the Chicago Stock Exchange, NYSE, Philadelphia Stock Exchange, SIX Swiss Exchange and Tokyo Stock Exchange.

In 2006, Daimler discontinued all its listings except for those on the Frankfurt Stock Exchange, NYSE, and Stuttgart Stock Exchange citing a desire to cut costs and administrative burden.¹⁶⁷ At the time of the announcement, a company spokesperson reported that the reduced number of listings would save approximately €50,000 per year.¹⁶⁸

In 2010, the company discontinued its sole remaining cross-border listing on NYSE (which it had maintained since 1993), noting that:¹⁶⁹

the main reason for ending the NYSE listing and deregistering with the SEC is a significant change in the behaviour of investors, who now trade in Daimler shares primarily in Germany and on electronic trading platforms. Another reason was to reduce the complexity of financial reporting as well as administrative costs and fees.

The relatively stable geographic dispersion of European and US ownership following Daimler's delisting appears to support this rationale:

- in 2006, 43.6% of shares were held by German investors, 30.9% were held by other European investors, and 17.2% by US investors;¹⁷⁰
- in 2018, 32.7% of shares were held by German investors, 29.2% by other European investors, and 16.4% by US investors.¹⁷¹

The role of the local ecosystem

Discussions with stakeholders highlight that the local ecosystem around issuers (e.g. underwriters, bookrunners, advisory firms, brokers and market-makers) can play a role in constraining cross-border listing, particularly for local capital markets.

The limited number of cross-border listings may be linked to:

- the limited reach of global underwriters—a company may not be able to attract global underwriters with experience in conducting cross-border IPOs. There is some empirical evidence that international underwriters play a significant role in driving cross-border capital flows;¹⁷²

¹⁶⁷ DaimlerChrysler (2006), 'Annual Report', <https://www.daimler.com/documents/investors/berichte/geschaeftsberichte/daimlerchrysler/daimler-ir-annualreport-2006.pdf>.

¹⁶⁸ Chung, J. (2006), 'Daimler to delist from 12 exchanges', *Financial Times*, June, <https://www.ft.com/content/69bd1862-007c-11db-8078-0000779e2340>.

¹⁶⁹ Daimler (2010), 'Annual Report', <https://www.daimler.com/documents/investors/berichte/geschaeftsberichte/daimler/daimler-ir-annualreport-2010.pdf>

¹⁷⁰ DaimlerChrysler (2006), 'Annual Report'.

¹⁷¹ Daimler (2018), 'Annual Report', <https://www.daimler.com/documents/investors/reports/annual-report/daimler/daimler-ir-annual-report-2018.pdf>.

¹⁷² See Caglio, C., Hanley, K.W. and Marietta-Westburg, J. (2016), 'What does it take to list abroad? The role of global underwriters', *Federal Reserve Discussion Paper*.

- the local nature of the expertise—the knowledge and expertise on the company is often very localised in Europe;
- the need for the exchange to partner with advisers—often to attract listings from other countries, the trading venues need to partner with the local advisers, making it hard to attract the domestic issuers;
- conflicts of interest between the underwriters and the advisory firms—if the advisers make profit from providing domestic market-making activity on the stock, they may have an incentive to ensure that the IPO remains domestic.

The impact of local ecosystems in influencing cross-border listings can be seen through:

- EU-27 stock exchanges establishing local offices/representatives in other member states (e.g. Euronext in Italy, Spain and Germany, or the Spotlight Stock Market in Denmark);
- EU-27 stock exchanges undertaking partnerships with local underwriters and advisers in other EU member states to attempt to attract issuers in those countries;
- stock exchange operators in the EU-27 (i.e. Euronext and Nasdaq) operating federal models—i.e. acquiring groups of national stock exchanges, integrating some back-office and technological infrastructure, but maintaining individual exchanges in each jurisdiction.

Post-trade barriers

There is some evidence that the post-trade landscape remains a barrier to cross-border listing. In 2017, the European Post Trade Forum identified barriers that might cause risk in the cross-border equity issuance process:¹⁷³

- domestic corporate law may require primary shares to be pre-funded before shares can be issued. The entities that participate in the primary issuance will need to evidence that they have enough funds to pay for their part in the primary issuance, before the actual process takes place;
- domestic requirements to create shares vary (in timing, amount of pre-funding, local intermediation);
- an independent third party (such as the local commercial register) is sometimes required to confirm that shares have been pre-funded;
- CSDs may require physical share certificates to be deposited a day or more before trading starts.

However, interviews with stakeholders suggest that recent initiatives, such as T2S and CSDR, have reduced the barriers to cross-border equity issuance.

In the absence of T2S, an issuer conducting a cross-border listing would need to have a CSD presence in each local market (or the investors would need to appoint local custodians in the issuer's domestic market). Under T2S and CSDR, the issuer can centralise the primary issuance through whichever CSD it chooses. This has removed one barrier to cross-border listing.

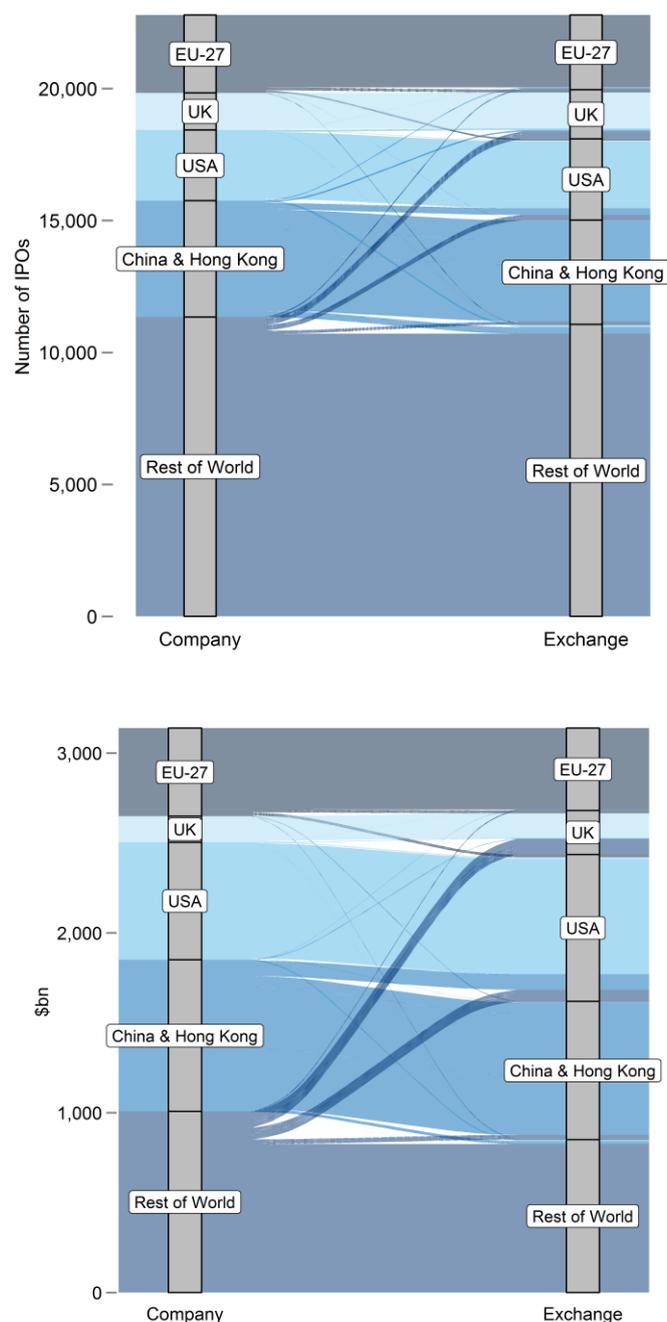
¹⁷³ European Post Trade Forum (2017), 'EPTF Report – Annex 3 Detailed analysis of the European Post Trade Landscape 15th May 2017', https://ec.europa.eu/info/sites/info/files/170515-epf-report-annex-3_en.pdf.

6.6 Reasons for EU issuers to list in the UK or third countries and not in the EU

As noted above, most companies will not undertake a cross-border listing.

Figure 6.5 below presents the pattern of global IPO flows since 2000 (both number of IPOs and value), and shows that:

- global IPOs also exhibit significant home bias;
- the USA and the UK have attracted the largest flows of cross-border IPOs. The inflow is greater in terms of value than volume, implying that the exchanges in these countries are attracting the larger companies to list. The UK's international attractiveness is discussed in more detail in section 6.6.2.

Figure 6.5 Global IPO flows, 2000–19

Note: Top panel: number of IPOs; bottom panel value of the IPOs (\$bn). Data covers Dealogic deals categorised as 'ECM-IPO'. Excludes funds raised by certain investment funds and REITs. 2019 data as at November 2019. The height of the boxes and width of the flow arrows are proportionally scaled to the number/value of IPOs.

Source: Dealogic.

6.6.1 Choice of listing venue

Our analysis, based on initial interviews with a range of issuers, investors and listing venues, has highlighted the following drivers for companies when choosing a trading venue on which to list:

- regulation-specific factors (listing and trading requirements, transparency);
- exchange-specific factors (liquidity, which can be linked to the index or the stock market as a whole; access to pool of investment capital; costs and prices; analysts' industry knowledge);
- company-specific factors (geographical presence, for example in terms of product market presence; advisers' choices).

This supports previous findings reported in market investigations. For example, the Commission, in its decision on the proposed merger of Deutsche Börse and NYSE Euronext, found that:¹⁷⁴

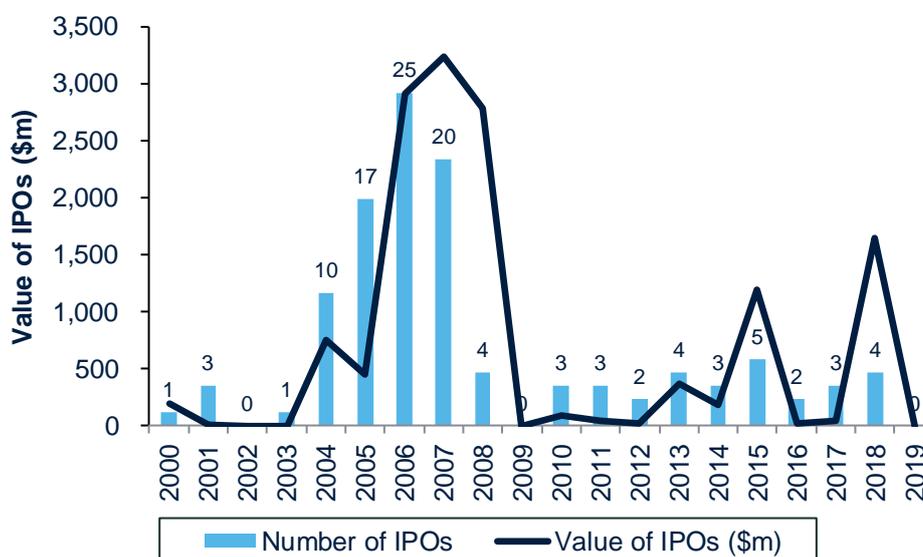
the listing decision of issuing companies depends on external factors such as regulation, investor base, business strategies as well as on elements influenced by the exchanges themselves (such as listing fees and trading services) and the liquidity of the trading venue.

As part of our survey, issuers were asked about the relative importance of these factors in their choice of listing venue. The results suggest that location of business activity and access to capital are particularly important overall drivers behind choice of listing venue. This is generally supported in the structured interviews with issuers. Some larger issuers also emphasised the need to have access to specialised and knowledgeable investors, which is in turn influenced by the listing choices of peer group companies.

6.6.2 EU-27 issuers in the UK

Figure 6.6 below shows the number and value of IPOs of EU-27 companies in the UK.

Figure 6.6 Value and number of EU-27 company IPOs on UK exchanges, 2000–19



Note: Data excludes IPOs of certain industry categories: closed-end funds, acquisition-restructuring vehicles, capital pool companies, investment management, special-purpose vehicles and REITs.

Source: Dealogic.

¹⁷⁴ See European Commission (2012), 'Commission Decision of 1.2.2012 addressed to: Deutsche Börse AG and NYSE Euronext, Case No COMP/M.6166 - Deutsche Börse/Nyxe Euronext, https://ec.europa.eu/competition/mergers/cases/decisions/m6166_20120201_20610_2711467_EN.pdf.

The following observations can be made:

- the majority of IPOs in the sample (82/110) took place on AIM;
- the majority of IPO proceeds (\$10.6bn/\$14bn) were raised on the London Stock Exchange Main Market;
- the most common countries of domicile in the sample are Ireland (33), followed by the Netherlands (18), and Italy (10).

The UK is a significant international financial centre and, despite the reduction in the number of listings (as discussed in section 2) is generally regarded as the dominant hub in Europe for global equity finance.

In 2017, the FCA analysed the UK's international attractiveness for listings. Important findings include:¹⁷⁵

- the relative attractiveness of the UK for IPOs, driven by a range of factors such as the strength of the UK Listing Rule 'brand'; a robust legal framework;¹⁷⁶ the strength of corporate governance requirements; the depth of available capital; the interaction between index inclusion and analyst coverage; and the diversity of the UK investor base for premium listed- and AIM listed-shares;
- the relative strengths and weaknesses in investor expertise—the UK was seen as world-leading in terms of investor expertise for the extractive industries, but relatively weak in relation to technology (particularly biotech);¹⁷⁷
- the choice for issuers—the diversity of MTFs and regulated markets alongside the Standard and Premium segments of the UK Listing Regime generally provides sufficient choice for issuers;
- dual-class shares—there is disagreement among stakeholders as to whether permitting dual-class share structures across the listing segments would improve the effectiveness of UK capital markets for early-stage science and technology companies. This is discussed further in section 7.4;
- a degree of home bias remains—some stakeholders note that cross-border IPOs in the UK can be hard to market if there is no clear connection to the UK.

Box 6.7 and Box 6.8 below present examples of EU-27 companies that have undertaken recent IPOs in the UK.

¹⁷⁵ Financial Conduct Authority (2017), 'Review of the Effectiveness of Primary Markets: The UK Primary Markets Landscape', discussion paper, <https://www.fca.org.uk/publication/discussion/dp17-02.pdf>.

¹⁷⁶ LaPorta et al. (1997) is one of the first papers that discusses the impact of legal origin on investor protection and economic development. LaPorta, Lopez-de-Silanes and Schleifer (2008) provides a summary of the academic literature followed the initial study. See LaPorta, R., Lopez-de-Silanes, F., Schleifer, A. and Vishny, R.W. (1997), 'Legal determinants of external finance', *Journal of Finance*, **52**:3; and LaPorta, R. Lopez-de-Silanes, F. and Schleifer, A. (2008), 'The economic consequences of legal origins', *Journal of Economic Literature*, **46**:2.

¹⁷⁷ Stakeholders saw the USA as the dominant market for biotech/pharmaceutical IPOs as there was perceived to be a greater depth and diversity of investors, specialist analysts, and particular expertise in valuing pre-revenue companies.

Box 6.7 EU issuer listing in the UK: Rhi Magnesita case study

Rhi Magnesita moved its listing from Vienna to London in 2017; this listing venue choice being driven by a desire to list on the same venue as its peer companies.

Rhi Magnesita is one of the largest producers of refractory products. Formed by the merger in 2017 between Austrian refractory producer RHI AG and Magnesita, a Brazilian competitor, as at 2018 Rhi Magnesita had 14,000 employees, 35 production sites in 16 countries and revenues of €3.1bn.¹⁷⁸ Initially, the merged company planned to incorporate in the UK, but opted against doing so because of concerns that merger laws between the UK and EU would diverge after the departure of the UK from the EU.¹⁷⁹ The merged entity is incorporated in the Netherlands (due to conformity between Dutch corporate governance rules and UK Listing Authority Premium Listing requirements) and is headquartered in Austria.

Prior to the merger, RHI AG was listed on the Vienna Stock Exchange, but in October 2017 the merged entity sought a single listing on the London Stock Exchange main market.¹⁸⁰ No new shares were offered in the listing.

At the time of the merger, the CEO said that the choice of London as a listing venue was driven by the concentration of investors specialising in raw materials companies, as well as the presence of listed competitors (such as Vesuvius). The shares are also a constituent of the FTSE 250 index.

In March 2019, the company sought a listing of depositary receipts on the Vienna Stock Exchange. The main reason cited was the desire to have a secondary listing on a regulated market in the EU following Brexit.¹⁸¹

Box 6.8 EU issuer listing in the UK: Avast plc case study

Avast opted for a listing on LSE over NYSE due to a perception that the company was too mature to be of interest to US investors.

Global cybersecurity company, Avast was founded in YYYY and is headquartered in the Czech Republic, but is incorporated in the UK. In 2012 Avast attempted an IPO on Nasdaq, but cancelled the offering citing market conditions.¹⁸² In 2014, the private equity firm, CVC Capital Partners, acquired a stake in Avast.

Avast chose to make its IPO on the London Stock Exchange's main market, raising £147.4m in gross proceeds and achieving a valuation of £2.4bn. At the time of the listing, the company announced that the IPO would allow it to reduce overall indebtedness and that the proceeds would be used to redeem its redeemable shares. It also noted that an IPO was chosen to increase profile, brand and credibility; to assist in recruiting/incentivising key management; and to provide an exit option to insiders.¹⁸³

¹⁷⁸ RHI Magnesita (2019), 'The driving force in refractories: Annual report 2018', https://ir.rhimagnesita.com/wp-content/uploads/2019/04/rhim_annual_report_2018.pdf.

¹⁷⁹ Pooler, M. and Massoudi, A. (2016), 'RHI shuns UK incorporation after Brexit', *Financial Times*, October, <https://www.ft.com/content/804a4f42-8bc6-11e6-8aa5-f79f5696c731>.

¹⁸⁰ See RHI Magnesita (2017), 'RHI Magnesita N.V. Admission to the London Stock Exchange', press release, 27 October, <https://ir.rhimagnesita.com/rhi-magnesita-n-v-admission-to-the-london-stock-exchange/>.

¹⁸¹ RHI Magnesita (2019), 'RHI Magnesita to obtain secondary listing on Vienna Stock Exchange', press release, 27 March, <https://ir.rhimagnesita.com/rhi-magnesita-to-obtain-secondary-listing-on-vienna-stock-exchange/>.

¹⁸² Reuters (2012), 'Avast Software postpones proposed Nasdaq IPO-underwriter', July, <https://www.reuters.com/article/avast-ipo/avast-software-postpones-proposed-nasdaq-ipo-underwriter-idUSL4E8IP4J620120725>.

¹⁸³ See <https://investors.avast.com/investors/ipo-information/#page=1>.

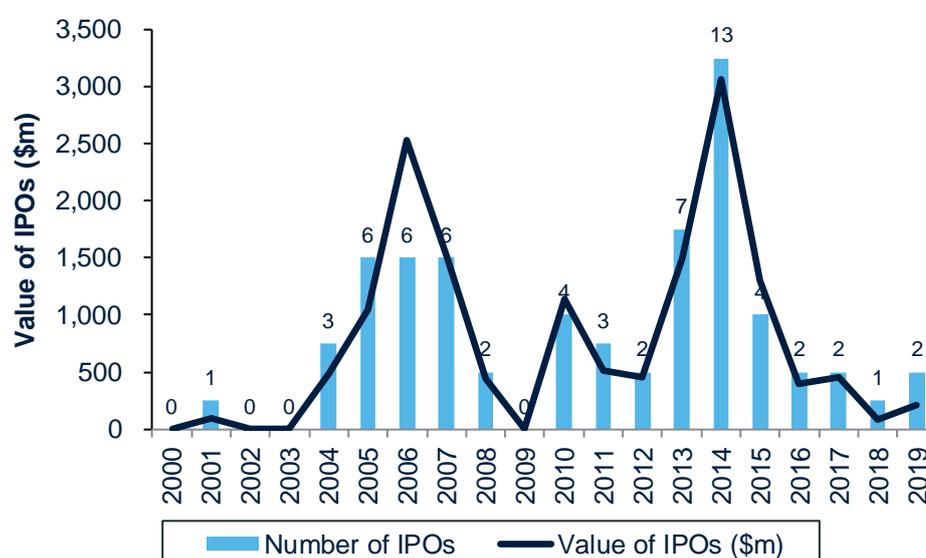
Some sources noted that Avast opted for London over New York as a listing venue due to its mature business and plans to issue dividends.¹⁸⁴ According to the CEO:¹⁸⁵

We're already too big and settled in our ways for a tech company heading to Wall Street. That's for companies with circa 100 million dollars in revenue and growth of around 30 percent. We are much more mature company. Our revenues are almost eight times higher and we have high single-digit growth... European investors are not generally betting on the high growth, they are more interested in financial fundamentals. American investors in tech IPOs act almost like a VC. They don't have a lot invested and they are looking for some quick appreciation, in contrast to European investors who are writing much bigger cheques.

6.6.3 EU-27 issuers in the USA

Figure 6.7 shows the number and value of IPOs of EU-27 companies on US exchanges.

Figure 6.7 Value and number of EU-27 company IPOs on US exchanges, 2000–19



Note: Data excludes IPOs of certain industry categories: closed-end funds, acquisition-restructuring vehicles, capital pool companies, investment management, special-purpose vehicles and REITs.

Source: Dealogic.

The following observations can be made:

- the majority of IPO proceeds from EU-27 companies (\$9.3bn out of a total of \$15.2bn) were raised on NYSE;
- in terms of the number of IPOs from EU-27 companies, Nasdaq and NYSE have had a similar market share over the full time period. However, in 2018 and 2019, Nasdaq had

¹⁸⁴ Fildes, N. and Espinoza, J. (2018), 'Avast chooses London over New York for \$4bn listing', *Financial Times*, April, <https://www.ft.com/content/15dec84c-3e38-11e8-b7e0-52972418fec4>.

¹⁸⁵ Forbes (2018), 'The story behind Avast: One of Europe's biggest tech IPOs of 2018', September, <https://www.forbes.com/sites/forbesinternational/2018/09/06/as-the-largest-european-tech-ipo-avast-makes-its-founder-a-new-billionaire/#41f277064a4a>.

a larger market share of EU-27 IPOs. This may reflect broader competition between Nasdaq and NYSE in recent years;¹⁸⁶

- most of the IPOs since 2012 have relied on the 'emerging growth company' classification.

Historically, the USA has been seen as a location for large EU-27 companies to hold a dual-listing rather than for EU-27 companies to seek a single listing. Some research suggests that many large companies have tended to discontinue such listings as the benefits have reduced.¹⁸⁷ In particular, this research suggests that the potential benefits of higher liquidity, wider analyst coverage and improved corporate governance are insignificant for a large EU company seeking a US cross-listing. This is because many large US institutional investors prefer to trade in the company's domestic market where existing liquidity is higher; and because differences in corporate governance standards are now much less pronounced.

There are some examples of EU-27 companies choosing to list in the USA and not on EU-27 exchanges (see Box 6.9 and Box 6.10). Box 6.11 provides a case study of Ferrari, which underwent an IPO on NYSE but subsequently sought an additional listing on Borsa Italiana.

Box 6.9 EU issuer listing in the USA: Trivago case study

Trivago's decision to list in the USA may have been linked to the number of similar companies, including its majority shareholder, that were already listed on Nasdaq.

Trivago is a high-growth German technology company offering a global hotel search platform. Founded in 2005, it went through several rounds of venture capital funding before Expedia acquired a 62% stake in 2013.

Trivago is currently traded on Nasdaq, following its \$287m IPO in December 2016. In public statements, Axel Hefer, Trivago CFO, has suggested that its choice of listing location was due to a number of other companies (including Booking Holdings and Expedia) in similar categories being listed in the USA.

Expedia, the majority stakeholder of Trivago, is also listed on Nasdaq. It conducted a similar spin-off exercise with TripAdvisor in 2011, which is also listed on Nasdaq.

Prior to its IPO, Trivago operated as a German limited liability company (GmbH). However, the company undertook a corporate reorganisation in which it established a Dutch public limited holding company (N.V.). Consequently, Trivago is incorporated under the laws of the Netherlands, and is subject to the Dutch Corporate Governance Code and the Dutch Financial Reporting Supervision Act.

Source: Trivago (2019), 'Our story', <https://company.trivago.com/our-story/>; Hefer, A. (2017), 'Here's what we learned from the Trivago IPO', CNBC, July, <https://www.cnbc.com/2017/07/26/trivago-cfo-heres-what-we-learned-from-our-ipo-commentary.html>; Trivago NV Form F-3 registration statement (2018), <https://ir.trivago.com/static-files/b50ed849-c33c-42bb-aeb5-188f5c8d5fcc>; and Nasdaq (2018), 'Trivago raises \$287m in IPO, stock up 7.5% on debut', December, <https://www.nasdaq.com/articles/trivago-raises-287-million-ipo-stock-75-debut-2016-12-19>.

¹⁸⁶ See Henderson, R. (2019), 'Nasdaq on track to steal NYSE's IPO crown', 27 November, *Financial Times*, <https://www.ft.com/content/6fedbca0-0d7e-11ea-bb52-34c8d9dc6d84>.

¹⁸⁷ See McKinsey (2008), 'Why cross-listing shares doesn't create value', <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/why-cross-listing-shares-doesnt-create-value>.

Box 6.10 EU issuer listing in the USA: Spotify case study

Spotify opted to undertake a direct listing on NYSE as it did not need to raise capital and could avoid relying on intermediaries.

Spotify is a high-growth technology company that offers an audio-streaming platform. It was founded in 2006, legally domiciled in Luxembourg and headquartered in Sweden.

In 2018, Spotify listed on NYSE through a direct listing, i.e. without conducting a formal IPO or selling any shares. It also opted against hiring an underwriting syndicate, which would traditionally market the shares through a roadshow, gauge investor interest and advise on the offer price and allocation.

At the time of listing, Spotify emphasised the direct listing as a way to let ordinary investors bet on its growth, without relying on institutional investors.¹⁸⁸ The company investor presentation cited five reasons for choosing a direct listing.¹⁸⁹

- i. Listing without selling shares—management believed it did not need to raise new capital. (The company had €1.5bn in cash and cash equivalents at the time of listing and no outstanding debt after exchanging convertible notes.)
- ii. Offer liquidity to existing shareholders—listing would allow employees and insiders to sell their shares.
- iii. Equal access to all buyers and sellers—unlike a traditional IPO, there is no allocation process, shares can be purchased on the secondary market only, and there is no lock-up period or price stabilisation.
- iv. Increased transparency—Spotify did not conduct roadshows for institutional investors, instead focusing on a live-streamed investor day.
- v. Market-driven price discovery—the company was confident in its well-known brand, global scale and business model.

Box 6.11 EU issuer listing in the USA: Ferrari case study

Following a spin-off from FCA, Ferrari sought a dual-listing on NYSE and Borsa Italiana; the additional listing being to provide liquidity for FCA's shareholders.

Ferrari is an Italian luxury sports car manufacturer founded by Enzo Ferrari in 1939, with the first Ferrari-badged car produced in 1947. In 1969, Fiat SpA acquired a 50% stake in Ferrari, with an option on additional shares. Fiat exercised this option shortly after Enzo Ferrari's death in 1988, increasing its ownership stake to 90%.¹⁹⁰ The remaining 10% of shares were held by Piero Ferrari.

In 2014, FCA (the group established following the merger of Fiat and Chrysler in 2014) announced its intention to separate Ferrari from FCA through an IPO of 10% of Ferrari's shares.¹⁹¹ The separation began with a restructuring that established Ferrari NV as the

¹⁸⁸ Bullock, N. and Nicolaou, A. (2018), 'Why Spotify is risking an unconventional IPO', *Financial Times*, <https://www.ft.com/content/e0e57248-2376-11e8-ae48-60d3531b7d11>.

¹⁸⁹ See 'Investor Day – March 2018', <https://investors.spotify.com/events/investor-day-march-2018/default.aspx>.

¹⁹⁰ *New York Times* (1988), 'Fiat raises stake in Ferrari to 90%', <https://www.nytimes.com/1988/09/08/business/company-news-fiat-raises-stake-in-ferrari-to-90.html>.

¹⁹¹ Fiat Chrysler Automobiles (2014), 'FCA Announces Board Intention to Spin Off Ferrari S.p.A.', 29 October.

new Dutch holding company of Ferrari SpA. The spin-off of Ferrari allowed FCA to reduce its debt burden and fund a €48bn investment programme by Fiat Chrysler.¹⁹²

In October 2015, Ferrari NV completed its IPO on NYSE, achieving a valuation of \$9.8bn. As all the shares offered were secondary shares, no new capital was raised. The IPO targeted retail investors alongside institutional investors, marketing to Ferrari owners and high-net-worth individuals in general.

Following the US IPO, Piero Ferrari retained a 10% stake, while Exor (the holding company controlled by the Agnelli family) held over 40% of the voting power.

In January 2016, Ferrari shares were also listed on the Borsa Italiana main market. According to the EU Prospectus, the Borsa Italiana MTA listing was chosen because:¹⁹³

- the spin-off from FCA resulted in the distribution of Ferrari shares to existing FCA shareholders. As the most liquid trading venue for FCA shares, MTA was chosen to increase the liquidity and trading of Ferrari shares;
- a listing on Borsa Italiana reflected the Italian heritage of Ferrari.

Box 6.12 US issuer listing in EU-27: Silvair case study

Silvair Inc. is a Delaware incorporated company that develops software for lighting systems and intelligent building management systems. However, according to company reports, almost all of its operational assets are located in Poland.

According to the company reports, the IPO was used to acquire capital for R&D expenditure; funding of large-coverage promotional activities in the USA and the EU; and funding the creation of distribution channels and attracting new partners.

The company also noted that, at the time of listing, Poland was classified as a developed market by FTSE Russell but a developing market by MSCI, meaning that companies listed in Warsaw can attract investors specialising in both emerging and developed markets.¹⁹⁴

According to Silvair's legal advisory team, the IPO on the Warsaw Stock Exchange required amendments to the rules and regulations of the exchange, as well as bespoke solutions, to register Silvair shares with the Depository Trust & Clearing Corporation so that they could be transferred to the CSD of Poland¹⁹⁵

¹⁹² Platt, E. (2015), 'Ferrari races to \$9.8bn valuation in US IPO', October, *Financial Times*, <https://www.ft.com/content/7e33d85a-7771-11e5-a95a-27d368e1ddf7>.

¹⁹³ 'Admission to listing and trading on the Mercato Telematico Azionario organized and managed by Borsa Italiana S.p.A. of common shares', [https://www.fcagroup.com/en-US/investors/past_corporate_actions/ferrari_separation/12_Prospectus_Ferrari_N_V_\(EU\)_20160103.pdf](https://www.fcagroup.com/en-US/investors/past_corporate_actions/ferrari_separation/12_Prospectus_Ferrari_N_V_(EU)_20160103.pdf).

¹⁹⁴ See Silvair (2019), 'Report of the Board of Directors on the activities of the Silvair Group and Silvair, Inc. in 2018', 30 April, p. 26, https://silvair.com/media/filer_public/bb/31/bb31001d-7fb9-47a2-a60e-144dbe6eef39/report_of_the_board_of_directors_on_the_activities_of_the_silvair_group_and_silvair_inc_in_2018.pdf.

¹⁹⁵ See Greenberg Traurig (2018), 'Greenberg Traurig advised Silvair, a US company, on its IPO on the Warsaw Stock Exchange' 31 July, <https://www.gtlaw.com/en/news/2018/7/press-release/greenberg-traurig-advised-silvair-a-us-company-on-its-ipo-on-the-warsaw-stock-exchange>.

7 Reasons for large firms not seeking to list and drivers of the EU listing gap

Key messages

- It is widely acknowledged that there is a 'listing gap' in the EU, defined as the difference between the actual number of listed firms and the number that could be listed. Our analysis indicates that around 8,000 large companies (and up to 17,000) in 14 EU member states are eligible to list but are not seeking to do so.
- Based on our analysis and interviews, large firms are not seeking a listing for the following reasons, in order of importance: i) readily available private equity; ii) issues around control; iii) the relative attractiveness of debt markets; iv) short-termism of public investors; and v) disclosure and reporting requirements.
- Some of the factors outside the direct control of regulators include the availability of private equity, the relative attractiveness of debt, and (to some extent) agency costs.
- However, there are also factors under the direct control of regulators (including the listing authorities), which include the disclosure requirements; rules on control-enhancing mechanisms; and agency costs related to corporate governance.
- Around 60% of the large unlisted companies (excluding corporate owners) in the EU are family-owned.¹⁹⁶ These families often want to keep control of their firm. The best way to encourage them to list might be to allow them to issue (time-limited) loyalty shares, facilitating the existence of blockholders in the ownership structure, and thereby reduce agency costs.
- Family businesses also create private benefits, such as succession, at the expense of outside shareholders. Policy action to incentivise listing should be conditional on there being rules to restrain some of the negative private benefits of family ownership and to manage potential conflicts of interest.
- It is healthy to have competition between different forms of company ownership given their relative merits. Dispersed (family) ownership models typically have higher (lower) agency costs, but lower (higher) private expropriation. While there are some negative private benefits with family ownership, such as related-party transactions, which should be managed, there are also some positive private benefits, including the less myopic nature of family ownership with respect to capital expenditure and strategic decision-making. This is reinforced through family succession. Given the challenge of reducing agency costs for listed companies with fragmented ownership structures (as evidenced by the reduction in the number of listed companies), policymakers should also encourage the listing of companies with family ownership models.
- The appropriate policy response depends on the context. In countries where ownership is fragmented (e.g. the UK), the policy aim should be to reduce impediments on blockholder control. In markets where there is already concentrated ownership (e.g. Germany, Italy), the policy objective should be to focus on preventing exploitation of outside shareholders.
- In major capital markets the policy focus is on shareholder activism, while in markets with more concentrated ownership the focus is on preventing insider stealing. Policymakers need to manage this trade-off carefully, to encourage more owners to

¹⁹⁶ Corporate owners are those owned by a subsidiary of another company. See Appendix A5 for further detail on our identification of unlisted companies.

list on public markets while protecting minority interests. This can be done in various ways, including allowing (time-limited) loyalty shares to be issued.

- Public policy should facilitate public listings, but not create imbalances that put businesses under pressure to list. Firms may have perfectly good reasons for wanting to remain private.

7.1 Introduction

As discussed in section 2, there has been a significant reduction in the number of listed companies in the EU and USA. In these regions, it is widely acknowledged that there is a listing gap, defined as the difference between the actual number of listed firms and the number that could be listed.

Academics estimate that the listing gap in the USA was around 5,000 companies in 2012.¹⁹⁷ For the EU, we have conducted some empirical analysis to shed light on the potential size of the listing gap (set out in more detail in Appendix 14.7A5). To our knowledge, this is the first time that such empirical analysis has been conducted in the EU.

An interesting follow-on public policy question is: why is a group of eligible firms not seeking a listing on public equity markets? There are a number of reasons, which we discuss below in turn.

Where factors are under the control of regulatory authorities, the authorities (including the listing authorities) can take action to shift the incentives towards listing. For example, regulators can act on the level of disclosure required from listed companies; relax restrictions on control-enhancing mechanisms, such as dual-class shares; and improve corporate governance standards to keep agency costs down. Other factors are not under the control of regulators, such as the macroeconomic conditions (e.g. access to cheap private financing), or, to a certain extent, the agency costs.

The extent to which the gap should be bridged, from a public policy perspective, depends on the social costs and benefits of the bridging actions.

This section is structured as follows:

- section 7.2 summarises the key characteristics of the identified sample of unlisted firms in the EU that might be suitable for listing. The underlying analysis is set out in Appendix A5; and
- sections 7.3–7.7 discuss reasons why these firms are not seeking listings on public equity markets; namely, the current unfavourable environment for listing, issues around control, agency costs, short-termism and information disclosure.

7.2 Identification of large unlisted companies eligible to list

We conducted empirical analysis (set out in Appendix A5) to identify large unlisted companies eligible to list in 14 EU member states.¹⁹⁸ This analysis, which applies a set of filtering criteria to a database of unlisted companies, finds a universe of companies that could be suitable for listing. Based on the analysis, we observe the following.

¹⁹⁷ This was calculated by comparing the actual number of listed companies to a prediction based on an econometric model taking into account the typical characteristics of a listed company. See: Doidge, G., Karolyi, A. and Stulz, R. (2017), 'The US listing gap', *Journal of Financial Economics*, **123**:3, pp. 464–487.

¹⁹⁸ Appendix A5 sets out the methodology used for this analysis and provides more detail on the underlying characteristics of the sample identified.

- There are around 8,000 large companies in 14 EU member states that could be listed but are not seeking to list. These firms come from a range of sectors, including manufacturing, wholesale and retail trade, and administrative support services. This is a conservative estimate excluding private companies that are subsidiaries of other companies. If corporate owners were included, there could be up to 17,000 large unlisted companies in the 14 EU member states eligible for listing.¹⁹⁹
- Family (or individual) ownership is particularly significant in EU countries. Around 60% of the identified sample of large unlisted companies (excluding corporate owners) in the EU are family-owned. When weighing up the advantages and disadvantages of going public, families are likely to consider control issues to be particularly important.
- The ownership structures of large unlisted companies across EU member states broadly reflects the relative importance of different types of private equity financing. In countries where private equity financing is significant, public markets must be a credible exit opportunity for the private financiers.
- The largest unlisted companies (in terms of total assets and turnover) are in the biggest economies (e.g. France, Germany and the UK). There are some very large unlisted companies in smaller economies, which could play a crucial anchor role and encourage more liquidity into those markets.
- Large unlisted companies in Eastern Europe are larger than the listed companies. In contrast, large unlisted companies in Western Europe are nowhere near as large as their listed counterparts. It may be that for those smaller companies, public equity markets do not represent a financing option worth considering at their current development stage.

The main reasons why these large unlisted companies may not seek a listing are analysed below, based on insights drawn from the interviews with market participants, the survey, and the academic literature.

7.3 Reason 1: the current environment for listing is unfavourable

One reason for many large unlisted firms to remain private is the relative attractiveness of alternative sources of funding. Traditionally, one of the main reasons that firms would seek to list on public markets was to raise funds for future investment. If they can fund their investments more easily and at a lower cost from alternative sources of finance, the benefit of seeking a listing decreases. Alternative forms of finance include internal funding, bank loans, the bond markets, and private equity.

According to the pecking-order theory in corporate finance, firms seek to raise external equity finance only after they have first exhausted their internal funds, and then external debt finance, which is both safer and cheaper for them.²⁰⁰

The environment over the past few years has favoured these alternative forms of finance. For example, many CFOs and other market participants we interviewed emphasised the following.

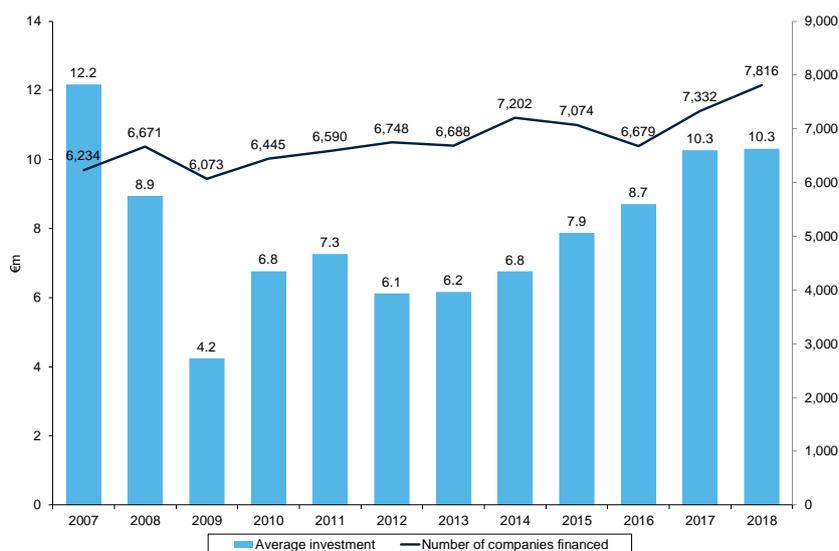
¹⁹⁹ Companies held by corporate owners usually finance themselves through their parent companies, which can access capital markets for them, and so are less likely to list. According to analysis based on Dealogic data, only 104 out of 4,826 IPOs in the EU28 since 2000 were equity carve-outs (IPOs involving the subsidiary of existing companies).

²⁰⁰ Equity financing is intrinsically riskier than debt financing: in exchange for the greater risk that shareholders bear compared with creditors, they generally require a higher rate of return. Equity funding also results in lost control for the existing owners. See Brealey, R.A., Myers, S.C. and Allen, F. (2010), *Principles of Corporate Finance*, tenth edn, chapter 18-4, McGraw-Hill Irwin.

- Private equity has flourished, due in part to cheaper debt to fund it. Since 2012, the average investment of private equity funds has almost doubled, from €6.1m to €10.3m (see Figure 7.1 below). The academic literature also identifies private equity as a key factor in the decline in IPO activity.²⁰¹
- Interest rates on debt are at a record low. It is easier and cheaper to access debt-based finance in an environment of low interest rates, supported by the monetary policy of central banks. The cost of borrowing in the euro area has fallen sharply in recent years (see Figure 2.6).
- In many member states tax incentives favour debt- over equity-based funding. Interest paid by companies is usually deductible from the tax base of the corporate tax rate, which is not the case for dividend payments.²⁰² This has been a long-standing structural obstacle to equity financing, but remains a relevant driver of large unlisted firms choosing to remain private.

Other forms of equity finance have also emerged to compete with public equity markets. These include equity-based crowdfunding and initial coin offerings. While a number of (mainly small) companies have used these options to raise equity, at present the funds raised by these sources remain of very small scale (with average investments of around €69,000 only) compared with IPOs.²⁰³ As these newer forms of equity finance develop, they may begin to have an impact on the listing decisions of larger firms.

Figure 7.1 Private equity financing in companies based in Europe



Note: 'Average investment' is calculated using the total private equity financing in companies based in Europe, with this financing including investment from non-European funds.

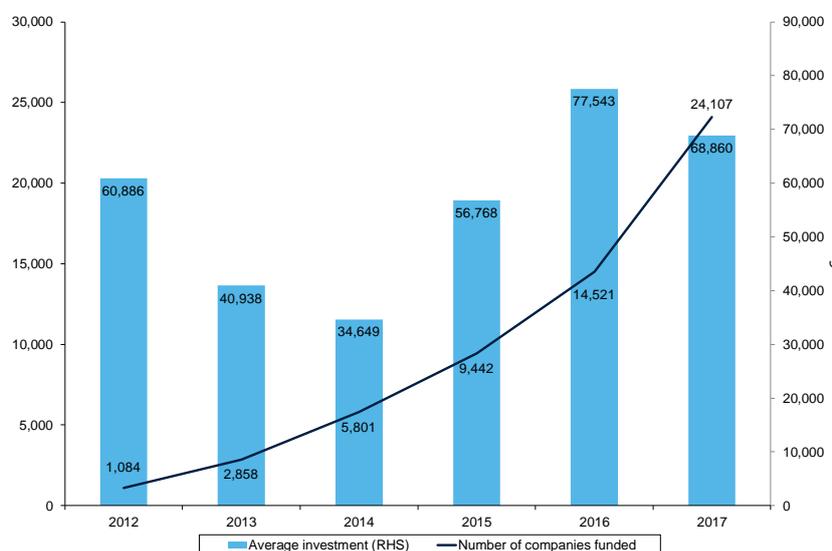
²⁰¹ See, for example, Ewens M. and Farre-Mensa, J. (2017), 'The Evolution of the Private Equity Market and the Decline in IPOs', http://gsf.aalto.fi/seminar_papers/ewens%20and%20farre%20menga.pdf; and Lattanzio, G., Megginson, W. and Sanati, A. (2019), 'Listing Gaps, Merger Waves, and the Privatization of American Equity Finance', <https://ssrn.com/abstract=3329555>.

²⁰² European Commission website, 'Corporate Tax Policy', <https://ec.europa.eu/jrc/en/corporate-tax-policy/debt-bias-in-corporate-taxation>.

²⁰³ The average investment on the crowdfunding platforms was around €69,000 in 2017. See Cambridge Centre for Alternative Finance (2019), 'Shifting paradigms: The 4th European alternative finance benchmarking industry report', https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2019-04-4th-european-alternative-finance-benchmarking-industry-report-shifting-paradigms.pdf.

Source: Oxera analysis, based on European Investment Fund (2019), 'European Small Business Finance Outlook', Working Paper 2019/57.

Figure 7.2 Total alternative investments in European businesses raised from online platforms surveyed in the study, and number of businesses funded (excluding the UK)



Note: The alternative investment instruments included in the study include, for example, equity-based crowdfunding, peer-to-peer business lending, balance sheet business lending, reward-based crowdfunding. They do not include initial coin offerings.

Source: Centre for Alternative Finance (2019), 'Shifting paradigms: The 4th European alternative finance benchmarking industry report'.

7.4 Reason 2: loss of control

A second reason for not listing is control. Existing owners rarely want to cede control of their business, but the new investors will want to have some control over their future investment. This is a classic tension in most equity-raising.

The listing rules around free float and voting rules can discourage founder owners from listing the company on the public markets.

In the case of private equity-owned companies, the founders are likely to have already ceded a considerable share of the control. However, in the case of unlisted family-run companies, control is often a big challenge.

The results of our issuer survey and stakeholder interviews show that control is a key influencing factor in the listing decision.²⁰⁴ Loss of control is widely cited by unlisted companies as the most important reason for staying private. These results echo the findings of previous academic surveys. In a survey of CFOs, Brau and Fawcett (2006) find that control is the primary reason to remain private.²⁰⁵ In addition to retaining control of

²⁰⁴ Some already listed companies have restructured to provide greater flexibility in their use of control-enhancing mechanisms. A recent example is Campari Group, which has announced plans to relocate its registered office to the Netherlands and introduce a new loyalty share scheme. The Group has stated that it will retain tax residency in Italy and will continue its single listing on Borsa Italiana. See Campari Group (2020), 'Campari Group announces the transfer of registered office of Davide Campari-Milano S.p.A to the Netherlands', press release, <https://www.camparigroup.com/en/campari-group-announces-transfer-registered-office-davide-campari-milano-spa-netherlands>.

²⁰⁵ Brau, J.C. and Fawcett, S.E. (2006), 'Evidence on What CFOs Think about the IPO Process: Practice, Theory and Managerial Implications', *Journal of Applied Corporate Finance*, **18** (Summer), pp. 107–117.

the decision-making processes, it is easier to manage/control the future investor base of the company in private markets (should the firm want to raise additional equity in the future, etc.).

Box 7.1 Case study: The Economist Group

The Economist Group has adopted limits on ownership stakes and multiple share classes, which are partially driven by a desire for editorial independence. These make an IPO an unlikely outcome.

The issue of control can be particularly significant for newspapers wanting to keep their editorial independence from the owners. The Economist Group did this by setting in its Articles of Association a 50% cap on the ownership of its total share capital that can be held by a single company or individual, and a 20% cap on the voting rights exercised at a company general meeting. In addition to these limitations, it divided its capital into multiple share classes, each associated with different rights:

- holders of ordinary shares do not participate in the appointment of directors, but otherwise have the same rank as other shareholders. The transfer of such shares must be approved by the Board of directors;
- holders of A and B special shares appoint, respectively, 7 and 6 of the Group's 13-strong Board of directors. While all B shares are held by Exor NV (the Agnelli family's holding company), the ownership of A shares is split between multiple families, current and former staff;
- holders of trust shares do not have voting rights, do not receive dividends and do not have any other economic interest in the company. Nevertheless, their consent is needed to transfer A and B shares; and to appoint the editor of *The Economist* and the Chairman of the company.

Due to this structure and its inherent limitations, an IPO of The Economist Group seems unlikely. It would necessitate a complete overhaul of the company's ownership structure and governance, which is unlikely to be agreed by trust shareholders, or even A shareholders, such as the Rothschild family (which owns about 25% of the capital).

Source: The Economist Group website, 'Ownership' sub-section within 'Results and governance', https://www.economistgroup.com/results_and_governance/ownership.html, accessed 24 January 2020; Spence, A. and Karnitschnig, M. (2015), 'A Jersey Lady and The Economist', *Politico*, 5 August.

As discussed in section 3.2.3, mechanisms (e.g. dual-class shares) exist to facilitate the listing of companies willing to sacrifice a higher valuation for more control. Regulators could ease restrictions on control-enhancing mechanisms (such as dual class shares) to encourage companies to list without owners having to relinquish control of their companies.

The advantage of introducing control-enhancing mechanisms is to reduce agency costs typically associated with fragmented ownership. However, the elimination of one market failure may give rise to another. Owners, even if they do not have a majority share in the company, can derive private benefits of control from such control-enhancing mechanisms, such as appointing friends to the Board and other management positions, or engage in related-party transactions. This change of control should be priced into the value of the shares by investors. The trade-off associated with control-enhancing mechanisms has led some academics to call for IPOs with dual-class shares to include sunset clauses after a

fixed period of time (e.g. ten or 15 years) unless their extension is approved by shareholders that are not affiliated with the controller.²⁰⁶

Regulators therefore have a balance to strike between fragmented ownership (which limits private benefits of control but increases agency costs) and block ownership with significant control over the company (which has the reverse effect). This trade-off is discussed further in the next section.

7.5 Reason 3: agency costs and private benefits of control

A third reason for not seeking a listing is the increased agency costs for owners of the private company. Public companies tend to have more diversified ownership structures.

Agency costs arise from the separation of ownership and control of the company. If the interests of the owners (the principals) are not aligned with the interests of the management (the agents), the shareholders incur costs to monitor the managers and constrain their actions. Agency costs arise when, for example, managers pursue projects that are not value-maximising for the shareholders.

Agency costs therefore typically arise when ownership is fragmented. Jensen (1989) predicts this (partial) 'eclipse of the public corporation' and attributes it to the failure of governance by owners who often hold very small stakes in companies, managed by collective funds such as pension funds, insurance companies and mutual funds, which creates agency cost issues as these owners typically exert weak oversight.²⁰⁷

In general, agency costs are easier to manage when ownership is concentrated. It is also easier for a block of one of a few majority shareholders to monitor management closely than for dispersed ownership structures. Concentrated ownership structures are easier to maintain in private markets.

Empirical evidence shows that blockholder ownership structures are popular in Germany, France and Italy, but less so in the UK. In a 2014 study of company ownership in Germany, 72% of the publicly traded firms had at least one shareholder owning more than 25% of the shares. For half of the 72%, the blockholder was a family group.²⁰⁸ In 2006, the share of publicly listed firms having at least one blockholder in Germany, France and Italy was 69%, 71% and 76% respectively, compared with 23% in the UK (and 36% on average across 35 countries).²⁰⁹ In many countries this ownership pattern is persistent over time. For example, a study of family-held companies in 1996 finds that surviving firms ten years later are still largely family-held (72% of the surviving firms in Italy, 68% in Germany, and 50% in the UK).²¹⁰

It is possible to separate 'insider' from 'outsider' shareholders. The former can derive private benefits from their shareholding in the company, in addition to financial returns. (For example, shareholders who are also managers can enjoy corporate advantages, while shareholders of other companies can encourage the company to deal with them.) In such cases, inside owners may prefer to retain control by not going public in order to avoid potential conflicts with outside owners. In Italy, where family ownership is significant, such issues are being mitigated through measures to force listed companies to disclose related-party transactions, or by giving the right to minority shareholders to be represented by a non-executive director tasked with looking after their interests. As noted in Appendix

²⁰⁶ Bebchuk, L and Kastiel, K. (2017), 'The untenable case for perpetual dual-class stock', *Virginia Law Review*, **103**, pp. 585–631.

²⁰⁷ Jensen, M. (1989), 'Eclipse of the Public Corporation', *Harvard Business Review*, September–October.

²⁰⁸ Franks, J., Mayer, C. and Wagner, H. (2016), 'The Survival of the Weakest: Flourishing Family Firms in Germany', *Journal of Applied Corporate Finance*, **27**:4, pp. 27–35.

²⁰⁹ Franks, J. and Mayer, C. (2017), 'Evolution of Ownership and Control Around the World: The Changing Face of Capitalism', Saïd Business School Research Paper 2017-08, April.

²¹⁰ Franks, J., Mayer, C., Volpin, P. and Wagner, H.F. (2012), 'The Life Cycle of Family Ownership: International Evidence', *The Review of Financial Studies*, **25**:6, June, pp. 1675–1712.

A3.3.5, related-party transactions fall under the purview of the EU Shareholder Rights Directive II. This Directive requires qualifying related-party transactions to be made public and subject to shareholder or Board approval.

In fact, insider ownership can be a deliberate shareholding strategy in itself, carried out for different reasons. Insider ownership reduces agency costs by lowering the potential for misaligned incentives between the firm's owners and its managers. For this reason, some firms purposely devise and implement an employee-shareholder strategy. In France, a specific legal form exists for such companies (*Société Coopérative et Participative*). In the UK, the John Lewis Partnership is a 100% employee-owned company (see Box 7.2).

Insider ownership is also significant in Japan. In a study of ownership of around 100 listed and unlisted Japanese companies, insider ownership grew from 21.8% in 1953 to 38.3% in 2009, with a peak of 61.6% in 1990.²¹¹ Ownership has also concentrated in Japan, with the share held by the top 3 and 5 shareholders increasing from 15.0% and 18.7% respectively in 1950 to 21.2% and 26.9% in 2009.

Box 7.2 Case study: John Lewis Partnership

John Lewis Partnership (JLP) is one of the UK's largest employee-owned businesses. An IPO would be unfeasible as it would require a complete rewriting of the company's constitution.

JLP is the parent company of John Lewis, a department store chain with 51 bricks-and-mortar shops across the UK, and Waitrose, a supermarket chain with 349 branches. In 2018, JLP generated revenue of over £10.3bn and had 83,900 'partners' (employees).²¹²

The specificity of JLP resides in its ownership structure: the shares of the company are held by a trust on behalf of the employees. The company has a written constitution that sets out the rules of governance within the company. Control is shared between three entities, whose respective attributions are outlined below:

- the **Partnership Council**, representing the employees, discusses and makes recommendations on company policy. It can hold the Chairman to account and pass a resolution to have them removed. The Council is composed of elected members among the employees, with a three-year term;
- the **Partnership Board** steers the company's strategy, monitors its performance, and is responsible for oversight of its operations;
- the **Chairman** is responsible for the company's commercial performance, and appoints the Executive Team.

Each employee is paid an annual bonus set as a fixed percentage of their annual pay, with that percentage being the same for every employee of the firm, including the top management team. In 2019, this percentage was set at 3%—the lowest ever in the company's history, given adverse financial and other conditions. The company does not pay dividends, but instead pays the annual partnership bonus.

This structure is highly incompatible with an IPO project, which would necessitate a significant rewriting of the company's constitution and redefining the purpose of the trust that effectively owns the company's shares. When the idea of floating JLP was raised in 1999, the Partnership Council was overwhelmingly against it. Law firm,

²¹¹ Franks, J., Mayer, C. and Miyajima, H., (2014), 'The ownership of Japanese corporations in the 20th century', *The Review of Financial Studies*, **27**:9, pp. 2580–2625.

²¹² John Lewis Partnership (2019), 'The Partnership Difference: Annual Report and Accounts 2019'.

Linklaters, noted at the time that such a project would run counter to the trust's objective to protect the constitution and democratic functioning of the company.

Source: John Lewis Partnership (2019), 'The Partnership Difference: Annual Report and Accounts 2019'; John Lewis Partnership, 'The Constitution of the John Lewis Partnership'; and BBC News (1999), 'John Lewis rules out float', 20 September.

Regulators seeking to encourage listing therefore need to find solutions to improve the governance of listed companies, by balancing the alleviation of agency issues with restricting the ability to derive private benefits of control.

Family-run businesses want to keep control. This can best be achieved by reducing restrictions on family control (such as allowing them to issue loyalty shares), which has the advantage that it reduces agency costs, while family-run businesses create private benefits, such as succession.

In companies (or markets, more broadly) with fragmented ownership, where there are no blockholders of any decent size, there are no private benefits, but there are agency costs.

The policy objectives differ depending on the ownership structure in the country.

- In countries where ownership of listed companies is fragmented, such as the UK (see Table 7.1), the policy focus needs to be on reducing the impediments to blockholder control.
- In markets where there is already concentrated ownership, such as in Germany (where 'non-financial investors' have ownership stakes of 25% or more in one-third of listed firms)²¹³, the policy objective needs to focus on preventing the exploitation of outside shareholders. As noted in section 7.5, the EU Shareholder Rights Directive II and Takeover Directive both set requirements to protect minority shareholders from this effect.

Our interviews with stakeholders across these financial centres highlight examples of how regulators can influence agency costs. For example, in the UK, the new Stewardship Code places major new demands on owners to demonstrate the quality and impact of their engagement.²¹⁴ This is an attempt to make owners in the UK more active—if it works, it will reduce agency costs. On the other hand, in Italy there are attempts to reduce private benefits by forcing disclosure on related-party transactions and allowing minority shareholders to elect a director to represent their interests.

If policymakers fail to influence the agency costs of listed companies, the owners of large unlisted companies might find the costs of listing too high compared to the benefits, and they are likely to keep them private.

Table 7.1 Ownership of listed companies in Germany, Japan, the UK and the USA, 2000–14

UK	2000	2006	2010	2014 ¹
Rest of world	36%	40%	43%	51%
Individuals	16%	13%	11%	12%
Non-financial investors	-	-	-	-
Insurance companies	21%	15%	9%	6%
Pension funds	18%	13%	6%	3%
Investment funds/mutual funds	1%	2%	9%	11%

²¹³ Frank, J. (2020), 'Institutional ownership and governance', Finance Working Paper 656/2020, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3530849.

²¹⁴ Financial Reporting Council, 'The UK Stewardship Code 2020'.

Other financial institutions	3%	10%	12%	7%
USA	2000	2006	2010	2014
Rest of world	9%	12%	13%	16%
Individuals	43%	30%	37%	39%
Non-financial investors	1%	0%	1%	5%
Insurance companies	6%	8%	7%	2%
Pension funds	19%	23%	16%	13%
Investment funds/mutual funds	18%	24%	18%	24%
Other financial institutions	1%	4%	4%	6%
Germany	2000	2006	2010	2014¹
Rest of world	-	54%	55%	56%
Individuals	-	11%	13%	12%
Non-financial investors	-	16%	19%	18%
Insurance companies	-	3%	2%	1%
Pension funds	-	8%	6%	6%
Investment funds/mutual funds	-	6%	3%	5%
Other financial institutions	-	0%	0%	0%
Japan	2000		2009	
Rest of world	13%		20%	
Individuals	27%		28%	
Non-financial investors	17%		17%	
Insurance companies	8%		6%	
Pension funds	9%		12%	
Investment funds/mutual funds	26%		19%	
Other financial institutions				

Note: ¹ 2014 data in the UK and Germany adjusted to account for local ownership of large institutional investors, namely Blackrock, Vanguard, and Fidelity. The three asset managers are categorised as foreign investors in the rest of the time series. In the UK and Germany this adjustment accounts for 2% and 1% respectively—thus mutual fund ownership of local investors is increased by 2% and 1% respectively, whereas foreign ownership is reduced.

Source: UK: the Office for National Statistics. USA: the Federal Reserve Board. Germany: the Bundesbank, includes all listed companies. If the German sample were confined to the DAX 30, foreign ownership would be higher (64% compared with 56%), and institutional ownership would be 22% for the DAX 30 compared with 29% for all companies. Japan: Franks, Mayer and Miyajima (2014), op. cit.

7.6 Reason 4: short-termism of public investors

The fourth reason highlighted in the interviews concerns the risk of diverging interests between the existing owners of the company and investors in the public markets—in particular, around time horizons for business strategy and performance. Investors in public markets can be more focused on short-term gains, while private companies may have more freedom (see Box 7.3 for the example of Chanel).

There is some evidence to support this view, including the following, for example.

- In a survey of 400 CFOs in the USA, the listing requirement to publish quarterly earnings was identified as putting pressure on company executives, with 78% of the sample admitting to sacrificing long-term value in order to smooth earnings.²¹⁵ The CFOs argued that public financial market pressures and over-reactions encourage decisions that at

²¹⁵ Graham, J.R., Harvey, C.R. and Rajgopal, S. (2005), 'The economic implications of corporate financial reporting', *Journal of Accounting and Economics*, **40**:1–3, pp. 3–73, https://faculty.fuqua.duke.edu/~charvey/Research/Working_Papers/W73_The_economic_implications.pdf.

times sacrifice long-term value in order to meet earnings targets; a sentiment that was also expressed by some of the CFOs we interviewed.

- Cremers, Pareek and Sautner (2017) find a link between an inflow of short-term institutional investors and cuts in R&D expenditure aimed at generating positive earnings.²¹⁶
- Asker, Farre-Mensa and Ljungqvist (2015) find that public firms invest less and are less responsive to new investment opportunities than private firms.²¹⁷
- In a survey by ESMA,²¹⁸ half of the respondents indicated that they generally consider a long-term investment period (for either debt or equity) to be longer than six years, whereas the most common time horizon for general business activities was indicated as less than five years. The most commonly reported answer for average holding period for equities was one to four years. A significant number of respondents considered sell-side analysis as a key driver of short-termism. However, the same study notes that the short-term focus of sell-side research might itself be the product of buy-side investors' short-term horizons and a lack of data from company disclosures focusing on the long term.

Box 7.3 Case study: Chanel

Chanel sees a lack of short-term financial constraints afforded by its private status as a key driver of its success.

Chanel is a well-known luxury company and brand in France, founded by Gabrielle Chanel in 1909. It is ultimately held by Alain and Gérard Wertheimer, and has remained private throughout its existence. Known for its discretion, the company released a rare report in 2018, noting: 'Being a wholly privately owned company [...] affords us total independence in finance all of our strategic investments'; and that 'Operating without short-term financial constraints gives us the freedom and the luxury to make the right decision for our brand'.

To monitor its performance, Chanel uses an in-house metric, 'brand equity', which it measures by '[carrying] out annual studies of consumer perceptions of our brand. Each study takes into account a large number of consumers across all of our key markets. The studies analyse brand perception according to detailed criteria such as saliency [...], value [...], strength [...] and desirability [...].' These studies have been carried out for over 25 years, and results serve as a support to key decision-making.

Source: Chanel (2018), 'Report to society'.

7.7 Reason 5: information disclosure

A fifth reason for not seeking a listing may be the information disclosure requirements for public companies. As discussed in section 4.3, listed firms are subject to numerous reporting requirements, not only at the initial stage, but also ongoing and ad hoc ones; for example, in relation to the firm's financial position, prospects and risk factors, the

²¹⁶ Cremers, M., Pareek, A. and Sautner, Z. (2017), 'Short-Term Investors, Long-Term Investments, and Firm Value', March.

²¹⁷ Asker, J.W., Farre-Mensa, J. and Ljungqvist, A. (2015), 'Corporate Investment and Stock Market Listing: A Puzzle?', *Review of Financial Studies*, **28**:2, pp. 342–390, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2720248.

²¹⁸ European Securities and Markets Authority (2019), 'Undue short-term pressure on corporations', Report to the European Commission, https://www.esma.europa.eu/sites/default/files/library/esma30-22-762_report_on_undue_short-term_pressure_on_corporations_from_the_financial_sector.pdf.

remuneration of the senior executives, and changes in the ownership of the shareholder base.

Our analysis and interviews with senior executives in unlisted companies identifies the following barriers to large unlisted firms seeking a listing.²¹⁹

- Litigation risk—according to many commentators, the private equity wave (particularly in the USA) was helped by an organisational desire to mitigate the burden of litigation risk.²²⁰ Recent US research found that the reduction in shareholder litigation risk lowers the likelihood of firms delisting from stock exchanges.²²¹
- Greater public scrutiny on public firms, including on non-financial factors such as their environmental, social and governance strategy and their remuneration policies.
- The time required to fulfil the regulatory requirements—senior executives of unlisted firms consider that they would have to spend a significant amount of their time on regulatory requirements, leaving less time to focus on adding value to the business.
- The risks of exposing business secrets, particularly important for protecting IP. A number of senior executives of unlisted companies cited this risk as the greatest obstacle to listing on public markets.²²² This is a risk for companies in all markets, including in the USA as well as the EU.

²¹⁹ This is supported by other survey analysis. See Brau, J.C. and Fawcett, S.E. (2006), 'Evidence on What CFOs Think about the IPO Process: Practice, Theory and Managerial Implications', *Journal of Applied Corporate Finance*, **18** (Summer), pp. 107–117.

²²⁰ See, for example, Talley, E. (2009), 'Public Ownership, Firm Governance, and Litigation Risk', *The University of Chicago Law Review*, **76**: 1 (Winter), pp. 355–336.

²²¹ Le, N. and Nguyen, D.D. and Vathunyoo, S. (2019), 'Does Shareholder Litigation Risk Cause Public Firms to Delist? Evidence from Universal Demand Laws, May, <https://ssrn.com/abstract=3382805>.

²²² See, for example, De Fontenay, E. (2017), 'The deregulation of private capital and the decline of the public company', Harvard Law School Forum on Corporate Governance, <https://corpgov.law.harvard.edu/2017/04/27/the-deregulation-of-private-capital-and-the-decline-of-the-public-company/>; and Doidge, G., Karolyi, A. and Stulz, R. (2017), 'The US listing gap', *Journal of Financial Economics*, **123**:3, pp. 464–487.

8 IPO process

Key messages

- Equity issuance involves underwriters, investment banks, advisers and the stock exchanges. Historically, IPOs were typically based on a fixed price determined by the underwriter in discussion with the issuer. Over the past 20 years, many countries have seen a convergence towards book-building as an alternative approach to conducting equity issues that can result in more predictable outcomes.
- Information flow is central to the equity issuance process. Thus, interactions between the parties in the value chain are key to a successful outcome. While there are potential conflicts of interest to the book-building approach, the market has put measures in place to manage this. Issuers tend to appoint multiple book runners and/or independent corporate advisers.
- Our analysis indicates that the IPO process delivers more accurate pricing in the EU than in the USA and that fees (as a proportion of capital raised) are lower in the EU than the USA. We have also observed large companies directly listing themselves as an alternative to an IPO process.
- Although there seems to be strong competition between investment banks to advise on IPOs, this is in relation to large companies in particular. There are fewer players available for IPOs of smaller companies, which tend to be less profitable.
- Practical areas for further improvement of the IPO process in the EU include:
 - promoting IPO allocation rules to encourage retail investor participation in European IPOs. There are examples of this in Singapore and Hong Kong, and in Australia the technology has been considered, but not yet implemented;
 - promoting more digitalisation of the IPO process. Regulators can support adoption by allowing digital-only compliance and supporting the development of regtech solutions (i.e. new technology that is used to enhance regulatory processes);
 - reducing the volume of time-sensitive disclosure, and thereby speeding up the IPO process. If elements of the disclosure requirements could become less time-sensitive, there would be more flexibility in the process and less of a rush to complete a listing within a given time window;
 - further reducing the disclosure requirements for follow-on fundraising;
 - considering the role of the EIF to act as an anchor investor to crowd in investment in member states with less-developed public equity markets;
 - promoting unconnected research in the IPO process by assessing whether additional safeguards are needed (in line with market practice in France, and recent rules changes in the UK), such as ensuring that analysts working at firms that are not part of the underwriting syndicate have sufficient access to issuer management when producing research.

8.1 Introduction

The raising of equity finance on public markets involves exchanges, underwriters, investment banks and other advisers, such as lawyers, accountants and public relations agencies. Information flow is central to this process, making the interactions between the parties in the value chain key to a successful outcome.

This section investigates the relationships between the participants in primary markets and between different financial intermediaries involved in raising equity. It explores whether these relationships could be placing restrictions on the functioning of primary equity markets in the EU, and whether there might be bottlenecks in the system.

The section is structured as follows:

- section 8.2 describes the emergence of the book-building approach to IPOs and the recent interest in direct listings;
- section 8.3 analyses how the IPO process is performing in Europe, considering the time taken, prices, retail participation and user satisfaction; and
- section 8.4 discusses ways in which the IPO process could be improved in Europe.

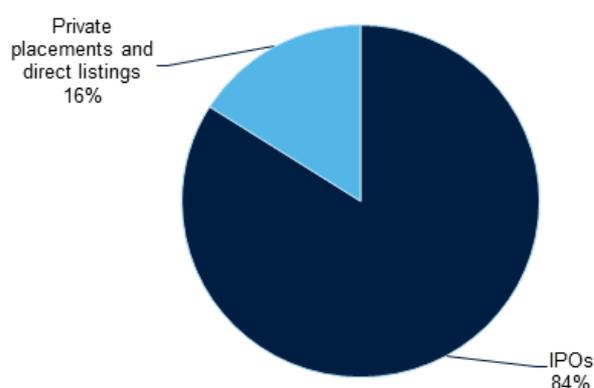
8.2 Different approaches to listing

A company's shares can be listed on a stock market through:

- an IPO, in the form of a capital increase and/or a sale of shares currently held by investors. By offering new or existing shares, the company makes its shares available to new investors, both institutional and retail;
- private placement, where shares are sold directly to a select group of professional/qualified investors. In this case, no officially approved prospectus is necessary unless the company plans to list on a regulated market;
- direct listing, where shares are simply made available for trading, without increasing capital.

IPOs are the most popular way to list shares in the EU. Figure 8.1 below shows the types of new listing²²³ on a cross-section of European stock exchanges between 2017 and 2019.

Figure 8.1 Types of new listing, 2017–19



²²³ For the purposes of this analysis, new listings include IPOs, private placements and direct listings/introductions only.

Note: The data covers 619 new listings on Borsa Italiana (Main Market and AIM Italia), Deutsche Börse (Main Market and Scale), Euronext (Main Markets, Euronext Growth and Euronext Access), London Stock Exchange (Main Market and AIM) and Nasdaq Nordic (Main Markets and First North). Excludes new listings identified as resulting from business combinations and spin-offs, secondary listings, transfers from other venues or segments, change of domicile, technical listings identified within the panel, and listings for which no reason could be identified.

Source: Oxera analysis of stock exchange data.

In the case of IPOs, the equity being offered can be a combination of existing shares owned (e.g. by the founders, private equity funds, management and employees) and new shares created by the company's Board. Proceeds from any offering of the former accrue to the existing owners of those shares, and proceeds of any offering of the latter accrue to the company.

Public offerings of this kind are conducted by underwriters, which take a variety of forms, from specialist corporate finance boutiques, to large integrated investment banks with multiple lines of business (including equity research, sales and trading). The underwriters organise the offering, including the production of any prospectus, and manage the sales process.²²⁴

Recently, there has also been some interest in direct listings from large technology companies that already have an investor appetite.

8.2.1 The book-building process

In the EU, the standard approach to conducting an IPO is book-building, whereby underwriters/issuers and potential investors exchange information to estimate the demand curve ('the book') for the issuance. The book-building methodology has long been used in the USA and has become dominant internationally. Before the 1990s, most European IPOs were fixed-price public offerings, where the price and allocation rules are set before information on demand is received, and shares are allocated according to the rules announced earlier.

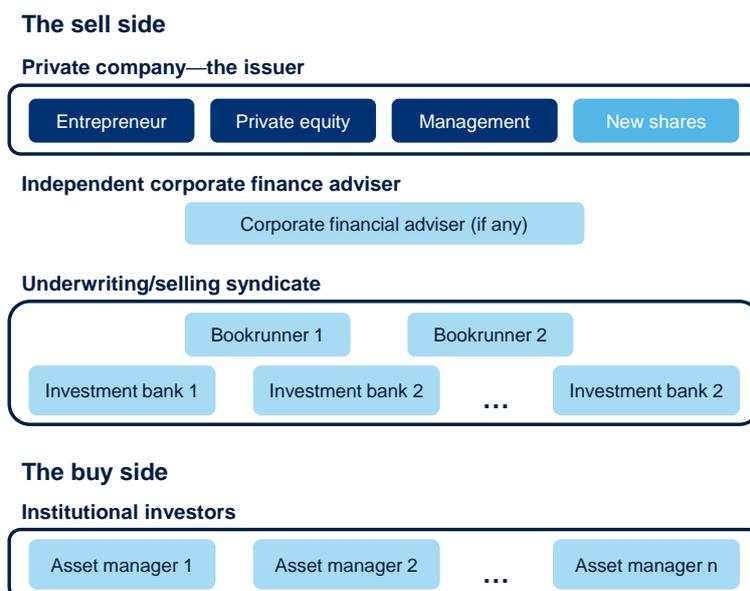
The dominance of book-building over fixed-price offerings means that comparisons with fixed-price IPOs rely largely on historical data. Academic studies have found that book-built IPOs have tended to be more expensive than fixed-price offerings, but can lead to lower underpricing.²²⁵ However, similar studies also suggest that there is more competition over fees in Europe compared to the USA, which might partially offset the tendency for book-building to be more expensive.

Several parties are involved in a typical book-building process, the key ones being:

- the existing shareholders, the company (the issuer), the bookrunner, and the underwriter syndicate, collectively the 'sell side';
- the investors, the 'buy side' (as shown in Figure 8.2).

²²⁴ In this report, the terms underwriter, bookrunner and investment bank are used interchangeably.

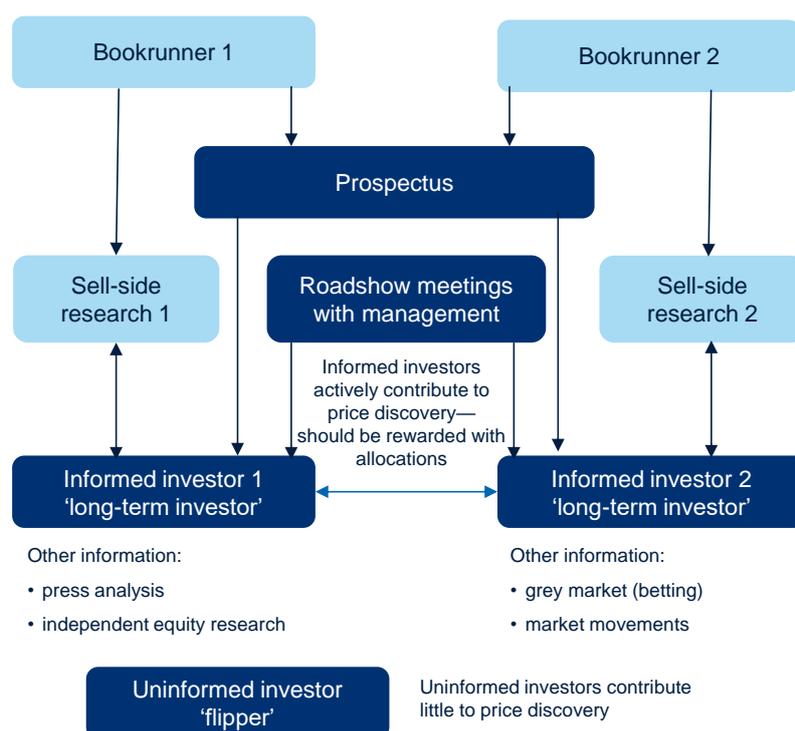
²²⁵ See Ljungqvist, A.P. Jenkinson, T. and Wilhelm Jr., W.J. (2003), 'Global integration in primary equity markets: The role of US banks and US investors', *The Review of Financial Studies*, **16**:1, pp. 63–99.

Figure 8.2 Interactions in a typical IPO

Source: Oxera.

The issuer will appoint one or more investment banks to manage and lead the offering. The other key players are the prospective buyers of the shares. In an equity offering there will be a large universe of potential investors who might want to buy the shares from the issuer. Each bookrunner may have access to a different network of prospective investors—indeed, some other members of the underwriting syndicate may be included specifically for their links to particular investor groups (e.g. investors in other countries).

Book-building is explicitly designed as an information-revelation process. It is part of a longer price-discovery process that typically starts several months before the intended issuance date with some initial market testing. In the book-building stage of the process, underwriters and potential investors generate and capture information on the valuation of the company and the demand for shares. The information flows that occur during book-building are summarised in Figure 8.3.

Figure 8.3 Information flows during book-building

Source: Oxera.

The significant influence that bookrunners have in setting the final issuance price has given rise to concerns from academics, regulators and issuers that bookrunners might face a conflict of interest and not necessarily act fully in the interests of the issuer. As required by regulation in many countries, this potential conflict has to be managed by the investment bank (see Box 8.1).

Box 8.1 Managing conflicts of interest in IPO book-building

Many bookrunners are large integrated investment banks with significant sales/trading and other activities (such as hedging or prime brokerage services). The clients of investment banks for many of these services are investors (the buy side in IPOs), which results in a long-term business relationship.

As shown by recent research commissioned by the FCA, the revenues obtained by investment banks from these ongoing business lines make the fees they charge for running equity issues seem insignificant.²²⁶ Therefore, whereas an issuer might want to price its shares with a particular level of under-pricing, bookrunners may be influenced by their investor clients, who would prefer a lower issuance price so that they can enjoy an immediate increase in the value of their holdings. As required by regulation, the investment bank has to manage this potential conflict. For example, MiFID investment firms are required to produce conflict of interest policies and to keep a written record of their justification for each investor allocation.²²⁷

²²⁶ Jenkinson, T., Jones, H. and Suntheim, F. (2018), 'Quid Pro Quo? What Factors Influence IPO Allocations to Investors?', *The Journal of Finance*, **73**:5, pp. 2303–2341.

²²⁷ This is set out in MiFID II Articles 16 and 23, Delegated Regulation (EU) 2017/565 Articles 38–41 and the associated ESMA Q&As.

The issuer can protect itself from the potential conflicts of interest in two ways:

- i) employ more than one bookrunner, so that any suggestions by a given bookrunner to set the price too low or to allocate shares disproportionately to favoured investors does not go unchallenged by the other bookrunner(s);²²⁸
- ii) appoint an independent corporate finance adviser, in addition to the bookrunner, with a focus on guiding the issuer during equity offerings. The EU has seen strong growth of such advisers.²²⁹ While they might increase the total cost to the issuer, evidence suggests that their fees are highly contingency-based, indicating that these higher costs result from improved performance.

8.2.2 Direct listing

Direct listings are a way for a company to go public without an IPO. Instead of hiring investment bankers to sell new shares to the public (and incurring the cost of hiring underwriters), the company makes its shares 'directly' available for sale on the stock exchange. The company then uses the opening auction procedure of the stock exchange to set the initial price, rather than having underwriters building an order book of demand at various prices ahead of the launch.

There is a commonly held view that the traditional book-built IPOs tend to under-price newly public stocks (the 'under-pricing' cost of an IPO²³⁰), and that selling new stocks in the open auction will tend to get a higher market price. This is one of the reasons why direct listings tend to be popular among venture capitalists and start-up founders, who, as sellers of stock in newly public companies, naturally want a higher price.

The main differences between a traditional IPO and a direct listing are that there is no fundraising in a direct listing and there is no underwriter offering to buy the shares if there is insufficient demand. Therefore, there is no indirect cost of under-pricing, and no underwriting fees. Furthermore, in a typical IPO there is also an organised marketing effort (the investor roadshow) led by the investment banks to sell the existing shares or assist the company to issue new shares to investors at the time of listing.

In the context of a direct listing, there are a number of important challenges.

- Without an investment bank organising an investor roadshow, the firm needs to ensure that it is sufficiently transparent to investors such that, when it is listed, the investor community has some degree of understanding of how its stocks will trade in the secondary markets.
- Similar to the IPO process, the firm still needs to go through the process of agreeing with the listing authority that it is eligible for listing (i.e. it meets the listing rules set out in section 3.2.1). For example, there is still a need to produce a prospectus or information document (and have that signed off by the regulator if the issuer is seeking

²²⁸ The growth in multiple bookrunners is documented by Corwin, S.A. and Schultz, P. (2005), 'The Role of IPO Underwriting Syndicates: Pricing, Information Production and Underwriter Competition', *The Journal of Finance*, **60**:1, pp. 443–86.

²²⁹ Jenkinson, Jones and Suntheim (2018, op. cit.) discuss the role of independent corporate finance advisers in the context of IPOs managed by UK-based investment banks.

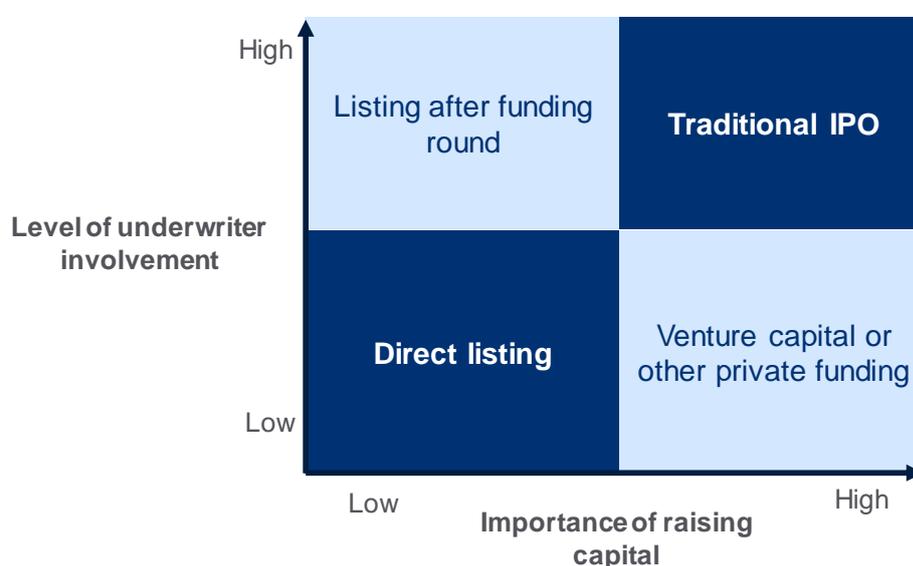
²³⁰ The general tendency to under-price IPOs is good for the ecosystem. If investors expect to make money from IPOs, they will devote attention to small unknown companies, and it will be relatively easy for those companies to raise money and for their investors to sell shares. If the investor expectation is that every IPO will price at the market-clearing price, there is less incentive to invest in the time to do the necessary research and due diligence. The investor might be better off investing in the secondary markets once the stock price has been tested for a few weeks.

a listing on a regulated market). More generally, the firm also needs to be prepared for the challenges (as well as the opportunities) of being a listed company.

- Another challenge is the free-float requirement. For a direct listing, the firm's shareholding needs to be sufficiently diverse such that it can meet the free-float requirement. On occasion it will not satisfy this requirement without an offer of additional shares.²³¹
- For a direct listing to be successful, the open auction needs to have enough buyers and sellers. Existing shareholders in the firm seeking to sell (such as employees or venture capitalists) can put in orders to sell shares in the opening auction, but the firm itself cannot. In a traditional IPO, the firm typically makes additional shares available for sale to mitigate this issue.

The choice of whether to conduct a direct listing or an IPO will depend on the circumstances, and in particular on the level of underwriter involvement and the importance to the existing owners of raising capital (see Figure 8.4 below).

Figure 8.4 Direct listing and IPO matrix



Source: IPOhub, <https://www.ipohub.org/ipo-alternative-direct-listing/>.

Despite the challenges with direct listing, there have been some examples that have been seen as successful, including the following.

- A demerger of an existing company is essentially a direct listing. The listing of Prosus N.V. on Euronext Amsterdam in 2019 is a recent example of a direct listing as a result of a demerger.²³²
- Another example is the direct listing of Metro Bank in 2016 on the London Stock Exchange, where there was a private capital-raising and immediately after that a direct listing. In Germany there have been several listings without a simultaneous public offering of shares that have followed a private placement of shares (examples include

²³¹ This is why businesses that have used stock as a form of delayed remuneration for their employees tend to find it slightly easier to list directly (as the employees would typically count towards the free-float requirement).

²³² See <https://live.euronext.com/en/ipo-showcase/prosus>, accessed 26 January 2020.

Evonik Industries, Schaeffler and Jost Werke).²³³ This sequencing meant that there was good visibility on the pricing of the shares to investors before the listing event.

- Most recently, in the USA, Slack and Spotify conducted high-profile direct listings.²³⁴ These are large well-known companies, with reasonably diverse shareholder bases (including both venture capital investors and employees).²³⁵ Their reasons to list were driven more by the benefit of having a traded secondary market in their securities and the platform for future capital-raising than the need to raise capital at the time of listing. The listing event also helped raise their profiles globally without the need for an investment-bank-led investor roadshow.

Some exchanges have responded to the demands of some large private companies to list without having to pay underwriting fees and are changing their rules to accommodate more direct listings.²³⁶

8.3 How is the IPO process performing in Europe?

From a public policy perspective, the functioning of the IPO process can be assessed on the basis of the outcomes it delivers to end users, which in this case include issuers and investors. These outcomes, examined below, include:

- the time taken and complexity in the process (section 8.3.3);
- the prices, in terms of the two largest costs: underwriting fees and under-pricing (section 8.3.4);
- allocations and retail participation (section 8.3.5);
- user satisfaction (section 8.3.6).

8.3.3 Time taken

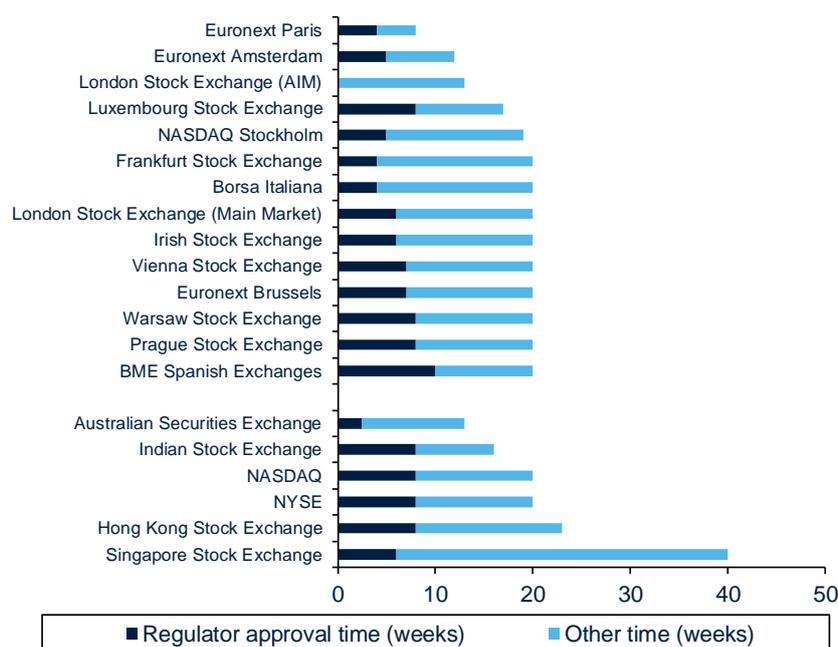
Figure 8.5 below shows the estimated time to obtain approval for a prospectus covering a listing on different stock exchanges. While these timetables are just approximations from one advisory firm, and the process will vary case by case, they indicate limited differences across the EU in overall timing, with a slightly quicker process to list on Euronext Paris, Euronext Amsterdam and London AIM. These estimates are in line with the interview feedback. The typical EU IPO process appears to be marginally quicker than on some Asian exchanges, such as in Singapore and Hong Kong, which could be due to higher retail participation in listing on these exchanges.

²³³ Seiler, V.O. and Rath, D. (2019), 'Direct Listing als Alternative zum IPO', *Börsen-Zeitung*, <https://de.lw.com/thoughtLeadership/Direct-Listing-als-Alternative-zum-IPO>.

²³⁴ Spotify went public in April 2018, followed by Slack in June 2019.

²³⁵ In the context of the Slack and Spotify direct listings, additional steps were put in place to allow shareholders to dematerialise shares over a period ahead of the launch of the transaction. There was also a significant amount of support around the trading of those shares through the assistance of some of the investment banks and the provision of market-making services.

²³⁶ For example, on 20 December 2019 the NYSE filed with the SEC proposed rule changes to expand the use of direct listing. See 'Notice of Filing and Immediate Effectiveness of a Proposed Rule Change Amending Annual Listing Fees for Equity Securities, Debt Securities, and Listed Structured Products Traded on NYSE Bonds', <https://www.sec.gov/rules/sro/nyse/nysearchive/nysearchive2019.htm#SR-NYSE-2019-67>.

Figure 8.5 Typical listing approval times, by stock exchanges

Note: Baker McKenzie estimate of typical time to list on a selected group of stock exchanges. Oxera has grouped individual activities into 'regulator approval time' (early liaison with the regulator, resolving regulator queries and regulator approval of prospectus) and 'other time' (appointment of legal financial and legal advisers, due diligence, and prospectus distributed to potential investors.)

Source: Baker McKenzie (2020), 'Cross-border Listings Guide'.

8.3.4 Prices (underwriting fees and under-pricing)

As discussed in section 4.3, the two largest cost components in an IPO are underwriting fees and under-pricing.

Underwriting fees

Underwriting fees paid to investment banks typically represent the largest direct cost item, and are usually expressed in percentage terms as a gross spread charged by the underwriting syndicate—i.e. the syndicate receives a certain percentage of the issue price for each share sold. The underwriting fee rewards the underwriting investment bank for the risk it takes in the IPO process.

The finding that gross spreads paid to underwriters in Europe are considerably lower than those in the USA is well-documented in the literature.²³⁷ Kaserer and Schiereck (2011) find that, from January 1999 to March 2011:²³⁸

- median IPO underwriting fees were 4.5% on Deutsche Börse, 3.25% on the London Stock Exchange, 3.64% on Euronext, 6.5% on NYSE, 7% on NASDAQ, and 2.5% on HKEX;

²³⁷ See, for example, Torstila, S. (2003), 'The Clustering of IPO Gross Spreads: International Evidence', *Journal of Financial and Quantitative Analysis*, **38**, pp. 673–94; Oxera and London Stock Exchange (2006), 'The Cost of Capital: An International Comparison', June; Abrahamson, M., Jenkinson, T. and Jones, H. (2011), 'Why don't US issuers demand European fees for IPOs?', *Journal of Finance*, **66**:6, pp. 2055–2082; and Kaserer, C. and Schiereck, D. (2011), 'Primary Market Activity and the Cost of Going and Being Public—An Update', Working Paper.

²³⁸ Kaserer and Schiereck (2011), op. cit.

- median SEO underwriting fees were 3% on Deutsche Börse, 2.9% on the London Stock Exchange, 3.8% on Euronext, 4.1% on NYSE, 5.2% on NASDAQ, and 2.5% on HKEX.

Table 8.1 provides updated analysis of the average underwriting fees on major exchanges since 2010. This data shows that underwriting fees are broadly unchanged and there is still a noticeable difference between Europe and in the USA.

Table 8.1 Underwriting fees for IPOs on major exchanges, 2010–19

All IPOs		
	Sample size	Gross spread ¹ (%)
UK, Main Market	189	2.5
UK, AIM	362	5
Borsa Italiana, Main Market	39	3
Borsa Italiana, AIM Italia	114	4
Euronext ²	198	4
Deutsche Börse, Main Market	88	3
Deutsche Börse, Scale	16	4.5
USA, NYSE	616	6.5
USA, Nasdaq	911	7

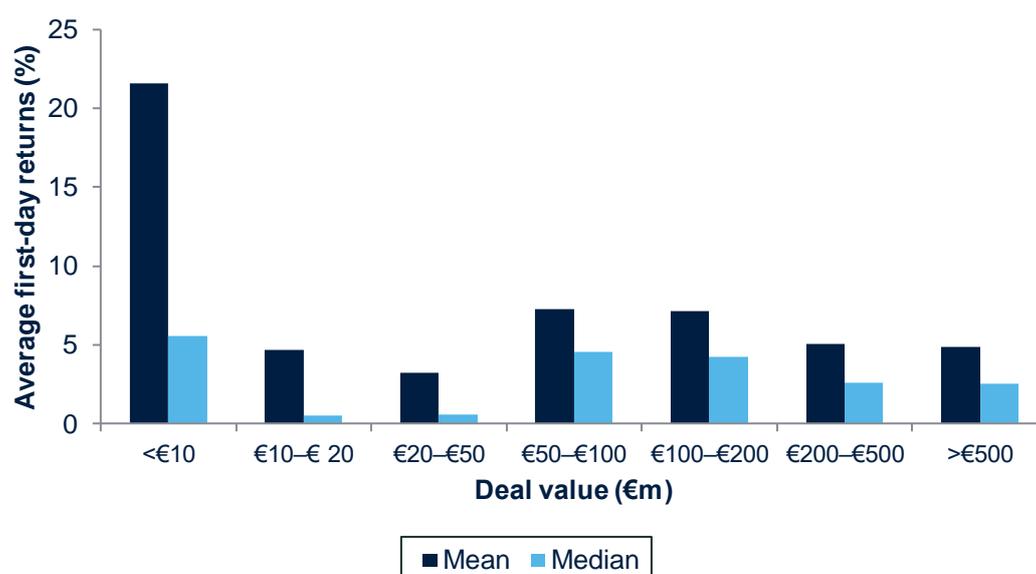
Note: Based on a dataset of IPOs conducted between January 2010 and November 2019. ¹ Median values presented. ² Covers main and junior markets for Amsterdam, Brussels, Paris and Lisbon.

Source: Dealogic.

Under-pricing

Figure 8.6 below shows the average under-pricing²³⁹ by amount raised for IPOs on EU-27 exchanges since 2010. The data shows that median under-pricing for each deal size has been at, or below, 5%. Such levels of under-pricing are low relative to the US markets, for example. Within each deal sub-group there are some highly under-priced IPOs, such that the mean is higher than the median. This is particularly the case for IPOs with a deal size of under €10m.

²³⁹ Under-pricing is the increase in price between the initial offer price and subsequent market price (usually the first-day closing price). It is interpreted as a cost to issuers because under-pricing implies that the company sold its shares at a price lower than the true value.

Figure 8.6 Average under-pricing in EU-27, by deal size, 2010–19

Note: Sample sizes for each deal value are (from left to right): 711, 120, 155, 81, 59, 83, 95.

Source: Dealogic.

Figure 8.7 shows how the average (mean) under-pricing varied across European exchanges over the same period. This reveals that the high average under-pricing for smaller IPOs has been driven by the volumes of IPOs on Warsaw Stock Exchange's NewConnect MTF.

Information asymmetries (between the issuer and potential new investors) would typically be expected to be greater for smaller companies, which might explain the higher levels of under-pricing for small issues and on junior markets.

Figure 8.7 Average under-pricing, by exchange, 2010–19

Note: Sample sizes for each exchange segment (from left to right): 88, 16, 189, 362, 142, 56, 39, 114, 77, 159, 113, 269.

Source: Dealogic.

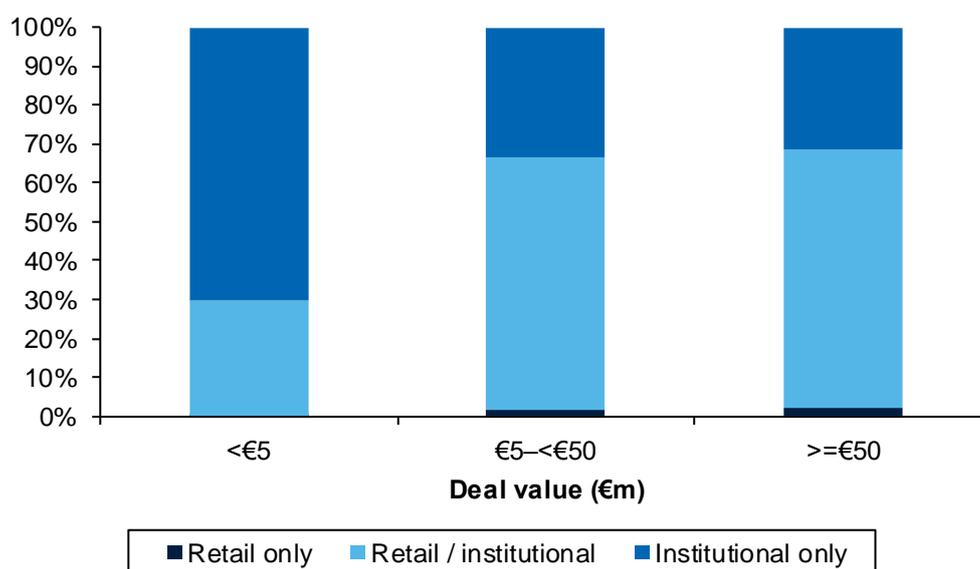
8.3.5 Allocations and retail participation

The prevalence of institutional investors on the buy side of IPOs is well-known among market participants and has been documented in the academic literature.²⁴⁰ Data on the actual allocation of shares in IPOs is difficult to obtain as it is held by the main underwriter and not published. Previous studies have generally relied on data provided by a single investment bank or disclosed to regulators.

Some data is available from public databases on the types of investors targeted by IPOs. Figure 8.8 gives a breakdown of EU-27 IPOs based on whether the tranche was marketed specifically to institutional investors, specifically to retail investors, or to both. This data shows that:

- for the smallest IPOs, the majority (70%) of the offer was marketed specifically at institutional investors. Less than 0.5% was marketed specifically at retail investors;
- for larger IPOs, approximately 2% of the offer was marketed specifically at retail investors.

Figure 8.8 Breakdown of EU-27 IPOs by tranche, 2010–19



Note: 'Retail only': the tranche was marketed specifically to retail investors; 'Retail/institutional': the tranche was jointly marketed; 'Institutional only': the tranche was marketed specifically to institutional investors. Sample sizes from left to right 561, 425 and 318.

Source: Dealogic.

The same data also shows that IPOs triggered by a privatisation were much more likely to include a tranche specifically marketed at retail investors than other IPOs (14% of privatisation IPOs included a retail-specific tranche compared with 1% of other IPOs).

Although tranche-level marketing data shows that a very small proportion of IPOs are marketed specifically to retail investors, estimates provided in a recent paper suggest that retail investors account for 25% of demand for some IPOs on Euronext.²⁴¹ This figure is

²⁴⁰ See, for example, Ljungqvist, A.P. and Wilhelm Jr, W.J. (2002), 'IPO allocations: discriminatory or discretionary?', *Journal of Financial Economics*, **65**:2, pp. 167–201; Jenkinson et al. (2018), op. cit.

²⁴¹ Economist Intelligence Unit (2020), 'Untapped capital: understanding the retail investor pool', https://eiuPerspectives.economist.com/sites/default/files/eiu-primarybid_untapped_capital_report.pdf.

broadly consistent with those in previous empirical analyses within the academic literature and suggests that allocation to retail investors may be higher.²⁴²

Data is also available on retail ownership of existing listed shares, which provides an indication of more general retail participation in equity markets. Figure 8.9 shows the level of retail ownership of listed shares across a number of EU member states.

Figure 8.9 Retail ownership of listed shares in 13 EU member states, 2018



Source: Economist Intelligence Unit (2020), 'Untapped capital: understanding the retail investor pool', https://eiuperspectives.economist.com/sites/default/files/eiu-primarybid_untapped_capital_report.pdf.

This data shows that retail investors account for a (significant) minority of share ownership across the major European financial centres.

Retail participation may be particularly relevant for SMEs, where ownership data suggests that individual investors play a more significant role. For example, UK individual investors own, on average, 11.3% of FTSE 100 companies compared to 25.1% of AIM-listed companies.²⁴³

8.3.6 User satisfaction

Another indicator of the performance of the IPO process is user satisfaction. As part of our survey we asked issuers to rate (on a scale of 1 to 10) their satisfaction with the listing process and outcome. The average score for satisfaction with the:

- listing process was 7.15 out of 10;
- listing outcome was 7.15 out of 10;
- independent adviser performance was 7.6 out of 10.

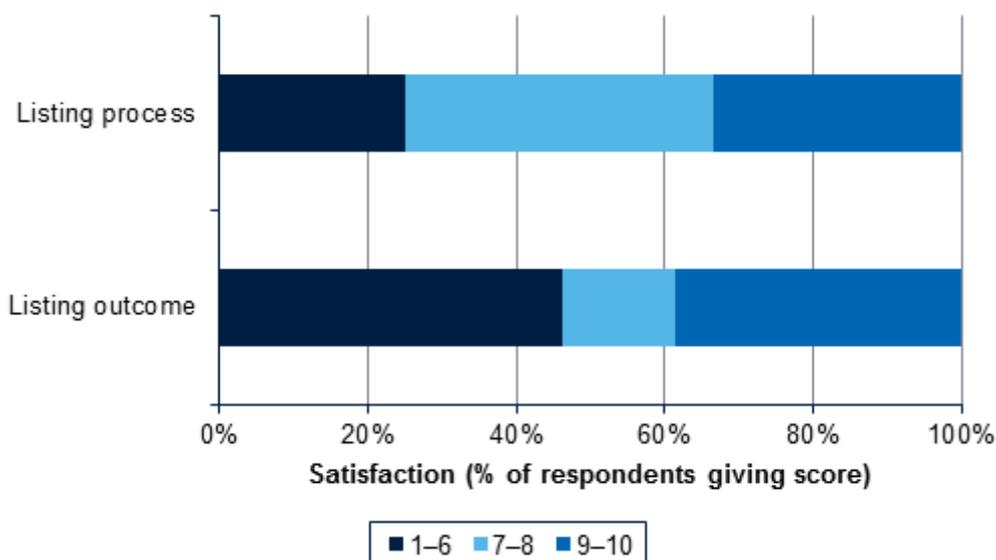
These results indicate that users of the IPO process are fairly satisfied.

²⁴² Ljungqvist, A.P. and Wilhelm Jr, W.J. (2002), 'IPO allocations: discriminatory or discretionary?', *Journal of Financial Economics*, **65**:2.

²⁴³ Office for National Statistics (2020), 'Ownership of UK quoted shares: 2018', <https://www.ons.gov.uk/economy/investmentspensionsandtrusts/bulletins/ownershipofukquotedshares/2018>.

Although our survey is based on a small sample, these results, shown in Figure 8.10, correspond well with the insights from our structured interviews.

Figure 8.10 Satisfaction with the listing process and outcome



Note: Respondents were asked: 'How satisfied were you with the listing process in general? Please use a scale from 1 to 10, where 1 is extremely dissatisfied and 10 is extremely satisfied. How satisfied were you with the listing outcome in general? Please use a scale from 1 to 10, where 1 is extremely dissatisfied and 10 is extremely satisfied'. Base size n=13.

Source: Oxera.

8.4 How could the IPO process be improved in Europe?

Based on our analysis and interview feedback, it appears that the IPO process is working fairly well in the main European markets. However, specific areas where it could be improved are explored below.

Flexibility in the IPO process

- Time-sensitivity—some bookrunners said that more flexibility in the disclosure requirements in the EU would help to avoid the need to squeeze IPOs through set time windows. For example, the EU could learn lessons from the shelf registration approach in the USA, with EDGAR-style registration documentation.²⁴⁴ A US shelf registration statement is a filing with the SEC to register a public offering, usually where there is no present intention to immediately sell all the securities being registered. When the issuer wants to offer securities, it takes the statement 'off the shelf' and adds to it additional time-sensitive information (but without having to do the full disclosure documentation within the set IPO time window). An effective shelf registration statement enables an issuer to access the equity markets quickly when needed or when market conditions are optimal.²⁴⁵ The Prospectus Regulation has recently introduced a similar process for follow-on issuances in the EU, called the Universal Registration Document. China is also

²⁴⁴ EDGAR is the SEC's automated electronic repository of US company filings.

²⁴⁵ Shelf registration (Rule 415 of the US Securities Act) allows a company to comply with US SEC registration requirements for a new stock offering before proceeding with the actual public offering.

introducing a pre-IPO registration process to reduce the amount of time the actual IPO takes.²⁴⁶

- Flexibility in the price-formation process—some investors indicated that, compared with the USA, there is less flexibility for market participants to drive the price-formation process in the EU. In the EU, if asset managers want to price outside the initial range, they need to request another prospectus.²⁴⁷ In the USA, the buy side can price outside the range.²⁴⁸ This is mostly driven by market practice, with the exception of the need for the investment banks to justify IPO allocation and the requirement to issue a new prospectus if the valuation is outside the set range. The re-publication of a prospectus can trigger the right of an investor to withdraw from the IPO.
- Flexibility in the free-float requirements—as discussed in section 3.2.1, the free-float requirements vary by exchange, although most market segments have a set limit as a percentage of the issuance. To encourage more listings, it may make more sense for the listing authority to tailor the requirement according to the size of issue. For example, a free float of 5% for the Saudi Aramco IPO would have been \$85.3bn of stock, and would be expected to be highly liquid, but would not have met the free-float requirements to list on many EU markets.²⁴⁹ Free-float requirements are still useful to ensure that a sufficient volume of stock is available for trading at a given time.

Information flow and digitalisation

- Digitalisation in the IPO process—many market participants have suggested that there should be more digitalisation in the IPO process. Technology solutions exist to improve the efficiency of information flow during the IPO process (such as Research FN, see Box 8.2 below). While some of the large investment banks have very recently moved to a fully digital process, many still rely on manual procedures. Quicker adoption of existing technologies to disseminate information in the IPO process would help to reduce unnecessary administrative costs, such as the printing and posting of prospectuses. Feedback from the structured interviews suggested that the printing of documentation is sometimes to comply with the requirements of national regulators and sometimes driven by client demand. There is limited justification for documents to be printed and posted in the modern era. Regulators could enable further efficiency improvements in the IPO process by allowing digital-only compliance and by supporting the development of regtech solutions.²⁵⁰ The outbreak of COVID-19 might accelerate this. For example, due to the constraints caused by the outbreak, on 3 April 2020 Zentalis conducted its IPO on the Nasdaq stock exchange on a fully virtual basis. This included virtual investor

²⁴⁶ This follows a successful pilot exercise in 2019 on the Shanghai Stock Exchange's sci-tech board. The new registration-based IPO system simplifies and shortens a previously lengthy approval process to list in China, with redefined roles for the Shanghai stock exchange and the China Securities Regulatory Commission.

²⁴⁷ For example, in France, if the final price is outside the price range indicated in the securities note, a supplemental securities note must be approved by the Autorité des marchés financiers and published. If the prospectus indicates that the lower range is indicative, a final price below the range may be disclosed in a press release. Otherwise approval from the Autorité des marchés financiers is required. These measures are intended to ensure that investors participating in the IPO are adequately informed to make reasonable decisions. For an academic analysis on why so few European IPOs price outside the range, see Jenkinson, T., Morrison, A. and Wilhelm, W. (2006), 'Why are European IPOs so rarely priced outside the indicative price range?', *Journal of Financial Economics*, **80**, pp. 185–209.

²⁴⁸ In the USA, Securities Act Rule 430A allows issuers to make pricing-related changes to the registration statement without review by the SEC. Under this rule, issuers can change the value of the deal by up to 20% in either direction. For a detailed discussion, see Latham & Watkins LLP (2019), 'US IPO Guide: 2019 Edition', December, <https://www.lw.com/thoughtLeadership/lw-us-ipo-guide>.

²⁴⁹ The Saudi Aramco IPO raised 1.5% free float for €25.6bn on the Saudi Stock Exchange in December 2019.

²⁵⁰ 'Regtech' is new technology that is used to enhance regulatory processes.

meetings and a fully digitalised information-disclosure process, leading to efficiencies and cost savings.²⁵¹

- As well as disseminating information more cheaply and quickly, some investors suggested to us that it would be helpful if there were a digital technology platform that could also distribute the consensus of research on EBIT and EBITDA ratios, as well as the full research reports on the IPO. This would reduce search costs for potential investors and make it easier and quicker for them to assess whether they want to participate in the IPO, and leaving them more time to devote to detailed due diligence.

Investor appetite in European IPOs

- Promoting IPO allocation rules to encourage retail investor participation in European IPOs. There are examples of this in Singapore and Hong Kong, and in Australia the technology has been considered, but not yet implemented (see Box 8.2). In Europe, there have been market-led attempts to promote retail investor access to equity issuance using technology. One example is PrimaryBid, which uses an online platform to provide individual investors with access to company placings.²⁵² Some exchanges offer a subscription service to retail clients that facilitates their participation in equity markets. For example, Deutsche Börse offers DirectPlace, a subscription service that allows retail investors to submit orders for an IPO through their custodian bank.²⁵³ Allocation rules can be set to balance the need for institutional investors to drive the price formation, while not crowding out retail allocation.
- Reduce the regulatory burden on secondary raisings to retail investors. At the moment the incentive for issuers is to limit follow-on fundraising to institutional investors because the disclosure requirements are less onerous. While retail investors can buy existing shares on the secondary market based on the initial disclosure requirements, this is not the case for new shares, where additional disclosure documentation is required. As discussed in section 7, one of the key benefits of listing is the ability to raise follow-on funds. Provided that a class of the company's shares is already listed (and authorised), supplementary disclosure documentation provides little incremental information and is an unnecessary burden for companies seeking to issue previously authorised shares. Reducing the disclosure requirements from follow-on fundraising to retail investors would be likely to enable more equity issuance to be available for retail participation.²⁵⁴
- The need for anchor investors in new and small financial centres—in many financial centres anchor investors play an important role in crowding in additional investment. Some stakeholders have suggested that the EIF and/or the EBRD, for example, could play this anchor role for some regions. It is worth further exploring whether the EIF and/or the EBRD co-investing with private funds could help support an increased appetite for IPOs, particularly in smaller financial centres.²⁵⁵ The Commission could also direct the EIF to develop SME fund management teams, in a similar way to its current

²⁵¹ See, for example, Nasdaq (2020), 'Nasdaq's Head of Healthcare Listings on the State of IPOs During the Coronavirus Pandemic,' press release, 3 April, <https://www.nasdaq.com/articles/nasdaqs-head-of-healthcare-listings-on-the-state-of-ipos-during-the-coronavirus-pandemic>.

²⁵² See <https://www.primarybid.com>.

²⁵³ See Deutsche Börse (2017), 'DirectPlace - Subscription of securities via Börse Frankfurt', <https://www.deutsche-boerse-cash-market.com/resource/blob/71000/b9bdeb3bd84bb9b6dcb33ffa35bae837/data/Factsheet-DirectPlace-subscription-functionality-German-only-.pdf>.

²⁵⁴ It is worth recalling that retail investors can draw on the information contained in the ongoing disclosure requirements for primary raisings to inform their investment decisions. Given the evidence that cumulative disclosures are not read by retail investors, it might be more effective from an investor protection perspective to focus any additional disclosure requirements only on those elements that are highly likely to be used by the retail investor, such as a statement of what the firm plans to do with the additional funds.

²⁵⁵ The anchor investment can help to develop and stabilise the existing and the new investment. This is important for the credibility of the third-pillar pension programme launches.

support for venture capital and private equity. European Commission President Ursula von der Leyen has already announced an intention to 'create a private-public fund specialising in Initial Public Offerings of SMEs', which could provide a similar mechanism for increasing SME stock liquidity.²⁵⁶

- Unconnected research—following a comprehensive review of the functioning of the UK IPO markets in 2017, the FCA made changes to ensure that research houses unconnected to the bookrunners have sufficient access to the issuer's management (see Box 8.4 below).²⁵⁷ The new UK rules are similar to the long-standing market practice in France and the USA, where the IPO candidate invites unconnected analysts²⁵⁸ are invited to analyst presentations. It might be worth further exploring whether lessons from this could be deployed in other EU member states.

Box 8.2 Retail IPO allocation rules

Retail clients have traditionally had limited access to invest in European IPOs. Some technology companies have developed tools to facilitate such access. In Australia, OnMarket BookBuilds has developed an app (in collaboration with the Australian Securities Exchange) allowing retail investors to directly place bids for shares and be allocated shares on a pro-rata basis.²⁵⁹ As noted in the Myners review,²⁶⁰ this system aims to allow fair, orderly and transparent pricing and allocation of new securities 'on market' by using the existing stock exchange infrastructure. The aim of this digital auction method is to help remove gaming from the IPO process and bring wider transparency to enhance price discovery.

OnMarket has recommended to the Australian Securities Exchange the following changes to the IPO allocation rules in Australia:

- reserving at least 25% of every IPO for the general public, as opposed to institutional investors. If the public does not bid, the portion of the reserved 25% that has not been applied for may be allocated to clients associated with the syndicate banks and brokers;
- ensuring that any legally eligible person, or entity, may bid, by providing adequate distribution facilities that inform public investors of the offering and allow them to bid;
- ensuring that the allocations within this pool are fair and that investors that receive an allocation from syndicate banks cannot double-dip into the portion reserved for the public.

While the Australian Securities Exchange is yet to adopt these changes, the suggestions were based on rules that exist in Hong Kong and Singapore. Both the Hong Kong Stock

²⁵⁶ von der Leyen, U. (2019), 'A Union that strives for more: My agenda for Europe',

https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf.

²⁵⁷ See Financial Conduct Authority (2017), 'Reforming the availability of the information in the UK equity IPO process', Policy Statement PS17/23, <https://www.fca.org.uk/publication/policy/ps17-23.pdf>.

²⁵⁸ The FCA defines unconnected analysts as 'those working at firms which are not part of the underwriting syndicate, e.g. independent research providers or non-syndicate banks, and who produce unconnected research on an offering.' See Financial Conduct Authority (2017), 'Reforming the availability of the information in the UK equity IPO process', PS17/23, <https://www.fca.org.uk/publication/policy/ps17-23.pdf>.

²⁵⁹ OnMarket BookBuilds (2016), 'Submission regarding proposed changes to admission requirements for listed entities'.

²⁶⁰ Panel chaired by Lord Myners, CBE (2014), 'An independent review for the Secretary of State for Business, Innovation and Skills: IPOs and Bookbuilding in Future HM Government Primary Share Disposals,' 16 December, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/388660/bis-14-1300-myners-independent-review-for-secretary-of-state-for-business-ipos-and-bookbuilding-in-future-hm-government-primary-share-disposals.pdf.

Exchange and Singapore Stock Exchange have IPO listing rules that ensure that there is a substantial share of the offering available to retail investors.

- Hong Kong Stock Exchange listing rules allow the lead manager and all syndicated distributors to place a maximum of 75% of the issue with their institutional clients.²⁶¹ The lead manager is then required to make adequate distribution facilities available for the residual 25% to be bid for, and allocated to, the 'general public'.
- Under Rule 210(1) of the Singapore Stock Exchange rulebook, allocation to retail investors is ensured via distribution requirements: for offers less than SGD75m, at least 40% of the issue or SGD15m, whichever is lower, must be allocated to investors who hold less than 0.8% of the offer, or SGD300,000, whichever is lower; for offers between SGD75m and SGD120m, at least 20% of the issue must be allocated to investors who hold less than 0.4% of the offer; and for offers greater than SGD120m there are no allocation requirements.²⁶² In 2017, Singapore added a further requirement that issuers on the main Board allocate at least 5% of the offer (or SGD50m if lower) to a public subscription tranche.²⁶³

In France, the General Regulation and recommendations of the Autorité des marchés financiers require that, if market demand permits, issuers must make at least 10% of the overall offering accessible to retail investors. In Belgium, the Royal Decree of 17 May 2007 details a similar rule regarding retail allocation.

Box 8.3 Digitalisation in the IPO process: ResearchFN case study

ResearchFN is a digital technology solution created by NetRoadshow and developed as an industry-wide standard in 2017. It provides paperless pre-deal research delivery electronically. It files all pre-deal reports and documentation in one place for the benefit of the investor community. The technology supports the IPO at every phase, from initial presentations to conference calls to prospectus distribution. It also manages the flow of information between the participants in the IPO process in a secure manner to ensure full compliance with the regulatory requirements.

All the large investment banks and regional leaders work with ResearchFN, including Bank of America Merrill Lynch, Barclays and UBS. According to the ResearchFN website, it has been used in 95% of global IPOs since 1997.

Source: ResearchFN website, <https://www.researchfn.com/>

Box 8.4 FCA reforms on unconnected research

Around four weeks before the public announcement of an IPO, there would be an 'analyst presentation', where the issuer's management presents information from the draft prospectus to analysts employed by underwriting banks ('connected analysts'). Following the public announcement, the underwriting syndicate would publish this connected research and then impose a 'blackout' period of 10–14 calendar days during which it releases no new information. This would be followed by publication of the draft unapproved ('pathfinder') prospectus with the price range.

²⁶¹ Stock Exchange of Hong Kong Limited n.d., Appendix 6: Placing Guidelines for Equity Securities, http://en-rules.hkex.com.hk/net_file_store/new_rulebooks/c/o/consol_mb.pdf.

²⁶² Singapore Exchange Limited n.d., Mainboard Rules, http://rulebook.sgx.com/en/display/display_viewall.html?rbid=3271&element_id=4830&print=1.

²⁶³ Singapore Exchange Limited (2017), 'Minimum Allocation to Facilitate Greater Retail Participation in IPOs', Response to Consultation, March, <https://api2.sgx.com/sites/default/files/170307%2BResponse%2Bto%2Bpublic%2Bconsultation.pdf>.

The FCA was concerned that the prospectus was being made available to investors too late in the process to inform investment decisions, and that analysts from outside firms lacked access to relevant information. This was seen as particularly problematic given potential conflicts of interest associated with connected research.

Following a comprehensive review of the functioning the IPO market in the UK, the FCA changed its rules to ensure that, before any connected research is released, a prospectus or registration document is published, and unconnected analysts have sufficient access to the issuer's management.

Source: Financial Conduct Authority (2016), 'Availability of information in the UK equity IPO process', Discussion Paper DP16/3, <https://fca.org.uk/publication/discussion/dp16-3.pdf>.

PART II: SECONDARY MARKETS

9 The design and functioning of secondary markets

Key messages

Secondary equity markets are where investors buy and sell shares. These markets provide organised places and mechanisms for the trading of shares, and enable market participants to price and fund investments that require a long-term commitment of wealth, while retaining the opportunity to access that wealth when needed.

A well-functioning equity market provides liquidity and a reliable price-formation process. These market functions allow investors to (re)allocate their asset holdings at low cost, enabling them to manage their financial risks according to their preferences. More efficient secondary markets also lower the cost of raising capital for issuers in the primary markets.

The trading process is underpinned by important post-trading arrangements (consisting of clearing and settlement), which can have an impact on the functioning of equity trading markets.

Equity trading, clearing and (central) settlement all feature network effects and benefit from economies of scale. However, subtle differences in their economic characteristics mean that the optimal market design may be different. More specifically, the characteristics of (central) settlement mean that it lends itself to a more monopolistic structure. Security clearing, with a requirement of 'universal reach' (a trader needs to be able to clear with all potential traders), has resulted in a number of models in practice, from the US-style one-provider model to more competitive models with open access and interoperability where market participants can choose from several interconnected providers. While equity trading also exhibits network effects and economies of scale, the market can sustain multiple competing trading venues.

When competition was introduced at the trading level, the main concerns were the implications of trading fragmentation for liquidity and market efficiency. The economics literature indicates that if investors can multi-home easily, such that they have a wide range of venues where they can execute their trades, and if search costs are low for investors, fragmentation of trading does not need to reduce liquidity. Under these two conditions, traders can navigate multiple trading venues to find the best prices for their trades—to some extent, all trading venues together form one pool of liquidity.

There is evidence that these two conditions hold in practice. The increasing popularity of new and alternative trading venues indicates that the set-up costs have been reduced significantly. There is also a considerable amount of multi-homing, with market participants choosing their trading venue based on their specific priorities. In addition, the use of SOR (an automated way of handling orders) has allowed traders in the EU to search for the best available opportunity across a range of trading venues. These features enable the equity trading market to sustain competition and at the same time deliver efficiency in price formation and overall liquidity. In sections 11 and 12, we assess the impact of competition on market outcomes (e.g. explicit and implicit costs).

The rest of Part II sets out Oxera's analysis on the functioning of the secondary equity markets in the EU.

9.1 Introduction

The performance of the secondary markets is important for the primary markets. For example, as discussed in section 5, the low liquidity in SME equity markets is a key barrier to SMEs seeking to list in the public equity market.

This section gives a short overview of how secondary markets operate. It sets out the economic characteristics of trading, clearing and (central) settlement (the three levels of the value chain in secondary markets) and the implications of the secondary markets trading infrastructure for their optimal market design. These considerations are important for the analysis in the subsequent sections, which aims to answer the following questions.

- How has the structure of secondary markets developed across member states and regions in the EU, especially as a result of greater competition among trading venues since MiFID I? (section 10)
- Has the market structure resulted in greater choice and innovation, and lower explicit costs, and how has this affected investors? (section 11)
- How have implicit costs evolved across various markets in the EU? (section 12)
- Are there barriers preventing further development of secondary equity markets in the EU? (section 13)

9.2 What is the role of secondary equity markets?

Secondary equity markets are where investors buy and sell shares in a company. They provide organised places and mechanisms for the trading of shares.

Secondary markets enable market participants to price and fund investments that require a long-term commitment of wealth, while retaining the opportunity to access that wealth when needed.²⁶⁴ More efficient secondary markets also lower the cost of raising capital for issuers in the primary markets.

A well-functioning secondary market is one that is accessible, efficient, liquid, fair and resilient. In particular, it should:

- deliver choice and innovation to the benefit of end-investors;
- be competitive, with providers actively competing to attract order flow, helping to drive down the explicit costs of trading and deliver better outcomes to end users;
- support price formation, so that market participants can efficiently price the value of the stock at any point in time; and
- provide sufficient liquidity, so that orders can be executed within a short timeframe at a price close to the stock's consensus value.

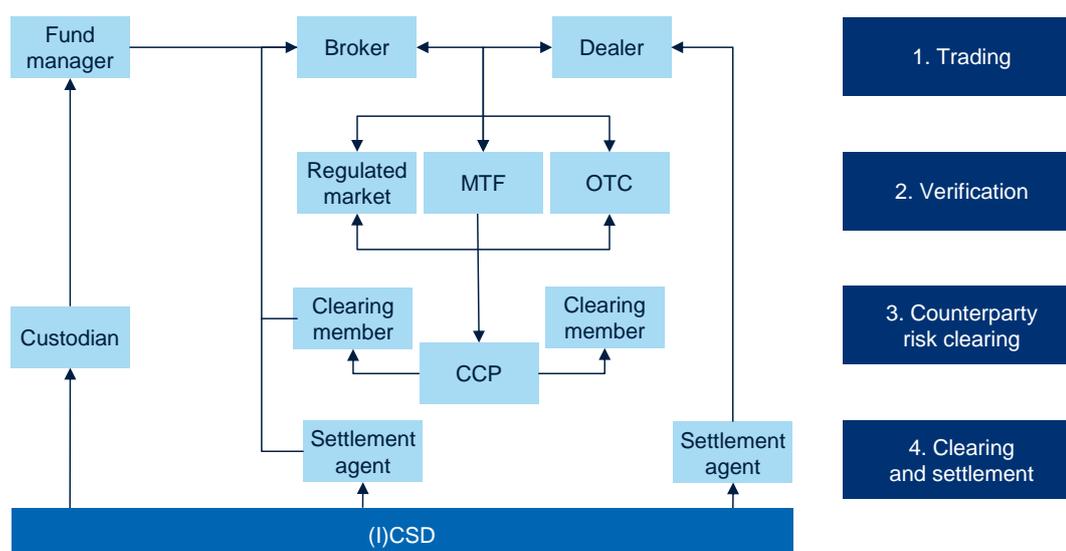
A number of people and firms are involved in equity trading. The 'straightforward' process of investors buying and selling (or holding) securities is underpinned by a complex structure and a longer value chain (see Figure 9.1 below). The functioning of equity trading in secondary markets comprises:

- trading services—offered by brokers and trading venues; and
- post-trading services—clearing and settlement, and custody and safekeeping, offered by infrastructure providers and custodians.²⁶⁵

²⁶⁴ Foucault, T. Pagano, M and Roel, A. (2013), *Market Liquidity: Theory, Evidence and Policy*, Oxford University Press.

²⁶⁵ For a more detailed description of these activities, see Oxera (2011), 'Monitoring prices, costs and volumes of trading and post-trading services', prepared for DG Internal Market and Services, European Commission, May; Oxera (2007), 'Methodology for Monitoring Prices, Costs and Volumes of Trading and Post-trading activities', prepared for DG Internal Markets and Services, section 3.

Figure 9.1 The value chain for trading and post-trading transactions: a stylised illustration



Note: This stylised illustration combines a regulated market with a central counterparty (CCP) on the street side and a centralised matching utility on the institutional side. As such, it illustrates the interaction of the transactions on the street side and the institutional side, and does not capture all the possible value chains.

Source: Oxera.

Trading venues are the typical meeting place for investors in equity markets. They bring together buyers and sellers and establish prices to match demand with available supply.

The rationale for trading venues is well-described in the economics literature on micro-market structure and in economic textbooks. At the most general level, a stock exchange is a firm that creates a market in equity instruments. In addition to listing services (discussed further in section 8), a stock exchange provides a mechanism for transferring the ownership of equities from one party to another. In addition, it fulfils two core, related, functions:²⁶⁶

- the provision of trading or liquidity—enabling traders to buy and sell assets;
- price formation—the process of determining the price of an asset in the market.

These market functions allow investors to (re)allocate their asset holdings at low cost, enabling them to manage their financial risks according to their personal preferences.

Price formation is unique to financial markets. While the matching of buyers with sellers is central to the exchange of many physical goods, equity markets differ from other non-financial markets, in that the 'goods' being exchanged are claims to uncertain and imprecisely predictable future cash flows.

This feature gives rise to an important function of a stock exchange, or more generally a lit venue. It provides an efficient information-gathering process that ensures that market participants can make informed commercial decisions based on information about the

²⁶⁶ See, for example, Oxera (2019), 'The design of equity trading markets in Europe', prepared for the Federation of European Securities Exchanges, March and Petram, L.O. (2011), 'The world's first stock exchange: how the Amsterdam market for Dutch East India Company shares became a modern securities market, 1602-1700', PhD thesis; O'Hara, M. (2003), 'Presidential Address: Liquidity and Price Discovery', *Journal of Finance*, **58**:4, pp. 1335–1354.

prices of the assets being traded in the market. This is a central feature of well-functioning financial markets. An inefficient price-formation process, on the other hand, can lead to mispricing, whereby the market price diverges from the fundamental value of the asset being traded.

The direct beneficiaries of an effective price-formation process are the investors, fund managers, and publicly listed firms that take decisions based on those prices.

Accurate prices (ones that reflect the fundamental value of the asset being traded according to the information available) lead to a number of benefits, including:

- more efficient markets—in a well-functioning market, the current price of an asset is the best estimate of the future price, expressed in today's terms at a risk-adjusted rate of return, conditioned on all available information. Better price formation leads to fewer and less frequent costly price shocks;
- fairer markets—fairness in markets requires a reliable price-formation process with effective detection and deterrence against improper trading. Having accurate prices incentivises more liquidity provision and more trading;
- lower cost of capital for businesses due to illiquidity cost and risk premia²⁶⁷—if prices are efficient and information is incorporated quickly and effectively into asset pricing, this will contribute to lower asset volatility and a lower cost of capital;²⁶⁸
- improved products and new business models—the price formation provided by exchanges leads to the development of new products and business models, resulting in more choice and competition for trading and new propositions for consumers;²⁶⁹
- wider benefits—for example, the broader finance and valuation industry uses the accurate prices formed on stock exchanges to determine the value of other assets.²⁷⁰

Alongside lit venues, since the introduction of MiFID, which brought in pre-trade transparency waivers, dark trading venues have played an increasingly important role within secondary markets. Trading on dark venues—i.e. trades executed with no pre-trade transparency and where orders are hidden prior to execution—can offer investors protection from both market impact and potential front-running, particularly for large orders. Moreover, the existence of dark venues leads to a greater choice for end-investors when it comes to trading.

While trading on dark venues can protect investors from market impact, it does not contribute to price formation. The lack of transparency regarding order flows in dark pools means that dark venues cannot determine prices in the same way as lit ones can. Instead, dark pools refer to the price provided by lit venues, often using the mid-price (i.e. halfway between the best bid and ask price).

²⁶⁷ For empirical trends identified within the illiquidity risk premium literature, see Amihud, Y. (2002), 'Illiquidity and stock returns: cross-section and time-series effects', *Journal of Financial Markets*, **5**:1, pp. 31–56; Pastor, L. and Stambaugh, R. (2003), 'Liquidity risk and expected stock returns', *The Journal of Political Economy*, **111**:3, pp. 642–685; Acharya, V.V. and Pedersen, L. (2005), 'Asset pricing with liquidity risk', *Journal of Financial Economics*, **77**:2, pp. 375–410.

²⁶⁸ See, for example, Fang, V.W., Noe, T.H. and Tice, S. (2009), 'Stock market liquidity and firm value', *Journal of Financial Economics*, **94**:1, pp. 50–169.

²⁶⁹ A model in which optimal product differentiation is affected by an IPO is presented in Foucault, T. and Fresnard, L. (2018), 'Corporate strategy, conformism, and the stock market', *Swiss Finance Institute Research*, Paper No. 18-51.

²⁷⁰ For example, managers use reactions to stock prices to inform their decisions on whether to proceed with proposed mergers, or to understand what might be the optimal level of product differentiation, see Luo, Y. (2005), 'Do Insiders Learn from Outsiders? Evidence from Mergers and Acquisitions', *Journal of Finance*, **60**:4, pp. 1951–1982.

9.3 Economics of equity trading, clearing and settlement

While this study focuses on equity trading, post-trading arrangements (clearing and settlement) can have a significant impact on the functioning of equity trading markets.

To analyse the functioning of secondary markets, it is useful to begin with an understanding of the economics of trading, clearing and settlement. This section gives an overview of the economic characteristics of trading and post-trading services in equity markets and their implications for the design of these markets. Clearing and settlement are analysed further in section 13.3.8.

Trading and post-trading markets feature:

- network effects—the benefit gained by users grows with the total number of users participating in the market; and
- economies of scale—the costs per unit fall as volumes increase.

In some markets, the combination of network effects and significant economies of scale can lead to natural monopolies.²⁷¹ In such monopolies, a single provider emerges because setting up a competing network based on similar technology would not be economically viable; any small-scale network would not be able to compete on cost and would be less able to attract new customers due to its partial coverage.²⁷²

Historically, in most countries, only one or possibly two exchanges offered trading in a given stock. In Europe and elsewhere, a combination of technological and regulatory developments has resulted in the introduction of competition at both the trading and the clearing level.

Different types of network effects arise in trading and post-trading, including the following. Two-sided effects involve users on either side of the market; whereas one-sided effects involve only one type of user.

One-sided network effects arise:

- between traders as a class (through liquidity)—the more traders there are that use a trading platform to trade a certain security, the more attractive that platform is to any trader wishing to trade in that security;
- in trade clearing undertaken by CCPs—the more trades that are cleared by the same CCP, the greater the potential to net the ensuing efficiencies.

Two-sided effects arise:

- between companies (issuers) and traders (through liquidity)—the more frequently a security is traded on a given platform, the more attractive that platform is to issuers. For a stock exchange to be successful, it needs to attract both issuers and traders;
- in trade settlement undertaken by CSDs between companies and investors—the more securities a CSD holds and settles, the more attractive the CSD is to investors (and their intermediaries);

²⁷¹ Early studies view exchanges as a natural monopoly due to the presence of network externalities and economies of scale. See, for example, Stigler, G.J. (1964), 'A Theory of Oligopoly', *The Journal of Political Economy*, **72**:1; and Bloch, E. and Schwartz, R.A. (1978), 'An analysis of the economic justification for consolidation in a secondary security market', *Journal of Banking & Finance*, **6**:1, pp. 117–136.

²⁷² Examples include fixed-line telecoms networks, electricity transmission, and water provision. See Appendix A6.1.

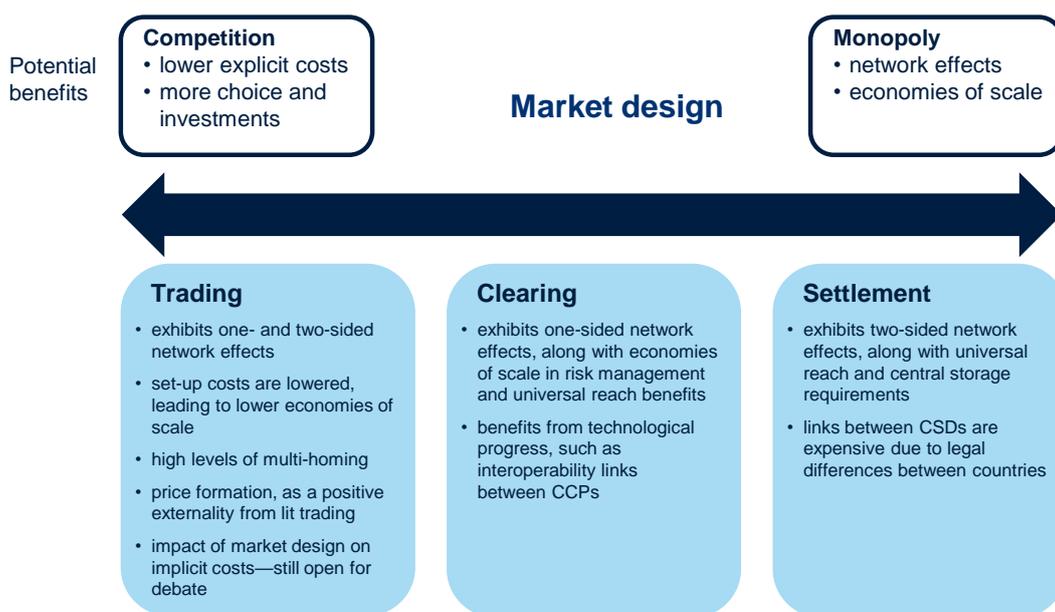
- where a platform needs market-makers (that provide liquidity) and brokers (that act on behalf of their clients).

Although standard network effects are a relevant economic characteristic of trading and post-trading, there are other, equally important, considerations when determining the optimal structure and design of these markets.

Both one- and two-sided network markets may be prone to 'tipping', such that a network that has obtained a critical mass of users may have a competitive advantage over rival networks. In equity markets, this is particularly relevant for liquidity, as trading in a security could tip towards the trading platform where most market participants already trade that security, and thus where liquidity is greatest. According to early theoretical models on this topic, the positive feedback loop between trading volume and liquidity eventually leads to concentration of trading in a single platform.²⁷³ The economic features of network markets are described in detail in Appendix A6.1.

The importance of network effects and economies of scale in trading and post-trading has been widely recognised. However, as acknowledged in the academic literature and observed in practice, the market design implications are complex and multifaceted. These are summarised in Figure 9.2 and discussed in more detail below.

Figure 9.2 Market design implications for trading, clearing and settlement in equity markets



Source: Oxera.

Equity settlement

Equity settlement exhibits two-sided network effects and requires 'universal reach', along with a central storage in which a listing company would choose to place its shares. A transaction, which involves the transfer of ownership of the securities from seller to buyer, is settled electronically via book entries in CSDs. By definition, this requires a centralised system to ensure consistent and reliable record-keeping of ownership. This centralised system is then accessible to all traders of the securities, regardless of the venue on which

²⁷³ Gomber, P., Sagade, S., Theissen, E., Weber, M.C. and Westheide, C. (2016), 'Competition between equity markets: A review of the consolidation versus fragmentation debate', *Journal of Economic Surveys*, **31**:3, September.

the trades were executed. As such, this market lends itself to a more monopolistic structure, rather than a competitive one.

Equity clearing

Equity clearing exhibits one-sided network effects and economies of scale in risk management (for the collaterals required to settle trades). CCPs also require universal reach. In other words, trades need to be cleared and settled regardless of who the counterparties are. This means that a CCP is useful to a trader only if it can clear a trade with all potential traders. Partly as a result of this feature, in practice the following four models are observed.

- One user-owned CCP serving all market participants—this model is used in the USA, with the National Securities Clearing Corporation being formed through horizontal consolidation of the individual CCPs.
- A bundled/vertically integrated relationship between individual trading platforms and CCPs (e.g. Deutsche Börse and Eurex, BATS and EuroCCP)—the vertically integrated CCP is the buyer to every seller and the seller to every buyer on the corresponding platform.
- Open access with multi-homing—*open access* means that multiple CCPs have access to clear trades on a given trading platform, offering investors benefits from more efficient netting. However, market participants may be required to *multi-home*—i.e. to use more than one CCP (discussed in more detail below)—in order to clear all their trades executed on different platforms.
- Open access with interoperability—this set-up goes one step further from the model above, in that *interoperable links* among CCPs require them to interconnect and share their open interest pool, further improving netting efficiency. Therefore, while having potential benefits from a monopolistic outcome, the open access with interoperability across the CCP model makes it viable to maintain competition within several interconnected CCPs. However, the fewer players there are in this market, the greater the economies of scale that can be achieved.

Equity trading

As noted, equity trading exhibits both one- and two-sided network effects, as well as economies of scale. Failure to capture these benefits sufficiently would lead to inefficient price formation (and potentially mispricing), as well as higher implicit and explicit transaction costs. At the other end of the competitive spectrum is the monopolistic outcome, which would mean the consolidation of order flow into a single limit order book.

Foucault (2008), in reviewing the academic literature on competition versus consolidation for equity trading, finds that there is generally no theoretical or empirical evidence (in either the USA or the EU) that the consolidation of order books would lessen liquidity, and emphasised two conditions proposed by Harris (2003)²⁷⁴ for this conclusion to hold:²⁷⁵

- investors can multi-home easily and/or at low cost;
- search costs for investors are low—i.e. the cost of identifying the strategy to execute their order at the best possible price.

²⁷⁴ De Fontnouvelle, P., Fische, R.P. and Harris, J.H. (2003), 'The Behavior of Bid-Ask Spreads and Volume in Options Markets during the Competition for Listings in 1999', *Journal of Finance*, **58**:6.

²⁷⁵ Another finding is that inter-market competition generally enhances consolidated market liquidity, as long as the market is not too fragmented and the supply cost is not needlessly duplicated across venues. See Foucault, T. and Menkveld, A.J. (2008), 'Competition for Order Flow and Smart Order Routing Systems', *The Journal of Finance*, **63**:1, pp. 119–158.

The increasing popularity of MTFs and other trading venues shows that the set-up costs have been reduced significantly. It also shows that there is a considerable amount of multi-homing, with market participants having a wide range of venues on which to execute their trades according to their specific priorities. Competition among trading venues also puts downward pressure on trade execution fees (see section 11.5 for our findings on this). In addition, the use of SOR allows traders in the EU to search for the best available opportunity throughout a range of trading venues. While the upfront fixed costs of such systems are high and suitable only for large trading/brokerage firms, SOR helps lower search costs for end-investors. This is because it relies on defined rules, configurations and algorithms to look for the best prices available.

These features mean that the equity trading market is able to sustain competition and to enjoy the benefits from that competition in the form of lower costs to end-investors, without compromising on the efficiency in price formation or overall liquidity.

The impact of competition on both explicit and implicit costs is examined next.

9.4 Developments in equity trading

Over the past decade there has been a fundamental change in how equity trading operates in Europe, driven by technological development and entry by new players, and supported by regulatory change.

Before 2007, trading on a given stock exchange took place on only one (or possibly two) trading venue(s). The stock would typically trade on the same venue on which it was listed. As such, there was a direct link between the primary and secondary markets. In 2007, this changed, with the introduction of the European Markets in Financial Instruments Directive (MiFID I). MiFID I opened up competition for equity trading, delivering more choice and lower trading costs for businesses in the EU.

MiFID I removed the 'concentration rule', which required investment firms to route equity orders only to the stock exchange on which the company was listed. The key objective of MiFID I was to encourage competition between trading venues in the EU and to ensure investor and consumer protection. This opened up the possibility to trade equities on alternative trading venues, including on both lit and dark venues.

This change in market structure, combined with technological innovation, has fuelled other changes, such as the rise of algorithmic trading. In fact, exchange operators worldwide have made considerable investments in their technological infrastructure to reduce order execution and communication latencies, and to attract market share from competing venues. These reductions in latency and the offering of co-location²⁷⁶ are especially attractive to high-frequency traders (HFTs), who transact a large number of (usually small) orders in fractions of a second. HFTs, and algorithmic trading in general, can help increase market activity. However, other liquidity dimensions, such as market depth, may be affected, as high-frequency trading is often characterised by a very small order size.

To address the unintended consequences of MiFID I, a number of measures were introduced in MiFID II to increase transparency and to shift dark trading (trading under the reference price and the negotiated transaction waiver)²⁷⁷ to lit venues. These measures included:

- a transparency regime—increasing regulatory reporting;

²⁷⁶ Allowing firms to rent server space next to an exchange's matching engine in order to improve on speed.

²⁷⁷ The updated MiFID II rules seek to make financial markets more efficient, resilient and transparent, by introducing pre- and post-trade transparency and trading obligations for shares and derivatives. The new rules seek to move more OTC trading onto trading venues, and to establish a new type of trading venue for non-equity instruments (i.e. organised trading facilities). MiFID II also expands the pre- and post-trading transparency regime to equity-like instruments (e.g. depository receipts, ETF and certificates).

- a double volume cap mechanism (DVCM)—limiting the volume of certain transactions that can be executed on dark pools to 4% at the trading venue level and 8% for all EU trading venues;
- a tick size regime—requiring all trading venues to price stocks in the same increments;
- a share trading obligation—effectively prohibiting OTC trading via broker crossing networks (BCNs).

We discuss next how these developments have affected the structure and functioning of the secondary markets in the EU.

10 Overview of trading activities

Key messages

- This section gives an overview of equity trading in the EU, including trends in volumes, and across financial centres, trading venues and investor types.
- Based on our analysis, we observe a spectrum of models for equity trading in the EU, from connected and competitive models, mostly in large financial centres in Western Europe, to more local and independent models, which are more common in small financial centres in Central and Eastern Europe.
- Equity trading in the EU (including UK) has been fairly stable, with around 2,600bn shares traded at a value of around €20,000bn annually between 2015 and 2018. However, most trading activity is concentrated in a small number of trading venues in large financial centres, on stocks domiciled in these markets.
- There is significant home bias in equity trading, with domestic holdings ranging from 30% to 96% of total trading across the member states. A large share (between 40% and 90%, depending on the member state) of the cross-border trading activity comes from other EU member states.²⁷⁸ The USA is a significant investor, particularly for companies based in the UK and Netherlands. Equity investment from China is relatively limited.
- Cross-border trading is mostly concentrated among stocks in large financial centres. This trend has been supported by the consolidation of some exchanges and the growth of alternative trading platforms in Western Europe. With the exception of Nasdaq Baltics, equity trading in Central and Eastern Europe has remained more independent.
- The investor base is another important consideration for the development of equity markets in the EU. Insurers and pension funds are a major component of domestic investment in large and mid-size financial centres—accounting for 30%, while they account for only 9% in small financial centres.²⁷⁹ Market participants in our interviews highlighted that the low share of insurance and pension equity investment in small financial centres is due to restrictions in investor mandates and regulation. More specifically, legislative capital requirements or accounting rules may drive pension funds away from equities in favour of other investments (including sovereign bonds).²⁸⁰
- From a policy perspective, the focus for the CMU should be on:
 - removing the barriers to cross-border trading in small financial centres (discussed further in section 13.2) and further integrating them into the other capital markets on a pan-European basis. This would help expand the pool of liquidity and enable firms in these countries to attract more capital, at a lower cost;
 - encouraging the development of private pension and insurance provision in local markets. The Commission could, for example, enlist the support of the Directorate-General for Economic and Financial Affairs (DG ECFIN) and the Structural Reform Support Service (SRSS) to help with this, as part of its broader

²⁷⁸ Oxera analysis of ECB and IMF data.

²⁷⁹ Oxera analysis of ECB and IMF data.

²⁸⁰ PensionsEurope (2018), 'Pension Funds Statistics and Trends 2018', <https://www.pensions europe.eu/system/files/PensionsEurope%20Pension%20Funds%20Statistics%20and%20Trends%202018.pdf>.

work programme. It could also promote the use of tax incentives by Member States to this effect.

- reviewing the ability of private pension providers and insurers to invest in equity. The Commission's review of equity capital charges under Solvency II will be important here, and similar consideration might be given to bank capital standards. The Commission could also prompt member states to reconsider national restrictions on pension funds.

10.1 Introduction

This section gives an overview of equity trading in the EU, including the trends in volumes over time, across financial centres, trading venues and investor types.

10.2 Financial centres

From our analysis, we observe a spectrum of models for equity trading in the EU, from connected and competitive models, mostly in large financial centres in Western Europe, to the more local and independent models, more common in small financial centres in Central and Eastern Europe.

A connected and competitive equity trading market is likely to have most, or all, of the following characteristics:

- a range of trading venues, some of which are pan-European, and trading mechanisms to match market participants' needs in terms of order size, speed, liquidity, and cost;
- the intermediaries (market-makers, dealers, and brokers) include both large international and smaller local players;
- a significant foreign investor base, in addition to domestic investors, from all over the world;
- trading venues that can easily access the infrastructure for post-trading services.

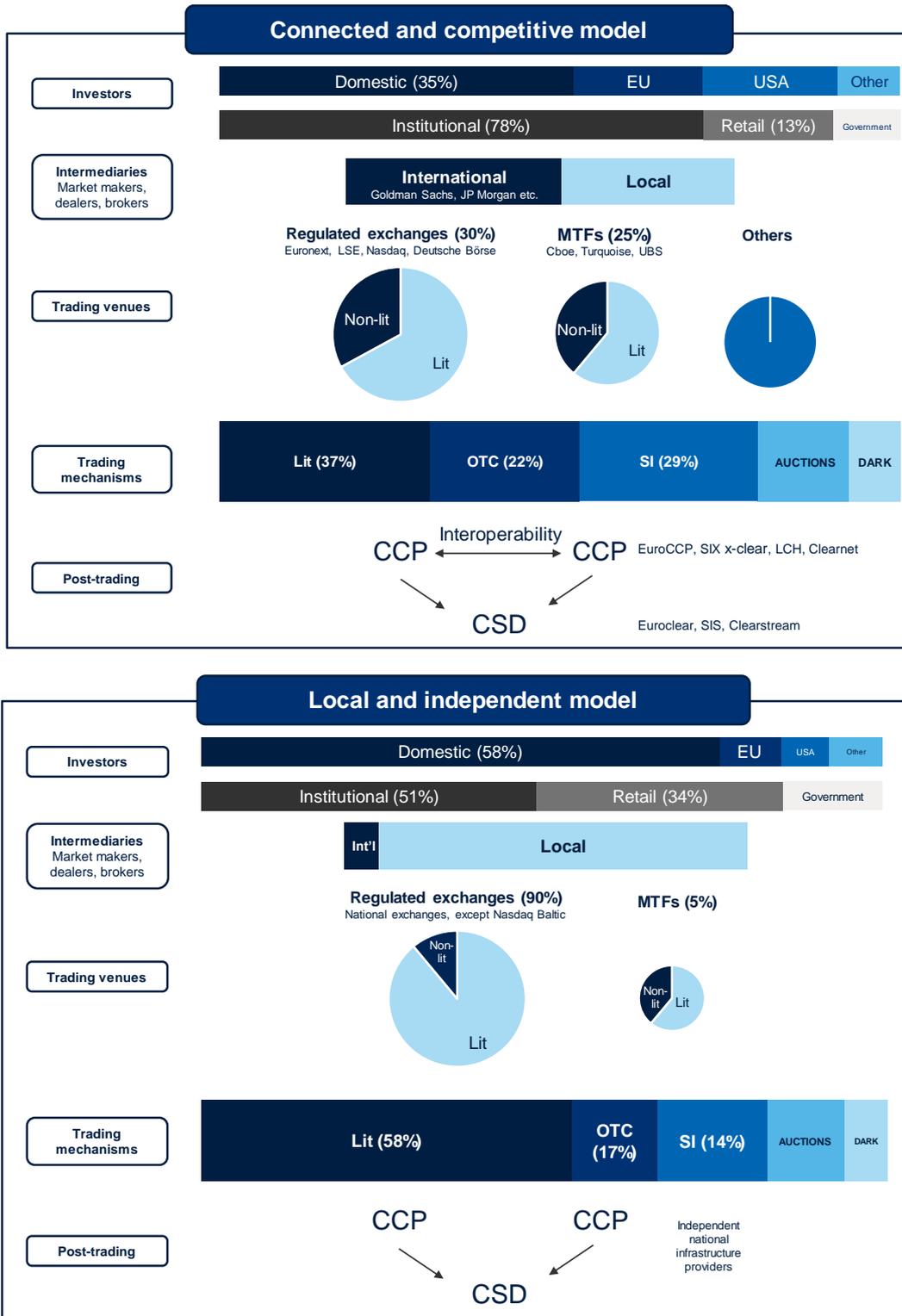
On the other hand, a local and independent market tends to have most, or all, of the following features:

- a low level of foreign investments, with most investments coming from other EU countries;
- the regulated exchanges are the main trading venues, with few alternatives;
- an 'independent' clearing and settlement infrastructure at the national level, without interoperability to pan-European providers;
- mostly local intermediaries with knowledge of the specific markets.

As discussed in the subsequent sections, most of the large financial centres in Western Europe are more at the connected and competitive end of the spectrum, while the smaller financial centres in Central and Eastern Europe are more at the local and independent end.

Figure 10.1 below illustrates these models.

Figure 10.1 Models in EU equity trading secondary markets: a stylised illustration



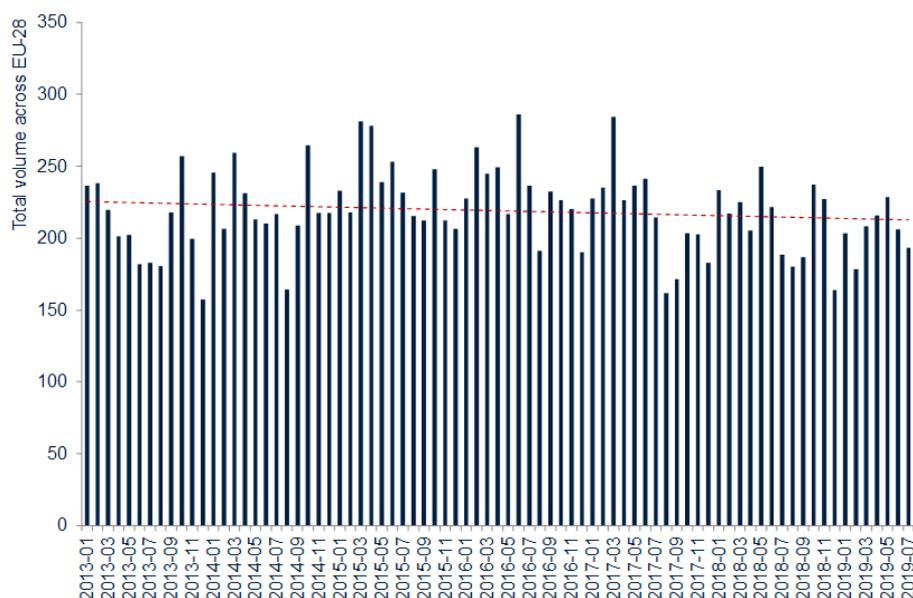
Source: Oxera.

In this section, we give an overview of equity trading across EU markets, reflecting differences in these two models, as well as showing the nuances in between. The analysis by country presented in this section is based on the country of domicile of the securities, rather than the trading venue location, for example.

10.3 Trends in equity trading

The volume of equity trading in the EU increased from around 600m shares traded in 1999 to 2,535bn shares traded in 2018.²⁸¹ Although, since 2013, the volume of shares traded has been fairly stable, at around 2,600bn per year, as shown in Figure 10.2.

Figure 10.2 Volume of equity trading in EU, 2013–19 (bn)



Note: Sum of total number of shares traded across the EU-28, including the UK, from January 2013 to July 2019.

Source: Oxera analysis of Refinitiv Market Share Reporter data.

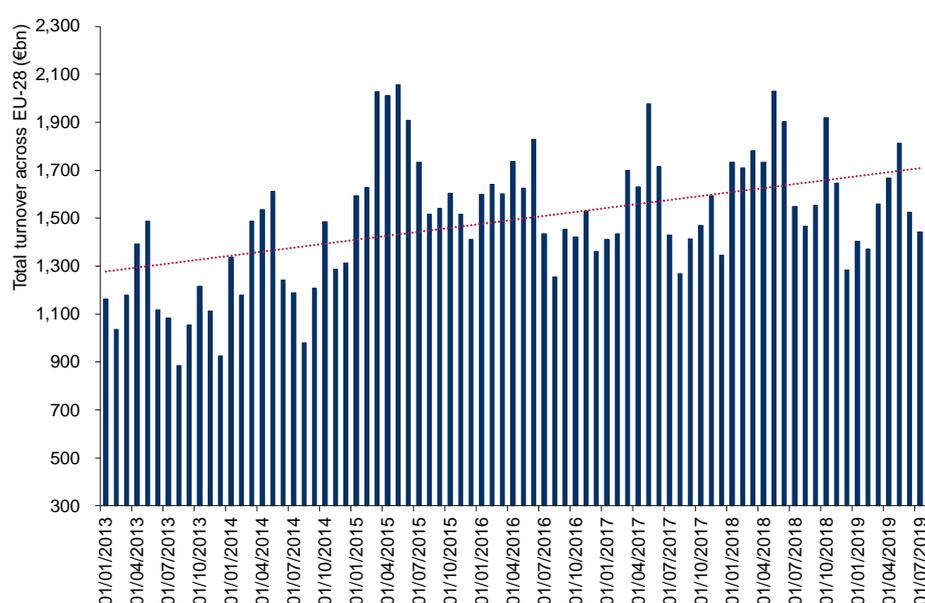
The value of shares traded in EU equity markets increased from around €17,800bn²⁸² in 1999 to around €20,160bn in 2018,²⁸³ as shown in Figure 10.3 below. Most of this increase took place between 2013 and 2015, with the value of equity trading rising from €13,580bn in 2013 to over €20,000bn by 2015. This was partly due to the upward trend in stock prices as the markets recovered from the 2008 financial crisis and the subsequent sovereign debt crisis. Since 2015, the value of equity trading in EU markets has been fairly stable.

²⁸¹ The total volume traded in 1999 refers to the total volume traded on Deutsche Börse, Euronext, Nasdaq, and the Athens, Italy, London and Madrid stock exchanges, based on data from the International Federation of Stock Exchanges and Oxera calculations. It is therefore a rough estimate of the total volume in Europe. See Oxera (2001), 'Competition Analysis: final assessment', analysis conducted for the London Stock Exchange, March.

The total volume traded in 2018 is based on Oxera analysis of Refinitiv Market Share Reporter data on total number of shares traded across the EU-28. The yearly value is a sum of monthly values. Monthly volume is estimated as the sum of daily data where no trading activity days are counted as missing values (n.a.). For stock exchanges that trade share by share, the volume is the number of shares that were traded on the trade date. For stock exchanges that trade in lots, the volume is divided by the lot size.

²⁸² The number refers to the total equity turnover on Deutsche Börse, Euronext, Nasdaq, and the London Stock Exchange in 1999, from the International Federation of Stock Exchanges. The total equity turnover in 1999 has been converted from \$ to € using the Eurostat average annual exchange rate for 1999.

²⁸³ The total volume in the EU in the first half of 2019 was 1,433bn.

Figure 10.3 Value of equity trading in the EU, 2013–19 (€bn)

Note: Total turnover value of shares traded across the EU-28, including the UK, from January 2013 to July 2019.

Source: Oxera analysis of Refinitiv Market Share Reporter data.

The size of equity markets varies significantly across the member states (see Appendix A7.3 for a more detailed overview). Based on analysis of data from Refinitiv Market Share Reporter, we identify three groups:

- large financial centres—consisting of France, Germany, Italy, the Netherlands, Spain, Sweden and the UK.²⁸⁴ In 2018, this group accounted for 89% of the total value of equity trading and 92% of the total number of shares traded in the EU-28. The value of equity trading in the group overall has been fairly stable over time and there has been a high volume in the number of shares traded, with each financial centre having more than 100bn trades in 2018;
- mid-sized financial centres—consisting of Austria, Belgium, Denmark, Finland, Ireland, Luxembourg, Poland and Portugal.²⁸⁵ In 2018, this group accounted for 11% of the total value of equity trading and 7% of the total number of shares traded in the EU-28. The number of shares traded in 2018 across members states in the group ranged between 10bn and 45bn;
- smaller financial centres—consisting of Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Romania, Slovakia and Slovenia.²⁸⁶ In 2018, this group accounted for only 0.32% of the total value of equity trading and 1% of the total number of shares traded in the EU-28. The number of shares traded in 2018 in each small financial centre was under 10bn, ranging from 480,000 in Slovakia to 3.5bn in Hungary.

While this classification is based on trading activity, a similar pattern can be seen when looking at the relationship between GDP per capita and the size of the equity market (in

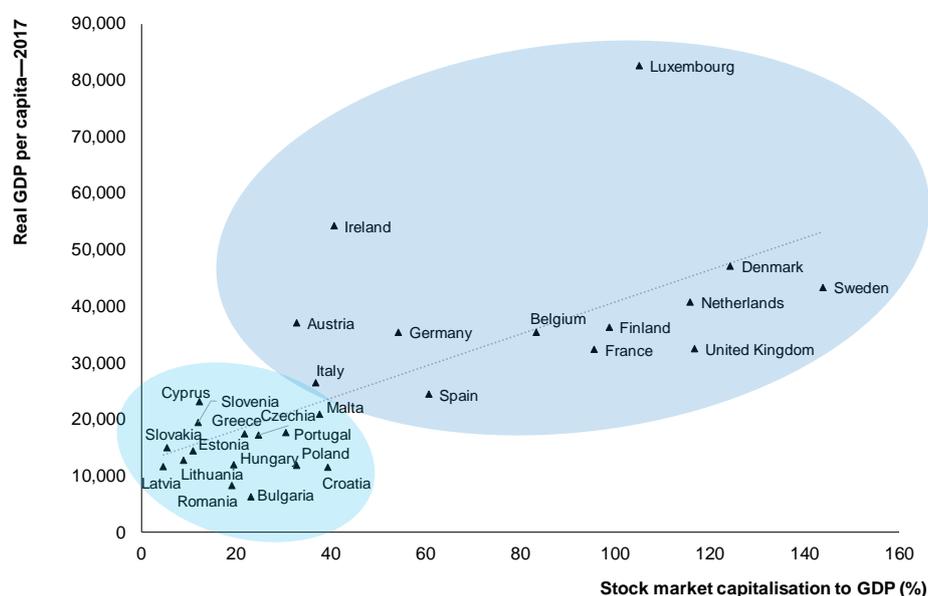
²⁸⁴ A 'large financial centre' is defined as a member state whose average annual value of equity trading between the 2013 and 2018 was above €500bn.

²⁸⁵ A 'mid-sized financial centre' is defined as a member state whose average annual value of equity trading between 2013 and 2018 was between €50bn and €500bn.

²⁸⁶ A 'small financial centre' is defined as a member state whose average annual value of equity trading was less than €50bn in 2018.

terms of market cap)—see Figure 10.4. The large and mid-sized financial centres (the darker blue area in the figure) have a high real GDP per capita and a larger equity market. Meanwhile the smaller financial centres (the lighter blue area in the figure) have a lower real GDP per capita and a smaller equity market.

Figure 10.4 Real GDP per capita and size of equity market, 2017



Note: Relationship between real GDP per capita and the size of equity market capitalisation as a percentage of GDP across EU member states.

Source: Oxera analysis of World Bank, Eurostat, Census and Economic Information Center.

Another noteworthy trend is the concentration of equity trading on a small number of venues, based in the large financial centres. In 2018, Euronext, Deutsche Börse Group and London Stock Exchange accounted for 70% of the total value of equity trading in the EU-28, as was shown in Table 2.1. Meanwhile, BME, Borsa Italiana, Deutsche Börse Group, Euronext, London Stock Exchange and Nasdaq Stockholm accounted for 93% of the total number of shares traded in the same period, as was shown in Table 2.2. This trend has been supported by the consolidation of a number of stock exchanges, mainly in Western Europe. On the other hand, the exchanges in Eastern and Central European countries generally remain independent (with the notable exception of Nasdaq Baltics).²⁸⁷

Furthermore, the trading platforms (including MTFs) that have successfully grown and developed to operate across borders typically cover securities domiciled in large financial centres in Western Europe, and not the majority of securities domiciled in smaller financial centres in Central and Eastern Europe.

Over the last decade, MTFs have emerged as strong competitors to the traditional stock exchanges, capturing significant market share. This has resulted in increased fragmentation of trading activity. While this is more prevalent in large financial centres, considerable variations exist across countries. (See Appendix A7 for more detail on the trends described here across the EU markets.)

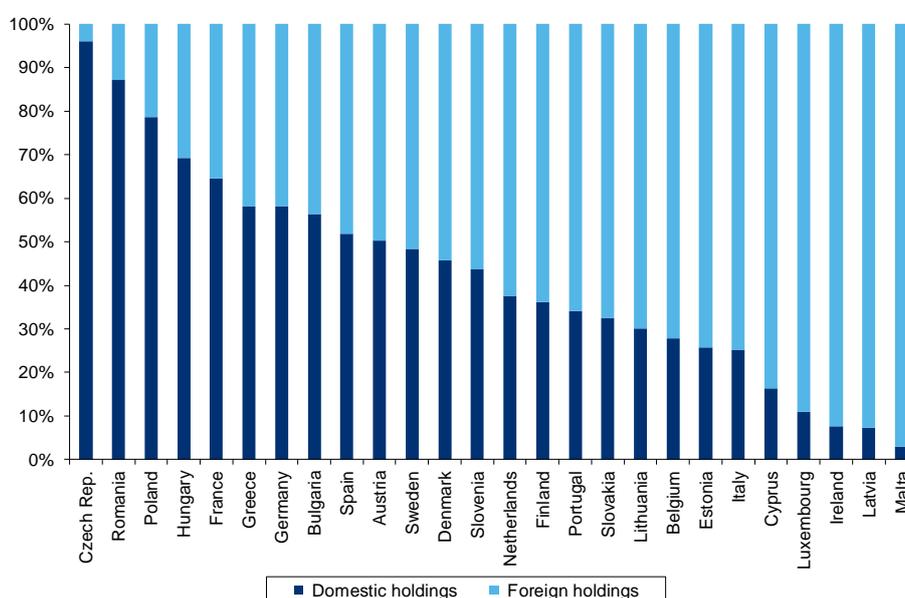
²⁸⁷ McAndrews, J. and Stefanidis, C. (2002), 'The consolidation of European stock exchanges', *Current Issues in Economics and Finance*, 8:6, June, <https://pdfs.semanticscholar.org/34a0/99d91799b899add99adde6ba2f2aacce76d.pdf>.

10.4 Cross-border trading

Where an investor from one country trades in equities domiciled (and potentially listed) in a different country, we define this as cross-border trading. The amount of cross-border trading in the EU has increased since 2013, but mostly in large financial centres.

As a proxy for cross-border trading, we analysed how the share of foreign investor holdings in stock markets varies across member states. At the aggregate EU-27 level, foreign holdings accounted for 59% of total equity investment in 2018, slightly up from 57% in 2013.²⁸⁸ However, the proportion of foreign holdings varies significantly across countries, as shown in Figure 10.5. In large financial centres foreign holdings make up between 35 and 65% of total equity investment. Over half of the total foreign equity holdings in the EU-27 are for investments in firms based in France, Germany, Ireland, Luxembourg and the Netherlands.

Figure 10.5 Domestic versus foreign holdings in the EU, 2018 (%)



Note: The data is for equity holdings only, and does not include Croatia and the UK.

Source: Oxera analysis of ECB and IMF data.

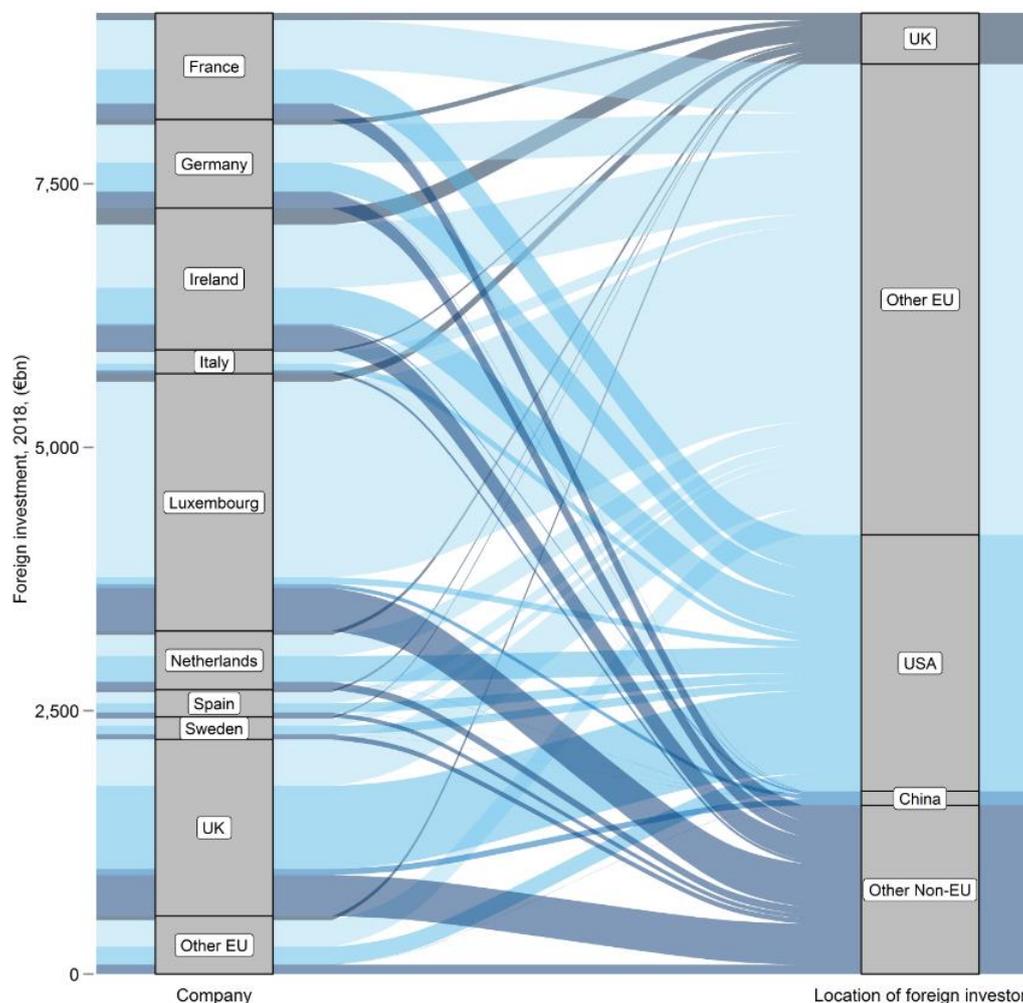
Most foreign investment is from other EU countries, as shown in Figure 10.6 below. Luxembourg stands out as attracting the highest amount of foreign investment, followed by other large financial centres (the UK, Ireland, France and Germany). The Netherlands also attracts a high amount of foreign investment, while it is relatively low in Spain and Italy. On the investor side (the right-hand bars in Figure 10.6.), we see that 'other EU-27 member states' is the largest source of foreign investment for member states in the EU (accounting for over half of total foreign investment), followed by the USA. Investment from Chinese stakeholders in equity markets in the EU is relatively limited.

As shown in Figure 10.6, the UK attracts a substantially higher amount of investment from US companies than other EU countries do (47%). The Netherlands also receives a high proportion of its foreign investments from US companies (44%). Other large financial centres (France, Germany and Ireland) have a significant proportion of their foreign investments from other EU-27 countries (between 43% and 46%). All the other European

²⁸⁸ Source: Oxera analysis of ECB and IMF data. Foreign holdings are defined as equity holdings from outside the country of reference. Each institutional unit is defined as foreign if its predominant economic interest is outside the country of reference. The UK is not included due to data unavailability.

countries receive foreign investment mainly from other EU-27 countries (46%) and from the USA (30%). Investment from the rest of the world (i.e. all other countries except the EU, China and USA) represents on average 20% of foreign investment in the EU-27 countries.

Figure 10.6 Location of foreign equity investors in the EU, 2018 (€bn)



Note: The left-hand side shows the domicile of the company whose stocks are held by foreign investors; the right-hand side shows the location of the foreign investors. The height of the boxes and the width of the flow arrows are scaled to the size of the investment.

Source: Oxera analysis of IMF data on securities statistics.

Another important observation is the limited amount of cross-border trading in Central and Eastern Europe (and foreign investment for stocks based in this region).

In Western Europe the growth in cross-border trading has been supported by consolidation of some exchanges and the growth of alternative trading platforms, such as MTFs. The value of equity trading on MTFs increased from around €2,400bn in 2013 to €4,600bn in 2018, and the share of total equity trading taking place on MTFs increased from 18% in 2013 to 23% in 2018.²⁸⁹ As MTFs facilitate trading on a wide range of securities, and without the need to be listed on the venue, their growth supports cross-border trading.

²⁸⁹ Based on Oxera analysis of Refinitiv Market Share Reporter data.

With the exception of Nasdaq Baltics, equity trading in Central and Eastern Europe has remained independent, with no access to trading on MTFs.²⁹⁰ Cyprus and Malta are two exceptions, since their stocks are traded at a high number of MTFs. In contrast, stocks domiciled in Western Europe are traded across many trading venues in the EU.

10.5 Investor base

In this section we examine the investor base split into the following categories:

- institutional investors: insurance and pension funds, monetary financial institutions, non-financial institutions, and other financial institutions;
- retail investors: proxied by households and non-profit institutions serving households;
- general government.

The empirical analysis presented here, based on data from the IMF and Eurostat, focuses on 26 member states (see Appendix A1 for a detailed explanation of the data sources used).²⁹¹ The UK and Croatia are excluded due to data availability.

Institutional investors

Institutional investors hold 69% of the shares of (listed and unlisted) firms across the 26 member states. Insurers and pension funds account for 24% of total holdings, while other institutions hold 45%.²⁹²

The share of institutional investor holdings is slightly higher in large and medium-sized financial centres: on average 72%, compared to 61% in small financial centres.²⁹³

In all member states analysed, insurers, pension funds, and financial corporations other than monetary financial institutions are the main categories of institutional investor, accounting for more than 50% of the total institutional investor holdings, with the only exception being Malta, where insurance corporations, pension funds, and financial corporations other than monetary financial institutions account for 35% of institutional investors' holdings.²⁹⁴

Insights from interviews with market participants suggest that mandates for insurance corporation and pension funds not allowing investment in equity may explain the lower share of institutional investor in small financial centres (see section 13.3). More specifically, legislative capital requirements (including Solvency II and other legal requirements imposed by member states) or accounting rules may drive them away from equities in favour of other investments (including sovereign bonds). The equity exposure depends on the development of a pension fund's solvency position (funding ratio) and solvency requirements. The ability of pension funds to invest in equity also depends on the supervisors' decision on solvency margins and/or the need for ex ante approval to change the risk profile of the investment portfolio.²⁹⁵

²⁹⁰ Appendix A7 provides more detail on these trends.

²⁹¹ Based on European Commission (2010), 'European System of Accounts – ESA 2010', p. 132, <https://ec.europa.eu/eurostat/documents/3859598/5925693/KS-02-13-269-EN.PDF/44cd9d01-bc64-40e5-bd40-d17df0c69334>; and International Monetary Fund (2015), 'Handbook of securities statistics', pp. 72–74, <https://www.imf.org/external/np/sta/wgsd/pdf/hss.pdf>.

²⁹² Oxera analysis of IMF and Eurostat data. See Appendix A1.4.

²⁹³ Ibid.

²⁹⁴ Ibid.

²⁹⁵ PensionsEurope (2018), 'Pension Funds Statistics and Trends 2018', <https://www.pensionseurope.eu/system/files/PensionsEurope%20Pension%20Funds%20Statistics%20and%20Trends%202018.pdf>.

The Commission's study on the drivers of investments in equity by insurers and pension funds find that insurers' investments in public equity have dropped significantly over the last 20 years, from 11,5% of total investments (excluding UK) in 1999 to 3,3% after the financial crisis, and have not fully recovered to their pre-crisis levels.

Similarly, in the pension fund sector, the EU share of equity in total investments was considerably higher (at 50%) before the global financial crisis than it is today.²⁹⁶ At the same time, in many countries, the share of pension funds' investments in equities has increased in recent decades, with the main drivers being low interest rates, a search for yield, and risk diversification. However, according to PensionsEurope's 2018 survey, pension funds do not in general aim to make significant changes to the share of their investments in public equities in the upcoming year.²⁹⁷

Retail investment

Retail investors account for 24% of total equity investment across the 26 member states. The share of retail investment at the EU-26 level has been fairly stable over time, at around 24–25% between 2013 and 2018.²⁹⁸

The share of retail investor holdings is typically less than 30% in the member states analysed. The participation of retail investors is particularly low in small financial centres, mainly due to cultural reasons: a relatively low level of financial literacy and a general distrust of capital markets among retail investors and the general public (section 13.3.4 for a more detailed analysis). The exceptions are some small financial centres (Czech Republic, Greece, Hungary, Malta, Romania and Slovakia) and some larger financial centres (Belgium, Italy and Spain), where the share of retail investment is slightly higher (between 33% and 52%).²⁹⁹ See Figure 10.7 below.

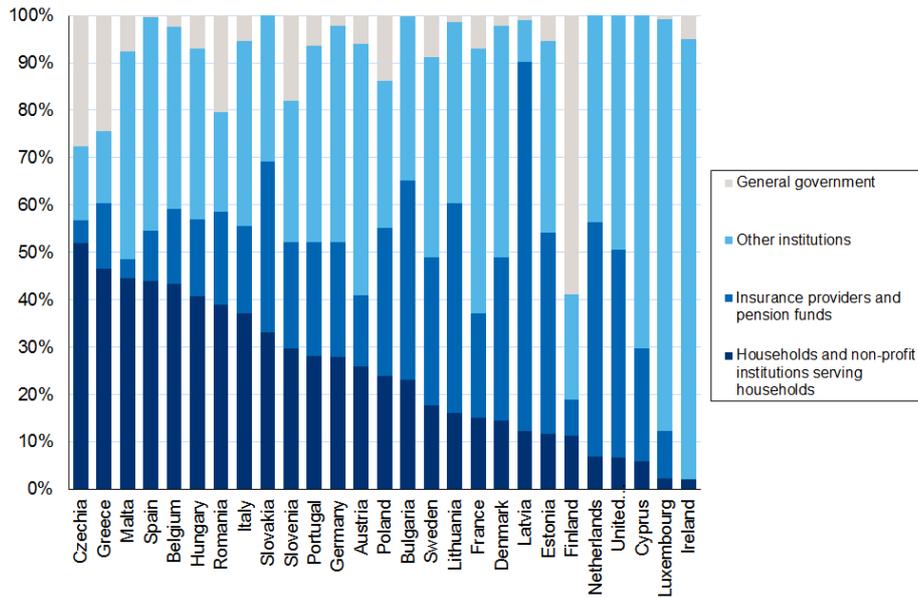
²⁹⁶ European Commission (2019), 'Study on the drivers of investments in equity by insurers and pension funds', December, https://ec.europa.eu/info/sites/info/files/business_economy_euro/growth_and_investment/documents/191216-insurers-pension-funds-investments-in-equity_en_5.pdf.

²⁹⁷ PensionsEurope (2018), 'PensionsEurope survey report on drivers of equity investments by pension funds', September, https://www.pensionseurope.eu/system/files/PE%20survey%20report%20on%20drivers%20of%20equity%20investments%20by%20pension%20funds%20-%20September%202018%20-%20FINAL_1.pdf.

²⁹⁸ Ibid.

²⁹⁹ Ibid.

Figure 10.7 Investor base in equity markets, by country of domicile of the company, 2018 (%)

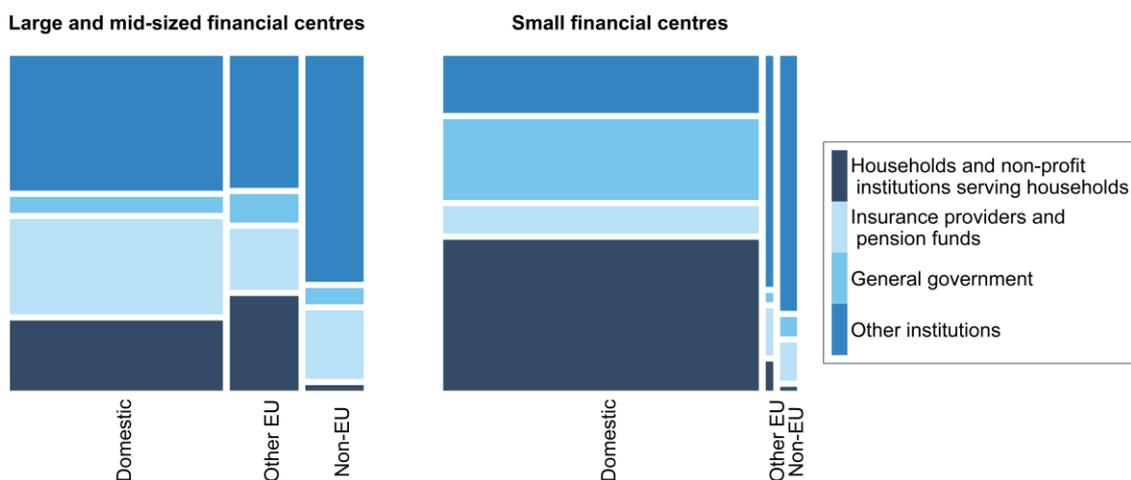


Note: 'Other institutions': monetary financial, non-financial and other financial institutions.

Source: Oxera analysis of IMF and ECB data.

Figure 10.8 gives a breakdown of the investor base country and type of investor. Small financial centres (shown on the right-hand side) are in general characterised by a low level of domestic institutional investment compared with large and mid-sized financial centres (left-hand side), at 52% and 78% respectively. As a result, retail and government investment play a bigger role within the domestic sources of equity investment for small financial centres. General government accounts for 26% among domestic investors in smaller financial centres, while it accounts for 5% of domestic investment in larger financial centres.

Figure 10.8 Investor base in equity markets, by size of financial centre, 2018



Note: The left-hand panel shows the aggregate picture for large and mid-sized financial centres. The right-hand panel shows the investor base for all small financial centres.

Source: Oxera analysis of ECB and IMF data.

When looking at foreign equity investment, the picture is the opposite: in large and mid-sized financial centres, retail investors account for around 30% of total investment from other EU-26 countries.

Moreover, insurers and pension funds are a major component of domestic investment in large and mid-sized financial centres, accounting for 30%, while they account for only 9% in smaller financial centres. One explanation is the small size of insurance corporations and pension funds in these markets. Small financial centres, such as Bulgaria, Croatia and Romania, have fewer than 25 pension funds, with total assets held below €15bn in 2017.³⁰⁰ Large financial centres, on the other hand, generally have more than 100 pension funds, with France and Ireland having more than 20,000. In 2017, the total assets held by pension funds in large financial centres remained above €15bn.³⁰¹ Market participants highlight that the low share held in small financial centres is due to the existence of mandates for insurance corporation and pension funds that do not allow investment in equity, which are likely to come from the legislative capital requirements and/or accounting rules applicable to these funds. One policy consideration is to remove this restriction in insurance and pension fund mandates to allow more participation from institutional investors in small financial centres. (See section 14 for our discussion on policy recommendations.)

10.6 Summary, key insights and policy considerations

This section set out the overall picture of trading activities in EU equity markets and highlighted several areas to explore further in the subsequent sections.

Four key insights have been identified.

- Trading activities have remained relatively stable over the past few years and alternative trading venues have gained popularity among market participants, depending on their trading needs. However, these positive developments have occurred mostly in large financial centres, and have been rather limited in small financial centres.
- The trend in consolidation among trading venues that brings in the benefits from network effects has occurred mainly across large financial centres in Western Europe. The markets in Central and Eastern Europe are based mostly on separate independent national infrastructures (with the exception of Nasdaq Baltics).
- Most EU markets exhibit a significant level of home bias, with domestic holdings ranging from 30% to 96% of total equity holdings. While a large part of foreign holdings in most EU markets comes from other EU countries, there is a considerable difference between large and small financial centres in their levels of foreign holdings as a proportion of total holdings. In particular, smaller financial centres generally have a low level of foreign holdings. Market participants suggested that the limited foreign exposure is due to the lack of local market knowledge and relatively low liquidity provision in small financial centres. Other factors identified as contributing to this are the lack of possibilities of development and foreign exposure for local companies and the higher level of perceived riskiness of frontier markets.
- When examining the investor base more closely, it can be seen that the level of investment from domestic insurers and pension funds is substantially lower in small compared to large financial centres. One policy consideration to encourage the overall level of participation from insurance and pension funds across all EU markets is to require investment decision-makers to explain the value for money of their decisions,

³⁰⁰ PensionsEurope (2018), 'Pension Funds Statistics and Trends 2018', <https://www.pensionseurope.eu/system/files/PensionsEurope%20Pension%20Funds%20Statistics%20and%20Trends%202018.pdf>.

³⁰¹ Ibid.

so as to justify why they are not reaping higher than bond returns, in this case available at low cost through passive investment mechanisms.

More specifically for small financial centres, it is also important to promote the development of private pension and insurance provision in these local markets and review the restrictions on their ability to invest in equity. The support of DG ECFIN and SRSS could be enlisted to help encourage the development of these sectors as part of the Commission's broader work programme. Moreover, the Commission could promote the use of tax incentives by Member States to this effect.

In addition, the Commission's review of equity capital charges under Solvency II³⁰² will be important to understand the regulatory impact on the ability of private pension providers and insurers to invest in equity, and similar consideration might be given to bank capital standards. The Commission could also prompt member states to reconsider national restrictions on pension funds.

Overall, these factors indicate and contribute to the lower level of liquidity observed in stocks domiciled in small financial centres. As investors have access to a limited pool of liquidity, the cost of raising capital in public equity markets becomes higher for firms, leading to negative impacts on the real economy.

We discuss in more detail in section 14 the policy options to address these issues and to encourage further integration of local capital markets into the rest of the EU.

³⁰² EIOPA is to provide the Commission with technical advice in form of an Opinion in June 2020, for a comprehensive review of the Solvency II Directive, https://www.eiopa.europa.eu/browse/solvency-ii/2020-review-solvency-ii_en.

11 Choice and innovation in trading mechanisms

Key messages

- This section looks at the ways to trade in equity markets and assesses how competition at the trading level affects end users.
- The introduction of competition has led to lower trading fees, new service propositions and more choice for traders. However, these benefits have largely been felt in the large financial centres only; smaller financial centres are yet to see the full benefits of new entry.
- In 2007, the MiFID framework introduced competition in equity trading. Since then, alternative trading venues have emerged that compete with the regulated markets for order flow by tailoring trading mechanisms to the needs of different types of equity trader.³⁰³ In 2018, MiFID II introduced further rules, including revisions to the transparency regime, tick sizes, a cap on dark trading, and share trade obligations, all of which have affected the trading choices of market participants.
- The increased competitive pressure has resulted in lower trading fees, new service propositions tailored to the specific needs of traders and investors, and, overall, more choice for end users. Our analysis indicates the following.
 - Average broker commission rates across the EU fell from 14 basis points (bp) in 2009 to 6bp in 2019. Much of this reduction relates to the unbundling of trading and research fees in 2018. Following this rule change, fees decreased from 10bp to 7bp in one quarter alone. EU fees are still higher than in the USA, where commission rates fell from 11bp to around 3bp over the same period.
 - In the first half of 2019, 33% of equity trading (in terms of value traded) took place on a lit open-limit order book,³⁰⁴ 2% on a midpoint dark venue,³⁰⁵ 17% in systematic internalisers (SIs), 10% in conventional auctions (with high growth in closing auctions), and 1% in periodic auctions.³⁰⁶
- The benefits from competition have been felt mainly in the large and well-established financial centres. Smaller financial centres—such as those in Central and Eastern Europe—have not yet seen the benefits from new entry. For example, in 2018, trading on MTFs accounted for around 23% of equity trading in large and mid-sized financial centres compared to only around 5% in small financial centres.³⁰⁷ Furthermore, although the downward pressure on commission rates is observed across both large and small financial centres, the effect of the unbundling of trading and research fees is more observable in larger countries than smaller ones.
- Our empirical analysis indicates that fragmentation of order flow has not reduced market liquidity, as traders have access to the necessary technology to search for the best available option to execute their trade. This is consistent with the academic

³⁰³ Innovations in trading mechanisms and variations in their market design have emerged to accommodate investors' specific needs. The choice of trading mechanisms is inherently a function of the trading strategy, order size, speed of execution, and ex ante price impact, among other factors. Some investors favour speed of execution (the time taken to execute an order) over absolute price; others (e.g. those placing large orders) might prefer to minimise market impact costs at the expense of speed.

³⁰⁴ In this section, lit trading refers to trades generated by lit orders executed on an electronic open-limit order book, excluding trades executed during an auction period. This is the categorisation in the Refinitiv dataset that we use for our analysis here.

³⁰⁵ In this section, dark trading refers to trades executed under the Mid-Point Reference Price Waiver as defined in MiFID II. This is the categorisation in the Refinitiv dataset that we use for our analysis here.

³⁰⁶ At the time of writing, data for the second half of 2019 was not available.

³⁰⁷ Estimates based on Oxera's analysis of Refinitiv Market Share Reporter data.

literature on multi-homing and two-sided platforms. Nevertheless, it remains important to monitor closely these developments and the liquidity metrics (discussed in more detail in the next section), particularly in mid-sized and small financial centres.

- We advise that policymakers embrace the choice and innovation taking place in equity markets, while being mindful of protecting price formation and the overall share of trading on lit markets. Future policy action could aim to develop an ecosystem for trading in small and local financial centres, and encourage technological development in order to further lower the search costs for brokers that are multi-homing.

11.1 Introduction

This section gives an overview of the mechanisms for equity trading in the EU and assesses the impact of competition at the trading level on investors.

11.2 Regulatory context

Equity trading has evolved significantly over the past two decades, with regulatory reform and technological developments reshaping the market structure.

In 2007, MiFID I introduced greater competition among trading venues, allowing trades to be executed on venues other than the traditional regulated markets. More recently, in January 2018, MiFID II brought in regulatory changes that affected the functioning of secondary markets in Europe—see Table 11.1.

Table 11.1 Impact of MiFID II on equity trading

MiFID II: regulatory change	Practical implication
Pre- and post-trade transparency regime—increasing regulatory reporting	Despite the greater regulatory reporting requirements for other trading mechanisms (which is expected to increase the share of lit trading), the share of lit trading has exhibited a downward trend—from 40% before MiFID II to 35% in 2018, with a further decrease in the first half of 2019, to 33%.
DVCM—limiting the volume of certain transactions that can be executed on dark pools to 4% at the trading venue level and 8% for all EU trading venues	Trading on dark pools was relatively popular under MiFID I, but its market share decreased post-MiFID II, from 4.8% to around 2.5%.
Tick size regime—requiring all trading venues to price stocks in the same increments	Initially, SIs were exempted from this regime and from pre-trade transparency requirements above standard market size, both of which supported the rapid share increase of SIs. The exemption was removed in December 2018.
Share trading obligation—in effect prohibiting OTC trading via BCNs	Significant reduction in OTC trading reported through an Approved Publication Arrangement (APA), from an average of 35.7% to 16.4 %; and reduction of OTC trades reported to platforms, from 11.6% to 11.2%.
Share trading obligation—SIs included as one of the venues allowed, besides being exempted from the tick size regime initially, and from pre-trade transparency requirements above a standard market size (see above)	Trading in SIs sharply gained market share post-MiFID II, to around 24% of total turnover value.
Unbundling of trading and research fees	The average broker commission rate across all EU countries has decreased—following MiFID II, fees decreased from 10bp to 7bp in one quarter alone.

Note: Non-exhaustive list of regulatory changes associated with MiFID II. The practical implications may be affected by factors other than regulatory changes introduced under MiFID II.

Source: Oxera.

11.3 Trading mechanisms

Following the introduction of MiFID I in November 2007, alternative venues emerged using various trading mechanisms to compete for the order flow from the regulated markets.

Appendix A8 gives an overview of the differences between trading mechanisms based on: i) order types and order matching system; ii) pre- and post-trade transparency requirements; iii) the price determination process and contribution to price formation; iv) the speed of execution; and v) the type of interaction between market participants (i.e. multilateral versus bilateral trade).

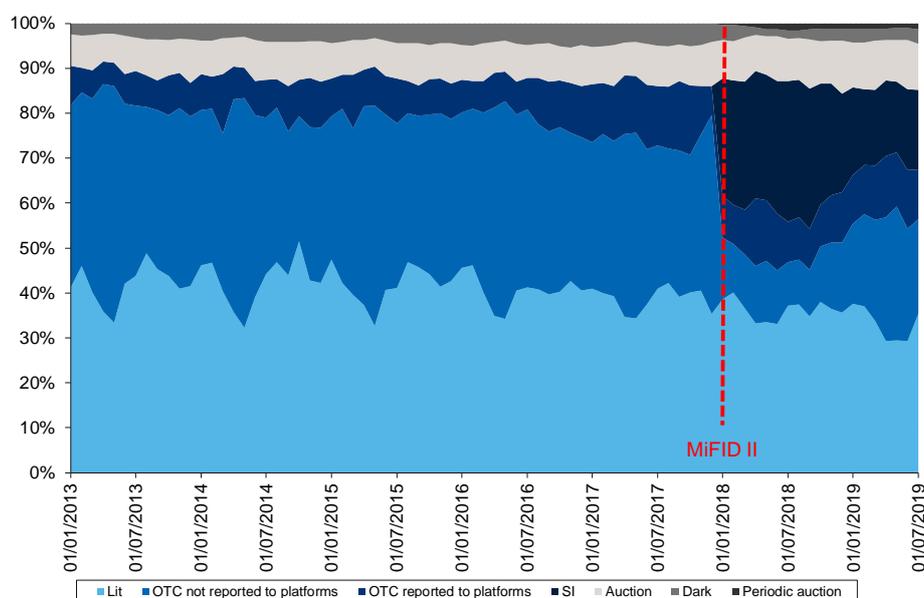
In this section, we discuss how the share of trading mechanisms has changed over time, explain their relevance for the overall dynamics of secondary markets by highlighting their advantages and disadvantages from the perspectives of different market participants, and present evidence on various factors that could explain the observed trends. In particular, we discuss lit and dark trading, OTCs, SIs, and auctions. Specifically, we analyse the growing market share of closing auctions that is evidenced by the clustering of liquidity at the end of the day, as well as periodic auctions.

The relative share of trading mechanisms has changed over time—see Figure 11.1 below.

Comparing the first half of 2013 with the first half of 2019 shows:³⁰⁸

- a decrease in the share of lit trading, from 40% to 33%;
- a decrease in the share of dark trading, from 3% to 2%;
- a rise in SIs, which gained a 17% market share in the first half of 2019;
- an increase in the market share of trading in auctions (more specifically closing auctions), from 7% to 10%, as well as periodic auctions, from 0% to 1%.

Figure 11.1 Distribution of equity trading in the EU by trading mechanism, 2013–19 (%)



Note: The concentration of trades across different mechanisms is measured at the EU-wide level as a weighted average of the monthly turnover. The turnover value at the aggregate EU level is the

³⁰⁸ Oxera analysis of Refinitiv Market Share Reporter data.

sum of monthly turnover values observed across the EU-28. The red dotted line denotes the introduction of MiFID II in January 2018.

Source: Oxera analysis of Refinitiv Market Share Reporter data.

Each trading mechanism has advantages and disadvantages from the perspectives of different market participants, and various factors could explain the trends set out above.

11.3.1 Lit trading

There has been a shift from lit trading to alternative trading types, as the latter offer several advantages over lit trading.

- First, lit markets bear high risks for investors who are not engaging in market-making practices. Lit trading presents a trade-off between immediate execution at the current price (market order) or waiting for a better price while accepting exposure to risks. For a trader who is not a market-maker (i.e. is not placing limit orders on both sides of the market), a limit order carries costs due to risks and uncertainty about future events.³⁰⁹
- Second, non-traditional trading mechanisms offer better conditions for large orders—i.e. orders of a size that cannot be filled immediately by the liquidity on any lit exchange, or for which the market impact cost would be very high because the order would have to walk the lit order book and receive worse prices than the best quotes.³¹⁰ In addition, since MiFID I, the level of pre- and post-trade transparency requirements in lit markets has been significantly higher, and remains so.

11.3.2 Dark trading

Trading in dark pools can be attractive because the pools are designed to reduce the market impact of large orders and to minimise the opportunities to front-run large orders. It can also be cost-efficient since all trades are executed at the mid-price—i.e. buyers or sellers do not pay the bid–ask spread. While dark trading protects investors from market impact, this is mainly relevant to large trades—it does not directly contribute to price formation.³¹¹ As prices in dark pools are not determined by internal demand and supply, but are based on external reference points derived from the primary lit exchanges (i.e. the dark pools use the price-formation process of lit markets), dark pools do not contribute to pre-trade price formation. Therefore, if the orders traded in dark pools might otherwise have been publicly displayed and contributed to price formation, the development of dark pools and use of dark orders could inhibit price discovery.³¹²

However, academic literature recognises an indirect effect that dark pools can have on price formation, deriving from the segmentation of informed traders (those seeking to profit by trading off private information) and uninformed traders (those motivated to trade

³⁰⁹ As this type of order waits in the order book, it is subject to pre-trade transparency rules that require the disclosure of the volumes available at various price levels. Consequently, these orders may be more susceptible to front-running or other similar predatory practices. Moreover, the execution of a limit order is not guaranteed, but instead depends on future incoming orders and price movements. While favourable price movements may allow traders who placed a limit order to obtain a better price than they would have if they had placed a market order, adverse price movements might cost them the opportunity to trade.

³¹⁰ A large order would have to walk the order book because of short-term imbalances in demand and supply. A large trade posted to a lit order book is associated with temporary price impacts that can happen because a large buy (sell) order placed at once will lift (hit) most of the currently resting sell (buy) orders, causing a liquidity imbalance and leading to a less favourable final execution price.

³¹¹ See, for example, Petrescu, M. and Wedow, M. (2017), 'Dark pools in European equity markets: emergence, competition and implications', European Central Bank Occasional Paper Series No. 193., Tables B1 and B2; and Sun, Y., Ibikunle, G. and Mare, D. (2017), 'Light versus Dark: Commonality in Lit and Dark liquidity', Conference Paper and Presentation at 4th Young Finance Scholar Conference, 12–13 June, University of Sussex.

³¹² By removing order flow from lit venues, dark pools reduce the information contained in lit order books where prices are formed; prices can only react to trades conducted 'in the dark' after the trades are executed.

by a need to rebalance portfolios and smooth their consumption streams over time).³¹³ A certain amount of dark trading could help price formation, to the extent that it can reduce the pricing errors of uninformed traders on lit markets through the self-selection of informed traders on lit markets and uninformed traders in dark markets.

Since MiFID II, dark trading has seen a reduction in market share, from 4.8% to around 2.5%.³¹⁴ This reduction can be attributed to the DVCM introduced in MiFID II, since this regulatory requirement sought to limit trading on dark pools and return some dark volumes to lit venues.

11.3.3 OTC trading

OTC trading was particularly popular under MiFID I rules. Investment banks operated BCNs that match the orders of clients internally with those of other clients, or with in-house orders of the investment bank itself.³¹⁵ BCNs were attractive because they were not subject to pre-trade transparency requirements and could provide price improvements because they did not have to comply with the standard tick sizes adopted by regulated markets and MTFs.

MiFID II introduced the share trading obligation, which in effect prohibited OTC trading via BCNs, predominantly leading to a reduction in OTC trading reported through an APA.³¹⁶ Moreover, MiFID II share trading provision has resulted in a reduction in OTC trades reported to platforms, albeit this reduction is less significant than the other category.³¹⁷ (See Appendix A8.1 for a further explanation of these OTC categories.)

11.3.4 Systematic internalisers

Prior to MiFID II, SIs were not very common, as established trading through BCNs and dark pools offered similar benefits, such as potential price improvements, while being subject to limited transparency requirements.³¹⁸ To some extent, SIs offer price

³¹³ For example, Comerton-Forde and Putniņš (2015) find that dark trades tend to be less informed than trades on the lit market, with low levels of dark trading potentially beneficial for price formation. See Comerton-Forde, C. and Putniņš, T.J. (2015), 'Dark trading and price discovery', *Journal of Financial Economics*, **118**. This segmentation is also noted in a European context by Brugler (2015) and Degryse et al. (2015). See Brugler, J. (2015), 'Into the light: Dark pool trading and intraday market quality on the primary exchange', Bank of England Working Paper No. 545; and Degryse, H., De Jong, F. and van Kervel, V. (2015), 'The Impact of Dark Trading and Visible Fragmentation on Market Quality', *Review of Finance*, **19**:4, pp. 1587–1622. Zhu (2014) presents a model in which the presence of a dark pool causes the market to become split between informed and uninformed traders. Informed traders are attracted to the lit venue, where they can achieve more certain execution. Conversely, uninformed traders opt to trade in the dark pool, where they can trade at lower cost. A concentration of informed traders on the lit venue will improve price formation, but will increase both adverse selection costs and spreads. See Zhu, H. (2014), 'Do dark pools harm price discovery?', *Review of Financial Studies*, **27**:3.

³¹⁴ For the purpose of this study, as reported in the Reuters Market Share Reporter dataset, dark trading refers only to trades executed under the Mid-Point Reference Price Waiver, as defined in MiFID II. The change in market share post-MiFID II for each trading mechanism is estimated by comparing the average post-MiFID II (from January 2018 to July 2019) with the corresponding average market share observed across a comparable period prior to the implementation of MiFID II (June 2016 to December 2017).

³¹⁵ Under MiFID I, which was in force until 3 January 2018, brokers used the structure of the BCN to have clients interact with their principal liquidity on an OTC basis, and there was no requirement to become an SI, an MTF or an OTF.

³¹⁶ Since the introduction of MiFID II, the market share of OTC trades reported through an APA has decreased significantly, from an average of 35.7% to 16.4%. Source: Oxera analysis based on Refinitiv Market Share Reporter data.

³¹⁷ Since the introduction of MiFID II, the market share of OTC trades reported under the rules of an exchange has reduced from 11.6% to 11.2%. The estimates are based on Oxera's analysis of Refinitiv Market Share Reporter data.

³¹⁸ BCNs provided price improvements as they did not have to comply with the standard tick sizes adopted by regulated markets and MTFs. Dark pools could provide a potential price improvement—offering a better price than that available on a lit venue—as they often execute trades at the mid-price.

improvement benefits, as SI quotes should reflect 'prevailing market conditions',³¹⁹ while referring to the most relevant market in terms of liquidity. This implies that SIs are potentially able to offer better pricing than transparent liquidity providers active on the lit book,³²⁰ resulting in lower explicit transaction costs to the buy side and other clients. Two different types of SI operators have emerged: electronic liquidity providers, and SI trading executed by investment banks (see Appendix A8.2 for further details).

Following the introduction of MiFID II, the overall trading in SIs sharply gained market share, to around 24% of total turnover value.³²¹ One explanation for this is that the 'share trading obligation' in MiFID II includes SIs as one of the venues allowed. In addition, SIs were exempted from the tick size regime initially,³²² and from pre-trade transparency requirements above standard market size, both of which supported the rapid increase in the share of SIs.

11.3.5 Auctions (excluding periodic auctions)

For the purpose of this study, auctions are split into two categories:

- conventional auctions—undefined auctions, scheduled opening auctions, scheduled closing auctions, scheduled intraday auctions, and unscheduled auctions;
- periodic auctions—a relatively new trading type that emerged after the introduction of MiFID II.

Since the introduction of MiFID II, the market share of conventional auctions (including both primary exchanges and MTFs) has increased slightly, from 8.4% to 9.7% of total trading.³²³ This seems to be driven mainly by the increasing popularity of closing auctions since MiFID II.³²⁴

Closing auctions

³¹⁹ Reflecting prevailing market conditions means that SI quotes should, at the time of publication, be close in price to quotes of equivalent sizes for the same financial instrument in the reference market. SIs may update their quotes at any time provided that the quote is consistent with their intention to trade with clients. SIs are allowed to choose the size(s) at which they wish to quote, provided the quote size falls between 10% and 100% of standard market size. (The standard market size should be based on the average value of transactions of a particular financial instrument.) SIs are allowed to offer prices better than the published quotes to their clients in 'justified cases', provided that the improved price falls within a public range close to market conditions.

³²⁰ ESMA's view is that price improvements are justified only where they are meaningful and reflect the minimum tick size. See European Union Emissions Trading Scheme (2018), 'MiFID II tick-size regime'.

³²¹ Since the introduction of MiFID II, the average market share of European SI trading, based on total monthly turnover values from January 2018 to July 2019, has been 24%. The estimates are based on Oxera's analysis of Refinitiv Market Share Reporter data. The market share of SI trading represents a negligible share of total turnover traded at the EU-wide level prior to MiFID II. Many banks and brokers chose not to register as an SI, but instead executed client orders off venue through BCNs, which were not regulated as trading venues under MiFID I and did not provide for transparency and open price formation.

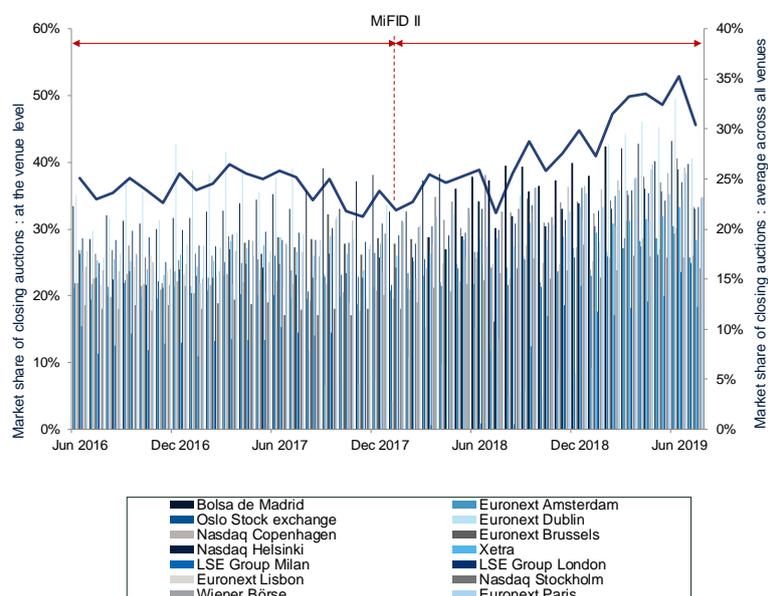
³²² The initial capacity of SIs to improve prices without being subjected to tick sizes meant that they were able to offer their clients price improvements. In conjunction with the best-execution requirements, this meant that SIs were highly likely to capture significant trading flows in the post-MiFID II market structure. The initial exemption from the tick size regime was further amended in December 2018, when ESMA published its final report: European Securities and Markets Authority (2018), 'Final report. Amendment to Commission Delegated Regulation (EU) 2017/588 (RTS 11)'.

³²³ This analysis is based on data from the Refinitiv Market Share Reporter. This data refers to auction trading in both primary exchanges and MTFs. In this dataset, the 'auction' category refers to 'Trades executed during an auction period operated by electronic open limit order book e.g. open/close/volatility/scheduled, auctions used to set the opening pricing level for subsequent periods of continuous trading or to create the closing price'.

³²⁴ Referring to a representative sample of European primary exchanges, the average market share in closing auctions increased from 24% before MiFID II to 28% after its introduction. Data on closing auctions is taken from Cboe.

Figure 11.2 below shows the market share of closing auctions (on the basis of turnover value) reported by primary exchanges, where there has been considerable growth over the past three years.³²⁵

Figure 11.2 Growing market share of closing auctions reported at primary exchanges, 2013–19 (%)



Note: Evolution of the market share of closing auctions for a representative sample of main European trading venues. The aggregate European trend is based on the volume-weighted average of the market share of closing auctions in the venues included in this chart. The y axis on the left-hand side represents the market share of closing auctions at the venue level for individual European primary exchanges, and the y axis on the right-hand side represents the average market share of closing auctions across all venues.

Source: Oxera analysis of Cboe data. Cboe explicitly breaks down the auctions category into opening, closing, and unscheduled.

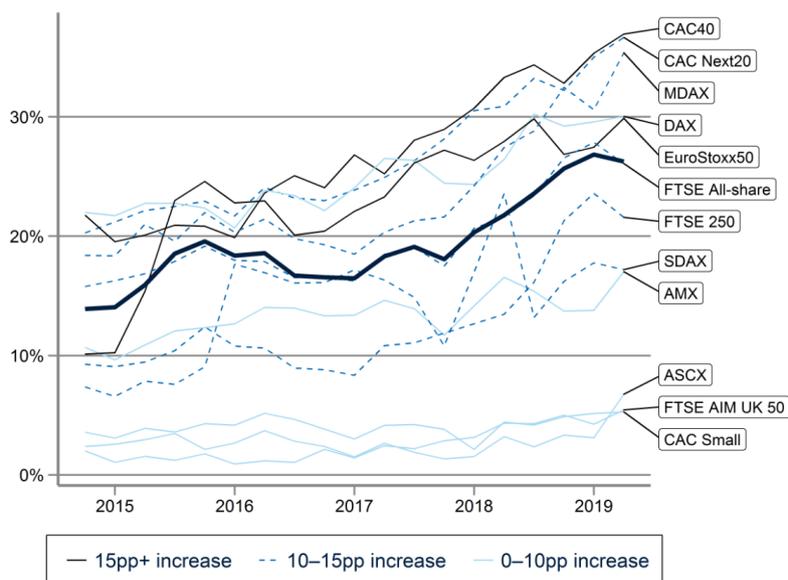
High growth in closing auctions is also observed when using index-level analysis, mostly in large financial centres and in large cap stocks. For example, trading in closing auctions for the French index, CAC 40,³²⁶ increased by 16.2% over the four-year period from 2015 to 2019—from 20.3% in the first half of 2015 to 37.0% in the first half of 2019 (see Figure 11.3 below). This is in comparison to trading in closing auctions for the CAC Small index,³²⁷ which increased by 11.1%, from 3.5% to 5.4% over the same period.

³²⁵ Trading in closing auctions across main European primary exchanges increased at a CAGR of 6.7% over the three-year period from 2016 to 2019, shifting from a market share of 25.1% in June 2016 to 30.5% in July 2019.

³²⁶ The CAC 40 is a benchmark French stock market index representing a capitalisation-weighted measure of the 40 most significant stocks among the 100 largest market caps on Euronext Paris.

³²⁷ The CAC Small (formerly the CAC Small 90) is a stock market index used by the Paris Stock Exchange. It is a small-cap index representing all the main-market French equities not included in the CAC 40, the CAC Next 20 or the CAC Mid 60.

Figure 11.3 Market share of closing auctions for top indices in the EU, 2015–19 (%)

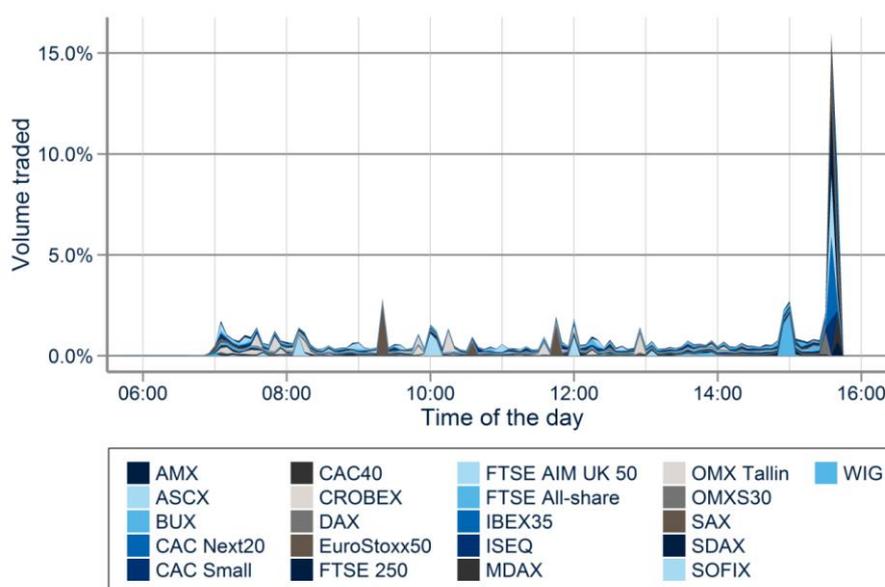


Note: pp, percentage points. The increase in market share for a given index is calculated based on the difference in annual average share of closing auctions in 2015 and 2018. The market share of closing auctions is estimated as the ratio between volume traded at the close and the total volume traded across all trading mechanisms for each stock in the index.

Source: Oxera analysis of Cboe data.

Intraday trading volume data tells a similar story (see Figure 11.4 below). In ten out of 21 indices studied, over 20% of the total volume is traded during the last 15 minutes of trading on a typical trading day.

There is a trade-off between having more liquidity, and thus more efficient price discovery, in continuous trading and in closing auctions. The growing concentration of volumes at the end of the day at the expense of the intraday session could undermine the price-formation process and increase intraday volatility. In addition, trading at the close may increase market exposure to potential operational incidents or infrastructure malfunctions. We discuss this trend in section 11.3.6, along with other developments in these alternative trading mechanisms, and potential policy implications.

Figure 11.4 Intra-day volume traded, 22 May 2019 (%)

Note: Trading of stocks within selected indices on a typical trading day (Wednesday 22 May 2019). Trading volumes for each index on that day add up to 100%.

Source: Oxera analysis of Refinitiv data.

The attractiveness of closing auctions is partly driven by the rise of passive fund management,³²⁸ for which rebalancing of an investment portfolio is generally done at the net asset value at the end of the day.³²⁹ Passive investors are inclined to use closing auctions as they usually provide settlement and benchmark prices used to evaluate portfolios. Stakeholders have highlighted that these auctions represent a point where liquidity accumulates and a diversity of trading participants interacts, thereby ensuring that the closing price is as representative of ongoing trading interests as possible.³³⁰

In addition, low-cost ETFs (designed to track the performance of an index or benchmark) and the prices on which passive investors rely to benchmark their performance are set in closing auctions.

Closing auctions also provide relatively low cost for liquidity at the close.³³¹ They allow investors to benefit from the centralised liquidity over a short timeframe and to avoid the potentially adverse price impact from transacting block trades during the day. They also simplify required reporting, given the additional best-execution requirements from MiFID II.

Moreover, closing prices have traditionally been tied to either the price of the last trade during the continuous trading session or a volume-weighted average price of the last

³²⁸ Passive investment strategies in Europe have increased to around €1tn in assets. In addition, the ETF sector in Europe could hit €2tn of assets by 2024, from €760bn in March 2020. See Eckett, T. (2019), 'European ETF assets to hit €2tn by 2024', *Morningstar*, May.

³²⁹ See Autorité des marchés financiers (2019), 'Growing importance of the closing auction in share trading volumes', October, https://www.amf-france.org/en_US/Publications/Lettres-et-cahiers/Risques-et-tendances/Archives?docId=workspace%3A%2F%2FSpacesStore%2Fa16f34e9-6cae-4bd3-adc6-0fb96a559b9e.

³³⁰ Response of FESE to European Securities and Markets Authority (2018), 'Call for Evidence on Periodic Auctions', November.

³³¹ Mason, J. (2019), 'Last orders: Rise of closing auctions stirs worries in European stock markets', Reuters, <https://uk.reuters.com/article/uk-europe-stocks/last-orders-rise-of-closing-auctions-stirs-worries-in-european-stock-markets-idUKKCN1V70MA>.

trades prior to the close. However, concerns about the ability of last-trade mechanisms to generate closing prices that are efficient and resilient to manipulation attempts (potentially from HFTs, who have technological advantages over other investors, including passive investors) have led many exchanges to replace them in favour of closing auctions.

The possibility to trade at close has traditionally been a premise of primary exchanges. However, a trend towards increased competition in the provision of closing auctions has recently been observed. New entrants are offering trading in closing auctions at lower fees,³³² as opposed to primary exchanges that often charge higher fees to transact in closing auctions compared with the transaction fees in the intraday markets.³³³

Periodic auctions

Trading in periodic auctions has also emerged since the introduction of MiFID II. Despite the limited market share of periodic auctions (around 1% in turnover value),³³⁴ they have seen a significant increase since MiFID II. Limited pre-trade transparency in periodic auctions (compared to lit trading) is attractive to market participants who are concerned about market impact and who previously traded in dark venues but have been forced by the DVCM to change their trading patterns. The limited pre-trade transparency due mainly to the very short auction duration also allows for trades to limit the market impact and information leakage.

In addition, trades in periodic auctions are executed at the midpoint, with low price impact and internalisation capabilities attracting a market segment that previously executed on BCNs. Moreover, speed and latency are not as important here as in lit trading because there is no comparative advantage to participants with faster trading technologies.

11.3.6 Policy implications of innovation in trading mechanisms

This section discusses the potential implications of alternative trading mechanisms on market functioning in equity markets and the key takeaways for policymakers. Over time, financial markets have evolved to provide better solutions to accommodate the specific needs of different investors. The choice of trading mechanisms is inherently a function of the trading strategy, order size, speed of execution, and ex ante price impact, among other factors.

Academic research has reported mixed findings on the effects of these new innovations in trading mechanisms on liquidity. For instance, several studies conclude that dark trading has a negative impact on lit liquidity, showing that high levels of dark trading harm informational efficiency and price discovery.³³⁵ Other empirical studies find no detrimental effect associated with dark trading, and even a positive impact on liquidity. This is mostly because dark pools facilitate trades that otherwise might not easily have occurred in lit venues when the limit order queue builds up.³³⁶ Overall, the market microstructure

³³² For instance, CBOE states that it will only start charging customers at the end of the year to use its 3C product, while Aquis charges a fixed £10,000 subscription. See Mason, J. (2019), 'Corrected – Last orders: rise of closing auctions stirs worries in European stock markets', *Reuters*, August.

³³³ Each exchange has a different fee structure, so it is difficult to estimate the exact premium.

³³⁴ Estimates based on Oxera's analysis of Refinitiv Market Share Reporter data.

³³⁵ See Degryse, H., De Jong, F. and Van Kervel, V. (2014), 'The impact of dark trading and visible fragmentation on market quality', *European Banking Center Discussion Paper*, No. 2011-016, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1816434; Comerton-Forde, C. and Putniņš, T.J. (2015), 'Dark trading and price discovery', *Journal of Financial Economics*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2183392.

³³⁶ See He, W.P. and Lepone, A. (2014), 'Determinants of liquidity and execution probability in exchange operated dark pool: evidence from the Australian Securities Exchange', *Pacific Finance Journal*, **30C**, pp. 1–16; Gresse, C. (2017), 'Effects of lit and dark market fragmentation liquidity', *Journal of Financial Markets*, February, **35**, pp.1–20.

Regulators have also conducted studies on dark liquidity. The UK FCA found dark trading not to be harmful to market quality in the aggregate UK equity market until the level of dark trading crosses a certain threshold.

literature and market regulators recognise that there is a limit to the amount of dark trading that can occur in a market before price formation and liquidity are impaired. We discuss the general impacts of fragmentation on liquidity in more detail in section 12.3.

Dark trading caters to very large trades where traders are particularly concerned about market impact and risks of front-running.³³⁷ Traders of large-sized orders seek trading solutions that minimise their explicit and implicit costs, including price impact (to help them deliver best execution for their clients). Their first preference from a cost of trading perspective is to look for a counterparty to their trade on a venue that offers a midpoint solution (e.g. dark pools). In that case, the cost of trading would be limited to a trading venue fee. Between 2015 and 2018, the order size transacted across European dark pools was on average 11.8 times higher than that traded across European lit venues (see Figure 11.5 below).³³⁸ Moreover, over the same period, the average order size across lit venues decreased by 18.8%, as opposed to the 145% increase observed across dark pools.³³⁹ The substantial growth of large-sized orders in dark pools may be a consequence of the DVCM, which has potentially resulted in a shift towards trades that are large enough to benefit from the large-in-scale waiver.

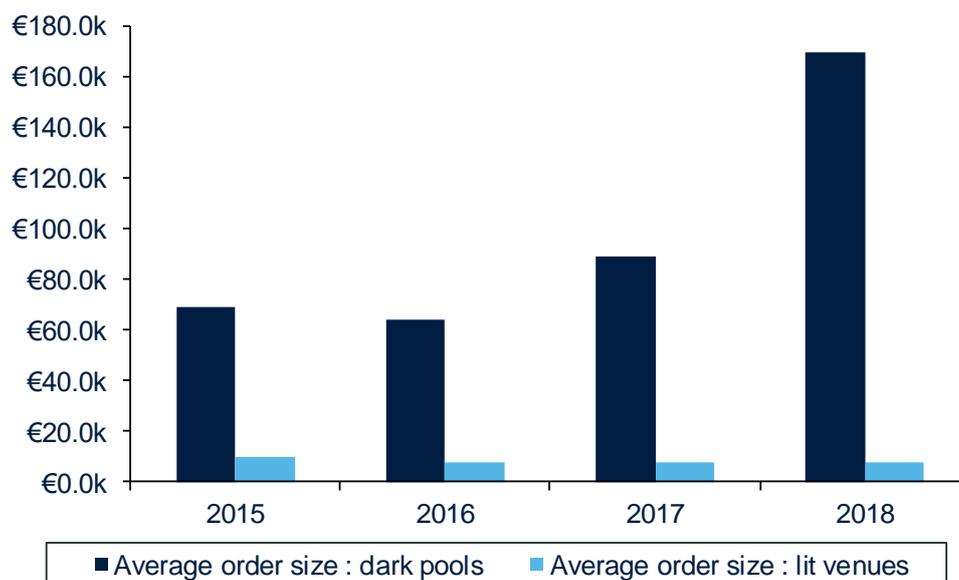
See Financial Conduct Authority (2017), 'Aggregate market quality – Implications of dark trading'. In a review of dark liquidity in its securities market, the Australian Securities and Investments Commission found that growth in dark trading (below block size) led to a widening of bid–offer spreads on lit exchange markets for a number of securities. See Australian Securities and Investments Commission (2013), 'Dark liquidity and high-frequency trading', ASIC Report 331. There is also evidence that the quality of price formation has been adversely affected in securities with high levels of dark trading below block size. Most dark liquidity is priced by reference to prices on the exchange markets. As liquidity is shifting away from lit exchange markets, there is less demand (fewer lit orders), which can widen bid–ask spreads.

³³⁷ See Garvey, R., Huang, T. and Wu, F. (2016), 'Why do traders choose dark markets?', *Journal of Banking and Finance*, **68**, pp. 12–28. In a dark pool, large volume orders that cannot be matched sit in the order book until the end of the trading day with no information made public about the depth of trading interest. It is more difficult for algorithms to detect these trades because they cannot use other information in the order book for inference. Consequently, a main benefit of trading via a dark pool is the ability to execute (larger) orders without disclosing trading intent, and thus avoid information leakage that could cut into trading profits if fast algorithms were able to ascertain and trade against the direction of order flow. Traders are likely to prefer dark pools to placing a limit order in a lit venue, not only because of the reduced risks of information leakage, but also to avoid price impact costs.

³³⁸ The average order size observed across dark pools from 2015 to 2018 was €98,000, whereas the average order size observed across main European lit venues for the same period was €8,300. These values are estimated as a weighted rather than a simple average, where the corresponding weights are computed according to the value of stocks traded on each venue from 2015 to 2018. Source: Oxera's analysis based on Liquidmetrix data for dark pools and WFE data for lit venues.

³³⁹ See European Central Bank (2017), 'Dark Pools in European equity markets: emergence, competition and implications', Occasional Paper Series, No. 193, July. This paper shows that order size on some dark pools is considerably higher than the extent of sufficient liquidity that could have been obtained at the best prices on lit venues.

Figure 11.5 Average order size in main European dark pools and lit venues, 2015–18 (€'000s)



Note: The average order size across European dark pools is estimated as the weighted average of the order size over a given year from 2015 to 2018. The weights are computed according to the total annual equity turnover on each venue. Thus, venues with higher turnover each year will have higher weight in the calculation of the average order size.

The sample of European dark pools includes BXE Dark, BlockMatch, CXE Dark, Liquidnet, Nordic@Mid, POSIT, SG CIB AlphaY, SLS, Turquoise Dark, and UBS MTF.

The sample of European lit venues includes BME Spanish Exchanges, Cboe Europe, Deutsche Börse AG, Euronext, Irish Stock Exchange, LSEG, Nasdaq Nordic Exchanges, SIX Swiss Exchange, Warsaw Stock Exchange, Wiener Börse, and Zagreb Stock Exchange.

Source: Oxera analysis, based on Liquidmetrix data for dark pools and WFE data for lit venues.

For less-liquid stocks, in particular, there is on average less volume available in order books for immediate trading at best prices, which leads to higher market impact costs. The resulting higher cost of placing large market orders in a lit order book may lead to more traders preferring to use dark pools instead.³⁴⁰

The growing popularity of SI trades may also have a significant impact on the efficient functioning of the equity markets in two ways. First, SIs provide limited real-time pre- and post-trade transparency, and thus do not contribute to the price-formation process since quotes above standard market size are private.³⁴¹ Second, despite the limited contribution of SIs to price formation, they can provide potential price improvements for their clients by offering better pricing than the prices provided by transparent liquidity providers active on the lit book, including lower explicit transaction costs to the buy side and other clients.

Furthermore, the increasing share of volume traded at close may shift liquidity from continuous trading to closing auctions, distort price-setting mechanisms, and increase intraday price volatility. Thus, there is a trade-off between having more liquidity—and thus

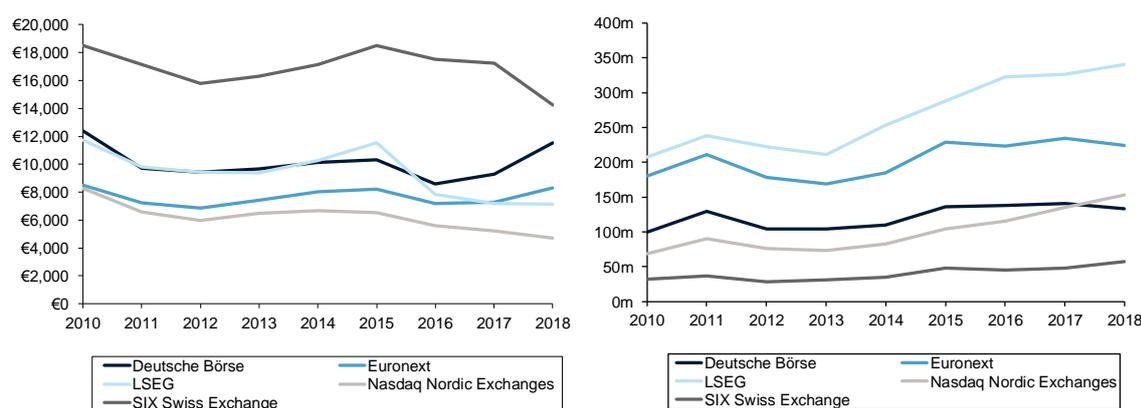
³⁴⁰ European Central Bank (2017), 'Dark Pools in European equity markets: emergence, competition and implications', Occasional Paper Series, No. 193, July, <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op193.en.pdf>.

³⁴¹ SIs are also allowed to defer reporting on large-size transactions up to the following day, and are required to report smaller transactions only as 'close to real-time as is technically possible' and in any case within one minute of the relevant transaction.

price discovery that is more efficient—in continuous trading and in closing auctions. Additionally, a high concentration of volumes over such a short period of time increases the market exposure to potential operational incidents or infrastructure malfunction.

Along with these innovations, we also see the rise of algorithmic trading and high-frequency trading, which have benefited from the competition between venues through the types of orders permitted, smaller tick sizes, latency and other system improvements, as well as lower fees and, in particular, the 'maker-taker rebates'. This growth in algorithmic and high-frequency trading is reflected in the market by an increase in the number of trades and by smaller average order (see Figure 11.6).

Figure 11.6 Average order size and number of trades for a representative sample of the largest European lit venues, 2010–18



Note: The number of trades in a given year shows the total year-to-date number of trades expressed in units of millions. The average order size is estimated as the ratio of the total turnover to the total number of trades, both reported annually.

Source: Oxera analysis of WFE data.

A common theme from alternative trading mechanisms, as discussed here, is that they expand the choices available to investors and accommodate their trade execution needs. For example, some investors may favour speed of execution (the time taken to execute an order) over absolute price, while those placing large orders may wish to minimise market impact costs and so favour anonymous or dark trading facilities for order execution, perhaps at the expense of immediacy. This has been demonstrated clearly in how the market has dealt with the high volatility sparked by the COVID-19 pandemic. Rather than the expected 'high volatility, high volumes' response, the industry has changed to executing electronic block trades in the dark pool.³⁴²

In addition, the fragmentation of order flow across various mechanisms has not resulted in a deterioration in market liquidity as long as traders have access to the necessary technology to search for the best available option to execute their trade. This is consistent with the existing literature on the topic.

It nonetheless remains important to monitor these developments consistently, specifically using the liquidity metrics described in the next section, and to consider whether policy interventions are required. More specifically, the development of these trading mechanisms in mid-size and small financial centres is still at the early stage, and can

³⁴² At the height of the COVID-19 crisis on 9 March 2020 (now called 'Black Monday 2020'), the percentage of activity executed in Turquoise Plato that was matched via its block trading platform was 59%. See, interview of Robert Barnes, CEO of LSEG's Turquoise, <https://www.thetradenews.com/turquoise-chief-says-industry-profile-changed-block-trading-soars/>.

benefit from close monitoring with good-quality data collected for future policy interventions, if required.

11.4 The number of trading venues by country of domicile of the securities

The previous section discussed the innovations in new trading mechanisms that cater to specific trading needs available in the EU market as a result of the increased competitive pressure from alternative trading venues to the regulated markets. However, how these mechanisms have developed varies significantly across the EU markets.

Over the last decade, MTFs have emerged as strong competitors to the traditional stock exchanges, capturing significant market share as a result of competitive pricing, creating new fee structures (such as maker-taker fee schedules), and delivering innovation. The rise in high-frequency trading has also played a role in the success of MTFs.

In 2018, trading on MTFs in large and mid-size financial centres accounted for around 23% and around 5% in small financial centres. In smaller financial centres, the share of regulated markets is still high, at over 50% in almost all the countries and over 75% for nine out of the 14 countries analysed.³⁴³

In addition, the fragmentation of trading activity across different venues is not homogeneous across the EU. Large and mid-sized financial centres exhibit greater fragmentation, especially Ireland, Luxembourg and the Netherlands, driven by the high percentage of trading on MTF venues, the low percentage of trading on the primary market, and the high level of trading on alternative venues, such as Posit and Equiduct. Appendix A10 provides further information on how these trends vary across countries.

As innovations in trading mechanisms have mostly occurred in large financial centres, market participants in small financial centres have not benefited from them. This is likely to contribute to the overall less vibrant equity markets in these countries. One policy option to address this is to support the development of a pan-European infrastructure and ecosystem, introducing policy measures to incentivise large trading venues and international brokers to invest in essential services to support the trading in alternative mechanisms such as MTFs on a pan-European basis. For example, if a pan-European MTF can set up operation in small financial centres and receive sufficient trades that can be settled by its existing CCP through interoperability links with national CCPs, the cost of entering these markets would be substantially reduced, encouraging more developments in this area.

Currently, while open access has allowed CCPs other than the incumbent to obtain access to trading venues, without interoperability link between CCPs, investors and traders have not observed a clear benefit of lower costs as a result of competition from alternative trading venues, due to clearing and settlement costs. Another option is to facilitate cross-border mergers at the market infrastructure level, with a view to promoting competition and reducing costs through economies of scale and scope. In section 13.2.5 we discuss in more detail the implications of post-trade infrastructure for the further development of small financial centres.

11.5 Lower cost of trading: explicit costs

This section analyses the explicit costs of trading by measuring commission rates paid by fund managers to brokers over time.

³⁴³ Estimates based on Oxera's analysis of Refinitiv Market Share Reporter data.

Pricing of trade execution services varies by type of execution method, type of stock (e.g. small versus large caps), and the client's profile. Relevant factors identified in previous analysis of commission rates include the following.³⁴⁴

- Mix of transaction methods. The commission rates for electronic trading (e.g. algorithmic trading³⁴⁵ and direct market access) and programme trading³⁴⁶ are generally lower than for high-touch core brokerage. Core brokerage refers to trade execution services in which salespersons and traders typically manage the execution process.
- Domicile of security. The cost of trading may vary by the domicile of security. As shown below, commission rates in some—especially smaller—financial centres are typically higher than in larger financial centres.
- Volume of trading. Commission rates are usually negotiated between the broker and fund manager for (almost) all the fund manager's trade. The rate agreed depends on the value of total trades sent by that fund manager over a certain period (usually a year). As a result of economies of scale, the higher the value of total trades in equities (and other securities), the lower the rate.³⁴⁷
- Size of trade orders. In general, the more trade orders that are placed for a certain amount of value of trading, the higher the commission rate. This is likely to be due to a combination of economies of scale in trading and because some post-trading services are charged per transaction—a higher number of orders or transactions will result in a larger post-trading cost for brokerage firms.
- Unbundling of execution of research. The unbundling of execution and research was also expected to result in greater transparency of research pricing, leading to more competition between brokerage firms and to downward pressure on the element of commission rates used for the purchase of non-execution goods and services.
- Additional services. In some financial centres, before MiFID II, trade execution services were offered by (full-service) brokerage firms in a bundle with research and trade-execution-related services.³⁴⁸ Therefore, the commission rates in these financial centres would not just refer to trade execution services.

Figure 11.7 shows that the average broker commission rate across EU countries decreased between 2009 and 2019, from 14bp to 6bp. A significant proportion of this decrease is related to the implementation of the unbundling of trading and research fees. Following MiFID II, fees decreased from 10bp to 7bp in one quarter alone. Fees in Europe are still higher than commissions in the USA, where the rates decreased over the analysed period from 11bp to around 3bp.

³⁴⁴ Oxera (2011), 'Monitoring prices, costs and volumes of trading and post-trading services', report prepared for European Commission DG Internal Market and Service, May, pp. 92–93.

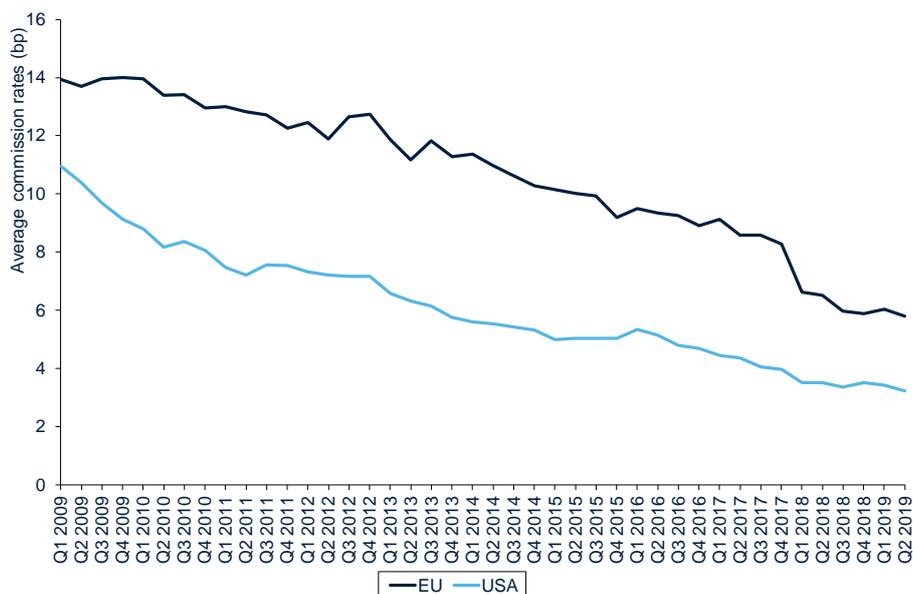
³⁴⁵ Algo-trading is trading in which buy or sell orders of a defined quantity are determined by a quantitative model that automatically generates the timing and size of trade orders.

³⁴⁶ Programme trading refers to the execution of automatically generated transactions for multiple securities transactions bundled into a single trading package. The analysis below examines the blended commission rate for all transaction methods.

³⁴⁷ See, for example, Oxera (2006), 'Soft Commissions and Bundled Brokerage Services: Post-implementation Review', a study for the FSA, October, pp. 9 and 70.

³⁴⁸ In some financial centres, such as the UK and France, it was common practice for fund management firms to enter into commission-sharing arrangements. Under such arrangements, an investment manager would agree with brokerage firms that the non-execution constituent of the commission rate should be paid into a commission-sharing pool, from which the investment manager could then pay for research from the brokerage firm or third-party research providers.

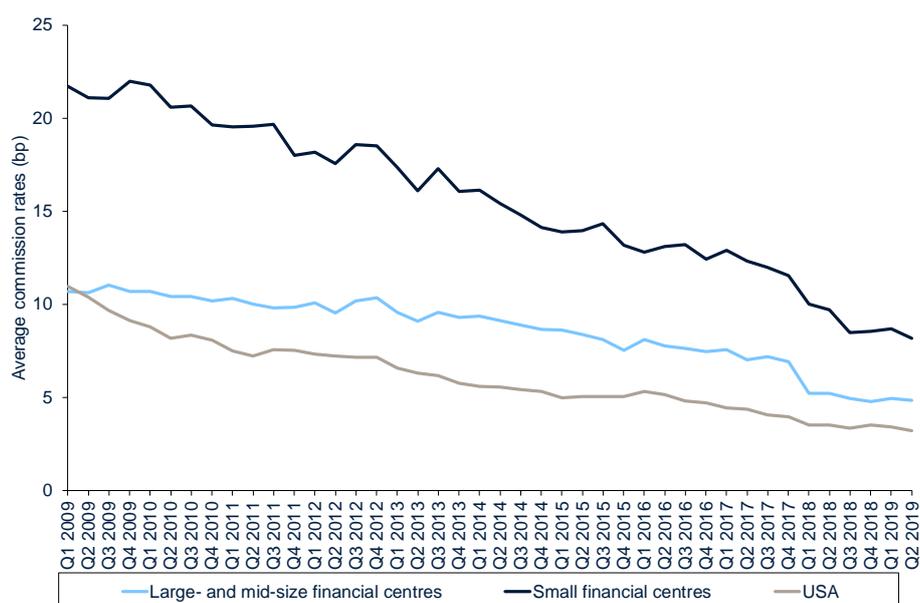
Figure 11.7 Average broker commission rates in the EU and the USA, 2009–19 (bp)



Note: The commission rates represent both a blended and execution-only rate based on data provided by TCA clients to Virtu. Country-level costs provided by Virtu were aggregated into regional costs (at the EU level) based on a simple average approach. This analysis covers 17 EU member states: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, and the UK.

Source: Oxera analysis of 'Virtu Global Peer database'. For more information on the underlying data and the country-specific cost methodology, see Appendix A1.3.

When looking at individual markets, overall trends are similar across all countries, with a downward pressure on commission rates across all the analysed EU markets; although the magnitude varies across countries (see Figure 11.8 below). Commission rates in smaller financial centres have steadily decreased by more than 60%, from more than 20bp to less than 10bp. Commission rates in the large markets were fairly stable until 2018, before a significant decrease following MiFID II. In particular, the effect of the unbundling of trading and research fees is more observable in large countries than in smaller ones. This could be due to the gradual implementation of MiFID II measures, starting from the larger markets and progressively being rolled out in smaller ones.

Figure 11.8 Average broker commission rates, 2009–19 (bp)

Note: Large and mid-sized financial centres include Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Spain, Sweden and the UK. Small financial centres include Czech Republic, Greece, Hungary, Poland and Portugal.

Source: Oxera analysis of 'Virtu Global Peer database'.

There is also considerable variation in commission rates in 2019 across countries, from 5bp in Finland to 11bp in Hungary. This variation could be related to a combination of factors. First, the commission rates cover the trading venue fees, which may vary across financial centres. Second, the scope of services offered across financial centres tends to vary. As explained above, the unbundling of trading and research services has not been implemented simultaneously across all financial centres. Some commission rates may therefore still be inclusive of some research services.

Oxera received data on trade execution (and market data) revenues from a number of exchanges and this confirms that revenues per value of trading have come down over the period 2009–19.

In summary, the introduction of competition at the trading venue level has led to two positive outcomes in equity markets:

- competition has resulted in more innovation and choice in trading mechanisms, although most of this has occurred in the large financial centres. For stocks domiciled in small financial centres, the trading typically occurs on the domestic regulated markets only;
- the explicit costs of trading (in terms of broker commission rates and trading fees charged by venues) have decreased since 2009. A large part of this has been due to the unbundling of trading and research fees.

12 Liquidity in equity markets: implicit costs

Key messages

- This section examines liquidity across EU markets and over time by analysing trends in two activity-based liquidity metrics (trading volume and turnover value) and two price-based liquidity metrics (bid–ask spread and implementation shortfall).
- Implementation shortfall provides the most holistic picture of how liquidity has changed over time, as it reflects not only the bid–ask spread but also the price impact while the order is being executed.

Liquidity metrics in the first half of 2019

- At the aggregate EU level, the bid–ask spread is around 7.1bp and the implementation shortfall is around 31.7bp.³⁴⁹ For large financial centres, they are around 6.8bp and 30.8bp respectively, and similar to those in the USA, which are at around 6.5bp and 30.5bp respectively.
- Small financial centres have significantly lower liquidity than large financial centres. The bid–ask spread is around 14bp and the implementation shortfall is at 56bp.
- For large-cap stocks (greater than €5bn) across all EU financial centres, the bid–ask spread and implementation shortfall are at around 4.9bp and 27.3bp respectively.
- Small-cap stocks (less than €500m) have significantly lower liquidity. The bid–ask spread and implementation shortfall for small-cap stocks across all EU financial centres are at around 84.2–138.9bp and 80.3–85.2bp respectively. (The ranges provided are for the market capitalisation group between €200m and €500m, and the group with less than €200m.)

Trends in liquidity metrics over time

- The bid–ask spread averaged across the EU has decreased from 23.3bp to 7.1bp over the ten-year period from 2009 to 2019; the implementation shortfall has also decreased, but to a lesser extent, from 47.5bp to 31.7bp. This reflects a reduction in market depth, which traders deal with in different ways—for example, by seeking out alternative non-lit trading mechanisms, breaking big trades up into smaller trades, and potentially cancelling the rest of their order when facing significant price fluctuations.
- In large financial centres, the bid–ask spread reduced from around 23.4bp to 6.8bp and the implementation shortfall from 45.6bp to 30.8bp over the same ten-year period. In small financial centres, bid–ask spreads decreased from 30.8bp in the first half of 2009 to 14.0bp in the first half of 2019, and the implementation shortfall declined from 86bp to 56bp in the same period. These are still well above the levels observed in large financial centres.
- Liquidity provision has improved for both large and small cap stocks, although the former remain substantially more liquid. For stocks with a market cap value over €500m, the implementation shortfall was around 40.8–80.1bp in the first half of 2009 compared to 27.6–64.7bp in the first half of 2019. For stocks with a market cap value less than €500m, the implementation shortfall was around 78.6–104.5bp in the first half of 2009, compared with 80.3–85.2bp in the first half of 2019.

³⁴⁹ Estimates based on Oxera's analysis of Virtu data.

- The gap in liquidity between large financial centres in the EU and the USA has narrowed significantly in recent years. The implementation shortfall in the USA and in the large EU financial centres was around 46bp and 51bp respectively in 2009, and decreased in both the USA and the large EU financial centres to around 31bp in 2019. The implementation shortfall for large cap stocks domiciled in large financial centres decreased from 39bp to 27bp.
- As our data covers the period 2009–19, it captures some of the impacts of the global financial crisis that began in 2008, in addition to any time trend of interest. When considering the time period before the crisis, the reduction in average implementation shortfall across the EU is smaller: from 39.3bp in the first half of 2004 to 31bp in 2019 for all stocks.
- The changes in implementation shortfall are due to a number of factors.
 - increased competition among trading venues has led to lower explicit trade execution costs, and potentially implicit costs, as traders have the flexibility to choose the best trading mechanism to execute their trades. Nevertheless, setting up access to multiple trading platforms has increased costs, such as the costs of developing SOR to search across multiple markets for the best available price;
 - algorithmic trading—in particular, high-frequency trading—has grown significantly over time, resulting in tighter bid–ask spreads and more efficient price formation, but also potentially a reduction in market depth due to a tendency to trade in smaller orders;
 - other market developments, such as the reduction in proprietary trading by investment banks after the 2008 financial crisis and the rise of passive investment, may have led to lower trading activities, potentially affecting liquidity.

Policy implications

- Based on our analysis of liquidity performance, we identify three areas for policy focus in EU equity markets: i) monitoring of liquidity; ii) small financial centres; and iii) SME stocks.
- Liquidity is a complex concept that consists of multiple dimensions such as market breadth, width, depth and immediacy.³⁵⁰ To understand the liquidity performance and have a well-rounded view of market development in this area requires regular and consistent monitoring of liquidity across EU markets. To capture the multi-dimensional nature of liquidity therefore means that the monitoring would need to consider a wide range of metrics. Implementation shortfall is considered a more comprehensive measurement of liquidity, as it captures the actual costs of trading for end-investors, including the prevailing spreads and price impacts of executing the trades. It is therefore important to monitor changes in implementation shortfall, along with other measurements of liquidity.
- Liquidity in small financial centres is much lower than other EU markets. The cost of trading has reduced but remains high, with low levels of liquidity (high implicit costs) compared to large financial centres. This results in higher costs of trading for investors and a higher cost of capital for firms seeking to raise funds in the public market.
- Small stocks remain considerably less liquid than large stocks. While there has been a reduction in the liquidity gap between small and large companies, the difference is still large. In addition to policies aimed at encouraging more listings of SMEs, policy options targeted at promoting more trading in SMEs are considered in this section. These include supporting the creation of fund structures to facilitate the investment

³⁵⁰ See Appendix A9.1 for a detailed discussion on liquidity dimensions.

of diversified pools of SME stocks; promoting the use of tax incentives for investing in small stocks; and facilitating greater investment in SME stocks by allowing UCITS to invest in SME growth markets.

- Potential barriers and policy suggestions to develop equity trading for SMEs and in small financial centres are addressed in section 13.

12.1 Introduction

A liquid market enables participants to buy and sell securities of any reasonable order size for similar prices without delay and without significant impact on prevailing prices. Given the complex and multifaceted nature of liquidity, there are various metrics to gauge the liquidity of a market.³⁵¹ Less liquid (or illiquid) assets are associated with high implicit costs of executing trades. Therefore, a low level of liquidity leads to higher total trading costs for market participants, and can potentially increase the cost of capital for firms seeking to raise funds in the public markets.

Overall, we examine trends in the following metrics:³⁵²

- trading volume and turnover, which refer to the value of the shares traded on the market—i.e. the free-float market capitalisation on primary stock exchanges;
- the bid–ask spread—the difference between the bid and ask prices (measured in basis points);
- implementation shortfall—slippage from the arrival price (measured in basis points) calculated as the difference between the weighted-average client execution price and the price at arrival timestamp for parent orders (i.e. the arrival price, also referred to as the arrival cost).³⁵³ This is the difference between the price actually achieved for an investor's trade and the last price obtained in that security prior to the investor starting to buy (or sell) it.³⁵⁴ The measure combines the impact of the prevailing spread and the impact on the price while the order is being executed, as well as any in-trade price momentum.³⁵⁵

The focus in this section is on findings based on the implementation shortfall as a comprehensive measurement of liquidity, which captures the actual implicit costs of trading for end-investors, including the prevailing spreads and price impacts of executing the trades. Using a holistic metric, such as implementation shortfall, increases the precision of the liquidity analysis while simultaneously capturing its multidimensional nature. Analysis of the other metrics (bid–ask spread, trading volume and turnover value) is reported in Appendix A7.

³⁵¹ See Appendix A10.1 for a discussion on liquidity metrics used by both industry practitioners and academics.

³⁵² See Appendix A1.3 for further details on the definitions, information sources and geographical coverage underpinning these metrics.

³⁵³ This would be higher than the implementation shortfall calculated for child orders because any price impacts relevant to such orders would be considerably lower than for parent orders owing to the smaller trade size. Implementation shortfall for parent orders reported potentially still overestimates liquidity. This is because parent orders may be partially cancelled if traders and their clients are not happy with the available trading opportunities.

³⁵⁴ Oxera (2012), 'High-frequency trading: towards capital market efficiency, or a step too far?', <https://www.oxera.com/wp-content/uploads/2018/03/High-frequency-trading.pdf>

³⁵⁵ This means that if the stock momentum is positive (i.e. moving in a beneficial direction for the trader, such as 'price goes up while you sell'), the momentum can offset the other cost components, and the weighted-average trader execution price will be greater than the arrival/starting price for sells, and less for buys.

Data on bid–ask spread and implementation shortfall is taken from the Virtu Global Peer Database,³⁵⁶ which is at a quarterly frequency. The database follows a well-established methodology to estimate implicit costs, based on Virtu’s sample of client trading on all types of trading venues. As with any database that does not cover the whole population, Virtu’s data is subject to its sample coverage. Therefore, it allows insightful observations to be elicited about trends over time and across markets, and provides estimated ranges of implicit costs, but should not be interpreted as exact levels. In addition, liquidity trends observed from Virtu data on the bid-ask spread, which is a more common measure, are consistent with other comparable databases. The findings presented here have also been discussed and confirmed to be consistent with views from market participants based on the interviews conducted for the study.

The data used in this section, their definitions, the characteristics of the underlying datasets, as well as the coverage of the representative samples under consideration, are described in Appendix A1.3.

12.2 Liquidity trends across EU equity markets

This section examines liquidity across EU markets and over time by analysing trends in two activity-based liquidity metrics (trading volume and turnover value) and two price-based liquidity metrics (bid–ask spread and implementation shortfall). The analysis of trends provides useful insights into the evolution of market liquidity over time, while simultaneously informing the analysis of liquidity drivers.

In addition to the trend analysis, we compare liquidity levels across regions, looking specifically at the USA and the EU. This informs the discussion on potential policy suggestions that could be adopted to improve European markets liquidity.

12.2.1 Overall improvement in liquidity in the EU equity markets

Section 10.3 showed that trading volume and turnover value—two activity-based metrics of liquidity, which provide a high-level indication of market breadth—have been stable at the aggregate EU level.

In this section, the trends in liquidity are examined in more detail, in particular looking at the implementation shortfall, which provides a comprehensive picture of how liquidity in the EU has changed over time. This metric reflects not only the transaction costs, but also the impact on price while the order is being executed. The price at which an order to trade is given can be different from the price at which it is executed. This is for a number of reasons, predominantly related to the following:

- the opportunity cost—sometimes it is not possible to execute a large trade in one go. Executing a trade in stages can create gains or losses depending on how the market price of the security moves;
- trade impact—instructing a large trade can have the effect of moving the security’s price up (if buying) or down (if selling);

³⁵⁶ Source disclaimer (from Virtu): ‘Many factors influence transaction cost including order size, volatility, and spread. Virtu’s peer universe includes a variety of firm types trading orders of all sizes in various market conditions. Virtu’s Peer commission numbers represent a blend of both execution-only and fully bundled rates. Investment firms represented in the Virtu peer universe follow diverse trading strategies. Trading performance for firms employing different trading strategies may not be directly comparable.’ In relation to its country-specific cost methodology, Virtu’s underlying country-specific cost calculations were supplied based on a weighted notional average.

- delay impact—if a transaction is delayed, market movements in the meantime can contribute to the arrival cost.³⁵⁷

By contrast, despite the bid–ask spread being a measure of liquidity that is a widely used by industry practitioners and in the academic literature, the metric has several drawbacks. First, it expresses the transaction cost only for those who wish to execute a marginal trade in the market; it does not provide information about how many units will be absorbed (which depends on the depth of the order book), nor about the extent to which a price will move after limit orders at the best-quoted price have been executed (price continuity of the order book).³⁵⁸ Thus, bid–ask spreads may understate the liquidity risk for larger trading positions and can therefore provide only a poor proxy for the level, and in particular variation, of liquidity costs for larger orders.³⁵⁹ Moreover, closing prices often deviate from the bid–ask quotes, as trades are likely to be completed at different prices from the quotes, or can even be outside them. In addition, quotes are not always available in all markets and for all time periods. Lit venues also often have designated market-makers who are obliged to quote bid–ask spreads in a pre-specified range and for a pre-specified volume. This further confounds the information contained in the spread.

Second, the growing number and variety of trading venues and MTFs has contributed to an increase in liquidity fragmentation, when the same stock is traded on several different venues, so the price and the amount of stock can vary between them. As such, the same financial instrument may have different prices—contingent on transaction size and trading venue—and this contributes to various bid–ask prices for the same instrument.

The bid–ask spread³⁶⁰ averaged across the EU has reduced from 23.3bp to 7.1bp over the ten-year period from 2009 to 2019 (based on a comparison of spread estimates in the first half of 2009 with those in the first half of 2019).³⁶¹ Consistent with bid–ask spread results, our trend analysis shows a reduction of implementation shortfall at the aggregate European level, from 47.5bp in the first half of 2009 to 31.7bp in the first half of 2019. This indicates an overall improvement in liquidity based on both bid–ask spreads and the implementation shortfall.

However, the implementation shortfall has improved less significantly than the bid–ask spread. This may reflect the countervailing impact of a reduction in market depth and immediacy, which are not captured when measuring bid–ask spreads.³⁶²

³⁵⁷ Arrival cost refers to the difference between the price at which an asset is valued immediately before an order (the arrival price) and the price at which it is actually traded (the execution price). See JP Morgan (2017), 'Transaction costs explained', https://am.jpmorgan.com/blob-gim/1383537981326/83456/JPM50934_MiFID%20II%20Transaction%20Costs%20Guide_A5_FINAL.pdf.

³⁵⁸ Muranga and Bank of Japan (1999), 'Dynamics of market liquidity of Japanese stocks: An analysis of tick-by-tick data of the Tokyo Stock Exchange', CGFS Papers chapters in Bank for International Settlements (ed.), 'Market Liquidity: Research Findings and Selected Policy Implications', volume 11, pp. 1–25, <https://ideas.repec.org/b/bis/biscgf/11.html>.

³⁵⁹ See Kaserer, C. and Rosch, C. (2013), 'Market liquidity in the financial crisis: The role of liquidity commonality and flight-to-quality', *Journal of Banking and Finance*, **45**, pp. 152–170.

³⁶⁰ In order-driven markets, the spread is given by the order book, and equals the difference between the best price associated with a selling limit order (the ask price) and the best price associated with a buying limit order (the bid price).

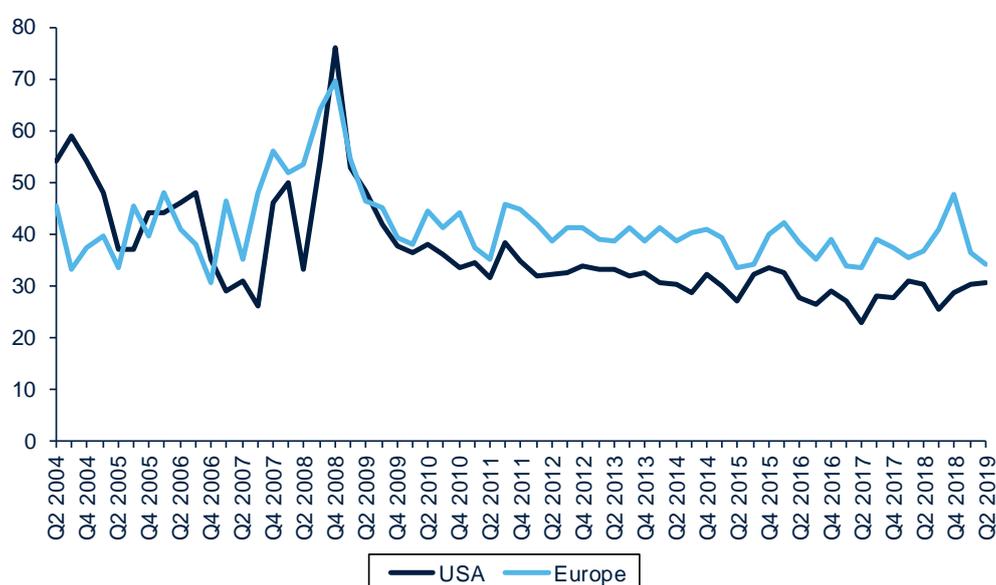
³⁶¹ Aggregate European values are estimated as a weighted-average approach on the basis of available number of orders (with a higher weight given to markets displaying better quality of data). The number of orders submitted for each category is used as an approximation of data quality.

³⁶² The FCA finds that market depth for FTSE100, as well as Euronext Paris and NYSE, was relatively stable between 2012 and 2015. In addition, an ESMA study in 2016 highlights that order duplication—a practice that has become increasingly popular as a result of traders looking to match orders across multiple trading venues—is likely to lead to overestimation of available liquidity. This implies that the actual market depth potentially exhibits a stable or downward trend over time. See European Securities and Markets Authority (2016), 'Order duplication and liquidity measurement in EU equity markets', https://www.esma.europa.eu/sites/default/files/library/2016-907_economic_report_on_duplicated_orders.pdf.

Examining trends from 2009 onwards, enabled by Virtu's data availability, means that some impacts during the financial crisis, when a lower level of liquidity would be expected, can be captured—i.e. higher bid–ask spreads and a higher implementation shortfall. To understand the extent to which the implementation shortfall has changed over time outside of the crisis effect, data from ITG's Global Cost Review Q2 2008 report³⁶³ was combined with the Virtu dataset that is used throughout this section. From this, a longer time-series was created, covering the 2004–19 period. When taking into account the pre-crisis period, the reduction in the implementation shortfall across the EU is of a smaller scale—from 39.3bp in the first half of 2004 to 31.7bp in the first half of 2019. The USA follows a similar trend, but has exhibited a slightly lower implementation shortfall in more recent years.

While it is not possible to conduct the same exercise to build a longer time series for the other analyses (presented here and in Appendix A9) due to data availability,³⁶⁴ it needs to be borne in mind that any trends covering the 2009–19 period are likely to capture some impacts from the financial crisis, as illustrated here.

Figure 12.1 Implementation shortfall trends, 2004–19 (bp)



Note: Country-level costs provided by Virtu were aggregated into costs at the European level based on a weighted average of the number of orders. Weights are assigned based on the number of orders submitted for each country. Thus, countries with more orders each quarter will have greater weight in the averages. Here, the sample includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the UK. The composition of this European sample is consistent with the sample used by the data provider. This is an exception from the remainder of the report, where Norway and Switzerland are not considered part of the European sample.

Source: Q2 2004 to Q4 2008: Investment Technology Group (2009), 'Global Cost Review Q2 2008', pp. 1, 4 and 5; Q2 2009 to Q2 2019: 'Virtu Global Peer database'.

12.2.2 Trends in liquidity for small and large financial centres

It is useful to look at trends in liquidity separately for large financial centres and small financial centres, as they may behave differently from each other. For instance, while trading volume and turnover value have been generally stable or increased in large

³⁶³ Investment Technology Group (2009), 'Global Cost Review Q2 2008', pp. 1, 4 and 5.

³⁶⁴ For example, the Investment Technology Group Global Cost Review Q2 2008 report does not include sufficiently detailed data.

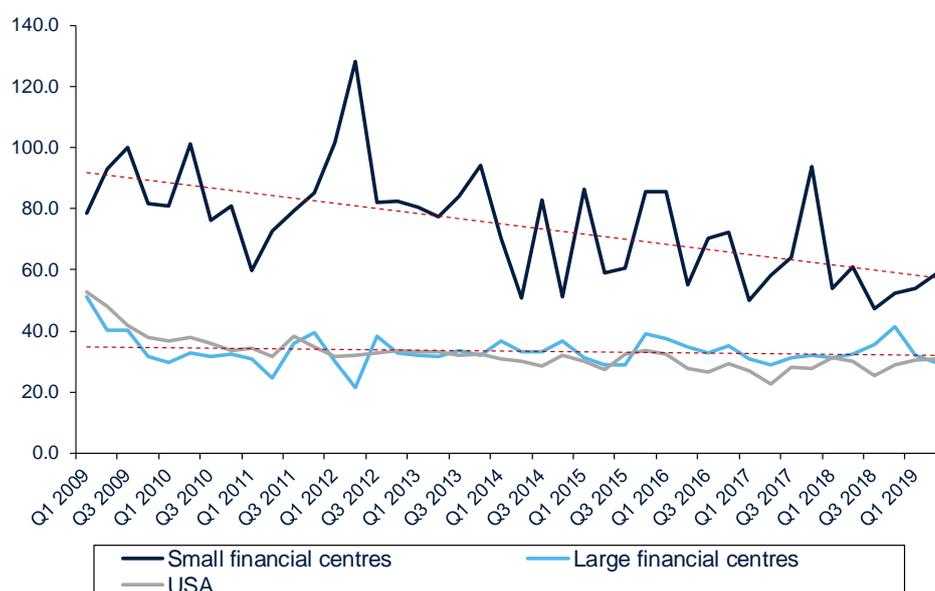
financial centres, small financial centres display a considerable reduction in both of these metrics. Moreover, while liquidity has generally improved across both samples, the reduction (in the bid–ask spread and implementation shortfall) in large financial centres is generally smaller than in small financial centres. In large financial centres, the bid–ask spread reduced from around 23.4bp to 6.8bp and the implementation shortfall from 45.6bp to 30.8bp between 2009 and 2019. This means that trading fragmentation in the large financial centres has not resulted in an increase in implicit costs.

In small financial centres, bid–ask spreads decreased from 30.8bp in the first half of 2009 to 14.0bp in the first half of 2019, and the implementation shortfall from 86bp to 56bp in the same period. This suggests that, despite having improved over time, liquidity in small financial centres remains significantly lower than in large financial centres.

Figure 12.2 shows the implementation shortfall for the group of large financial centres, the group of small financial centres, and the USA. In general, the reduction in implementation shortfall is much smaller than the reduction in the bid–ask spread, implying that the actual costs of trading have not seen such a significant improvement, as we take into account costs other than bid–ask spreads.

- The implementation shortfall in both the USA and large financial centres in the EU was around 46–51bp in the first half of 2009 and decreased to around 30.8–30.5bp in the first half of 2019.
- For small financial centres, the implementation shortfall started at a much higher level in the first half of 2009, reducing from 86bp to 56bp, still well above the level observed in large financial centres.

Figure 12.2 Implementation shortfall in small and large financial centres in the EU and the USA, 2009–19 (bp)



Note: Country-level costs provided by Virtu were aggregated into costs at the European level based on a weighted average of the number of orders. Weights are assigned based on the number of orders submitted for each country. Thus, countries with more orders each quarter have greater weight in the averages.

Source: Oxera analysis of 'Virtu Global Peer database'.

In general, country-specific trends are aligned with the trends at the aggregate financial centre level. Moreover, we observe that liquidity trends in the UK are comparable to those in other large financial centres elsewhere in Europe. In the UK, liquidity measured by the implementation shortfall improved from 44bp in the first half of 2009 to 33.6bp in the first

half of 2019. As a result, including UK in the sample does not seem to affect the overall results of the European sample.

In this section, it is shown that liquidity in small financial centres is much lower than in other European markets. This results in higher costs of trading for investors willing to participate in these markets, and, in turn, a higher cost of capital for firms wishing to raise funds in public markets. In addition to policies aiming at encouraging more listings, policy options that can facilitate more trading are considered. One such option is to support the development of a pan-European infrastructure and ecosystem through cross-border mergers at the market infrastructure level or by establishing interoperability links between CCPs. Other options include having large institutions (e.g. EIF/EBRD) acting as anchor investors and taking advantage of the benefits of indices by requiring small, nationally focused ('local') markets to be classified as 'emerging/frontier', to enable them to be included in the relevant indices. Another policy option is to promote the development of private pension and insurance provision in these local markets and review restrictions on the ability of pension and insurance providers to invest in equity.

The potential barriers to further development of equity trading in small financial centres are discussed more broadly in section 13.2, with policy recommendations to address these barriers depending on the development paths for EU equity markets presented in section 14.

12.2.3 Liquidity improvement varies based on market capitalisation

Liquidity provision has improved for both large and small cap stocks;³⁶⁵ nonetheless, large cap stocks remain substantially more liquid. This observation is consistent when using different liquidity metrics.

In line with the literature on the topic, our empirical analysis shows that large cap stocks are significantly more liquid than smaller size stocks.³⁶⁶ This may be related to factors such as better analyst coverage for large firms, leading to lower information asymmetry, and eventually lower adverse selection costs (see section 13.2.1 for a more detailed discussion on the role of research).³⁶⁷ Moreover, large stocks have a lower level of inventory risk, as the probability of fulfilment of limit orders tends to increase with a firm's size.³⁶⁸

Looking at trends over time, liquidity performance varies for different categories of market capitalisation. For instance, while trading volume was relatively stable during 2009–19 at the aggregate European level, significant differences can be observed across market capitalisation groups. This is consistent with the implementation shortfall having reduced by different rates across market capitalisation groups (see Figure 12.3). The gap in implementation shortfall between large and small cap stocks narrowed from around 64bp in the first half of 2009 to 52.7bp in the first half of 2019. However, small cap stocks started out with a much higher implementation shortfall than large caps, and while the gap is narrowing, it remains significantly wide.

³⁶⁵ For the purpose of this analysis, large cap stocks refer to stocks with a market capitalisation >€5bn; small cap stocks refer to stocks with a market capitalisation between €200m and €500m.

³⁶⁶ See Chordia, T., Shivakumar, L. and Subrahmanyam, A. (2004), 'Liquidity dynamics across small and large firms', *Economic Notes*, 33:1, pp. 111–143; Heflin, F., Shaw, K. and John, J. (2005), 'Disclosure policy and market liquidity: impact of depth quotes and order sizes', *Journal of Contemporary Accounting Research*, 4, pp. 829–865; Jain, P.K., Kim, J. and Rezaee, Z. (2005), 'Trends and determinants of market liquidity in the pre- and post- Sarbanes-Oxley act periods', 14th Annual Conference on Financial Economics and Accounting.

³⁶⁷ See, for example, Chae, J. (2005), 'Trading volume, information asymmetry and timing information', *The Journal of Finance*, 60, pp. 413–442.

³⁶⁸ See Kaserer, C. and Rosch, C. (2013), 'Market liquidity in the financial crisis: The role of liquidity commonality and flight-to-quality', *Journal of Banking and Finance*, 45, pp. 152–170.

- More specifically, for stocks with a market cap value over €500m, the implementation shortfall was around 40.8–80.1bp in the first half of 2009, compared to 27.6–64.7bp in the first half of 2019.
- For stocks with a market cap value less than €500m, the implementation shortfall was around 78.6–104.5bp in the first half of 2009, compared with 80.3–85.2bp in the first half of 2019.

Similar, and to some extent more pronounced, trends can be seen in the bid–ask spread. More specifically, in relative terms, the fall in the bid–ask spread was more significant for large-cap than for small-cap stocks (see section 13.2.2 for further detail).

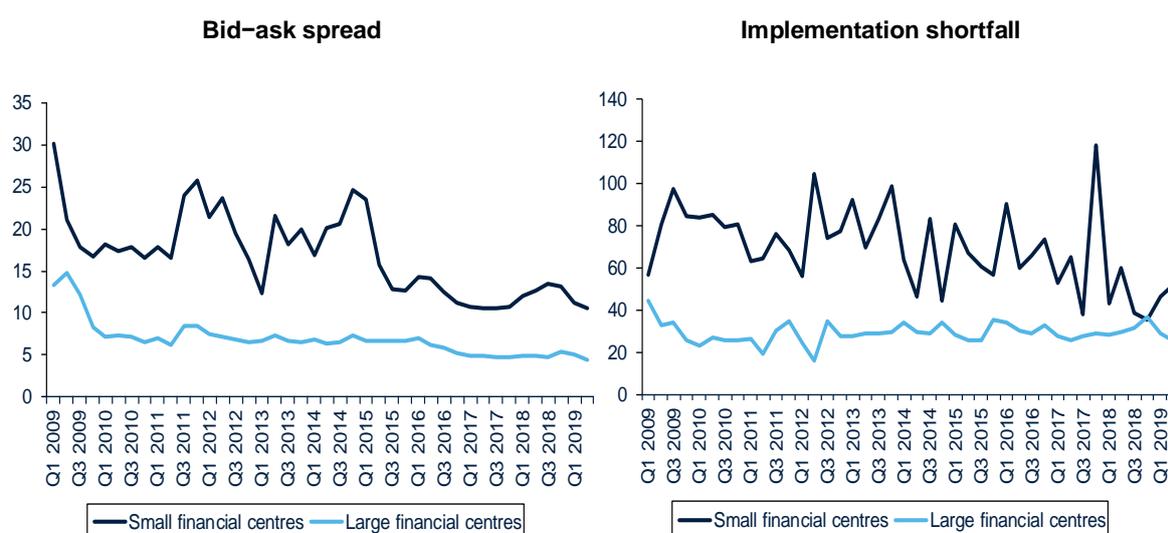
Figure 12.3 Implementation shortfall for EU-17 by market capitalisation, 2009–19 (bp)



Note: Country-level costs provided by Virtu were aggregated into costs at the European level based on a weighted average of the number of orders. Weights are assigned based on the number of orders submitted for each country. Thus, countries with more orders each quarter have greater weight in the averages. No data was available for stocks between €200m and €500m in Hungary, or for stocks of less than €200m in Czech Republic and Hungary.

Source: Oxera analysis of Virtu Global Peer Database.

Furthermore, most of the reduction in the bid–ask spread and implementation shortfall in large cap stocks observed above is likely to be driven by the reduction in these metrics for stocks from small financial centres. Large cap stocks domiciled in large financial centres experienced a smaller change in liquidity than the aggregate EU level over the last ten years (spreads reduced from around 14bp to 5bp and the implementation shortfall decreased from 39bp to 27bp). Figure 12.4 below shows that there is a small change in both the bid–ask spread and the implementation shortfall for large cap stocks from large financial centres, especially when considering the effects of the financial crisis.

Figure 12.4 Liquidity improvement for large caps, 2009–19 (bp)

Note: Country-level costs provided by Virtu were aggregated into costs at the European level based on a weighted average of the number of orders. Weights are assigned based on the number of orders submitted for each country. Thus, countries with more orders each quarter have greater weight in the averages. Virtu's underlying country-specific cost calculations were supplied based on a weighted notional average.

Source: Oxera analysis of Virtu Global Peer Database.

In this section, we show that small stocks remain considerably less liquid than large stocks. While there has been a reduction in the liquidity gap between small and large companies, the difference is still large. In addition to policies aimed at encouraging more listings of SMEs, policy options specifically promoting more trading in SMEs are considered in this section. These include supporting the creation of fund structures to facilitate the investment of diversified pools of SME stocks; promoting the use of tax incentives for investing in small stocks; and facilitating greater investment in SME stocks by allowing UCITS to invest in SME growth markets.

Other policy options depend on the chosen development path(s) for the EU equity markets. For example, if passive investments continue to be embraced as they have been developing in recent years, one policy option would be to encourage the adoption of indices in SMEs and to investigate any commercial barriers that exist; another would be to embrace private markets for SMEs.

Potential barriers to further development of equity trading for SMEs are discussed in section 13.1, with policy recommendations to address these barriers depending on the development paths for the EU equity markets presented in section 14.

12.3 Drivers of liquidity trends in the EU

In this section, we discuss and analyse recent developments in liquidity for equity trading across EU markets based on the empirical findings presented in this report, along with existing literature and research on the topic, and in the context of the significant changes in regulation and technology. Moreover, we draw our conclusions in light of the economic framework set out in section 9.

Many substantial changes occurring in the EU markets, including changes to market structure, market participants, technology, and regulations, have all affected liquidity in recent years.

First, increasing computing power has given rise to algorithmic trading, including high-frequency trading, which is 'characterised by the reliance on speed differences relative to other traders to make profits based on short-term predictions and by the objective to hold essentially no asset inventories for more than a very short period of time'.³⁶⁹ High-frequency trading is generally associated with tighter bid–ask spreads and more efficient price formation.³⁷⁰ This has coincided with increased competition among trading venues, which has lowered trade execution costs and allowed HFTs to access the venues' platforms more quickly (in some cases, through co-location). HFT market-makers, among other high-frequency trading strategies, also trade based on historical correlation patterns in price ticks to move liquidity between securities or markets. This is particularly relevant with the rise of alternative trading venues, making the task of pooling information from various sources to identify and exploit profitable trading opportunities both within and across markets more difficult and time-consuming for an average market participant, and thus more commercially attractive for HFTs.³⁷¹

Other market participants have also responded to this trend with faster speed of trading. In general, most trading is done by computers through the use of algorithms. This influence of HFTs has led to fundamental changes in equity trading, including a significant reduction in trade size.³⁷²

There has been concern about the lower market depth as a result of these developments. This would be consistent with our observation that the reduction in implementation shortfall, which captures market depth, is smaller than the reduction in the bid–ask spread. However, traders navigate this reduced market depth in different ways—for example, seeking out alternative non-lit trading mechanisms; breaking big trades up into smaller ones;³⁷³ and potentially cancelling the rest of the order when faced with significant price fluctuations. Indeed, Capponi et al. (2019) provides a theoretical model in the form of a Stackelberg game, investigating the optimal execution problem of a strategic large investor considering the market-maker's optimal response.³⁷⁴

³⁶⁹ Cartea, A., Jaimungal, S. and Penalva, J. (2015), *Algorithmic and High-Frequency Trading*, Cambridge University Press, August.

³⁷⁰ Jones, C.M. (2013), 'What do we know about high-frequency trading?', Columbia Business School Research Paper 13–11; Brogaard, J., Hendershott, T. and Riordan, R. (2013), 'High Frequency Trading and Price Discovery', European Central Bank, Working Paper Series, No. 1602,

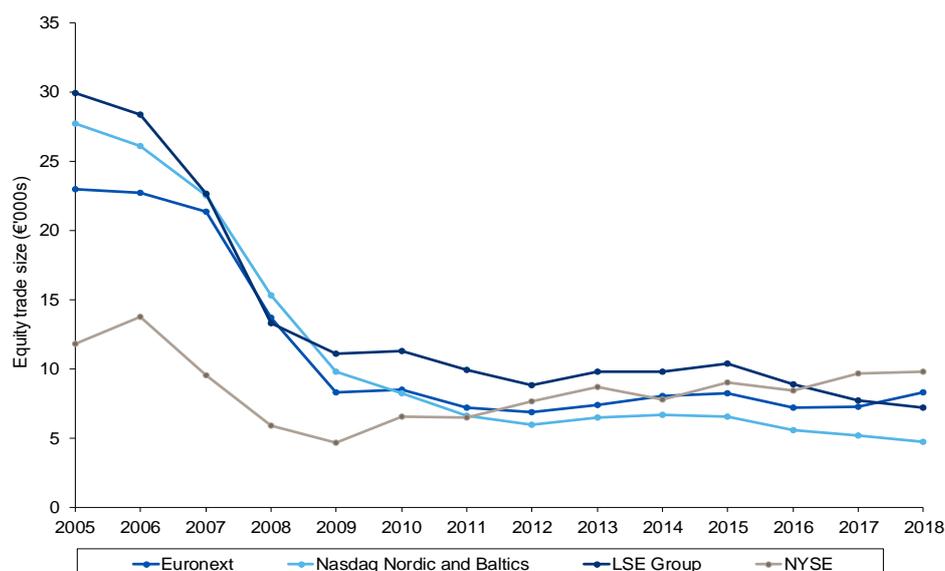
<https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1602.pdf>; Carrion, A. (2013), 'Very Fast Money: High Frequency Trading on the Nasdaq', *Journal of Financial Markets*, June. Menkveld (2013) provides direct evidence of how the entrance of HFTs reduced spreads for Dutch stocks trading on Chi-X Europe. Menkveld, A.J. (2013), 'High Frequency Trading and the New-Market-makers', *Journal of Financial Markets*, **16**, May.

³⁷¹ O'Hara, M. (2015), 'High frequency market microstructure', *Journal of Financial Economics*, **116**:2, pp. 257–270.

³⁷² O'Hara (2015) argues that this change is not driven just by market fragmentation, as the smaller trade size trend is also observed in future markets, which is not fragmented. Because 'silicon traders' can spot (and exploit) human traders by their tendency to trade in round numbers, all trading is converging to ever-smaller sizes and is being hidden whenever possible.

³⁷³ O'Hara (2015) finds that, on average, each parent order turned into 55.325 child executions, based on Investment Technology Group data on the number of parent orders and number of trades in 2013.

³⁷⁴ Capponi, A., Menkveld, A.J. and Zhang, H. (2019), 'Large Orders in Small Markets: On Optimal Execution with Endogenous Liquidity Supply', October 30, <https://ssrn.com/abstract=3326313> or <http://dx.doi.org/10.2139/ssrn.3326313>.

Figure 12.5 Average trade size for major stock exchanges, 2005–18 (€'000s)

Note: Before 2009 LSEG data includes London Stock Exchange only; after 2009, it includes Borsa Italiana as well. The equity trade size is calculated as the ratio of total value equity traded and total number of trades.

Source: Oxera analysis of WFE data.

Second, regulatory changes in response to the 2008 financial crisis³⁷⁵ aimed at reducing systemic risks in the financial system by strengthening the balance sheets and funding models of key market-making institutions. This, combined with banks' lower risk tolerance, has led to a significant reduction in their investment banking activities, including proprietary trading. While potentially not affected to the same extent as more illiquid markets such as corporate bonds, the cost of providing an immediacy service in equity markets might have been increased. Market microstructure theory indicates that the cost of market-making activities—such as market risk, capital/funding costs, and other costs—would be reflected in the implicit costs of trading. More specifically, market-makers respond to changes in the market environment and sentiment by adjusting their bid–ask spreads, the quantities they are willing to trade at these prices, or their quoting behaviour. For example, in response to rising volatility, markets could then witness a widening of bid–ask spreads and a decline in quoted depth (i.e. the quantities that can be traded at the best bid and ask price), before market-makers eventually discontinue quoting on an ongoing basis and only passively respond to clients' requests for quotes. (See Appendix A6.2 for further detail on the economics of market-making activities.)

Third, as discussed in previous sections, competition among trading venues, introduced by MiFID I in 2007, has led to lower trade execution costs (explicit costs), while its impact on liquidity (implicit costs) has been a hot topic among regulatory bodies, academic researchers and market participants. In section 9.2, we discussed the main economic concepts relevant to the market structure of equity trading. Here, we continue the discussion with an overview of the existing literature, and highlight the contributions from our empirical analyses in this report.

³⁷⁵ These regulatory changes, set out in the Basel III regime, are implemented in the EU through the Capital Requirement Regulation and Directive, and in the USA through the US Basel III Final Rule and the Dodd-Frank Act.

Fragmentation versus consolidation

Debates on the optimal design for equity markets have long centred around the question of market fragmentation versus consolidation. This is essentially the same question as that posed at the start of this section: would a competitive model work in the face of high economies of scale and various network effects that would tend to a natural monopoly based on standard economic arguments?

In addition to the potential benefits brought about by strong competition, market fragmentation can affect liquidity negatively on two key levels.

- An increase in the number of trading venues disperses order flow, resulting in multiple pools of liquidity. Decentralisation of liquidity reduces order sizes across venues. This is because, as liquidity is dispersed, it becomes necessary to trade in smaller sizes to minimise market impact. In conjunction with smaller order sizes being traded, a higher number of trades might be needed to complete customer orders.
- In the fact that fragmentation lowers trading fees at individual platforms, it might increase the overall trading costs due to a decrease in the average order size, requiring multiple executions. This might result in a decrease in overall transparency and market data quality, coupled with increased IT costs for the search of liquidity.

More recent empirical analysis in Gresse (2017)³⁷⁶ distinguishes between two important effects:

- the impact of algorithmic trading, which might have contributed to a decrease in volume traded at the best bid–ask prices, thus indicating less depth;
- the impact of fragmentation when competition was introduced.

Indeed, Gresse (2017) finds that neither dark trading nor fragmentation between lit order books harms liquidity, especially in large stocks, even after controlling for the level of algorithmic trading.³⁷⁷

Consistent with the existing literature, we observe that liquidity at the aggregate EU level has been at least stable in recent years, or in some cases has improved. However, areas of concern remain.

- While the gap between the liquidity in the USA and Europe has narrowed in recent years, there may be room for further reductions in the implicit costs of trading for large cap stocks in Europe—in particular, for those from large financial centres, which have been exposed to the highest level of venue competition and the most significant technological improvements,³⁷⁸ but whose implicit costs of trading mostly remain unchanged.
- various segments of the EU equity markets are still experiencing low levels of liquidity—more specifically, SMEs and smaller financial centres in the Central and Eastern European region.

³⁷⁶ Gresse, C. (2017), 'Effects of Lit and Dark Market Fragmentation on Liquidity', *Journal of Financial Markets*, **35**, pp. 1–20, <https://www.sciencedirect.com/science/article/abs/pii/S1386418116301690>.

³⁷⁷ Appendix A10 details the literature on liquidity trends and the impacts of fragmentation on liquidity in equity markets in the EU and the USA.

³⁷⁸ The FFI analysis (see Appendix A7.2) shows that the average number of trading venues used to achieve best execution when completing an order is 3.2 for large caps with a market cap greater than €10bn, as opposed to 2.5 venues for stocks with an average market cap less than €10bn. This is consistent with the findings in Gresse (2017). The author draws on high-frequency data for FTSE100, CAC40, and SBF120 stocks to show that, by the end of 2009, trading in European large equities had become substantially fragmented. Comparison between the SBF120 (a mid-cap index) and the CAC40 (a large-cap index) shows that order flow is much less fragmented in mid caps than in large caps, with Euronext capturing over 70% and 55% of the volumes respectively.

The US and EU approaches in promoting more competition and dealing with market fragmentation

The aim of MiFID I in 2007 was to promote competition among trading venues in the EU by allowing alternative venues to compete for order flows with the regulated markets. From 2005, Regulation National Market System (Reg NMS) served the same purpose in the USA, with several significant differences (see Table 12.1).

Table 12.1 Differences between MiFID in Europe and Reg NMS in the USA

	MiFID	Reg NMS
Requirement on trade execution	Best execution is defined along several dimensions, including speed; price; size; execution costs; and probability of execution and settlement	Execution at best available price: strict price priority—no trade-through rule, provided that the quote is automated (i.e. 'Order Protection Rule')
Responsible parties	Only investment firms are responsible for the best execution of their client <ul style="list-style-type: none"> markets do not need to be interconnected and route orders to each other more than one trading venue can be the best venue for trading a stock heterogeneity in traders is protected 	Trading venues are <i>directly</i> responsible for executing the orders at the best price <ul style="list-style-type: none"> markets need to link to each other and route orders to competing trading venues with better quotes if they cannot fill them at the best price
Requirement on a trade's execution quality	No statistics on execution quality required	Comparison on a trade's execution quality is facilitated as: <ul style="list-style-type: none"> trading venues need to publish statistics on several dimensions of execution quality intermediaries need to make public the market centres where they route the orders received from clients
Requirement on market data—i.e. 'consolidated tape'	Trading venues make price, volume and time of trades publicly available as close to real time as possible only 'on a reasonable commercial basis', leading to: <ul style="list-style-type: none"> dispersed quote and trade information potentially low quality of price discovery 	Consolidation of best quotes and trades in a single consolidator, leading to: <ul style="list-style-type: none"> lower search costs easier ability to comply with the best-execution duty higher competition among trading venues

Source: Petrella, G. (2009), 'MiFID, Reg NMS and Competition Across Trading Venues in Europe and United States', *Journal of Financial Regulation and Compliance*, <https://ssrn.com/abstract=1326963>

To comply with MiFID's best-execution rule, most large brokerage firms operating in the EU implement a SOR system. This enables them to access multiple liquidity pools to identify the best destination by using proprietary algorithms that optimise execution. The venue is selected on a dynamic basis. The system must incorporate both implicit and explicit costs. At a high level, these algorithms dynamically optimise where, how often, and at what price to trade. They seek to optimise their own best-execution objectives while taking into account short-term differences or opportunities across the various exchanges.³⁷⁹ A potential concern is that this might create a disadvantage for smaller

³⁷⁹ Maglaras, C., Ciamac, C.M., and Zheng, H.W. (2012), 'Optimal Order Routing in a Fragmented Market', Research Paper, <https://www.semanticscholar.org/paper/Optimal-Order-Routing-in-a-Fragmented-Market-Maglaras-Moallemi/c0be2bd18f5e4f49fd5fc48ca1a3012d06e6b061>.

investors, who may have access to smaller brokers only and would therefore not be able to benefit from such technology.

Besides using a SOR system that allows brokers to search for the best trading opportunities at low cost, the markets have shown other commercial arrangements to establish linked order books. One example is the single order book model operated by Euronext regulated markets (see Appendix 7 for a discussion on the consolidation trend). Linked order books can help consolidate liquidity not only between trading venues, but also between different order books run by the same venue. For instance, Cboe provides several interbook order types (such as dark lit sweep, lit sweep, and dark sweep), which offer participants an efficient way to access liquidity in both dark and/or lit order books with a single order.

Compared with MiFID I, MiFID II has raised the bar in terms of best-execution obligations, requiring firms to take 'all reasonable steps' to achieve best execution—while, under MiFID II firms, are required to take 'all sufficient steps'. MiFID II also increases requirements for pre- and post-trade transparency. The change in terminology and the introduction of reports on execution quality, top five venues and top five investment firms have increased the level of responsibility that investment firms have to take with respect to best execution.

Different from MiFID, which uses the multi-dimensional best-execution rule, Reg NMS focuses on price, along with promoting the wide availability of market data (both pre- and post-trade) through the 'consolidated tape'.³⁸⁰ This leads to strong competition among trading venues, as order flow moves very quickly to those offering the better quotes.³⁸¹ The aim is to mitigate the risks associated with market fragmentation by attempting to create a virtual central limit order book by linking competing platforms together.³⁸²

A broader overview of the US markets, the underlying trends encouraging liquidity, as well as the implications and drawbacks of the Reg NMS, are presented in the box below.

Box 12.1 Overview of liquidity in the US equity market

Liquidity in the US equity market has improved substantially by most measures since 2005, when the Reg NMS was adopted and implemented. A 2015 SEC study³⁸³ shows the following indicators of liquidity improvement in the US equity market: i) quoted bid–ask spreads for the largest stocks are significantly low, and overall spreads, including those for smaller stocks, are near historical lows; ii) displayed market depth for the median stock has grown nearly 300% in the past eight years, average daily trading volumes have returned to pre-financial crisis levels, and intraday volatility is near its lowest level in decades; iii) institutional investors also appear to be performing well—the average costs for block trade transactions have fallen by approximately 66% since 2001; and iv) while small cap stocks continue to lag behind, there has been some improvement—for instance, market depth for these securities has nearly doubled in the last ten years. These findings are consistent with our analysis of the liquidity performance of the US equity market.

³⁸⁰ While having potentially higher-quality data, the US model still faces a debate on the cost of market data similar to the debate in Europe.

³⁸¹ NYSE market share in NYSE-listed stocks was down from 75% in July 2005 to 32% in April 2008, corresponding to NYSE having the best bid–ask spread only 24% of the time. Petrella, G. (2009), 'MiFID, Reg NMS and Competition Across Trading Venues in Europe and United States', *Journal of Financial Regulation and Compliance*, June, <https://ssrn.com/abstract=1326963>.

³⁸² There has been strong support for a review of Reg NMS, with concerns about the high complexity involved in trade execution and potential favouring of tech-savvy market participants.

³⁸³ U.S. Securities and Exchange Commission (2015), 'U.S. Equity Market Structure: Making Our Markets Work Better for Investors'.

The US equity market has experienced a material transformation over the past few decades due to advances in technology and the adoption of new regulation.³⁸⁴ Several drivers may have contributed to this liquidity performance, including:

- the adoption of the Reg NMS, which was primarily intended to: i) promote efficient execution of securities transactions; ii) encourage fair competition; iii) facilitate the availability of information to investors; iv) ensure that brokers could execute investor orders in the best market; and v) provide an opportunity for orders to be executed without the participation of a broker;³⁸⁵
- electronification—the resulting increase in connectivity and speed has made markets more accessible;
- new market participants—the entrance of new market participants (e.g. electronic liquidity providers, which are proprietary trading firms) has contributed to the development of better tools to manage and automate traditional market-making;
- competition, fragmentation and complexity—competition has benefitted retail investors in a number of ways, including by making prices generally more efficient and driving commission rates to historically low levels. However, it has also created fragmentation. For example, market participants in the USA must connect to 13 exchanges and 47 active alternative trading systems. Nonetheless, evidence suggests that increased fragmentation has not impaired market liquidity;
- growth of ETFs—the growth of ETFs has made the equity markets more accessible for individuals and institutional investors, and is now a central component of investors' portfolios.

On the other hand, the growth of dark pools, maker-taker and taker-maker exchange trading models, greater competition in providing market liquidity, and the technological advances in high-frequency trading have all contributed to concerns being raised about the future and integrity of US equity markets.³⁸⁶

The debate on unintended consequences of the Reg NMS is ongoing and attracts a high level of attention, focusing on the following main areas.

There are concerns that the regulation might have facilitated HFT's ability to arbitrage, as a result of the increased market fragmentation.³⁸⁷

The Reg NMS may have created a complex and fragmented market with too great a focus on speed.³⁸⁸ In this respect, the Securities Industry and Financial Markets Association (SIFMA) has proposed the evaluation of the protection rule and proposed a volume threshold for protected status and exemptions for large orders.³⁸⁹ It has also called for changes around market data—a contentious issue in the market, with brokers and banks arguing that prices are exorbitant, and exchanges arguing that rates are set by competition.

While making the electronically accessible NBBO the primary determinant for order execution, the trade-through rule has created complications in the market, not only for

³⁸⁴ Blackrock (2019), 'Mark-to-market structure: An end-investor perspective on the evolution of developed equity markets'.

³⁸⁵ See CFA Institute (2017), 'Regulation NMS – Review and Recommendations'.

³⁸⁶ Ibid.

³⁸⁷ See *International Financial Law Review* (2014), 'Reg NMS in the spotlight amid HFT criticism', <https://www.iflr.com/Article/3341781/Reg-NMS-in-the-spotlight-amid-HFT-criticism.html>.

³⁸⁸ See *Financial Times* (2017), 'SEC urged to review rules for equity market trading', <https://www.ft.com/content/ac12e7b0-14c9-11e7-80f4-13e067d5072c>.

³⁸⁹ Ibid.

trading venues that have to send business to their competitors, 390 but also for institutional investors, which face the complication and cost of accessing and executing against orders at the top of the order books of trading venues displaying the NBBO before executing a large block order with a broker.³⁹¹

The Order Protection Rule has also raised costs, as market participants are compelled to build connectivity to 13 protected venues, irrespective of available liquidity. This level of interconnectivity may also increase the risk of market disruptions. Moreover, this rule reduces the incentives for exchanges to innovate, by declaring price to be most important component of execution, as opposed to liquidity, anonymity or other considerations that competitive forces deem valuable.

Unlike other major global markets, the US market maintains an inflexible 'one-size-fits-all' tick regime that does not account for differences in price levels and liquidity across thousands of listed securities.

Source: Oxera summary based on a review of various sources referenced in Box 12.1.

Despite the challenges and higher implementation/IT infrastructure costs of the US and EU markets, they have both showcased how a competitive model can work relatively efficiently, not only to deliver the benefits from lower explicit trade execution costs driven by strong competition among trading venues, but also maintaining sufficient liquidity and an efficient price-discovery process.

Table 12.2 summarises the drivers of the total costs of trading, including both explicit trade execution costs and the implicit costs/liquidity examined and discussed in this section.

Table 12.2 Drivers of liquidity trends—factors affecting the total costs of trading across the EU equity markets

Factor	Expected impact on explicit costs	Expected impact on implicit costs
Increased competition among trading venues	↓	↓
Costs of dealing with market fragmentation	↑	↑
Increase in algorithmic trading	n/a	~
Reduction in proprietary trading by banks	n/a	↑
Increase in passive fund management	n/a	↑

Source: Oxera.

This section has looked at how recent market developments, in both regulation and technology, have affected the EU secondary markets in equity, more specifically in terms of the choices in trading mechanisms, explicit trade execution costs, and implicit costs of trading—i.e. market liquidity. The changes in market structure described above have had a significant impact on the efficiency of this process. For instance, Lachapelle et al. (2013) models how HFTs can improve market efficiency—the stable states of offer and demand are more balanced and the effective bid–ask spread is smaller than without HFTs.³⁹² Pre-

³⁹⁰ The Order Protection Rule essentially requires all trading centres to ensure that trades are executed at the best publicly quoted prices, even if it means routing an order to a competitor that is publicly displaying a superior price.

³⁹¹ See CFA Institute (2017), 'Regulation NMS – Review and Recommendations'.

³⁹² Lachapelle, A., Lasry, J.M., Lehalle, C.A. and Lions, P.L. (2016), 'Efficiency of the price formation process in presence of high frequency participants: a mean field game analysis', *Mathematics and Financial Economics*, **10**:3, pp. 223–262.

and post-trade transparency is also important, along with the ability to aggregate information across trading venues due to market fragmentation, as it allows investors to determine whether and how to trade based on the market price of the security. Measuring market efficiency, however, is complex. Further details on the literature on market efficiency theory and its implications for equity market design are provided in Appendix A6.1.

While there has been an overall reduction in implicit costs of trading at the EU level, this reduction remains limited, especially based on trends in implementation shortfall. Furthermore, this is despite the introduction of competition among trading venues. As discussed, implementation shortfall is considered a more comprehensive measurement of liquidity, which captures the actual costs of trading for end-investors, including the prevailing spreads and price impacts of executing the trades. Therefore, it is important to monitor the development of liquidity across markets using implementation shortfall, along with other measurements of liquidity, in order to have a well-rounded view of liquidity performance over time.

13 Potential barriers to further development of equity trading in the EU

Key messages

- This section identifies important barriers to the further development of equity trading in the EU, focusing on SMEs, small financial centres, and cross-border trading.

SME liquidity

- Trading in small-cap stocks is very different to large-cap stocks; for example, for small caps, the order size relative to volume traded is considerably higher; the depth of the order book is typically more limited; and there are more zero-trading days. Furthermore, specific challenges arise regarding:
 - research coverage—the positive externality of research production remains and is likely to result in an under-provision of research, particularly in relation to SMEs. The MiFID II rules on unbundling of research, intended to address concerns about inducements (i.e. preventing brokers from competing on the basis of ‘free research’), may result in further under-provision of high-quality research on small companies;
 - the rise of passive investment and ETFs, which has so far contributed to liquidity in large rather than small caps (as SMEs have proportionately less weight in the main indices).
- Policy suggestions to support SME liquidity include:
 - supporting the creation of fund structures to facilitate the investment of diversified pools of SME stocks;
 - promoting the use of tax incentives for investing in small stocks;
 - facilitating greater investment in SME stocks—for example, by revising the UCITS Directive to allow UCITS to invest in SME growth markets (see also the policy measures discussed in section 5);
 - encouraging more passive investments in SMEs, by investigating the commercial barriers to the adoption of indices of SMEs;
 - promoting the provision of equity research. This could include a review of the new rules on unbundling of trade execution and research. Adoption of new technology such as AI could make the production of equity research more efficient—competitive pressure on intermediaries may provide the right incentives to adopt such new technologies;
 - incentivising large international brokers, trading venues, and technology providers to invest in essential services to support trading in small- and mid-cap stocks of SMEs on a pan-European basis. As well as the policy measures around research provision (see previous bullet), the Commission may want to reconsider a small-cap delay regime to make it more commercially attractive for market-makers to provide liquidity for small stocks.

Liquidity in small financial centres

- Small financial centres typically have few large companies, small free floats, and infrequent and irregular trading activity. Our empirical analysis finds that trading

activity in small financial centres is spread between mid-caps³⁹³ and large caps.³⁹⁴ This contrasts to large financial centres, where trading is more concentrated in large caps. In the first half of 2019, the average market share of equity trading was 48.3% in mid-caps and 38.9% in large caps for small financial centres, compared to 68.3% for large caps in large financial centres.³⁹⁵ The lower liquidity in small financial centres is therefore partly due to the smaller size of the companies in these markets, meaning that many of the barriers specific to SMEs are also directly relevant to small financial centres.

- As well as challenges with attracting foreign investors, small financial centres have a lower domestic institutional investor base, owing to less well-developed private pension and insurance markets, and cultural barriers impeding participation of retail investors in equity markets. One consequence of this is higher ownership concentration that can lead to wider spreads required by market-makers (due to a higher probability of informed trading) and a smaller free float (of shares available to be traded in the secondary markets).
- Most smaller financial centres have their own CCP. The absence of larger pan-European CCPs operating in smaller financial centres makes it commercially less attractive for brokers to trade in stocks domiciled in smaller financial centres, and for new trading platforms to enter because they would need to incur additional cost to establish connections with domestic CCPs in these markets.
- Policy suggestions to support the development of small financial centres include:
 - investigating the use of EIF and/or EBRD to act as an anchor investor to crowd in private investment in these markets;
 - promoting interoperability links between CCPs, or facilitating cross-border mergers at the market infrastructure level, and more broadly, supporting the development of a pan-European infrastructure and ecosystem;
 - promoting the development of private pension and insurance provision in local markets and reviewing restrictions on their ability to invest in equity. This includes a review of restrictions from mandates on pension funds in these markets, and the Commission could prompt member states to reconsider national restrictions on pension funds. The Commission's review of capital charges under Solvency II is also relevant here;
 - investigating the commercial barriers to the adoption of indices in local capital markets and requiring classification of local markets as 'emerging/frontier' to enable their inclusion in the relevant indices;
 - strengthening corporate governance to avoid scandals and encourage public trust in capital markets (e.g. inclusion in equity indices can help improve firms' quality), to raise standards in jurisdictions where local requirements are in practice weak. More specific actions could include: i) investigating the possible role of fiduciary rating agencies, as has been developed in Canada; ii) a recommendation on all exchanges to adopt high-quality market-monitoring technology; and iii) support for credible enforcement by the trading venues and market supervisor(s)—resources have to be provided and publicised and then cases pursued in order to achieve market confidence).

³⁹³ 'Mid-cap' refers to companies between €500m and €5bn in market capitalisation.

³⁹⁴ 'Large-cap' refers to companies with greater than €5bn in market capitalisation.

³⁹⁵ Based on Oxera's empirical analysis of Bloomberg trading volume data.

Cross-border trading

- Access to equity markets from international as well as domestic investors is important because cross-border capital flows increase financial development, which might otherwise be opposed by incumbents because it increases competition.
- Our empirical analysis finds that cross-border trading is more widespread in large financial centres than in small ones, although there is a wide variation across the EU. Potential barriers to greater cross-border trading included divergent, inconsistent and complex tax issues, such as capital gains tax reporting requirements on foreign intermediaries, and withholding taxes. Several of the barriers affecting international investors to access small financial centres are also relevant here, so the development of small financial centres should also increase cross-border trading in the EU.
- It may be that technology can facilitate cross-border business because its mechanisms for generating confidence are not geographically bound.

13.1 Introduction

One of the key questions for this report (as discussed in section 1) is:

'Are there barriers preventing further development of secondary equity markets in the EU?'

In the previous sections we find (in section 11) that competition among trading venues (following the introduction of MiFID I) has led to greater choice and innovation in equity trading and lower explicit costs. We then observed (in section 12) that there has been an overall improvement in liquidity at the EU level, but also identified areas of policy concern, including with respect to SMEs, and local financial centres.

This section analyses the barriers that might be holding back the further development of equity trading markets. We identify some policy suggestions to improve the situation, with a focus on SMEs (section 13.2), small financial centres (section 13.3) and cross-border trading (section 13.4).

Our analysis is based on empirical analysis, insights from interviews with market participants, particularly from equity traders and market infrastructure providers, and financial market regulators, and an in-depth review of the literature.³⁹⁶

13.2 Barriers to SME liquidity

Market participants have highlighted how regulations affect SMEs in very different ways compared to large-cap securities.

For example, we find that the share of order size relative to volume traded is considerably higher for SMEs. To capture the trade order size from a liquidity perspective, across different categories of stock size, the percentage of MDV to fill the order is used. Intuitively, an MDV of 5% suggests that we expect to require 5% of the 21-day MDV to fill the order. As the percentage of MDV increases, the order demands more liquidity from the marketplace. This causes price-impact costs to rise as it becomes more difficult to execute the trade without 'moving the market'.³⁹⁷ Moreover, a high percentage of the MDV can be due to the limited depth of the order book, liquidity-taking order being too large and/or a limited level of trading activity with higher probability of zero-trading days. This is consistent with feedback from market participants through the interviews suggesting

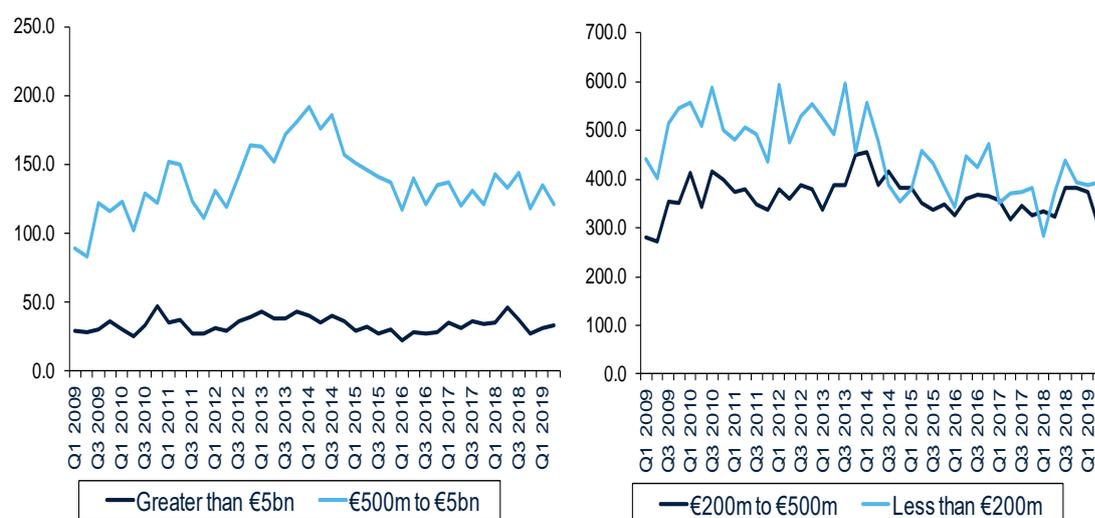
³⁹⁶ See Appendix 1 for more information on the sources used for this analysis.

³⁹⁷ Williams, R. (2016), 'Under the spotlight: how much does it cost to trade equities?', *Super The Journal of Superannuation Management*, http://www.fssuper.com.au/media/library/FS_Super/FS_Super_-_Under_the_spotlight-How_much_does_it_cost_to_trade_equities.pdf.

that investing in SMEs is often considered uneconomical due to lower liquidity and higher price-impact costs as a result of limited trading activity in small-cap stocks (see section 5.2).

Our empirical analysis shows that the percentage of order size relative to the 21-day MDV is considerably higher for smaller stocks: 9.6–10.7 times higher for small stocks (with market cap between €200m to €500m) compared to large caps (with market cap greater than €5bn) at the aggregate EU level.³⁹⁸ For stocks with a market cap value >€500m, the percentage of MDV was around 28.6–86.1% in the first half of 2009 compared with 31.8–127.8% in the first half of 2019. For stocks with a market cap value <€500m, the percentage of MDV was around 279.3–421.2% in the first half of 2009, compared to 321.3–383.6% in the first half of 2019.

Figure 13.1 Percentage of order size relative to the 21-day MDV, across different categories of stock size (%)



Note: The percentage of MDV reported at the aggregate EU level for individual categories of stock size is estimated as the weighted average based on number of orders. Weights are assigned based on the number of orders submitted for each country. Thus, countries with higher numbers of orders will have more weight in the averages. No data for stocks between €200m and €500m in Hungary and for large cap stocks in Czech Republic; no data for stocks less than €200m in Czech Republic and Hungary.

Source: Oxera analysis of Virtu Global Peer database.

Noting the fundamental differences in trading between SMEs and large stocks, this section discusses the main regulatory barriers and trends that might impede the development of equity trading for SMEs.

13.2.1 Impact of low research provision

The provision of research plays an important role in the functioning of equity markets as market participants are likely to rely on specialised analyst research to navigate through the volume and complexity of companies' information to make their investment decisions.

Prior to MiFID II, fund managers would receive not only trade execution services, but also 'research' services from their brokers, in return for dealing commissions.³⁹⁹ The regulatory

³⁹⁸ This is based on comparing the ratio between the percentage of MDV for small-cap stocks relative to large-cap stocks in the first half of 2009 and the first half of 2019 respectively.

³⁹⁹ The terms on which these extra services were provided were not always explicitly agreed. However, there was usually an understanding that the investment manager would generate a certain amount of business for the brokers in exchange for receiving the extra services.

concern with bundled brokerage arrangements is that the research might be an inducement for the fund manager to send trades to a broker. Rather than sending trades to brokers that would be best at executing the trade, fund managers might have an incentive to select brokers based on the quality and quantity of their research.

To address this concern, MiFID II requires fund managers and brokers to set separate charges for trade execution and research, and for the fund managers to pay for the research themselves (i.e. recovering the costs through the annual management charge) or to agree a separate research charge with their clients.⁴⁰⁰ While the new rules on unbundling might lead to higher-quality research and investment in new in-house analysis from the buy side, there may have been unintended consequences. Although other factors might also have impacted the willingness to provide research coverage, our empirical analysis shows a deterioration in equity research post-MiFID II. This is consistent with the existing literature on the topic. For instance, Guo et al. (2020) find that analyst coverage of EU firms decreased by 7.67% relative to the average coverage of these firms prior to MiFID II, indicating potentially a causal impact of unbundling on the quantity of research produced by analysts.⁴⁰¹ In practice, most asset managers have actually decided to charge research costs against their own profits. Internalising research costs makes asset managers even more selective and reduce the research services they acquire.

MiFID II is intended to address the concerns about inducements (i.e. preventing brokers from competing by offering 'research free of charge'), but it has not considered a market failure; namely, that relating to the positive externality of the production of research. This positive externality remains and is likely to exacerbate the existing under-provision of research, particularly for SMEs (see Appendix A6.3). The Commission has also acknowledged the negative impact of the unbundling rule on research coverage for SMEs in its proposal to exempt SMEs from this rule, as part of its 'Capital Markets Recovery Package' in response to the COVID-19 crisis.⁴⁰² It is also important to note that recent regulatory and technological changes have increased the scope for innovation in the provision of equity research. New participants have entered the market to provide equity research for investors and fund managers using advanced machine-learning techniques and AI-driven company analytics.⁴⁰³

Focusing on SMEs, our empirical analysis shows that equity research coverage is consistently lower for SMEs, compared to large-cap stocks. At the aggregate European level, from 2013 to 2019 the average number of analyst recommendations for large cap stocks was 15.7, compared to 3.0 for smaller caps (i.e. market cap <€500m) (see Figure 13.2).⁴⁰⁴ We also observe that small stocks display a significant reduction in equity research coverage, with the average number of analyst recommendations decreasing from 4.1 in the first half of 2013 to 3.1 in the first half of 2019 for stocks with market cap <€500m.⁴⁰⁵

⁴⁰⁰ As discussed in section 11.3, commission rates have come down since the implementation of MiFID II as research is no longer paid for out of commissions, and its cost needs to be explicitly disclosed to the clients of the fund managers.

⁴⁰¹ Guo, Y. and Mota, L. (2020), 'Should information be sold separately? Evidence from MiFID II', p. 19.

⁴⁰² Coronavirus response: Making capital markets work for Europe's recovery, 24 July 2020, https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1382.

⁴⁰³ For example, Fregnan (<https://www.fregnan.com/>) produces machine-driven research based on the collection and analysis of a significant amount of data for a given company.

⁴⁰⁴ Equity research at the aggregate EU level is estimated as the weighted average of monthly analyst recommendations for 14 EU member states. The weights are computed using the equity market capitalisation for each country in each year (i.e. higher weights are assigned to countries with higher equity market capitalisation).

⁴⁰⁵ We observe similar results when using the simple average as opposed to the weighted-average approach. The average number of analyst recommendations decreased from 3.0 in the first half of 2013 to 2.4 in the first half of 2019 for stocks with market cap <€500m.

However, the comparison of the impacts of unbundling between SMEs and large-cap stocks depends heavily on how these two categories have been defined. Guo et al. (2020)⁴⁰⁶ find that the post-MiFID II overall decrease in analyst coverage does not come from small- or mid-cap firms but is concentrated in large firms. Their explanation is that competition drives inferior research out of the market. Since large firms have much more coverage than small firms, research with low marginal value is more likely to exist. If investors opt out of inferior research, large firms are more affected. On the other hand, Fang et al. (2020)⁴⁰⁷ conclude that the reduction in research coverage is more pronounced for small-cap stocks. More specifically, small firms, those having less institutional ownership, those not issuing financing, and those with lower trading volume are less important for the sell side, and therefore more likely to suffer coverage losses.⁴⁰⁸ The different conclusions are, however, likely to be driven by how small-cap stocks have been defined differently in the two papers.⁴⁰⁹

Nevertheless, one possible explanation for the observed reduction in equity research coverage for SMEs is that mid-tier firms are less economically incentivised to produce research for small-cap stocks, compared to pre-MiFID II. Although separate charges need to be set for trade execution and research, and fund managers are no longer allowed to receive research free of charge, brokers may still have an incentive to offer research at very low fees, and potentially below cost, by using trade execution revenues to cross-subsidise the provision of research. Due to their scale, very large brokers may be more able to set very low fees and/or use trade execution to cross-subsidise the provision of unprofitable research than small or medium-sized brokers.⁴¹⁰ On the other hand, mid-tier firms may not have the sufficient scale to effectively cross-subsidise research for small-cap stocks.

In addition, the buy side, which now needs to demonstrate value for the research being paid for, might be less prepared to make payments for the analysis. Feedback from interviews suggests that many SMEs have little research other than from their broker. The lack of adequate research coverage is in turn likely to contribute to lower liquidity for such stocks.

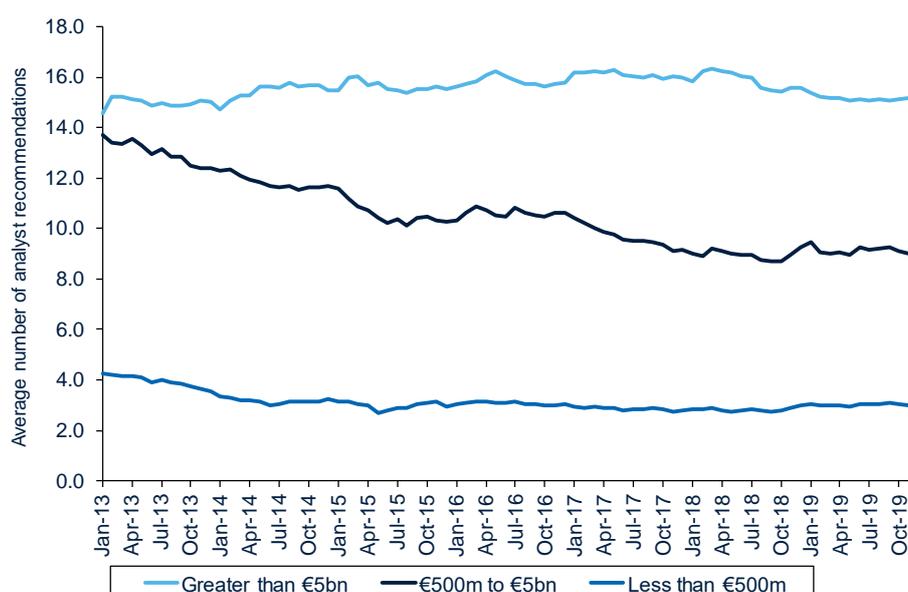
⁴⁰⁶ Guo and Mota (2020) op. cit., p.19.

⁴⁰⁷ Fang, B. Hope, O.-K., Zhongwei Huang, and Moldowan. R. (2020), 'The effects of mifid ii on sell-side analysts, buy-side analysts, and firms', forthcoming, *The Review of Accounting Studies*.

⁴⁰⁸ Ibid.

⁴⁰⁹ In Guo and Mota (2020), small firms are defined as firms whose average market capitalization before MiFID II falls below the median. In Fang et al. (2020), the authors first regress firm size on analyst coverage and then take the residual size. Small firms are the firms with the residual firm size in the first tertile by country-year.

⁴¹⁰ See Kinder, T. (2017), 'FCA sets sights on price-dumping in research market', *Financial News*, 16 October, <https://www.fnlondon.com/articles/fca-sets-sights-on-price-dumping-in-research-market-20171016>; and Flood, C. (2018), 'FCA to launch asset management Mifid probe', *Financial Times*, 18 June.

Figure 13.2 Number of analyst recommendations by stock size

Note: Equity research at the aggregate EU level is estimated as the weighted average of monthly analyst recommendations for EU-14 (no data for stocks between €500m and €5bn in Bulgaria and Slovakia, larger than €5bn and less than €500m in Slovakia). The weights are computed using the equity market capitalisation for each country in each year (i.e. higher weights are assigned to countries with higher equity market capitalisation).

Source: Oxera analysis of Bloomberg data.

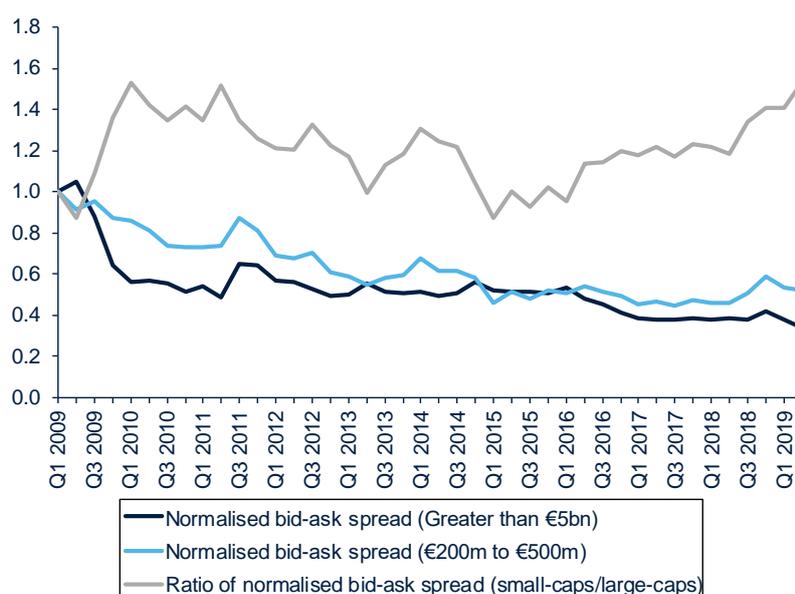
Furthermore, this is likely to affect small financial centres, where small-cap stocks, on average, account for a significant proportion of all listed securities. This is in addition to the fact that equity research coverage is considerably more prevalent in large financial centres than in small ones. On average, a stock domiciled in a large financial centre has around 8.5 analyst recommendations compared with 5.6 for stocks domiciled in one of the smaller financial centres.

13.2.2 Impact of the rise in passive investment

One important trend that is likely to affect trading in small- and mid-cap stocks is the rise of passive investment strategies. In particular, the rise of passive investment is expected to drive investment towards large caps and away from SMEs.

We observe that, in relative terms, the fall in the bid-ask spread was more significant for large- than for small-cap stocks. This is an indication that liquidity improvement at the EU level is more pronounced for large-cap stocks (corresponding to the ratio line in Figure 13.3 rising since 2015).⁴¹¹ A possible explanation is that large-cap stocks have benefitted more from the increasing popularity of passive investment, and ETFs more specifically, since they are heavily featured in traditional equity indices.

⁴¹¹ See section 12.2.3 for further information on liquidity trends for SMEs versus large-cap stocks.

Figure 13.3 Normalised bid-ask spreads for the EU, by market capitalisation

Note: This chart shows the relative decrease in the bid-ask spread between small and large caps. For this reason, both lines are normalised to 1 at the beginning of the observation period. The grey line depicts the ratio of the normalised bid-ask spread between small-cap and large-cap stocks.

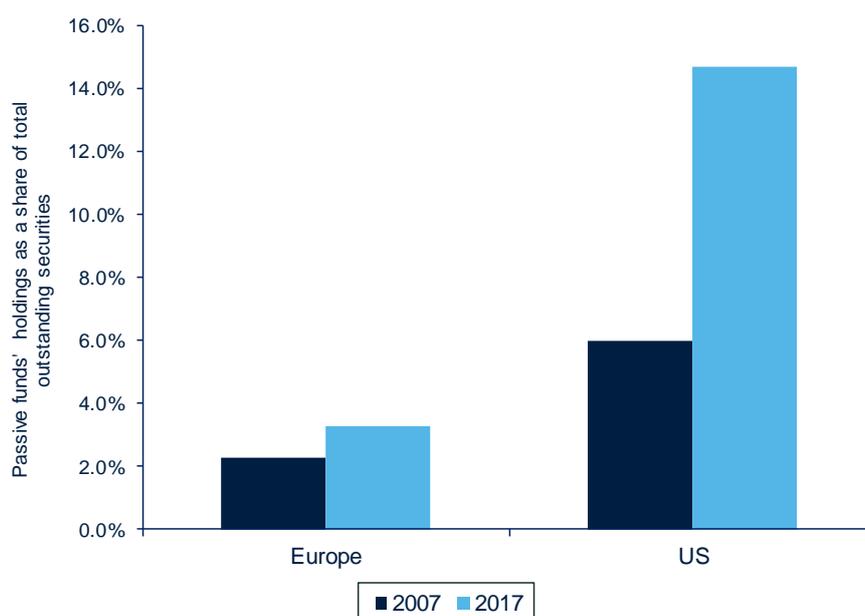
Source: Oxera's analysis of Virtu data.

Having expanded rapidly over recent years, passive fund⁴¹² assets now represent a significant proportion of the global investment fund universe, at around \$8 trillion, or 20% of aggregate investment fund assets as at June 2017.⁴¹³ Their size as a proportion of outstanding equity market volumes has increased considerably both in Europe and the USA (see Figure 13.4).⁴¹⁴

⁴¹² A fund is classified as passive if it has: i) a well-diversified portfolio; ii) low portfolio turnover; and iii) performance that closely tracks a standard index. This approach to fund classification will include declared index-tracking funds/ETFs as passive. See Financial Conduct Authority (2019), 'Does the growth of passive investing affect equity market performance?: A literature review', Research Note, <https://www.fca.org.uk/publication/research/research-note-does-growth-passive-investing-affect-equity-market-performance.pdf>.

⁴¹³ Sushko, V. and Turner, G. (2018), 'The implications of passive investing for securities markets', *BIS Quarterly Review*, March, https://www.bis.org/publ/qtrpdf/r_qt1803j.pdf.

⁴¹⁴ However, as also noted in a recent report by the Committee on Capital Markets Regulation in the USA, passive funds and ETFs do not represent the entire universe of passive investments as many institutional investors manage their investment internally. In addition, the passive/active classifications sometimes may not be informative as there is a spectrum in how fund managers select which index to use and how closely to track the index. Scott, H.S. and Gulliver, J. (2020), 'Reforming U.S. Capital Markets to Promote Economic Growth', Committee on Capital Markets Regulation, May. Available at SSRN: <https://ssrn.com/abstract=3619023>.

Figure 13.4 Share of passive funds in equity markets

Note: Holdings of passive funds as a share of total outstanding securities (i.e. equity market capitalisation). Equity market capitalisation (the denominator) is based on Bloomberg World Market Capitalization indices (WCAUUS for the USA, and constituent countries for Europe).⁴¹⁵

Source: Bloomberg; Lipper.

ETFs,⁴¹⁶ which allow intraday trading of shares in passive portfolios on a secondary market, have grown even faster, with their share of passive fund assets exceeding 40% in June 2017 compared to around 30% in 2007.⁴¹⁷ There are now more than 8,400 ETFs, and their assets under management climbed from \$5 trillion to \$5.6 trillion in the year to April 2019.⁴¹⁸

ETFs are attractive to investors for a number of reasons, including intraday tradability,⁴¹⁹ transparency, tax efficiency,⁴²⁰ and access to specific markets or asset classes.⁴²¹ Large-cap stocks have benefitted from the increasing popularity of passive investment, and ETFs more specifically, since they are heavily featured in traditional equity indices. For the most highly traded ETFs, the tighter the bid–offer spread in an ETF, the more investor orders it

⁴¹⁵ Ibid.

⁴¹⁶ A stock ETF is an asset that tracks a particular set of equities, similar to an index. It trades on an exchange just as a normal stock would, but, unlike a mutual fund, prices adjust throughout the day rather than at market close. These ETFs can track stocks in a single industry, such as energy, or an entire index of equities such as the S&P 500. By doing so, investors can gain exposure to a basket of equities and limited company-specific risk associated with single stocks. This instant diversification comes in a simple, low-cost, and tax-efficient tool that can be accessed through most online brokerages.

⁴¹⁷ Sushko and Turner (2018), op. cit.

⁴¹⁸ Jones, C. (2019), 'The next 'hidden liquidity problem' that could erupt', *Money Observer*, <https://www.moneyobserver.com/next-hidden-liquidity-problem-could-erupt>, accessed 24 January 2020.

⁴¹⁹ 81% of investors cite liquidity as a primary reason for their use of ETFs. Greenwich Associates (2019), 'ETFs: US Institutions' New tools of Choice for Portfolio Construction'.

⁴²⁰ In the UK, ETFs are exempt from stamp duty, so investors do not have to pay this tax when they buy the fund through their broker or fund platform.

⁴²¹ 79% of institutional investors. JP Morgan Research (2014), 'Understanding Exchange-Traded Funds. How ETFs Work', September.

is likely to attract, leading to higher turnover and more market-makers, in turn helping to further narrow spreads.⁴²²

Large caps are considerably more prevalent in major equity indices. Traditional equity indices weight the stocks they contain by market capitalisation, so that larger companies dominate. At the end of April 2014, three-quarters of the total value of the MSCI World Index (a benchmark widely followed by passive investors) was accounted for by large cap stocks valued at more than \$20bn.⁴²³ More recent evidence shows that, as at July 2019, 61% of the total value of the FTSE All-share index was accounted for by large-cap stocks, valued at more than €20bn, even though they make up only 4.3% of the 634 FTSE all-share constituents.⁴²⁴

Moreover, small-cap stocks are frequently not included in major stock indices. Our interview insights suggest that small-cap stocks often do not meet free-float requirements to be part of a major index. Several participants have indicated that being part of a major index would improve the liquidity of small cap stocks, while also incentivising smaller companies to improve their quality and corporate governance standards in order to be part of the index.

Another important element to this trend is the expected relative decline in active investment strategies in equity markets. Existing academic evidence suggests that the benefits of active management are amplified in small- and mid-cap stocks in the USA.⁴²⁵ The logic behind this proposition is that:

- within a given segment of the market, passive investors may not hold the value-weighted portfolio due to the illiquidity of and/or lack of available float in some constituent parts of this portfolio;
- small-cap equities are the part of equity portfolios most likely to pose liquidity and other issues for passive investors;
- thus, passive investors hold heavier weights in issues that are more liquid, meaning that active investors hold heavier weights in issues that are less liquid.

It is likely that this logic would apply similarly in EU markets. This also reveals that there is not a simple relationship between the rise of passive investment and the amount of investment by active managers in small-cap equities. Initially, one might expect a slightly higher proportion of (smaller) active portfolios to be invested in small-cap equities as increased passive investment focuses on highly liquid investment opportunities. At a larger scale, however, this offset could not be continued without fundamentally altering the nature of active investors' portfolios—a phenomenon that has not been observed.

Stocks included in indices tend to have higher liquidity and lower trading costs than non-index stocks, due to higher trading volume. These benefits would also apply to SME indices, even if to a lesser extent than for stocks in major indices. In addition, SMEs have been found to benefit more from index inclusion, compared to large-cap stocks. Kaptein (2016) analyses the price impact of index inclusion in the major large-, mid-, and small-cap stock indices of the Dutch stock market and finds that while the initial positive return from index inclusion experienced by stocks included in the large-cap index fully reverses

⁴²² ETF Research Academy (2015), 'Understanding ETF liquidity', <https://www.lyxor.com/understanding-etf-liquidity>, accessed 24 January 2020.

⁴²³ Schroders (2014), 'The hidden risks of going passive', <https://www.schroders.com/hu/sysglobalassets/digital/insights/pdfs/hidden-risk-of-going-passive-july-2014.pdf>, accessed 24 January 2020.

⁴²⁴ Estimated by Oxera based on Refinitiv data.

⁴²⁵ Wermers, R. (2020), 'Active Investing and the Efficiency of Security Markets', *The Journal of Investment Management*, forthcoming.

within 50 days, this positive abnormal return persists for the mid-cap index, suggesting that index inclusion makes previously less known, less liquid stocks more valuable by increasing the supply of public information about them.⁴²⁶

13.2.3 Policy suggestions to improve equity trading on small- and mid-cap stocks

The analysis above has identified research coverage and the rise of passive investment as two specific challenges for the development of equity trading on small- and mid-cap stocks.

In addition to the policy suggestions for SME listings discussed in section 5, based on our research and interviews with market participants we have identified further considerations, which include:

- supporting the creation of fund structures to facilitate the investment of diversified pools of SME stocks;
- promoting the use of tax incentives for investing in small stocks (as also discussed in section 5);
- facilitating greater investment in SME stocks, for example by revising the UCITS Directive to allow UCITS to invest in SME growth markets (see also the policy measures discussed in section 5);
- encouraging more passive investments in SMEs, by investigating the commercial barriers to the adoption of indices of SMEs;
- promoting the provision of equity research. This could include a review of the new rules on unbundling of trade execution and research. Adoption of new technology such as AI could make the production of equity research more efficient, and competitive pressure on intermediaries might provide the right incentives to adopt such new technologies;
- incentivising large international brokers, trading venues, and technology providers to invest in essential services to support trading in small- and mid-cap stocks of SMEs on a pan-European basis. As well as the policy measures around research provision (see previous bullet), the Commission may want to reconsider a small-cap delay regime to make it more commercially attractive for market-makers to provide liquidity for small stocks. Under the transparency regime, market makers have a limited period of time to hedge their risk before the mandatory publication of trade volumes under post-trade transparency requirements. If positions are made public, other market participants will employ this information to trade strategically. Managing this risk becomes more difficult as trade sizes increase or the liquidity of the instrument decreases. If these requirements are not properly designed and illiquid markets are classified as liquid and are therefore subject to transparency regimes, there is the risk that market makers could be discouraged from committing capital to facilitate trades, especially for wholesale trades, reducing liquidity and increasing spread. This is especially relevant for SMEs that are likely to be relatively less liquid and thus subject to deferred reporting.

We discuss in section 14 the interactions of these policy suggestions with the various development paths of EU equity markets.

⁴²⁶ Kaptein, R. (2016), 'The effect of index inclusion', Erasmus Universiteit Rotterdam, Erasmus School of Economics, <https://thesis.eur.nl/pub/33763/MA-Thesis-Robert-Kaptein.pdf>

13.3 Barriers to liquidity in small financial centres

Small financial centres are usually considered frontier or emerging markets.⁴²⁷ The main challenges affecting liquidity in these markets are:

- the small number of stocks with a large market capitalisation;
- the small number of shares outstanding;
- infrequent and irregular trading.

Typically, there are also short time-series of past trades, a lack of transparency and readily accessible information about traded companies, as well as various types of systemic risk, including illiquidity. These factors can mean that small financial centres suffer from higher levels of systematic risk.⁴²⁸ As the lack of regular trading is particularly acute, the time period between two subsequent trades can be several weeks.

This section examines the main barriers to the development of small financial centres in the EU.

13.3.4 The local and independent nature of small financial centres

The majority of companies operating in small financial centres are small (see section 2).⁴²⁹ Similar to SMEs in other EU countries, small firms in these markets face similar barriers to liquidity, such as lack of inclusion in indices and research. Market participants in these financial centres have also indicated that their supervision authority tends to deploy a strict interpretation of regulations without consideration of the local market conditions, leading to higher costs to and a greater burden on small firms.

We examine trading activity, measured by total trading volume, for different sized stocks in small and large financial centres. This is only indicative of the make-up of these markets since trading activity also reflects the liquidity differentials of different stock sizes—large stocks are more liquid and thus exhibit higher trading volume; at the same time, if they are traded more frequently, there is more supply of liquidity for such stocks.

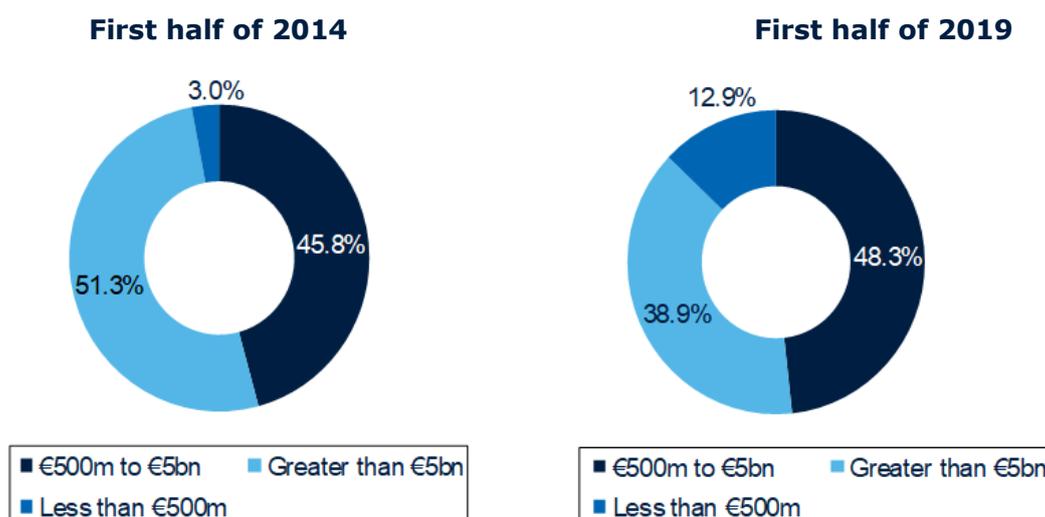
We find that trading activity in small financial centres is predominantly concentrated in mid-cap stocks—with a market cap between €500m and €5bn—with the average market share in the first half of 2019 at 48.3% (see Figure 13.5), while large-cap stocks (i.e. market capitalisation greater than €5bn) accounts for 38.9%.

This is in comparison with trading activity in large financial centres concentrated in large-cap stocks, with the average market share at 68.3% in the first half of 2019.

⁴²⁷ Frontier markets are used to describe the smaller, less-developed, less-liquid countries that make up emerging markets.

⁴²⁸ Minovic. J and Zivkovic. B (2010), 'Open issues in testing liquidity in Frontier Financial Markets: The Case of Serbia', *Journal of Economics*, **LV**:185, pp. 33–62.

⁴²⁹ In the region almost all firms are SMEs. See Appendix A5 for the European Commission of SMEs. They account for around 70% of employment and produce about 60% of added value.

Figure 13.5 Share of trading volume in small financial centres by stock size

Note: The fragmentation of trading volume is estimated in percentage terms based on the annual average of volume traded for each size category. The share of volume traded in small financial centres is predominantly driven by trading activity observed in Poland. Indeed, if Poland is removed from the sample, the concentration of market activity in mid-cap stocks in small financial centres becomes significantly more prevalent. Removing Poland from the sample increases the concentration of mid-caps to 92.3% in the first half of 2014 and 54.3% in the first half of 2019; whereas the market share of large caps reduces considerably, to 2.4% and 19.5% in 2014 and 2019 respectively. This reflects the relatively high level of trading activity of large caps in the Polish market.

Source: Oxera analysis of Bloomberg data.

Due to the concentration of mid- and small-cap stocks, the low level of liquidity in small financial centres is likely to be partly due to the reasons highlighted in the previous section. In particular:

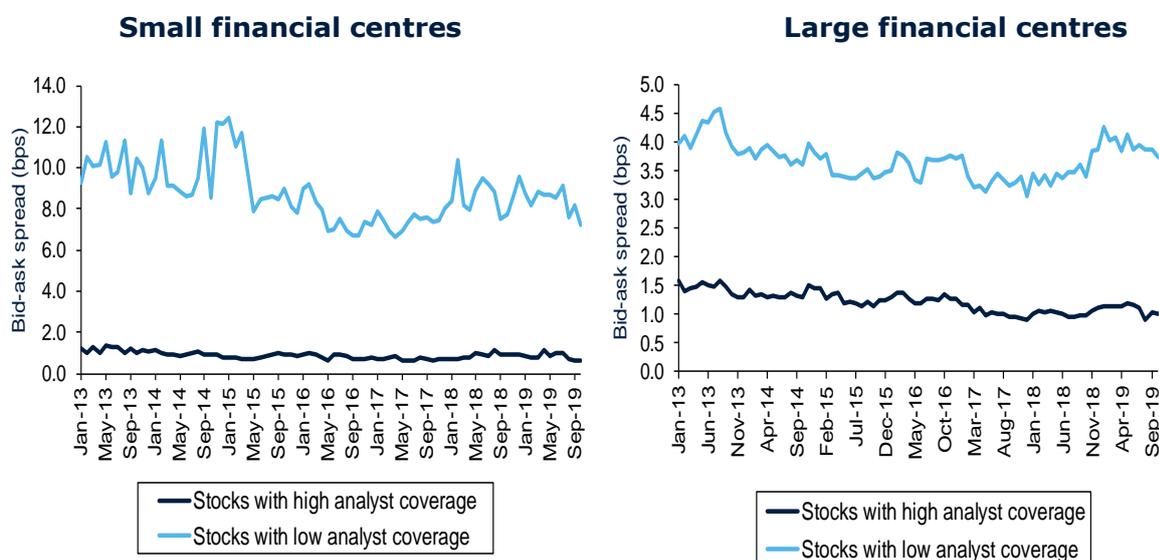
- a reduction in analyst coverage is likely to affect stocks domiciled in small financial centres more than those domiciled in large ones. We find that high coverage stocks—those with more analyst recommendations than their country average—are associated with around 10.7 times more trading activity and 8 times lower bid–ask spreads in small financial centres, compared to low-coverage stocks (see Figure 13.6). For large financial centres, this differential in market liquidity (as depicted by bid–ask spreads) and trading activity is significantly lower than that for smaller financial centres (see section 13.2.1);⁴³⁰
- passive investments, and more specifically ETFs, mostly feature stocks from large financial centres, with the top 20 European ETFs (ranked on the basis of the average volume) dominated by large financial centres' indices.⁴³¹ Therefore, stocks from small financial centres find it more difficult to attract investment, especially from outside their home country. Feedback from interviews suggests that small stocks have difficulties attracting sufficient liquidity partly because many institutional investors are restricted by their mandates to invest only in stocks with a market cap above a certain threshold. Moreover, in some cases stocks in local capital markets are featured in frontier-market

⁴³⁰ This is estimated based on the average values observed in small financial centres from January 2013 to November 2019. Small financial centres are served mostly by small and local brokers. For instance, in Croatia, three brokers account for more than 50% of turnover. Moreover, Polish brokerage houses are usually key providers of services (IPOs, analytical coverage, market-making) for SMEs. As such, the intermediary environment in small financial centres is characterised by economically disincentivised local brokers to provide research coverage—as they cannot afford to compete with large brokers on the basis of very low fees—and disinterested large brokers to operate in small financial centres due to low profitability.

⁴³¹ iShares MSCI Poland ETF is the only one based on a local market index.

indices, which have a higher perceived level of risk from investors' point of view. This results in a limited pool of institutional liquidity available for stocks in small financial centres.

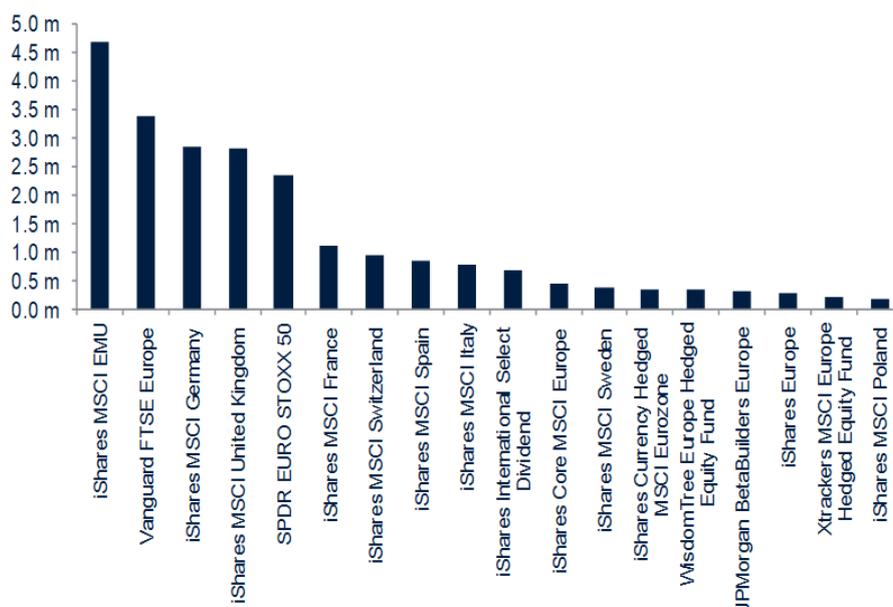
Figure 13.6 Bid-ask spreads and analyst coverage



Note: EU-14. There is no data for stocks with high analyst coverage in Croatia. To examine the importance of analyst coverage on liquidity provision, we separate the universe of stocks domiciled in the EU-14 into two groups for each country: 'High analyst coverage' individual stocks with a total number of analyst recommendations greater than the country-level average; and 'low analyst coverage' individual stocks with a number of analyst recommendations less than the country-level average. Observations more than three standard deviations away from the mean were disregarded. We then estimated the liquidity performance (measured by the average bid-ask spread) for both groups.

Source: Oxera analysis of Bloomberg data.

Figure 13.7 European ETFs, by volume traded



Note: Top 20 MTFs in the EU ranked by the average trading volume as at March 2019.

Source: Oxera analysis of Europe Equities ETFdb data, https://etfdb.com/etfdb-category/europe-equities/#etfs__overview&sort_name=assets_under_management&sort_order=desc&page=1.

In addition, the limited number of listings contributes to less liquidity in small financial centres as they can rely on only a handful of anchor stocks (see section 2). In Bulgaria, for example, the weak capital market has historically resulted from a mass privatisation of more than 1,000 Bulgarian public companies at the end of the 20th century. This mandatory listing led to low levels of corporate governance in most of the companies, liquidation and insolvency procedures in some of the companies as a result of their restructuring, with the ultimate outcome that a majority delisted from the exchange. Moreover, feedback from market participants indicates that the limited number of listings in Croatia, for example, is associated with a considerable number of large companies being state-owned.

The stock exchange consolidation in Europe has been observed mainly in northern and central Europe. In contrast, Central and Eastern European stock exchanges tend to be independently owned and operated. This is consistent with the views provided by market participants. Feedback from our interviews indicates that trading in local markets predominantly takes place on the primary exchange and is intermediated by a limited number of local brokers. Lack of competition in these markets is likely to have resulted in relatively higher fees.

The independent and local nature of these markets means that they have not experienced the gain in scale. Such a gain would help improve liquidity, as seen in several pan-European trading venues, in the following ways (see section 1.1):

- high network effects—the intrinsic value to each trader grows with the total number of traders participating in the market;⁴³²
- consolidation reduces the frequency of parallel trading of the same security into different national exchanges, leading to a reduction in market fragmentation;
- the integration of the technology trading platforms facilitates cross-border trading.

13.3.5 Insufficient domestic institutional investor base

While large financial centres tend to have a significant proportion of institutional investors, both domestic and foreign, small financial centres in the EU have difficulty in attracting foreign institutional investors (discussed further below), as well as lacking their own domestic institutional investor base. For example, in Greece only 20% of domestic investors are institutional and only 42% of foreign investors are institutional. Conversely, in Sweden, 71% of domestic investors are institutional and 76% of foreign investors are institutional.⁴³³

Other examples of the insufficient domestic institutional investor base are:

- Croatia, where mandatory pension funds are the main institutional investors but their investment is not of large enough scale to boost market liquidity;
- Slovakia, where the insufficient pool of institutional investors is reflected by a very low number of company share transactions on the Slovak stock exchange (only 24% of domestic investors are institutional);
- Bulgaria, where the local non-banking sector is relatively small with net assets under management of mutual funds and pension funds totalling €530m and €5.5bn

⁴³² Okuliar, A. (2014), 'Financial Exchange Consolidation and Antitrust: Is there a need for more intervention', *Antitrust*, **28**:2.

⁴³³ Based on Oxera's analysis of IMF and ECB data. See Appendix A1.4 for further details on the data source

respectively. (Insurance corporation and pension funds in Bulgaria account for 17% of domestic investors.)⁴³⁴

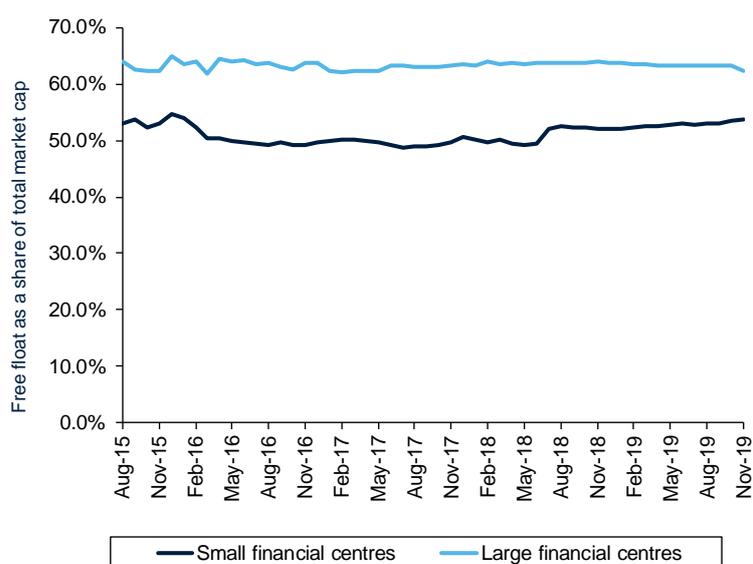
Interview insights from market participants suggest that small financial centres are struggling to attract more foreign investors because they are too local; they have relatively low levels of liquidity and are dominated by small-cap stocks. Moreover, the networks of brokers and retail investors in small financial markets are not sufficiently well-developed.

13.3.6 High level of ownership concentration

Stocks from small financial centres also tend to suffer from a high level of ownership concentration, which has been shown in academic literature to potentially impair firms' market liquidity. Market participants face an adverse-selection problem from informed investors when the level of ownership concentration is significant. Market-makers then mitigate their potential losses to informed traders by charging wider spreads and reducing the number of shares they offer in response to increases in the probability of informed trading (see Appendix A1.2).

We find that stocks domiciled in large financial centres have a larger equity free-float percentage⁴³⁵—generally associated with lower ownership concentration, a higher turnover ratio, and a lower bid–ask spread⁴³⁶—than those in small financial centres. The average equity free float over the past five years in large financial centres is 63% compared to an average of 51% observed across smaller financial centres.⁴³⁷

Figure 13.8 Equity free float estimated at the aggregate financial centre level



Note: The equity free-float percentage reported at the aggregate financial centre level is estimated as the average of equity free float observed at the country level. Observations more than three

⁴³⁴ Ibid.

⁴³⁵ Equity free float refers to the percentage of the company stock that is freely traded. The free-float percentage is calculated as follows: $(\text{free-float share}/\text{current shares outstanding}) \times 100$.

⁴³⁶ See Iskandrani, M.M.M. (2015), 'The effect of ownership level, concentration and owners' identity on market liquidity in the UK Capital Market', The University of Liverpool, <https://core.ac.uk/download/pdf/80772927.pdf>; Bhidé, A. (1993), 'The hidden costs of stock market liquidity', *Journal of Financial Economics*, **34**, pp. 31–51; Holmstrom, B. and Tirole, J. (1993), 'Market liquidity and performance monitoring', *Journal of Political Economy*, **101**, pp. 678–709; Bolton, P. and Von Thadden, E. (1998), 'Blocks, liquidity, and corporate control', *Journal of Finance*, **53**, pp. 1–25. These authors argue that dispersed shareholders have fewer incentives for information production if the float on a stock is smaller.

⁴³⁷ The five-year average period ranges from August 2015 to November 2019.

standard deviations away from the mean have been disregarded. This is based on the available data, where small financial centres include Estonia, Hungary, Poland and Croatia; large financial centres include France, Germany, Ireland, Italy, the Netherlands, Spain, Sweden, and the UK.

Source: Oxera analysis of Bloomberg data.

13.3.7 Cultural barriers impeding participation of retail investors in equity markets

In addition to the lack of institutional investors, retail investors in these markets are less active than those in large financial centres, due to:

- a relatively low level of financial literacy in general, but particularly among the younger population;⁴³⁸
- a general distrust of capital markets from retail investors and the general public. For example, a scandal in 2015 around two Hungarian brokerage firms resulted in both positive and negative effects.⁴³⁹ It led to a general decrease in confidence towards investment service providers. At the same time, the market has evolved since and become more prudent and integrated, as National Bank of Hungary increased its vigilance. Another example is the lack of equity culture in Slovakia as a result of an unsuccessful privatisation of state enterprises in the 1990s. This led to 300,000 small 'investors' holding worthless shares and being obliged to pay fees for the property account at depository.

Feedback from market participants has substantiated the observation that small financial centres experience less retail participation than large financial centres. They pointed to a solution to increase retail participation by providing tax advantages similar to the case of Sweden (see section 5.3).⁴⁴⁰

13.3.8 Post-trading arrangements

The European Commission report in 2002, 'Cross-border clearing and settlement arrangements in the EU', highlighted the importance of efficient cross-border clearing and settlement arrangements in promoting further trading across the EU countries.⁴⁴¹ Traditionally, each national market in Europe had its own monopoly securities trading, clearing and settlement systems, often by construct of law. Similar to trading, post-trade arrangements have changed significantly in the last two decades. In Europe, competition has been introduced at the clearing level in some of the financial centres. Furthermore, since the 2008 financial crisis, the move to central clearing is a fundamental change in the structure of the market as it serves as a mechanism for maintaining financial stability during times of market distress.⁴⁴²

⁴³⁸ HANFA and the Croatian National Bank in cooperation with the Ministry of Finance (2015), 'Measuring Financial Literacy and Financial Inclusion in Croatia'.

https://www.hnb.hr/documents/20182/499482/ep04022016_prezentacija.pdf/cf961d5c-a697-4295-84af-9fa98f44b6f5. Moreover, another study provides evidence that the lack of confidence in financial markets and the relatively low levels of financial literacy are more pronounced in Central and Eastern Europe. See Vienna Initiative (2018), 'Report by the Working Group on Capital Markets Union'.

⁴³⁹ Lestyánszky, A. (2015), 'Brokerage scandal engulphs Hungary', *The Budapest Beacon*, March, <https://budapestbeacon.com/brokerage-scandal-engulphs-hungary/>.

⁴⁴⁰ In Sweden, retail participation is significant. It is common for Swedish citizens to buy stocks. This might be because of the 'ISK', an investment savings account that allows citizens to invest in shares/funds through the account but does not require them to pay any taxes on the profits made. The citizen pays a tax on the value of their assets only, whether or not they make a profit or loss.

⁴⁴¹ Giovannini Group and European Commission. (2002), 'Cross-border clearing and settlement arrangements in the European Union', No. 163, Directorate-General for Economic and Financial Affairs.

⁴⁴² Introduced in 2012, the EMIR defines a standard set of requirements for CCPs across the EU. It requires all CCPs to submit applications for authorisation to supervisory authorities and to comply with new capital, risk management and governance requirements.

Feedback from interviews with market participants suggests that post-trading environment in small financial centres in the Central and Eastern European region lacks integration and is predominantly concentrated in the incumbent CCPs. This might discourage new venues to access markets in Central and Eastern Europe. For instance, although EuroCCP was set up in these markets, trading was limited because brokers were unwilling to switch away from the incumbent CCP due to a lack of interoperability, in this case between the incumbent CCP and EuroCCP. As a result, Turquoise and Cboe, while having set up access to equity markets in Hungary and Czech Republic,⁴⁴³ failed to attract sufficient order flows without using the national CCP instead of their existing CCP (i.e. EuroCCP). This would mean additional costs to these trading venues and thus made it not commercially attractive for them to operate in these markets. Giving other CCPs access to the domestic trading venues and establishing interoperability with the domestic CCPs in Central and Eastern Europe are, therefore, likely to result in a number of benefits, as follows.⁴⁴⁴

- Foreign brokers would be able to trade more easily in the Central and Eastern European countries—connecting to a domestic CCP comes with costs (e.g. due diligence and connectivity) and these would no longer be incurred if brokers can use a CCP they already use for clearing of equities in other financial centres. Furthermore, establishing interoperability between the domestic and new entrant CCP would enable brokers to consolidate all their trades on the CCP of their choice, thereby also benefitting from volume discounts (as a result of economies of scale) and margin offset. Consolidating all trades on one CCP also increases netting efficiencies and thereby reduces the settlement costs to brokers.⁴⁴⁵
- Alternative trading platforms are likely to find it easier to enter. Rather than only having the option of using the domestic CCP and having to negotiate on an access fee,⁴⁴⁶ new trading platforms could enter using larger existing CCPs that already offer competitive fees and that their users (i.e. brokers) already have access to. Currently, while 'open access' has allowed CCPs other than the domestic CCP to have access to trading venues, without interoperability link between CCPs investors and traders may still prefer to trade on the primary exchange. As a result, there is a risk that alternative trading venues would not be able to attract sufficient order flow without switching to the domestic CCP.

MIFID already provides for open access, the aforementioned benefits are unlikely to materialise without a requirement for interoperability. Without interoperability, brokers would have to use multiple CCPs and therefore would not be able to benefit from an increase in the scope for multilateral netting, volume discounts, an increase in margin offset (reducing collateral requirements), and a reduction in costs as a result of having to connect to just one CCP.

Bringing down the costs of clearing, and making it easier for foreign brokers and alternative trading platforms to enter, are likely to result in more trading and thus more

⁴⁴³ See Depository Trust & Clearing Corporation (2010), 'EuroCCP and Turquoise launch clearing and trading services for Hungarian and Czech Securities', <https://www.dtcc.com/news/2010/march/01/euroccp-and-turquoise-launch-clearing-and-trading-services-for-hungarian-and-czech-securities>.

⁴⁴⁴ See Barnes, R. (2018), 'Counterparty clearing house user choice: an evolving European landscape', Agenda, Oxera, March, https://www.oxera.com/wp-content/uploads/2018/03/Counterparty-clearing-house-user-choice_1.pdf.

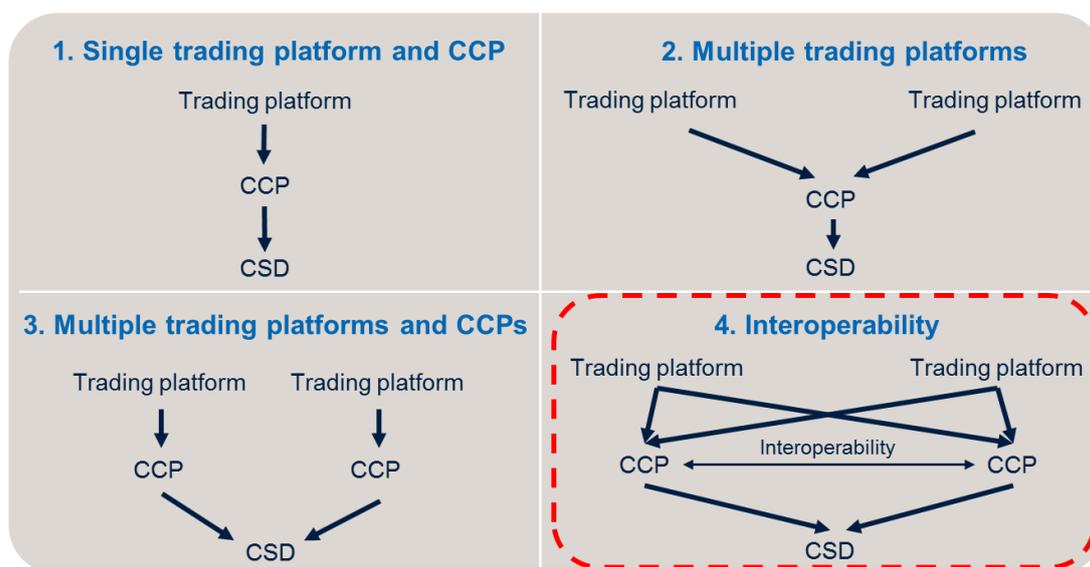
⁴⁴⁵ Where a single name trades on multiple platforms with different CCPs, consolidating in one CCP saves settlement fees. For example, if a company trades on LSE&x-clear + CBOE&EuroCCP + Turquoise&LCH Clearnet, there are at least three times the net settlement fees, reflecting three CCP net messages to the CSD. Once a single CCP x-clear cross-nets all of the company's trades via LSE CBOE Turquoise, two-thirds of the settlement costs will be saved.

⁴⁴⁶ Agreeing on an access fee may not be straightforward since the incumbent's vertically integrated trading platforms and CCP may use clearing fees to cross-subsidise their trade execution services.

liquidity.⁴⁴⁷ This is consistent with the views of market participants that interoperability in the post-trading infrastructure would help to increase efficiency, reduce costs and grow the investor base.

An alternative approach would be to replace existing CCPs by a regional CCP.⁴⁴⁸ Figure 13.9 outlines different models of trading and post-trading market infrastructure.

Figure 13.9 Different models of trading and post-trading market structure



Source: Oxera.

Box 13.1 The US model for equity clearing and settlement

The Depository Trust & Clearing Corporation (DTCC) plays a critical role in the efficient functioning of capital markets in the USA. Through its subsidiaries, it provides clearing and settlement services for all equity transactions in the USA:

- the National Securities Clearing Corporation is an SEC-registered clearing agency that clears equity transactions on major exchanges and trading platforms;⁴⁴⁹
- the Depository Trust Company is the only CSD in the USA.

Depository Trust & Clearing Corporation is a user-owned utility run to serve market needs, as its owners are also the end-users of the services it provides (and shareholders of the company). Keeping trading costs low is also a regulatory focus, as it is a competitive advantage to the USA and keeps money flowing to its capital markets. The three core subsidiaries (including Fixed Income Clearing Corporation (FICC) clearing primary dealer transactions) have rate-setting mechanisms that ensure that prices at least cover costs (as approved by the DTCC's Board of directors and regulators).⁴⁵⁰

⁴⁴⁷ European Systemic Risk Board (2019), 'CCP interoperability arrangements', report, January, https://www.esrb.europa.eu/pub/pdf/reports/esrb.report190131_CCP_interoperability_arrangements~99908a78e7.en.pdf.

⁴⁴⁸ Oliver Wyman (2015), 'Regional Central Counterparty: a solution for Central and Eastern Europe', <https://www.oliverwyman.com/our-expertise/insights/2015/sep/regional-central-counterparty.html>.

⁴⁴⁹ As noted above, the USA has considerably fewer CCPs operating than in the EU. As a result, the interoperability arrangements in use in Europe are not needed in the USA.

⁴⁵⁰ <https://www.sifma.org/resources/research/sifma-insights-spotlight-dtcc/>.

Comparison to T2S and implications in the context of ETFs

T2S provides a centralised infrastructure for CSDs operating in the EU, bringing the EU model closer to the DTCC model of the US market. Less than 2/3 of the countries in Europe are currently or planning to be linked to the platform.⁴⁵¹ In addition, settlement in T2S is currently restricted to euros and Danish Krone. These limitations mean that there is significant fragmentation between CSDs that are inside or outside of T2S.⁴⁵²

This lack of harmonisation is evident in the ETF market, where London Stock Exchange, despite being in the top five markets for ETFs based on assets under management and the number of ETFs listed, is not within T2S.⁴⁵³ As discussed previously, ETFs can be a useful channel to enhance liquidity, especially for SMEs and equities from emerging and frontier markets. Improving efficiency in issuing and trading ETFs can play an important role in the further development of these markets.

Source: Oxera, based on various sources.

13.3.9 Policy suggestions to improve equity trading in small financial centres

Our analysis has identified a number of challenges to the development for equity trading in small financial centres.

Key policy considerations for the development of equity trading in these markets will be around their ability to increase the amount of domestic investment in equity, particularly through greater involvement by pension funds and insurance companies, and for international investors to access these markets. Market infrastructure, and the development of the ecosystem more broadly, are also important factors in this.

Following our analysis, and based on the insights from our structured interviews with market participants, particularly equity traders and market infrastructure providers (which operate on a local and/or international basis), we have identified the following policy suggestions to support the development of small financial centres:

- investigating the use of EIF and/or EBRD to act as an anchor investor to crowd in private investment in these markets;
- promoting interoperability links between CCPs, which would be a step further from the existing 'open access' regulation, or facilitating cross-border mergers at the market infrastructure level, and more broadly, supporting the development of a pan-European infrastructure and ecosystem;
- promoting the development of private pension and insurance provision in local markets; for example, by reviewing restrictions on their ability to invest in equity. This includes a review of restrictions from mandates on pension funds in these markets, and The Commission could prompt member states to reconsider national restrictions on pension funds. The Commission's review of capital charges under Solvency II is also relevant and will be an important aspect of this;

⁴⁵¹ 21 countries are linked to T2S, among the 36 European countries in the European Central Securities Depositories Association.

⁴⁵² Clearstream (2019), 'Innovative Solutions for the ETF Market', Research Paper, <https://www.clearstream.com/resource/blob/1525860/099a709982d35105f16e10a33dc2f15e/study-clearstream-innovative-solutions-etf-market-data.pdf>.

⁴⁵³ Ibid.

- investigating the commercial barriers to the adoption of indices in local capital markets, and requiring classification of local markets as emerging/frontier, to enable their inclusion in the relevant indices;
- strengthening corporate governance to avoid scandals and encourage public trust in capital markets (e.g. inclusion in equity indices can help improve firms' quality), to raise standards in jurisdictions where local requirements are in practice weak. More specifically, policy actions could include:
 - investigating the possible role of fiduciary rating agencies, as has been developed in Canada.⁴⁵⁴ The role of fiduciary rating agencies primarily consists of an independent party that evaluates whether investment managers meet appropriate fiduciary standards (including the investment choice and monitoring process). This also covers the supervision of investee's corporate governance standards by investment managers.⁴⁵⁵ The role of fiduciary rating agencies is a useful market discipline which may contribute not only by raising corporate governance standards, but also by encouraging public trust in capital markets. The latter can be achieved using regulatory stimulus that protects the interests of retail investors;⁴⁵⁶
 - a recommendation on all exchanges to adopt high-quality market monitoring technology;
 - support for credible enforcement by the trading venues and market supervisor(s)—resources need to be provided and publicised, with cases pursued in order to achieve market confidence.

13.4 Barriers to cross-border trading

Cross-border trading is considerably more prevalent in large financial centres than in small ones. However, there is a wide variation in the level of cross-border trading across the EU. Based on literature review and structured interviews with market participants, the main factors identified as potential barriers are:

- divergent, inconsistent and complex tax issues relating to cross-border trading (discussed below);⁴⁵⁷
- issues relating to clearing and settlement (discussed in section 1.1).

It is also important to note that several of the barriers affecting the ability of small financial centres to attract foreign investment identified above are relevant here. As a result, improving the vibrancy and attractiveness of small financial centres in general will also help to promote further cross-border trading in these markets, as well as across the EU.

⁴⁵⁴ While much of the debate has been in Canada, the initiative is not limited to Canada. SEC in the USA is also undertaking initiatives to ensure that investment managers meet appropriate fiduciary standards. See *Financial Times* (2020), "Best Interest" deadline puts pressure on broker-dealers'.

⁴⁵⁵ See, for example: Centre for Fiduciary Excellence, <https://www.cefex.org/>.

⁴⁵⁶ For instance, in the USA, the SEC requires brokers to act in the best interest of their retail clients when recommending a transaction of investment strategies involving securities and be clearer on any commissions paid. See *Financial Times* (2020), "Best Interest" deadline puts pressure on broker-dealers'.

⁴⁵⁷ The European financial transaction tax was introduced in ten member states, which may have various effects on trading activities across the EU. In addition, there are significant variations across EU member states with regard to the in-scope transactions and tax rates associated with capital markets transactions.

13.4.10 Capital gains tax reporting requirements on foreign intermediaries

Differences in national capital gains tax regimes raise the costs of cross-border transactions. This is because manual intervention, and the services of an intermediary, are required when applying the relevant collection procedures.⁴⁵⁸

When a capital gains tax regime imposes specific tax collection or tax reporting obligations on foreign intermediaries,⁴⁵⁹ it may not be possible or economical for foreign intermediaries to hold the relevant securities. These intermediaries may in turn have to impose holding restrictions on their customers to avoid taxable or reportable transactions.

In addition, national capital gains tax regimes often restrict certain non-trading entities (i.e. those that hold large numbers of securities long-term) from lending securities if the domestic tax legislation treats a loan of securities as a sale for tax purposes. In Greece, for example, lending securities will generally be treated as a disposal for capital gains tax purposes, unless the borrower retains physical possession of the securities. In France, only certain forms of stock loan are ignored for capital gains tax purposes.

13.4.11 Withholding taxes

Inconsistent and complex national rules and procedures in applying the withholding tax can be burdensome for investors wishing to engage in cross-border securities transactions. These complications preclude automation across clearing and settlement systems and typically involve extensive manual intervention, usually through a local intermediary.

The complexity involved in identifying the legal nature of the owners of securities, their eligibility for exemptions and the specificity of double taxation arrangements affect the owner's entitlement to reclaim withholding tax paid on securities income. This leads to the need for local intermediaries. Local expertise is also necessary to navigate different national procedures for obtaining relief from withholding tax (e.g. documentation, timing of refunds, period for claiming relief).⁴⁶⁰

Additionally, there is a risk of double taxation in cross-border investments.⁴⁶¹ This risk often remains even if relief is claimed under domestic tax law provisions. As shown in a survey by the International Monetary Fund,⁴⁶² participants noted that many investors may be subject to capital market taxes in both their country of residence and the country where the investment is realised, and that this double taxation limits appetite for such investments.

The non-mutual recognition of the pension fund status across member states make them subject to withholding taxes on their cross-border investments while national pension

⁴⁵⁸ The risk of double taxation is less than in the case of the withholding tax, as most bilateral tax treaties address the risk of double taxation of capital gains on the purchase of shares, securities and derivatives by non-residents.

⁴⁵⁹ Examples of such difficulties include: i) a national requirement for computation of capital gains tax at the time of settlement for individual transactions, imposing a costly administrative burden on foreign operators in an environment where securities are held through multiple tiers of custodians, CSDs, and other financial intermediaries; and ii) the imposition of a minimum custody period on certain securities, which are then heavily taxed if this obligation is breached.

⁴⁶⁰ For instance, in some countries (e.g. France), income payments such as dividends on shares can be calculated based on available exemptions or reliefs and the amount paid at source reflects such entitlement to reduced withholding tax. In other countries (e.g. Germany), tax is specifically withheld and a reclaim from the tax authorities (in a particular format) is required.

⁴⁶¹ Although most of the member states have bilateral treaties to avoid double taxation (mostly harmonised on an OECD model agreed in the early 1960s), there are no common procedures for claiming tax treaty benefits, such as relief from withholding tax.

⁴⁶² International Monetary Fund (2019), 'A Capital Market Union for Europe', Staff Discussion Notes No. 19/07, <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2019/09/06/A-Capital-Market-Union-For-Europe-46856>.

funds are tax-exempted. To avoid withholding taxes, pension funds invest through tax-exempted but costly financial instruments.⁴⁶³ This represents a cost to non-resident pension funds. As they are often tax-exempted in their home member state, the tax credit arising from the withholding tax levied by other member states cannot be used to reduce any tax liability in their home member state.⁴⁶⁴

In this section, we discuss, in turn, the potential barriers to further development of the EU secondary markets in equity trading. The focus is on SMEs, small financial centres, and cross-border trading, where we find trading activities in general, and improvement in liquidity more specifically, to remain limited.

13.4.12 Policy suggestions to improve cross-border trading

As several barriers identified for developing small financial centres are also relevant to cross-border trading more broadly, the policy suggestions set out in section 13.3.6 are also relevant here.

Another complementary way to further develop cross-border trading more effectively is to improve the connectivity of the large financial centres so that potential investors, irrespective of their location, can access the investment opportunities on a pan-European basis. This can be achieved by removing remaining barriers to cross-border listings, encouraging more open access and interoperability links between CCPs, and/or facilitating cross-border mergers at the market infrastructure level, with a view to promoting competition and reducing costs through economies of scale and scope.

The Commission's long-standing efforts to remove barriers to the free flow of capital across member states remain a very important part of this process.⁴⁶⁵

Furthermore, the policy measures should also support the development of an advisory ecosystem that operates on a pan-European basis, with service offerings to all regions of the Single Market.

It may also be that technology can facilitate cross-border business because its mechanisms for generating confidence are not geographically bound.⁴⁶⁶

⁴⁶³ PensionsEurope (2016), 'Position Paper on the Withholding Tax Refund Barriers to Cross-Border Investment in the EU'.

⁴⁶⁴ Patzner, A., Nagler, J. and Mann, D. (2018), 'EU Claim: Refund of (Dividend) Withholding Tax', KPMG.

⁴⁶⁵ For more detail on these barriers, see, for example, European Commission (2015), 'Preliminary inventory of barriers to free movement of capital – in the context of the Capital Markets Union', <https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=26981&no=3>; and the European Commission and Council's 2017 joint roadmap to remove these barriers, many of which remain, https://ec.europa.eu/info/sites/info/files/170519-roadmap-national-capital-barriers_en.pdf.

⁴⁶⁶ Various options are being explored including blockchain. See, for example, Pinna, A. and Ruttenberg, W., (2016), 'Distributed Ledger Technologies in Securities Post-Trading Revolution or Evolution?', ECB Occasional Paper No. 172; 28 April.

PART III: FUTURE OF EQUITY MARKETS IN THE EUROPEAN UNION

14 Future of equity markets in the European Union

14.1 Introduction and our approach

As discussed in section 1, equity markets in the EU are currently punching below their weight, partly due to the fragmented nature of the EU, and partly because many newer member states only began to develop their public equity markets (from scratch) in the early 1990s. The Commission has set itself the objective of developing equity markets in the EU through its vision for a CMU. This section identifies eight possible development paths for these markets, drawing on insights from the analysis of primary and secondary markets presented in the previous sections.⁴⁶⁷

Review of these development paths will aid policy design and help to prioritise policies for advancing the paths that are most likely to lead to a successful CMU.

The success of equity markets in Europe and of the CMU will depend on a range of factors, including the extent to which:

- the benefits of raising finance from public markets outweigh the costs and requirements of raising finance via private markets;
- investors are made aware of and have access to investment opportunities generated by European businesses;
- local networks, particularly in the newer member states, can be fully integrated into a European-wide equity market ecosystem;
- broader retail participation in equity markets can be achieved;
- the Commission's existing policies⁴⁶⁸ are effective in delivering their intended objectives;
- the new opportunities offered by technological developments, such as big data analytics and AI, result in less friction in equities markets, as well as the extent to which these technologies have limitations;
- the sum of EU-wide and national regulation of financial services allows and enables competition to flourish;

⁴⁶⁷ This section draws on all the analysis conducted for this report, including the evidence gathered from our structured interviews with market participants, regulators and governments, our survey, a comprehensive review of the academic literature and market commentary, and our empirical analysis based on existing and new datasets.

⁴⁶⁸ Notably those listed in the Action Plan on financing sustainable growth, the Action Plan on building a CMU (and the mid-term review of the CMU Action Plan), the Roadmap towards a Banking Union, and the Digital Single Market agenda. See European Commission (2018), 'Renewed sustainable finance strategy and implementation of the action plan on financing sustainable growth', 8 March, COM/2018/097, https://ec.europa.eu/info/publications/sustainable-finance-renewed-strategy_en; European Commission (2015), 'Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions: Action Plan on Building a Capital Markets Union', COM/2015/0468; European Commission (2017), 'Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions on the Mid-Term Review of the Capital Markets Union Action Plan', COM/2017/292; European Commission (2012), 'Communication from the Commission to the European Parliament and the Council: A Roadmap Towards A Banking Union', COM/2012/0510; and European Commission (2017), 'Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions on the Mid-Term Review on the implementation of the Digital Single Market Strategy: A Connected Digital Single Market for All', COM/2017/0228.

- the extent to which business transacted in the UK migrates to EU markets following the departure of the UK from the EU, and the extent to which the UK markets and the EU markets remain integrated or fragmentation sets in.⁴⁶⁹

Consideration of these factors and of the wider analysis in our report shows that the delivery of a CMU requires additional policy action. There are multiple ways in which the EU could approach this. Some policies would help irrespective of the development paths envisaged; others become more or less relevant and important depending on the development path or paths that the Commission believes most likely to lead to a successful CMU.

The section is structured as follows.

- Section 14.2 sets out the baseline scenario and development path for the future of EU equity markets without any further policy interventions from the Commission. What is the current situation and how is it likely to evolve without policy adjustments?
- Section 14.3 sets out Oxera's vision for a CMU in the EU and what we would expect to see from a well-functioning equity market. What is the objective of a CMU? What would equity markets look like if it were achieved?
- Sections 14.4 to 14.6 describe the eight development paths that could deliver the CMU objective. Each path has different implications for the policy priorities.
- Section 14.7 provides some concluding remarks on how the Commission might best proceed.

14.2 The baseline scenario—current trends

Before outlining the baseline scenario, we note that it is subject to particular uncertainty as a result of the COVID-19 pandemic. Relevant points include the following:

- the inception of the pandemic saw a major correction in global equity prices;
- while this might deter investment in equities, there has already been a substantial rebound in equity prices;
- government-imposed constraints on a range of normal activities, such as holidays and entertainment, have left some consumers with additional funds to invest, while cash savings have become less attractive due to the spectre of negative interest rates.

In view of these considerations, there is no convincing case to replace this baseline with a specific alternative scenario.

Overall, Oxera's view is that current market developments will not deliver a CMU as envisaged by the Commission. Rather, we believe that further policy intervention by the Commission and other legislators is necessary for the delivery of such a CMU.⁴⁷⁰ This is because current trends will not dismantle the three main barriers to a CMU: i) the suppressors of public equity markets; ii) SMEs' limited access to public equity markets; and iii) the isolation of some local financial centres. Without intervention, these frictions might increase.

We look at each of these in turn below, but first note an important caveat: there is a limit to what regulation by the Commission can achieve by itself. Other bodies need to

⁴⁶⁹ Luis de Guindos, Vice-President of the ECB, 'Forging a new future between the UK and the EU', SUERF/De Nederlandsche Bank Conference, 8 January 2020, <https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200108~323f3e7dac.en.html>

⁴⁷⁰ Véron, N. and Wolff, G. (2016), 'Capital Markets Union: A Vision for the Long Term', *Journal of Financial Regulation*, 2:1, pp. 130–153.

contribute in a consistent manner. This is a point not only about subsidiarity—important though that is—but also about regulation creating incentives and opportunities to which market players respond if markets are to develop as policymakers intend they will.

14.2.1 Trends that tend to suppress the role of public equity markets

The first key issue analysed in our report is the role of public markets for firms seeking to raise funds and support their growth ambitions. Based on our analysis of the current trends, we would expect the relative cost of listing and/or raising funds on public equity markets to increase going forward, albeit at a decreasing rate. The minimum efficient scale for being a listed company is expected to further increase, and companies are likely to seek to list at a much later stage in their development.

In response, private capital markets are likely to be an increasingly popular channel for firms to raise funds, even if their own costs do not fall. Meanwhile, alternative, debt-based funding options are likely to remain cost-efficient and attractive compared to public equity markets, if one assumes that monetary policy remains highly accommodative. This is the working assumption adopted here because, albeit expected over the past decade, monetary policy has not yet been normalised, and, in response to COVID-19, official policy is pushing further towards accommodation in the form of negative interest rates. We do not have evidence to propose a specific time when normalisation will occur, as there are political as well as economic aspects to this.

From an investment perspective, we expect to see:

- growth in passive investment as a share of total investment, although active strategies are likely to remain a significant amount of total investment. This could lead to a further shift in trading towards large listed companies and less price and market discipline in public markets (as passive investment strategies tend to invest less in corporate governance than active strategies do⁴⁷¹). Investment banks already report materially increased stock volatility associated with the proliferation of ETFs; a proposition that is supported by some recent academic research;⁴⁷²
- low retail participation in public equity markets, with some ordinary savers increasingly prepared to invest in private markets through a variety of means, 'attracted by the offer of diversification, alternative income, and sustainable investment opportunities',⁴⁷³ although sustainable investment opportunities are also available in public equity markets;
- a decline in the proportional investment allocations of pension funds and insurers to public equity markets, as they increase their allocations to bonds and private equity and debt markets.

While the overall size of the public equity markets based on market capitalisation may continue to increase, the number of listed companies is expected to continue decreasing (albeit at a slower rate). Some underdeveloped markets may not grow very much at all, in either the number of listed companies or in market capitalisation.

These trends would have the following impacts on the markets targeted by the CMU initiative.

⁴⁷¹ Bebchuk, L. and Hirst, S. (2019), 'Index Funds and the Future of Corporate Governance: Theory, Evidence and Policy', *Columbia Law Review*, **119**.

⁴⁷² *Financial Times* (2018), 'Popularity of passive investing changes rules of the game', 22 October. Antoniou, C., Subrahmanyam, A. and Tosun, O. (2018), 'ETF Ownership and Corporate Investment', Harvard Law School on Corporate Governance, <https://corpgov.law.harvard.edu/2018/06/28/etf-ownership-and-corporate-investment/>, June.

⁴⁷³ *The Cerulli Edge* (2019), 'Retail Investors Are Developing a Taste for Private Markets', May.

- Public markets that are less deep and well-functioning would reduce their important role as an exit route for private markets, with significant implications for competition policy in general and the functioning of product and other economic markets across economies. This is because, for example, a pipeline of firms expanding by going public (rather than being acquired by more established firms) constrains incumbents and helps competition authorities to maintain competitive markets across industry sectors. This effect on the real economy could be mitigated, although to what extent is not clear, if reduced exit opportunities from private equity caused some firms to choose public listing in the first place. However, such firms would still be constrained by the increasing minimum efficient scale of public listing. Moreover, to the extent to which, in practice, reduced exit from private equity keeps firms small, there is likely to be a further muting effect on competition across industry sectors.
- Ordinary savers would find it harder and more expensive to participate in the growth of the corporate sector. To invest in the wealth creation of small companies, the general public would have to rely on investment through intermediaries and pay the associated fees, which may absorb a material part of the returns. Moreover, if fewer firms are publicly listed and more growth occurs under private equity arrangements, an increased proportional growth will simply be inaccessible to the general public, further undermining the socially helpful notion of 'shareholder democracy'.
- With less active investment strategies, there would be less market discipline on firm behaviour and asset pricing, as there would be less public and market scrutiny of disclosed information, and more insider information. This could increase cases of market abuse and reduce monitoring of companies' performance. The same argument can be made with respect to the larger share of companies operating in the private markets, although here the position is more nuanced. While post-fee returns of private equity to limited partners slightly underperformed the S&P 500 on average when measured over two decades around the millennium—probably implying weaker discipline—there was a wide distribution of results, suggesting that the identity of the private financiers may be important.⁴⁷⁴

14.2.2 SMEs' limited access to public equity markets

The relative cost of listing will remain considerably higher for smaller firms than for larger firms and there will be a (proportional) decline in funds raised on junior markets. In the majority of member states, SMEs are expected to continue to rely mostly on internal funds and bank funding to finance new projects. If less bank funding is available—for example, due to credit losses arising from COVID-19—SMEs might be able to access greater amounts of alternative sources of funds. However, the reduction in bank funding would be likely to be associated with reduced GDP, implying only a partial substitution of other funds.⁴⁷⁵

As noted above, the rise in passive investment is expected to drive investment towards large caps and away from SMEs, which have proportionately less weight in the main indices. This is important. As discussed in section 13, academic evidence suggests that the benefits of active management are amplified in small- and mid-cap stocks.⁴⁷⁶

A further unwinding of cross-subsidies between services and users at the broker level is expected, which is likely to lead to a reduction in advisory support on SME IPOs and a further reduction in the provision of external and independent research on SMEs. These

⁴⁷⁴ Kaplan, S. and Schoar, A (2005), 'Private Equity Performance: Returns, Persistence and Capital Flows', *The Journal of Finance*, **60**:4, pp. 1791–1823

⁴⁷⁵ Barrell, R., Davis, E.P., Fic, T. and Holland, D.N. (2009), 'Optimal regulation of bank capital and liquidity: how to calibrate new international standards', FSA Occasional Paper Series 38, July.

⁴⁷⁶ Wermers, R. (2020), 'Active Investing and the Efficiency of Security Markets', *The Journal of Investment Management*, forthcoming.

trends will make it difficult for SMEs to attract interest from investors and will result in low levels of liquidity on SME stocks.

These trends are likely to have the following impacts on a CMU.

- Access to public markets for SMEs would be reduced. As public markets are an important exit route for private equity and venture capital, there may also be knock-on effects for the provision of finance to SMEs from the private equity markets.
- Without policy intervention, SMEs would be likely to remain reliant on banks for funding—counter to the CMU objective to diversify funding sources. Given the importance of SMEs to growth and jobs in the EU, this would be likely to have a not insignificant impact on the European economy.

14.2.3 Integration of local financial centres

Also important for a CMU is the extent to which the local and large financial centres are integrated, with the gap between large financial centres and some local financial centres appearing have to have widened considerably over the past few years. For example, large financial centres have access to a far larger pool of investors and have benefitted from the introduction of competition (e.g. through the pan-European infrastructure for trading and clearing).

Based on our analysis of the current trends in the local financial centres, without new policy intervention we might expect to see:

- lower foreign investment in small financial centres (mostly from other EU countries) than in large financial centres;
- limited trading from alternative trading venues in small financial centres, with the vast majority of trading happening on regulated markets. Given the small size of these markets, this would mean limited incentives for new providers to enter, and therefore the majority of trading taking place on the primary exchanges in those countries, with limited trading on alternative trading venues;
- higher explicit costs of trading in smaller financial centres than in large ones;
- lower liquidity in small financial centres than in large ones;
- fragmented clearing and settlement infrastructure at the national level without integration and/or interoperability with pan-European providers.

These trends would have the following impacts on a CMU.

- The growth of businesses in jurisdictions without large financial centres would continue to be hampered by a lack of access to a single liquidity pool. This would be a major limitation of a CMU.
- Similarly, at the national level, the strong relationship between equity markets and the real economy means that the smaller equity markets in the Central and Eastern European region⁴⁷⁷ could continue to hamper growth in their real economies. Importantly, research suggests that countries with well-developed financial markets gain more from foreign direct investment.⁴⁷⁸

⁴⁷⁷ Relative to GDP, they are about half the size of the equity markets in the larger economies in the EU.

⁴⁷⁸ Alfaro, L. Chanda, A., Kalemli-Ozcan, S. and Sayek, S. (2004), 'FDI and economic growth: the role of local financial markets', *Journal of International Economics*, **64**:1, pp. 89–112.

14.3 What does a CMU look like?

In this context, the vision for a well-functioning market is one that delivers the CMU described by President Juncker in his 2016 State of the Union address.⁴⁷⁹ This means a market that strengthens the resilience of the European financial system; increases businesses' funding options; appropriately incentivises large and small investors; operates in an integrated way; and is less impaired by structural barriers from diverging tax systems, insolvency regimes and securities laws. While this report concerns mostly the funding of businesses, investor incentives and capital market integration, care is taken not to make recommendations that could adversely affect the resilience of a CMU, or indirectly reinforce structural barriers to its development.

Bearing in mind that financial markets can have a supportive or disruptive relationship with the real economy, the recommendations seek to maximise the support function and minimise disruption.⁴⁸⁰ A supportive relationship includes the i) production of information about investment opportunities; ii) monitoring of investments; iii) trading, diversification and management of risk; iv) pooling and mobilisation of savings; and v) facilitation of exchange of goods and services.⁴⁸¹

We consider how the three barriers to CMU discussed in the previous section would be addressed through policy actions in the next section.

14.4 Development paths

There are multiple development paths through which a CMU could be delivered, to a greater or lesser extent. This section explores eight paths, each of which has different policy implications.

Taking into account the trends discussed in section 14.2 and what makes a well-functioning CMU (as described in section 14.3), we have identified four key challenges to achieving the delivery of a CMU.

1. Access to capital market finance for SMEs—to reduce their reliance on own funds and bank finance. This would aim to address the barrier of 'SMEs' limited access to public equity markets'.
2. Institutional investor participation—to attract more institutional investment into EU equity markets. This, together with 'Retail investor participation' (challenge 4 below), would aim to address 'Trends that tend to suppress the role of public equity markets'.
3. Market integration—to better connect savers and borrowers irrespective of their geographical location. This would aim to address the barrier of 'Integration of local financial centres'.
4. Retail investor participation—to ensure that ordinary savers can benefit from the wealth creation of the corporate sector.

Each challenge could be addressed in a different way depending on the political direction of the EU.

Combining each of the four key challenges with two alternative options for delivering the CMU⁴⁸² results in eight possible development paths (see Figure 14.1).

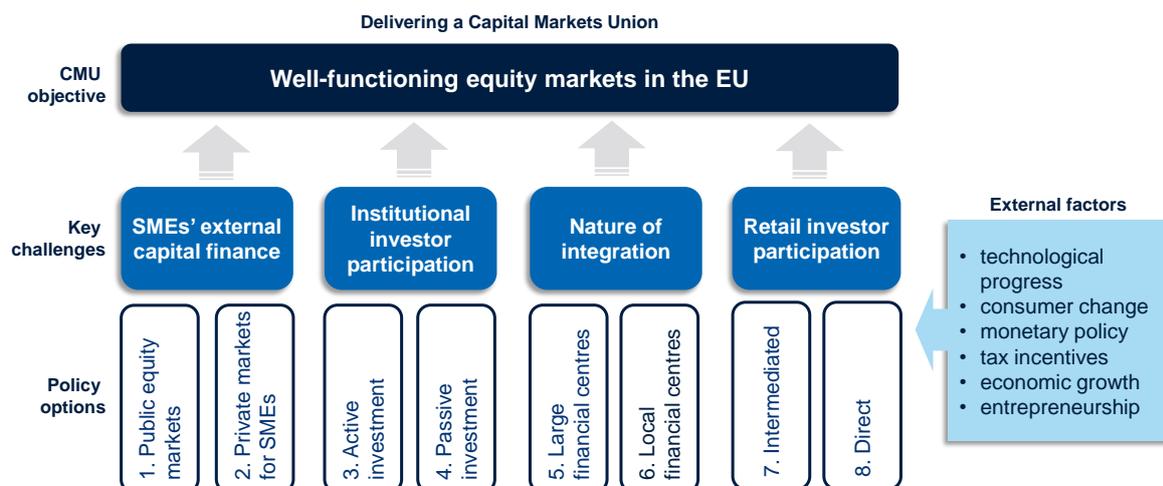
⁴⁷⁹ President Jean-Claude Juncker, State of the Union address, 14 September 2016.

⁴⁸⁰ Menkhoff, L. and Tolksdorf, N. (2001), *Financial Market Drift: Decoupling of the financial sector from the real economy?*, Springer-Verlag.

⁴⁸¹ Levine, R. (2005), 'Finance and Growth: Theory and Evidence', in P. Aghion and S.N. Durlauf (eds), *Handbook of Economic Growth*, Volume 1A, Elsevier B.V.

⁴⁸² In practice there is a spectrum, but showing two extremes helps to provide policy guidance.

Figure 14.1 Creating a Capital Markets Union to ensure well-functioning equity markets in the EU: development paths



Source: Oxera.

The paths and key policy choices are as follows. We discuss in more detail policy implications for each development path in the next section.

Box 14.1 Challenge 1: Access to capital market finance for SMEs

Although empirical evidence on the optimal intensity of financial regulation is scarce, SMEs clearly struggle with the layers and complexity of regulation—in particular, as it plays out in conjunction with the risk-averse practices of advisers and other intermediaries.⁴⁸³

Access issues arise in relation to information for would-be SME issuers and for those considering buying SME securities, the attractiveness (or not) of doing business with SMEs, from the perspective of advisers and other intermediaries, and whether SMEs give due consideration to the option of issuing securities. The latest EU survey, in 2019, shows that SME financing is in practice heavily biased towards bank overdrafts, leasing, hire purchase and bank loans.⁴⁸⁴

To address this access issue, we propose the two following development paths.

▪ **Development path 1: Develop public equity markets for SMEs**

The provision of equity finance to SMEs could be supported by making listing on public markets more attractive.

The policy implication would be to focus on reducing the relative cost of listing and removing barriers to listing—for example, by reducing agency costs, and making

⁴⁸³ However, our research does not suggest that increased regulation is the main driver of the listing gap. Many have noted the depth of the securities markets in the USA and its attractiveness as a listing venue for non-US companies. It might then be presumed that it has a lighter regulatory and enforcement regime than in the EU, for example. However, empirical work shows that this has not been the case historically; rather, both the costs of securities regulation and the intensity of enforcement have been higher in the USA than elsewhere (See Jackson, H. (2007), 'Variation in the intensity of financial regulation: preliminary evidence and potential implications', *Yale Journal on Regulation*, **24**:2, pp. 253–291).

⁴⁸⁴ Kwaak, T., Cheikh, N., de Kok, J., Kruithof, B., Sniijders, J. and Stoilova, V. (2019), 'Survey on the access to finance of enterprises (SAFE): Analytical Report', European Commission, November, <https://ec.europa.eu/docsroom/documents/38462>.

dual-class shares more flexible⁴⁸⁵—and improving any remaining frictions in the IPO process—for example, removing the requirement on SMEs to disclose information that adds little value to investors would shorten the time spent by IPO advisers on the process, thereby reducing agency costs.

Policies to support the development and attractiveness of SME growth markets, and other junior market segments, would be important to help drive down the minimum efficient scale for listing.

- **Development path 2: Embrace private markets as a solution for SMEs**

Facilitate the provision of finance to SMEs by private equity markets.

The policy implication would be to support the development of venture capital markets—for example, through careful calibration of tax treatments—and enable greater investment of funds in private markets—for example, by removing restrictions on investees.

Box 14.2 Challenge 2: Institutional investor participation

- **Development path 3: Maintain a significant role for active investment, in light of its positive externalities**

Large institutional investors help drive the price-formation process in IPOs, conduct most of the due diligence, and help deliver market discipline. Thus, a good way to attract greater active investment into these markets is to encourage large institutional investors to invest.

The policy implication would be to remove barriers to local pension/insurer investment in equity markets. A supporting recommendation is recorded under Development path 7 below.

- **Development path 4: Embrace the rise in passive investment**

With the rise in passive investment, indices play a greater role in asset allocations. The benefit of passive investment is the lower fees for investors.⁴⁸⁶

To fully embrace and further encourage this trend, the policy implication would be greater focus both on corporate governance, ensuring that corporations are run in the interests of stakeholders—because passive funds are known to invest less in governance than active funds—and on the functioning of the market for indices. Support might also be needed to develop indices and fund structures (e.g. ETFs) for SMEs and local capital markets.

Box 14.3 Challenge 3: Market integration

Infrastructure—trading, clearing and settlement are complementary activities, each of which can benefit from substantial economies of scale and scope.⁴⁸⁷ Moreover, trade and post-trade-services have traditionally been integrated to increase transactional efficiency. It follows that further integration of trading, clearing and settlement across

⁴⁸⁵ These would be time-limited, through sunset clauses.

⁴⁸⁶ While there has been concern about potential negative effects that the rise of passive investment may have on price efficiency and financial stability, the empirical evidence, especially in recent years, has been mixed, thus indicating the need for continued study and monitoring in this area.

⁴⁸⁷ Pirrong, C. (2008), 'The industrial organization of execution, clearing and settlement in financial markets', Goethe-Universität, Frankfurt am Main, Centre for Financial Studies, CFS Working Paper 2008/43.

the EU could produce substantial efficiency gains relative to the case where these activities are organised on a national basis. Nevertheless, the costs and benefits of further integration need to be considered carefully to ensure that any perverse effects based on national considerations do not outweigh the expected benefits.

Low frictions for raising capital and trading—low frictions matter for achieving the scale and scope economies and competition noted above. It remains important that the numerous potential barriers to cross-border trading are resolved in practice for all member states.⁴⁸⁸

Access by investors—facilitating access by international as well as domestic investors is important because cross-border capital flows increase financial development that might otherwise be opposed by incumbents because it increases competition.⁴⁸⁹ Technology may help to facilitate cross-border business because its mechanisms for generating confidence are not geographically bound.⁴⁹⁰

Keeping these points in mind, the two development paths to achieve further market integration are as follows.

▪ **Development path 5: Access to the large financial centres for issuers and investors in all parts of the EU**

Savers and borrowers, irrespective of their geographical location, could be better connected by improving the connectivity of the large financial centres, for example through greater use of linked or consolidated order books, so that potential issuers can access the existing large pools of liquidity.

The policy implication would be to remove barriers to capital-raising and investing across borders, and to develop a pan-European advisory ecosystem, with service offerings to all regions of the Single Market.

▪ **Development path 6: Further develop local financial centres and better connect them to large financial centres**

An alternative way to better connect savers and borrowers is to develop their access to local financial centres, and to improve the connectivity of the different pools of liquidity across the EU.

The policy implication would be to help the smaller markets benefit from greater economies of scale and scope, by considering a role for the EIF and/or the EBRD as an anchor investor to crowd in additional investment in each region, and by supporting or promoting support of the development of the local ecosystem for services such as fund management, equity research, and IPO advisers. Measures that could help open local market infrastructure to international investors or otherwise connect the local capital markets with the larger international capital markets could include tax incentives, the establishment of regional financial centres with fresh infrastructure, and other measures among small groups of similar member states (perhaps with support from the European Regional Development Fund). In addition, policymakers should ensure that neither the regulatory regime nor its national

⁴⁸⁸ These barriers have been analysed, by the Giovanni Group Report of 2001, as differences in technical standards for settlement and custody; limitations on investors' choice of supplier in clearing and settlement; national differences in settlement periods and other timings; national differences in tax provisions and collection; and legal differences around securities pledging and netting. The European Post-Trade Forum is working on addressing these barriers.

⁴⁸⁹ Rajan, R. and Zingales, L. (2003), 'The great reversals: the politics of financial development in the twentieth century', *Journal of Financial Economics*, **69**:1, pp. 5–50.

⁴⁹⁰ Various options are being explored including blockchain. See, for example, Pinna, A. and Ruttenberg, W., (2016), 'Distributed Ledger Technologies in Securities Post-Trading Revolution or Evolution?', ECB Occasional Paper No. 172; 28 April.

implementation provides barriers to normalising the remote working in financial markets that we have seen during the COVID-19 crisis and which could facilitate local access to infrastructure and services in large capital markets.

Box 14.4 Challenge 4: Retail investor participation

▪ Development path 7: Intermediated retail investor participation

Ordinary savers access the wealth creation of the corporate sector through financial intermediaries.

The policy implication would be to make the retail distribution channels more efficient, and to encourage pension and insurance provision by individuals, as this would support the complementary point under Development path 3; namely, to remove some restrictions on pension and insurers investing in equity markets.

▪ Development path 8: Direct retail investor participation

Ordinary savers participate directly in equity markets, both at the IPO stage and in the secondary markets.

The policy implication would be to facilitate equity trading by enabling greater direct retail access in IPOs and promoting better information flows to retail investors in the secondary markets. Specifically, technological solutions could enable direct retail allocation in the IPO book-building process. Retail participation in private capital markets would need to be regulated carefully to strike a balance between protection and enablement (costs and speed).

14.5 Policy implications—policies to influence development paths and deliver a CMU

As discussed, the policy priorities are slightly different for each development path. The policies presented below form a menu of ideas that follow logically from the research presented in this report, rather than a comprehensive list of actions to be implemented.⁴⁹¹

While policies that support more than one development path may have a high pay-off in terms of developing capital markets, it is not certain that these will produce the greatest net benefits. We strongly recommend that the Commission consider the operation of the EU's equity markets in the round, to identify a set of policies that, overall, will produce a successful market design. Assessment of the cumulative impact of the policy combinations would reveal their overall feasibility and be of material assistance in overall market design. (While we do not feel that there are material conflicts in a 'big picture' view, we believe that a thorough analysis of the new incentives for different market participants and their likely responses is necessary in order to optimise the overall impact of any measures taken.)

⁴⁹¹ For ease of readability and to avoid repetition, where the same policy priority applies to more than one development path, the reader is referred back to the earlier text.

Box 14.5 Policies to support Development path 1: Develop public equity markets



Policy 1: Support the development of investment vehicles focused on investment in diversified pools of SME stocks

- Direct the EIF to develop SME fund management teams in a similar way to its current support for venture capital and private equity.
- Redirect EIF financial support for private capital to larger firms towards support for SME IPOs.

Policy 2: Engage with the investor community about the merits of dual-class shares as a means of expanding the market

Policy 3: Use tax incentives

- Recommend that member states use tax incentives for investing in small stocks.
- No financial transaction tax for first x years.

Policy 4: Facilitate greater investment in SME stocks

- Update the UCITS Directive to allow UCITS to invest in SME growth markets.
- Facilitate the introduction by the private sector of a centralised, pan-European machine-readable database for prospectus and consensus analyst ratios, potentially funded with a Commission grant awarded following a competition and/or an auction for rights.
- Accelerate the listing process for SME stock, potentially through listing helpdesks and requiring NCAs to set up listing sandboxes (allowing innovative practices to be tested) and a simulation exercise among listing authorities to share best practice.

Policy 5: Reduce the imbalance between private and public companies in terms of disclosure requirements

- Evaluate the incremental benefit of, and potentially remove: i) disclosure requirements for secondary raisings that are additional to the ongoing requirements for primary raisings for the same share class; ii) the requirement for some listed firms to report quarterly and half-yearly, in addition to annually; and iii) the current exemptions for all private companies from ESG reporting.
- Redesign disclosure rules for small listed companies to better reflect the more limited externalities of failure (compared to large companies). Set up a bottom-up exercise with the investor community to identify the minimum standard to mandate.

Policy 6: Amend the governance standards of unlisted firms

- a. Make standards for audits and for the role and conduct of the Boards of unlisted firms, including SMEs, optional so that those seeking to list on public markets can adopt standards to facilitate the transition and reduce the risk of unsuitable listings that could be detrimental to the development of public markets in some contexts.
- b. Create national registries of company balance sheet and P&L accounts for all companies in the EU, to strengthen market discipline on the governance of firms, with checks by authorities and/or disciplining market agents on the publication and quality of appropriate financial statements.

Policy 7: Establish an advisory ecosystem for SMEs

- a. Promote the provision of equity research, for example via a review of the new rules on unbundling of trade execution and research, and adopting new technology such as AI that could make the production of equity research more efficient. Competitive pressure on intermediaries might provide the right incentives to adopt this new technology.
- b. Reintroduce a small-cap delay regime to make it more commercially attractive for market-makers to provide liquidity on small stocks.

Policy 8: Other market-building and market-correcting measures

A market-building measure could be the establishment of controlled information-sharing arrangements, along the lines of the UK's Small Business Enterprise and Employment Act 2015.⁴⁹² This legislation was enacted in response to research showing a lack of information about SMEs' creditworthiness as a potential barrier to competition in the market for the provision of banking services (and lending in particular) to such businesses.⁴⁹³ It enables the UK government to require designated banks to provide designated credit reference agencies (CRAs) with specified information about their SME customers, and places a duty on designated CRAs to provide such information to lenders, subject to the agreement of the business to which the information relates. Whether it is worth the technical challenge of rolling such a scheme out across the EU depends on the potential demand for cross-border investment in small businesses, which would need to be investigated. In principle, however, the Information Age should facilitate securities issuance by SMEs, and the challenge for officials is to work out how best to facilitate this.⁴⁹⁴

⁴⁹² Schammo, P. (2017), 'Market building and the Capital Markets Union: addressing information barriers in the SME funding market', *European Company and Financial Law Review*, **14**:2, pp. 271–313.

⁴⁹³ Boosting Finance Options for Business, UK Government Asset Publishing Service, 2012.

⁴⁹⁴ Peyrano, L. (2019), 'Catalysing the SME Growth Ecosystem', in E. Kaili, D. Psarrakis and R. van Hoinaru (eds), *New Information Age in New Models of Financing and Financial Reporting for European SMEs*, Palgrave.

Box 14.6 Policies to support Development path 2: Embrace private markets for SMEs



Policy 1: Support the development of investment vehicles (focused on investment in diversified pools of small *private* companies)

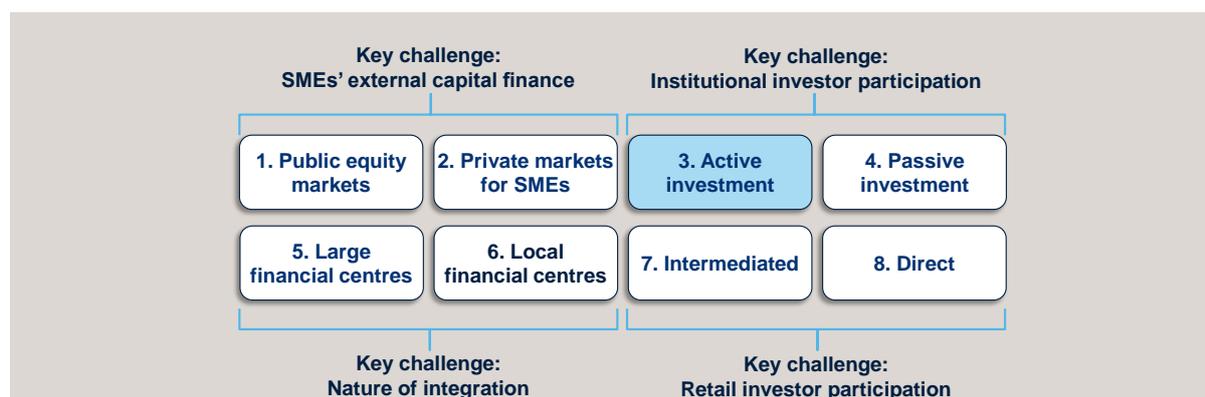
Require the EIF to enhance its support for SME fund management teams in venture capital and private equity; and direct it to continue, or increase, its financial support for the development of venture capital markets.

Policy 2: Facilitate greater investment in private markets

- a. Develop new investment vehicle types that are able to place a larger share of their investment in private equity markets and be available to retail investors, but which are more suited to illiquid investments. For example, this could be a new category of UCITS products, with different regulatory requirements, by updating the UCITS Directive. Also, make greater use of the proposed 'European Long-term Investment Fund' mechanism, which is designed to increase the amount of non-bank finance available for companies investing in the real economy of the EU.
- b. Permit greater retail investor participation in private equity funds, by requiring managers to meet enhanced 'scale and experience' criteria, and thereby strengthening protection for retail investors. Also, limit retail access to managers with an institutional investor base so that investors are exposed to experienced private markets managers only.

Policy 3: Governance standards of unlisted firms (as per Development path 1, policy 6)

Box 14.7 Policies to support Development path 3: Maintain the role of active investment



Policy 1: Promote institutional investor participation in IPOs

- a. Reconsider regulatory restrictions on pension funds and insurance companies from investing in public equity markets. For example, should firms be allowed to take into account a forward illiquidity spread when calculating their risk margin under Solvency II?⁴⁹⁵ The Commission's review of equity capital charges under Solvency II will be important here,⁴⁹⁶ and similar consideration might be given to bank capital standards—for example, should these be revisited in light of any issues or crisis ensuing from the COVID-19 pandemic? The Commission could also prompt member states to reconsider national restrictions on pension funds.⁴⁹⁷
- b. Bring investment opportunities to the attention of a broader institutional investor base in IPO markets—for example, through a shelf-registration system, and greater digitalisation of information flow.

Policy 2: Address restrictions and review incentives to invest in equity markets

- a. Widen the category of people who can advise on equity investment.
- b. Publish long-term performance tables of equities versus bonds, and related volatility, and equity/bond correlations.

Policy 3: Promote private pension and insurance provision

Continue to support the development of pan-European pension products, by taking full account of EFAMA's recommendation that the accompanying Level-2 measures ensure that these products are attractive to both savers and providers.

Policy 4: Reduce investor due diligence search costs

- a. A centralised, pan-European machine-readable database for prospectus and consensus analyst ratios (as per Development path 1, policy 4b).
- b. Reduce disclosure requirements (as per Development path 1, policy 5a)

⁴⁹⁵ Actuarial Association of Europe (2019), 'A review of the design of the Solvency II Risk Margin', Commentary Paper, December.

⁴⁹⁶ EIOPA is to provide the Commission with technical advice in the form of an Opinion in June 2020, for a comprehensive review of the Solvency II Directive, https://www.eiopa.europa.eu/browse/solvency-ii/2020-review-solvency-ii_en.

⁴⁹⁷ For example, the report of the European IPO Taskforce highlighted some recent changes in the pension funds' by-laws in Bulgaria that effectively led to all funds limiting their investments to the constituent companies of the main index only. 'European IPO Report 2020', <https://fese.eu/app/uploads/2020/03/European-IPO-Report-2020.pdf>.

- c. Shift disclosure focus towards investor enablement, through data provision, rather than investor protection, given the evidence that the cumulative disclosures are not read.

Box 14.8 Policies to support Development path 4—Embrace passive investment**Policy 1: Require improved investment in governance standards of the passive investor community**

Align standards with the United Nations Principles for Responsible Investment set out in 'How can a passive investor be a responsible investor' (2019).⁴⁹⁸ To achieve compliance with this policy, it is likely to be necessary to impose it through legislation, for example amending the UCITS Directive as it applies to passive funds.

Policy 2: Update approach to indices

- a. Reclassify small, nationally focused ('local') markets as 'emerging/frontier' to enable their inclusion in the relevant indices.
- b. Investigate the commercial barriers to the adoption of indices in SMEs.

Policy 3: Increase the awareness of the risk and returns of investing in equity markets compared to fixed income markets through financial education campaigns⁴⁹⁹

- a. Provide funding and support to national financial education campaigns to be translated into all member state languages.
- b. Open a call for tender for private companies to develop applications and other digital tools that help citizens, especially young people, to understand long-term financial planning.
- c. Provide young people with low-cost financial advice and seminars and financial literacy workshops about all investment options, with an emphasis on the risk and returns of equity investment.

Policy 4: Require investment decision-makers to explain the value for money of their decisions⁵⁰⁰

⁴⁹⁸ We consider this to be a very important issue given the limited resources devoted to corporate governance by passive investors. While the precise numbers change over time, Bebchuk et al. (2017) describe them as 'practically negligible'; for example, citing just 15 staff monitoring 13,000 investments. Bebchuk, L., Cohen, A., and Hirst, S. (2017), 'The Agency Problems of Institutional Investors', *Journal of Economic Perspectives*, **31**:3, pp. 89–112.

⁴⁹⁹ Based on the recommendations in European Youth Parliament (2019), 'Resolution Booklet', The 90th International Session of the European Youth Parliament', Valencia, https://issuu.com/valencia2019/docs/_resolutionbooklet.

⁵⁰⁰ For example, to justify why they are not reaping higher than bond returns—in this case, available at low cost through passive mechanisms for investing in equities.

- a. Consider provisions such as those proposed by the UK FCA following its 2017 Asset Management Market Study.⁵⁰¹
- b. Alternatively, create comparative performance tables for use by the beneficiaries of the investment decisions to change the incentives of the investment decision-makers.

⁵⁰¹ Financial Conduct Authority (2017), 'Asset Management Market Study', <https://www.fca.org.uk/publications/market-studies/asset-management-market-study>.

Box 14.9 Policies to support Development path 5—Develop and connect large financial centres



Policy 1: Remove remaining barriers to cross-border listings

Evaluate the role of eligibility criteria for the main indices or introduce a Regulation to reduce national discretion to impose non-statutory codes and other tertiary requirements that together can create a complex additional layer of unfamiliar requirements for non-domestic issuers to navigate.

Policy 2: Establish an advisory ecosystem for SMEs (as per Development path 1, policy 7)

Policy 3: Facilitate open access and interoperability links between CCPs.

Currently, while 'Open Access' has allowed CCPs other than the incumbent to get access to trading venues, without interoperability link between CCPs, investors and traders have not observed a clear benefit of lower costs as a result of competition from alternative trading venues, due to clearing and settlement costs. If, for example, a pan-European MTF can set up operation in a new market and receive sufficient trades that can be settled by its existing CCP through interoperability links with national CCPs, the cost of entering a new market would be substantially reduced, encouraging better connections between large financial centres.

Policy 4: Facilitate cross-border mergers at the market infrastructure level, with a view to promoting competition and reducing costs through economies of scale and scope.

While we observe a trend in consolidation at the trading-venue level, including those in smaller financial centres, national laws and customs may be a barrier to achieving further consolidation, especially for clearing and settlement infrastructure providers.⁵⁰² More specifically, as all CSDs in Europe are subject to national laws in the country in which they are incorporated, the national competent authority in each country has the power to impose its own set of rules and thus can potentially reverse efforts to achieve harmonisation in settlement in the EU.

It could, however, be worth waiting to see the effects of Directive 2018/0114 on amending Directive (EU) 2017/1132 as regards cross-border conversions, mergers and divisions, despite a recent EBA paper pointing to a number of areas of regulatory concern in banking.⁵⁰³

⁵⁰² Reddy, K.S. (2015), 'Determinants of Cross-border Mergers and Acquisitions: A Comprehensive Review and Future Direction', MPRA Paper No. 63969.

⁵⁰³ Gardella, A., Rimarchi, M. and Stroppa, D. (2020), 'Potential regulatory obstacles to cross-border mergers and acquisitions in the EU banking sector', EBA Staff Paper Series, February.

Policy 5: Facilitate technological development to further improve connectivity solutions and routing requirements between different participants in the equity trading system (e.g. to make it economical for even more traders to use SOR systems).

Box 14.10 Policies to support Development path 6—Better connect local financial centres



Policy 1: Use the EIF and/or EBRD to act as an anchor investor to crowd in private investment.

Policy 2: Update approach to indices (as per Development path 4, policy 2)

Policy 3: Strengthen corporate governance standards to secure public trust in capital markets, and raise standards in jurisdictions where local requirements are weak in practice.

- a. Introduce fiduciary rating agencies, as has been developed in Canada.⁵⁰⁴ The role of fiduciary rating agencies primarily consists of an independent party which evaluates whether investment managers meet appropriate fiduciary standards (including the investment choice and monitoring process). This also covers the supervision of investee's corporate governance standards by investment managers.⁵⁰⁵ The role of fiduciary rating agencies is a useful market discipline which may contribute not only in raising corporate governance standards but also in encouraging public trust in capital markets. The latter can be achieved using regulatory stimulus that protects the interests of retail investors.⁵⁰⁶
- b. Require all exchanges to adopt high-quality technology to monitor markets.
- c. Support credible enforcement by trading venues and market supervisor(s). Resources need to be provided and publicised, with cases pursued and results published.

Policy 4: Facilitate open access and interoperability links between CCPs (as per Development path 5, policy 3).

Policy 5: Promote private pension and insurance provision (as per Development path 3, policy 3).

⁵⁰⁴ While much of the debate has been in Canada, the initiative is not limited to Canada. SEC in the USA is also undertaking initiatives to ensure that investment managers meet appropriate fiduciary standards. See *Financial Times* (2020), "'Best Interest' deadline puts pressure on broker-dealers'.

⁵⁰⁵ See, for example, Centre for Fiduciary Excellence, <https://www.cefex.org/>.

⁵⁰⁶ For instance, in the US, SEC requires brokers to act in the best interest of their retail clients when recommending a transaction of investment strategies involving securities and be clearer on any commissions paid. See *Financial Times* (2020), "'Best Interest' deadline puts pressure on broker-dealers'.

Box 14.11 Policies to support Development path 7—Intermediated retail investor participation in equity



Policy 1: Encourage the development of investment vehicles in diversified pools of small private and public companies that can be used by retail investors to participate in equity markets.

- a. EIF support (as per Development path 1, policy 1a).
- b. Encourage greater pension and insurance provision: for example, enlist the support of DG ECFIN and SRSS to help encourage the development of these sectors as part of the Commission's broader work programme, and by promoting the use of tax incentives by member states to this effect.

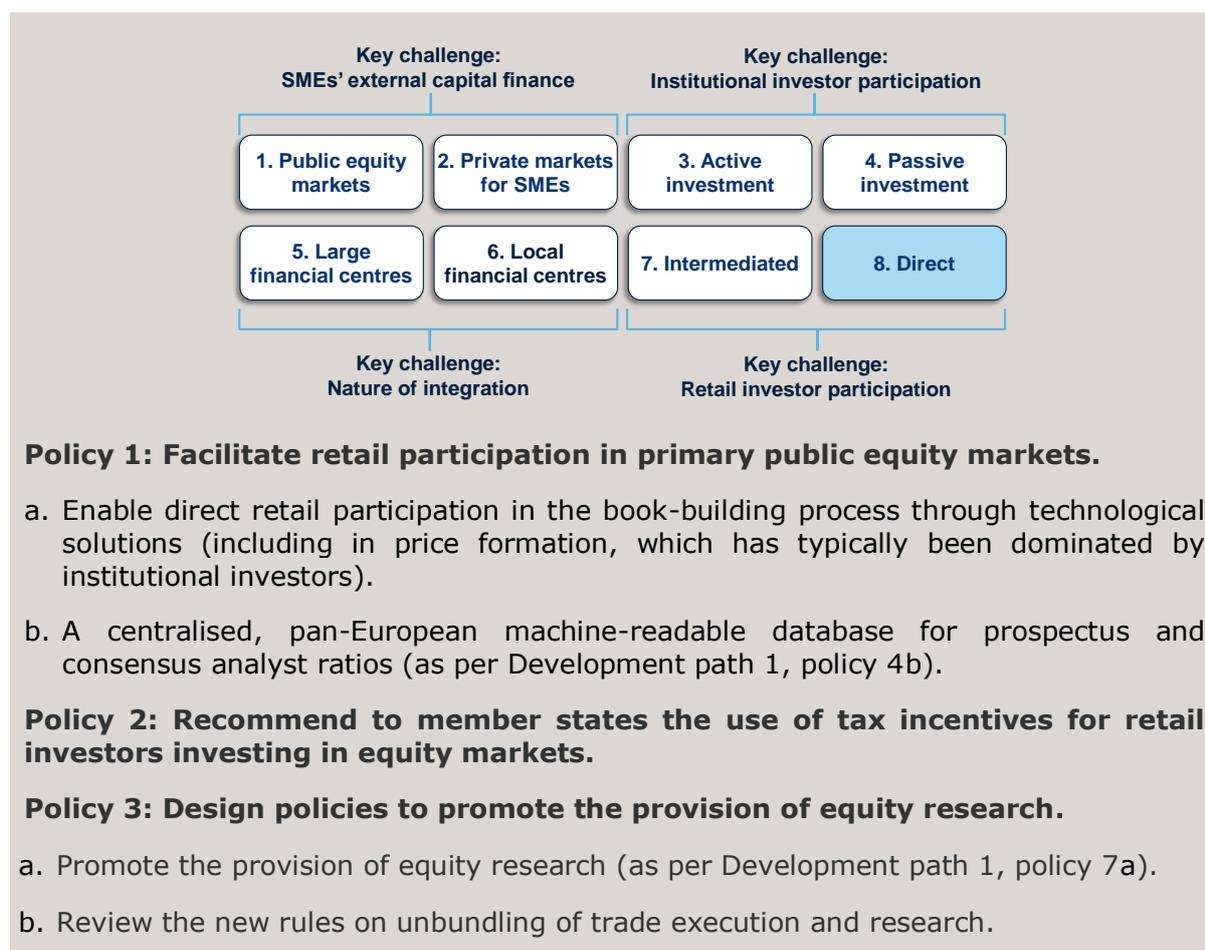
Policy 2: Increase the awareness of the risk and returns of investing in equity markets compared to fixed income markets through financial education campaigns (as per Development path 4, policy 3).

Policy 3: Require investment decision-makers to explain the value for money of their decisions (as per Development path 4, policy 4).

Policy 5: Create EU-wide equities to allow firms to list in an EU virtual jurisdiction subject to the European Court of Justice.

- a. Embolden potential investors in jurisdictions that lack equity culture and trust in courts.
- b. Base the technical requirements for EU-wide equities on existing Directives, with national exchanges being might to list them, and the ESMA playing a facilitating role. Trading could then be under existing arrangements.

Box 14.12 Policies to support Development path 8—Direct retail investor participation in equity



14.6 Sensitivity analysis

Above we have used our understanding of current trends in the EU's equity markets (section 14.2), our vision of the key elements of a successful CMU (section 14.3) and possible development paths toward this vision (section 14.4) to construct a set of policy options for the Commission. However, we note that the future of equity markets in Europe and the speed of their development may be influenced by factors outside of the Commission's control. These factors include decisions by national governments and other authorities, and exogenous shocks of various kinds, such as major shifts in technology, the entry of large new competitors and sudden changes in conditions affecting the macroeconomy.

We cannot predict which of these factors, if any, will materialise in practice; nor, if any of them do materialise, whether they will have significant impacts on the development of a CMU. Nonetheless, we can identify some of the more realistic possibilities and comment briefly upon them. Our central estimate of the expected impact on the suggested policies of these possibilities, given their nature and probability of occurrence, is a relatively small impact. We also note that some of the possibilities would support, not detract, from policy. See Box 14.13.

Box 14.13 External factors that affect equity market activity

Changes in monetary policy

Given the current level of interest rates, the most obvious possible shock to consider is a sharp rise in official rates. This could have adverse effects on the appetite for equity investment, as equity prices are generally considered to have benefitted from loose monetary policy such as quantitative easing. Such a rise seems a distant prospect as the world starts to grapple with the economic consequences of the COVID-19 pandemic. There is also some wider evidence that such a rise is unlikely.⁵⁰⁷ Thus monetary policy seems not to be a clear and present threat to the effectiveness of the policies described above.

Changes in tax incentives

Tax is a major and foreseeable cost for all firms and investors. Preferential tax treatment of some asset classes over others can distort investment decisions. For example, the tax bias towards debt over equity reduces equity market activity and increases company risk, as well as systemic risk. There is an academic literature about the benefits of removing the tax provisions that may distort debt versus equity funding decisions, so one might expect official policy to develop in this direction.⁵⁰⁸ Such a policy change would assist in the development of a CMU rather than reduce the effectiveness of the policies described above.

Changes in investor allocations/access

Institutional investors (pension funds, insurers, etc.) will direct their money towards (away from) asset classes that they perceive to be performing (underperforming). So, in principle, improved perceptions about future equity market performance are likely to lead greater stock market activity. Institutional investors, however, are often constrained in their investment allocations by market practice (e.g. investment mandates, index inclusion, etc.) and by national restrictions (for regulated investors), as well as by policies within the control of the Commission. From a retail investor perspective, allocations and access to the public equity markets can vary widely in terms of how culture, investment mandates and/or sales incentives either support or

⁵⁰⁷ Schmelzing, P. (2019), 'Eight Centuries of Global Real Interest Rates, R-G, and the "Suprasecular" Decline, 1311–2018', SSRN, November.

⁵⁰⁸ Fatica, S. (2013), 'The Debt-Equity Tax Bias: Consequences and Solutions', *Reflets et perspectives de la vie économique*, **LII**:1, pp. 5–18.

undermine the attractions of public equity markets. It is presumably to be expected that national governments will not take new measures to deter investment in contravention to EU policy towards a CMU. Also, given that a CMU is a long-term vision, we do not consider short-term perceptions by institutional or retail investors about future equity market performance to be a major issue. For example, over 60 equity peaks and troughs have been identified in data covering the period 1800–2000.⁵⁰⁹ It therefore appears that this external factor will also not be a material threat to the policies described above. On the contrary, we might reasonably expect that some national governments will enact investment-liberalising measures in support of a CMU.

Market dynamics

Markets may be subject to shocks that in turn can disrupt official policy. In the case of equity markets, possible disruptions include much greater use of AI to undertake trading, consolidation of investment platforms, and perhaps entry by large platforms that have developed high-scale, low-cost operations in other fields. Such changes can affect not only the investment process but also the underlying technology for payments and other operations.⁵¹⁰ It is not certain that major disruption will occur, for example because confidence is critical in financial services and this may favour incumbents. However, if there were such disruption, would it have major, adverse effects on the development of the CMU? It is not clear that it would. For example, low-cost platforms could help policies to develop the CMU by increasing usage of equity markets by retail consumers and helping local exchanges achieve minimum efficient scale for new operations.

COVID-19—the pandemic crisis that took hold in Europe during 2020 is vastly increasing transaction volumes in many equity markets. Historically, such volumes have not continued after the period of disturbance. The recent loss of value in equities, which averages around 30% initially, is large, and is seen by some as a warning that equities are not the best vehicle for accumulating pensions, and by others as a buying opportunity. Past reductions in the value of equities, even in the order of 40–50%, have seen the original value restored over a period of two to three years, typically. So if the recent shock, at least insofar as it has so far developed, follows historical patterns, it would not have a major effect on markets in the medium term. Indeed, just two months after the loss of value caused by COVID-19, shares have regained more than 50% of the loss. At the same time, the associated societal ‘lockdowns’ have revealed the extent to which it is possible for markets, including equity markets, to function remotely (and on a digital basis).⁵¹¹ We would expect potential efficiency gains revealed by this process to continue to be reaped in the future, and biotech, healthcare and pharmaceutical companies are likely to be highly active in raising finance for the foreseeable future.

Source: Oxera.

14.7 How might the Commission best proceed?

In our description of the development paths, we have provided a wide range of policy options to consider. Thus, while we argue in our sensitivity analysis that there are not obvious objections to supposing that the development paths can eventuate in practice, determining the best way forward from the policy perspective is not straightforward.

⁵⁰⁹ Gonzalez, L., Powell, J.G. Shi, J. and Wilson, A. (2005), ‘Two centuries of bull and bear market cycles’, *International Review of Economics & Finance*, **14**:4, pp. 469–486.

⁵¹⁰ Gomber, P., Kauffman, R.J, Parker, C. and Weber, B.W. (2018), ‘On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption and Transformation in Financial Services’, *Journal of Management Information Systems*, **35**:1, pp. 220–265.

⁵¹¹ www.afme.eu/reports/publications/details/Initial-Impact-of-COVID-19-on-European-Capital-Markets.

In our view, the best way to determine the detailed policy approach is first to recognise that changing equity markets for the better is a difficult challenge of market design, meaning that assessment of all relevant current market failures, design of interventions to address them, and a detailed consideration of how markets will react to any such interventions are required.

The critical point is to look at the market in the round, consider how it will change overall in response to the set of interventions and assess whether the net change will help or hinder equity markets in the performance of their fundamental social purpose; that is, to provide an effective, low-cost and non-distortive link between the owners of capital and its would-be users. This requires a markedly different mindset from that often adopted by regulators, in which individual aspects of the markets, such as liquidity or transparency, are considered and subjected to improvement measures without due consideration of the relevant markets in the round.

To see the importance of this point, it may be helpful to describe some of the trade-offs that will inevitably arise in just a narrow subset of markets' policymaking. Let us use as an example the issue of whether public capital markets can be a cost-effective vehicle for developing SMEs while providing acceptable opportunities and returns for investors. We believe that this case neatly illustrates the principle that it is essential to consider equity market design in the round and dangerous to intervene by discrete topic, as doing so may have unhelpful consequences in other areas.

Briefly, those who think that financing SMEs through private markets has material drawbacks, whether for SMEs themselves or for ordinary investors wanting exposure to growth companies, need to be careful about what kind of public equity market the SMEs would instead be entering.

If it is an equity market in which there is explicit policy support for passive investing due to its low costs or implicit support for passive investing—for example, through financial transaction taxes that bear more heavily on active funds and exacerbate the disparity in returns—then investors' access to SME stocks may be muted or disadvantaged.

Again, if it is a public equity market in which dual-class shares are banned or encumbered by severe restrictions, SME issuers of shares may decide that it is not a public equity market in which they wish to be involved, perhaps damaging their own and very probably ordinary investors' opportunities for growth.

Clearly, there are multiple trade-offs in play. For example, those who think it is important to encourage passive investing, because, on average, it best helps ordinary investors to build pensions, may still believe it appropriate to try to (loosely speaking) 'tax' passive funds in some way because these funds free-ride on the monitoring, governance and price formation of active traders. But how high can the 'tax' be before passive investing is undermined?

Similarly, the trade-off between, on the one hand, the resource and private costs of issuing information about publicly listed companies and, on the other hand, the needs of investors and market confidence have been carefully considered in the historical development of listing disclosure regimes. However, as technology and the information age develop further and further, how far should these regimes be recalibrated?

One important and potentially novel way to consider equity market design in the round is to conceptualise the market as a platform in ways that are increasingly familiar to economists due to the rise of big tech: what are the optimal conditions for attracting issuers and investors alike, at a cost acceptable to both?

In this approach, one might focus on the positive externalities of networks and seek to grow the equities market network as much as possible, especially as, in this case, it is not obvious that there are potentially costly tipping mechanisms in play that can foreclose

competition. At the same time, however, this brings into play a theme that matters very much to regulators: market confidence. A network for securities trading is not like a network for search goods or short-term experience goods. Expanding an equities network to allow trading of opaque shares of SMEs or serious oppression of non-family shareholders through dual-class shares could damage market confidence and lead to a lemons-type downward spiral in the market.⁵¹²

Even under the strategic approach outlined above, it will be helpful to use as a guide to detailed analysis four overarching issues of which the Commission is already aware. These are as follows.

1. The Commission needs to consider the nature and speed of technological development in the EU's equity markets and how this might best be harnessed.
2. The Commission needs to consider the beneficial role that competition can play in developing a CMU and how market forces can be freed to carry out this role without jeopardising investor interests in ways that could chill the development of equity markets.
3. The Commission needs to ensure that its approach to policymaking considers markets in the round, through detailed and independent economic analysis, including from the perspective of market design,⁵¹³ so that the overall system of regulation sets incentives such that equity markets deliver their core economic and social purposes.
4. The Commission needs to monitor the impact of the departure of the UK from the EU, and develop a policy response if market data suggests that the supply of capital to EU businesses is being adversely affected in any way.

We consider each of these briefly in turn.

The industry and its users have benefited from technological change and innovation, with examples including the entry of MTFs, new trading mechanisms, and SOR systems. While technology in itself is not going to solve all the issues we have identified, it can still help. A good example is AI bringing down the costs of SME research.

An important question then is what will drive the adoption of technology. This brings us to our second heading: we believe that competition is a critical driver of the adoption of new technology. The Commission's policy choices should therefore be tilted towards facilitating competition wherever this would not entail major risks. In some areas this might require a reconsideration of current regulations. For example, in the context of blockchain technology, regulators and supervisors would gain access only to the relevant data from the system. However, embedded supervision would still hold the Boards and senior management of financial intermediaries accountable for compliance with regulation.⁵¹⁴ (See Appendix A10.4 for our discussion on the implications of distributed ledger technology.)

⁵¹² Akerlof, G. A. (1970), 'The market for 'lemons': quality uncertainty and the market mechanism', *The Quarterly Journal of Economics*, **84**:3, August, pp. 488–500.

⁵¹³ Market design combines auction and matching theory with behavioural and experimental economics to design innovative markets to better meet goals. The goal of the market design approach is to mitigate some of the frictions and externalities that can prevent markets from reaching a first best solution, while at the same time promoting market outcomes that meet social goals. In practice, market design is largely concerned with the rules that guide market transactions and the infrastructure that enables those transactions to take place. See, for example, Roth, A.E. (2007) 'The Art of Designing Markets', *Harvard Business Review*, October; and Kominers, S.D., Teytelboym, A. and Crawford, V.P. (2017) 'An invitation to market design' *Oxford Review of Economic Policy*, **33**:4, pp. 541–571.

⁵¹⁴ Bank for International Settlements (2019), 'Embedded supervision: how to build regulation into blockchain finance', working paper, No. 811, September, <https://www.bis.org/publ/work811.htm>.

Turning to our third heading, we recognise that the Commission will, in common with almost all regulators, be under pressure to regulate in response to adverse market outcomes that achieve high profile. Yet this can lead to a cumulative burden of regulation that is too high, or at least to a set of interventions whose cumulative effect is not a well-functioning market. This problem arises even in relation to seemingly innocuous disclosure requirements.⁵¹⁵

We suggest that a conscious focus on the following would be helpful:

- market functioning and facilitating the competitive process (and value-chain analysis);
- understanding how regulation affects different types of companies (regulation designed for large cap companies could have a negative impact on small cap ones);
- market-monitoring (e.g. liquidity) to inform policymaking.

Our fourth issue, Brexit, is a specific case in which market monitoring will be important. The Commission needs to consider carefully what the data and evidence say about the ability of the EU's financial markets to carry out their primary function of providing the finance to enable the European economy to flourish, and what response might be appropriate.

While the significant home bias of many EU member states towards listing on, and investment in, equity markets means that Brexit will affect equity markets less than other financial markets, London will remain a significant financial centre in Europe and could contribute usefully to further development of the broader ecosystem for equity markets in the EU. For example, the UK (particularly London as a large financial centre) has some specialist skills and access to international investors that EU equity markets could benefit from continuing to draw on, while developing their own ecosystems.

As discussed above, the success of the EU's equity markets (in terms of the metrics discussed in section 14.3 above) will depend on their competitiveness on a global level, as this will determine their ability to attract international investment. Competitiveness is not easily achieved and will be aided by integration within the EU and by a degree of openness to London.

We consider these to be important issues for the Commission's extremely sensible objective of developing equity markets in the EU through its vision for a CMU. As discussed in section 2, equity markets in the EU are currently punching below their weight and this needs to change.

⁵¹⁵ Ben-Shahar, O. and Schneider, C. (2014), *More Than You Wanted to Know: The Failure of Mandated Disclosure*, Princeton University Press.

PART IV: APPENDICES

A1 Information sources

A core element of this study involved obtaining detailed data on primary and secondary equity markets for the EU-28, with a focus on the 14 jurisdictions selected for in-depth analysis: Bulgaria; Croatia; Estonia; France; Germany; Hungary; Ireland; Italy; the Netherlands; Poland; Slovakia; Spain; Sweden; and the UK.

The study also involved collaboration with the industry and our equity market advisory group formed of academics and experienced practitioners.

In this appendix, we provide details on the sources used for the study.

- **Data**—existing databases (e.g. Bloomberg, Refinitiv, ECB, WFE, etc.) were supplemented by data requests to market participants in the value chain—for example, requests to stock exchanges for data on listed companies, new listings and delistings. (All data sources used are listed in section A1.1 below).
- **Structured interviews**—we held interviews with leading market practitioners from trading venues, investors, issuers, market infrastructure providers, brokers, and advisers, as well as market regulators, policymakers, and academics.

Topics discussed in relation to primary markets included: i) the reasons for listing; ii) the main factors influencing the decision of a listed firm to delist; iii) considerations influencing the choice of where to list; and iv) barriers to listing, including regulatory barriers and interactions with intermediaries during the IPO process. For secondary markets, we explored: i) trading decisions; ii) trends in liquidity; iii) the use of alternative trading venues and trading mechanisms; and iv) barriers to liquidity, especially for small-cap stocks and small financial centres.

In total, 164 organisations (with 268 individuals) were interviewed across the EU markets (focusing on the selected EU-14 member states, see section A1.3), along with those operating in multiple EU jurisdictions and those operating outside the EU. (Table A1.2 and Table A1.3 below show the breakdowns of interviewees by organisation type and geography respectively.)

- **Survey**—the questionnaire for the survey of listed and unlisted companies was developed with input from the Commission and European Issuers. Some of the questions were based on previous surveys conducted by academics. To collect views from a range of companies, we partnered with national and pan-European business associations that shared the survey with their members. The data was collected via an online survey link, with 89 financial decision-makers (representing companies from 13 countries) responding to the survey.
- **Literature review**—we undertook a comprehensive review of the academic and policy literature, looking at topics including listing, liquidity trends, and market efficiency.

This appendix is structured as follows:

- section A1.1 gives more detail on the data sources used for the empirical analysis and the organisations interviewed;
- section A1.2 discusses some of the issues relating specifically to primary market data, and provides further detail on our data collection approach;
- section A1.3 presents further detail on the data used in the empirical analysis of liquidity presented in section 12;
- section A1.4 presents further detail on the data used in the empirical analysis of the investor base presented in section 10.3.

A1.1 Sources and interviews

For the empirical analysis presented throughout our report, we use a range of existing databases, combined with new data (see Table A1.1).

Table A1.1 Data sources

Information	Sources
Company data—listed companies: financials, sector and geography data	Bloomberg Refinitiv Company filings WFE FESE
Size of equity markets	ECB/Eurostat World Bank CEIC
Overview, background and textual data, including capital and market characteristics, trading systems, the regulatory environment, corporate behavioural activities, and liquidity metrics	Industry reports and publications from regulators, authorities and the ECB Academic literature Market exchanges
Primary markets	
Listed companies, new listings and delistings	Stock exchange data request Stock exchange factbooks WFE FESE
Listed company descriptive data	Stock exchange data request Bloomberg
Market capitalisation data	Stock exchange data request Stock exchange factbooks Bloomberg WFE
Private equity trends	Invest Europe ECB Preqin
IPO and follow-on equity issuance trends	Dealogic
Reasons for listing and delisting	Academic literature Industry reports Oxera survey data Stock exchange pricing schedules
Large unlisted companies	Academic literature BVD Orbis
IPO costs (underwriting and under-pricing)	Academic literature Dealogic
Perceptions of IPO process	Oxera survey
Issuance, IPOs and fees	Dealogic Refinitiv Deals
Secondary markets	
Trading volumes and turnover	Refinitiv Market Share Reporter
Bid–ask spreads, implementation shortfall and broker commission rates	Virtu Global Peer Database
Number of trades and order sizes across trading mechanisms	WFE
Average order size of dark pools	LiquidMetrix
Trading volume by market capitalisation group, analyst recommendations, and free-float percentage	Bloomberg

Information	Sources
Investor base	ECB, IMF
Transaction costs	Published studies Stock exchange data request

Source: Oxera.

In addition to the empirical sources described above, our findings have been informed by discussions with key stakeholders and market participants.

On 19 November 2019, we hosted a roundtable in Brussels on the future of equity markets. The participants included a number of leading CEOs, Board members and leading market experts. The insights from the discussion are incorporated throughout this report.

Alongside the Brussels roundtable event, we conducted a large number of structured interviews with market participants. Table A1.1 and Table A1.2 show the number of the organisations interviewed by type and geography.

Table A1.2 Interviewed organisations by type

Organisation type	Number of organisations interviewed
Buy side	24
Issuers	19
Brokers	18
Market infrastructure providers (including stock exchanges)	32
Regulators/policymakers	14
Trade associations	37
Other (data providers, academics, lawyers, etc.)	20
Total	164

Source: Oxera.

Table A1.3 Interviewees by geographical location

Geography	Number of interviewees
Large financial centres	151
Mid-size/small financial centres	40
Pan-European	73
Outside EU-28	4
Total EU-28	264
Total EU-14	179

Source: Oxera.

A1.2 Data collection: listings on EU exchanges

Section 2 presented an overview of some of the key trends in EU primary equity markets. These findings are based on an extensive analysis of data relating to listings on EU exchanges. Although data on listings is publicly available from a variety of sources, for the purposes of this study we compiled a new dataset based on data requests submitted to EU exchange operators. Below we discuss some of the issues with existing primary market databases, and then briefly describe our data collection approach.

A1.2.1 Issues with existing databases on listings

WFE is a frequently cited source for the numbers of listed companies, as the data it compiles comes directly from stock exchanges.⁵¹⁶ However, for the objectives of this study (mapping the number, size and geographic distribution of listings by trading venue), there are limitations with the WFE data (and similar sources):

- it is limited to fairly high-level time series, which are often consolidated across entire exchange groups (e.g. Euronext, Nasdaq, LSEG). These aggregated numbers can cover several regulated markets and junior market MTFs, across a range of member states, making it difficult to identify country- and market-level trends;
- although WFE data generally excludes financial vehicles (as is standard practice in the academic literature and among practitioners), this exclusion is not always applied consistently.⁵¹⁷

Several organisations provide consolidated datasets on IPOs; notably, FESE, WFE and Dealogic. While these datasets provide rich descriptive information at an individual IPO level, they are generally incomplete in their coverage of primary market activity. Datasets compiled by the associations of the trading venues are limited in their coverage to their members. Dealogic data is submitted by underwriting banks and so will not include direct listings, market transfers, certain private placements and any other new listings that underwriters do not disclose.

Individual stock exchanges also report their own primary market data statistics (covering new listings, listed companies and delistings). In most cases, these are more granular than the data consolidated by WFE, although the depth of data varies considerably across each exchange, and, by definition, the data covers only one exchange.

Academic and policy papers have compiled detailed primary market analysis, based on data provided by individual trading venues, supplemented by prospectus data, corporate action data and manual cleaning.⁵¹⁸ However, these tend to focus on a single stock exchange and, as noted, to our knowledge, no previous studies have conducted this analysis covering all listing venues in the EU.

For this study, we have therefore undertaken our own data collection exercise, to create a panel dataset of listed companies across a range of EU-28 stock exchanges. This company-level micro-data allows us to provide a more detailed picture of EU-28 listings. Our approach is explained further in the following section.

A1.2.2 Data collection: our approach

Most of the data in this section was obtained from a data request submitted to 19 stock exchange operators, covering approximately 60 main and junior markets in the EU. We supplemented this with data from WFE, FESE and Bloomberg, where necessary.

⁵¹⁶ See, for example, Lattanzio, G., Megginson, W.L. and Sanati, A. (2019), 'Listing gaps, merger waves and the privatisation of American equity finance', working paper; and Doidge, C., Karolyi, A. and Stulz, R.M. (2017), 'The US listing gap', *Journal of Financial Economics*, **123**:3.

⁵¹⁷ According to WFE, its data excludes 'investment funds, ETFs, unit trusts, and companies whose only business goal is to hold shares of other listed companies, such as holding companies and investment companies.' See 'Statistics Portal', <https://www.world-exchanges.org/our-work/statistics>.

⁵¹⁸ For a UK example, see Financial Conduct Authority (2017), 'Review of the effectiveness of primary markets: the UK primary markets landscape', Discussion Paper, <https://www.fca.org.uk/publication/discussion/dp17-02.pdf>. In the USA, the websites of Jay Ritter (<https://site.warrington.ufl.edu/ritter/ipo-data/>) and the Center for Research in Security Prices (<http://crsp.org/>) are key providers of primary market data.

The primary equity market data analysed consists of 'stock' data (number and market capitalisation of listed companies at a given point in time) and 'flow' data (information on new listings, delistings and transfers between markets during a given time period).

For the study, we sought to analyse trends using company-level micro-data, and constructed a panel dataset of listings on EU markets since 2010. This more granular data allows us to:

- disaggregate high-level trends—for example, foreign versus domestic companies, main versus junior markets;
- link observed trends in flow data (number of listings) with the underlying drivers—i.e. the number of new listings and delistings;
- identify and remove equity-like instruments that do not represent 'real-economy' companies, but are sometimes included in macro data—for example, ETFs, listed equity investment vehicles, and REITs.

To create a panel dataset, data requests were submitted to 19 stock exchange operators covering approximately 60 main and junior markets in the EU. Then, depending on data availability, we combined stock data for:

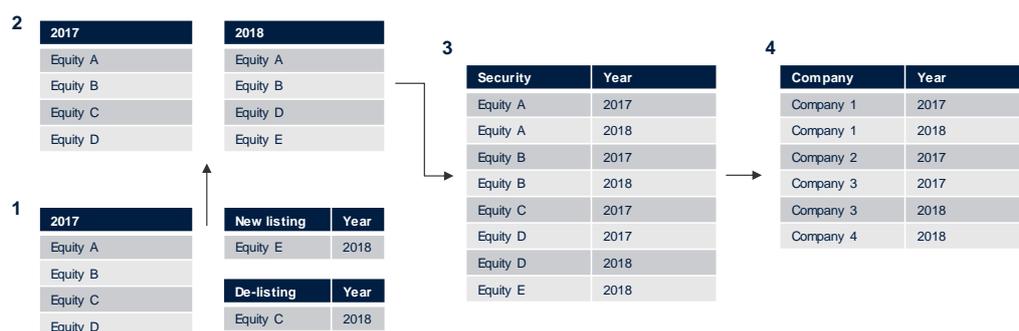
1. a given point (all listed companies at 31 December 2018) with flow data (all new listings and de-listings between 1 January 2010 and 31 December 2018) to infer stock data for other points in time;
2. multiple points in time (all listed companies between 31 December 2017 and 31 December 2018) to infer flow data for a given time period (2018).

We broadly reconciled our company-level data with other publicly available data sources where possible. However, due to the specificity of how our stock or flow data is defined, in some cases the figures obtained from the exercise differ slightly from existing data sources. This can occur, for example, if a company undertakes a corporate restructuring involving a name change, as well as a new security ISIN between two years. Other differences might occur if two listed companies merge, such that the merged entity operates under a different name, with a different security ISIN. These differences, however, do not fundamentally alter our results.

Some stock exchanges provided data at the level of an individual listed equity instrument, and a listed company may have more than one listed equity (e.g. dual-class shares). For the purposes of this report, we included in the final dataset only the main class of share listed on each exchange.

As noted above, we have also sought to exclude certain companies from our panel. These include ETFs, equity and non-equity investment vehicles, venture capital trusts, special-purpose acquisition companies, and REITs. This is because the focus of our analysis is real-economy companies, not those that primarily exist to hold other companies, real estate or other financial assets.

Some stock exchanges were not able to provide company-level data for the whole sample period; for example, Deutsche Börse could provide only basic delisting information for the main market of Frankfurt Stock Exchange, and could not provide any historical instrument-level data for Scale. In these cases, when reporting overall trends, we supplemented the panel data with estimates based on data provided by WFE or stock exchange factbooks (see Figure A1.1).

Figure A1.1 Data collection process

Note: 1. Some exchanges provided data on listed companies (or equities) at one year-end and data on listings and delistings in each year. 2. Other exchanges provided data on listed companies (or equities) at each year-end. 3. Using this we created a panel of listed companies (or equities). 4. Where there were multiple equities per company, we reduced the panel to observations at the company-year level.

Source: Oxera.

A1.3 Liquidity data

In section 12, we examined liquidity across the EU markets and over time by analysing trends in two activity-based metrics (trading volume and turnover value) and two price-based metrics (bid–ask spread and implementation shortfall). These metrics are defined as follows:

- trading volume and turnover (referring to the value of the shares traded on the market—i.e. the free-float market capitalisation) on primary stock exchanges;
- bid–ask spread: the difference (in bp) between the bid and ask price; and
- the implementation shortfall: slippage from the arrival price (in bp) calculated as the difference between the weighted-average client execution price and the price at arrival timestamp for parent orders.⁵¹⁹ The order arrival time is determined from the trader's point of view (i.e. when the order becomes available to be worked by the trader after it is released to the trading desk). As such, the arrival price consists of the next-available price after the order arrival timestamp. The next-available price is based on a composite price determined across multiple exchanges.⁵²⁰ Implementation shortfall as a measurement of liquidity combines the impact of the prevailing spread and the impact on the price while the order is being executed, as well as any in-trade price momentum.⁵²¹

Our data on trading volume and turnover is from Bloomberg and Refinitiv and at a monthly frequency. The country dimension represented in our analysis of Bloomberg and Refinitiv

⁵¹⁹ This would be higher than the implementation shortfall calculated for child orders. This is because any price impacts relevant to child orders would be considerably lower than for parent orders owing to the smaller trade size. The implementation shortfall for parent orders reported potentially still overestimates liquidity because parent orders might be cancelled partially if traders and their clients are not happy with the available trading opportunities.

⁵²⁰ In instances when the next-available price immediately after the order begins for the trader is missing, the fall-back option is to use the open price on the day of trading (as opposed to the next day's open price). If the order arrival timestamp is before market hours, the open price on that trading day is used. If the order arrival timestamp is after hours, the open price on the next trading day is used. The open price is based on the primary exchange.

⁵²¹ This means that if the stock momentum is positive (moving in a beneficial direction for the trader, such as 'price goes up while you sell'), the momentum can offset the other cost components, and the weighted-average trader execution price will be greater than the arrival/starting price for sells, and less for buys.

data is defined according to the country of domicile of a traded security, based on information from the primary listing exchange(s). For example, trading volume for Croatia covers trading activities on all EU primary stock exchanges (i.e. trades executed through any primary stock exchange in the EU) for Croatian stocks.

We obtained data on bid–ask spread and the implementation shortfall from the Virtu Global Peer Database, at a quarterly frequency.⁵²²

The country dimension for the analysis of bid–ask spread and the implementation shortfall is based on a definition similar to that used in trading volume and turnover analysis, according to Virtu’s country definition—i.e. the country of the traded security is determined by the primary listing exchange. In contrast to Bloomberg data (where our focus is on primary stock exchanges), Virtu data includes its client trading in all trading venues, including lit venues, dark pools, OTC and SIs. While the specific venues are not always explicitly provided by their clients—to which Virtu provides dealer/brokerage services—the data reported reflects the actual proportions of these trading venues. In addition, this data includes all order types (i.e. market orders and limit orders; although the majority are market orders) and covers 18.7% of European market volume (excluding the UK), 6.9% of the Emerging Europe volume, 34.1% of the UK volume, and 11.6% of the US volume. Coverage is typically lower for small financial centres, as is the case with other data providers such as Bloomberg and Refinitiv. The biggest benefit of using the Virtu Global Peer Database is that it reports the implementation shortfall—a multi-dimensional measurement of liquidity—and thus provides a comprehensive view of liquidity across the EU markets.

While Virtu follows a well-established methodology of estimating implicit costs, as with any database that does not cover the whole population its data is subject to its sample coverage and the profile of trades executed by the fund management firms in its sample. However, our findings based on this data are consistent with other comparable databases and insights shared by market practitioners from the structured interviews.

Moreover, the liquidity analysis presented in section 12 covers the following EU member states.

- At the aggregate EU level: data on bid–ask spreads and the implementation shortfall includes 17 EU member states (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, and the UK) due to data availability from Virtu.⁵²³ In addition, we refer to our analysis of the trading volume and turnover value covering all EU-28 from Refinitiv, presented in section 10.3.
- In-depth analysis at the financial centre level and breakdowns by market capitalisation:
 - large financial centres: France, Germany, Ireland, Italy, the Netherlands, Spain, Sweden, and the UK;
 - small financial centres: Bulgaria, Croatia, Estonia, Hungary, Poland, and Slovakia (for trading volume and turnover value data from Bloomberg)—these countries and those listed in the large financial centres above are referred to in the report as the ‘EU-14’. The list of small financial centres used for bid–ask spreads and the implementation

⁵²² Source disclaimer (from Virtu): ‘Many factors influence transaction cost including order size, volatility, and spread. Virtu’s peer universe includes a variety of firm types trading orders of all sizes in various market conditions. Virtu’s Peer commission numbers represent a blend of both execution-only and fully bundled rates. Investment firms represented in the Virtu peer universe follow diverse trading strategies. Trading performance for firms employing different trading strategies may not be directly comparable.’

Virtu’s underlying country-specific cost calculations are supplied based on a weighted notional average.

⁵²³ As noted in the Introduction, the UK was a member state of the EU during the period of analysis, and has therefore been included in the European sample.

shortfall data comprises Czech Republic, Greece, Hungary, and Poland, due to data availability.

As Virtu data on bid–ask spreads and implementation shortfall was provided at the country level, our analysis at the EU and financial-centre levels is based on weighted average of country-level data. Weights are assigned based on the number of orders submitted for each country in a given quarter. Thus, countries with higher numbers of orders each quarter will have more weight in the averages.

A1.4 Investor base data

In section 10.5 we examined the investor base across 26 EU member states by analysing data from both ECB and the IMF. Data for Croatia and the UK was not available in this dataset. The ECB dataset on institutional sector accounts was used to analyse the composition of domestic equity holdings, while the IMF dataset on equity statistics was used to analyse the composition of foreign holdings.

Our analysis of investors' holdings relies on two key definitions provided by both the IMF and the ECB:

- equity refers to both listed and unlisted shares;
- the residence of each institutional unit is defined as the economic territory with which it has the strongest connection. This is expressed as the centre of predominant economic interest.

The IMF dataset on equity statistics refers to the Coordinated Portfolio Investment Survey. Each participating economy conducts its own national survey twice a year, in respect of portfolio investment positions. Along with this, the survey of Securities Held as Foreign Exchange Reserves—which covers the geographical breakdown (by country) of holdings of securities held as part of reserve assets—also contributes to the IMF dataset. In addition, the survey of Securities Held by International Organisations provides information on securities assets held by international organisations. Moreover, to complement the Coordinated Portfolio Investment Survey, the Coordinated Direct Investment Survey is used to collect data on inward direct investment positions. The classification of institutional units in the dataset follows the System of National Accounts 2008, which aggregates units of the same place of residence and principal economic activity.⁵²⁴

The ECB dataset on institutional sector accounts is also consistent with the System of National Accounts 2008, but with differences in its presentation. The ECB reports the value of equity holdings denominated in the currency of the country of reference. Therefore, all values reported in section 10.5 are converted into euros using the ECB time series for bilateral exchange rates.⁵²⁵

⁵²⁴ For more information, see International Monetary Fund (2015), 'Handbook of securities statistics', <https://www.imf.org/external/np/sta/wgsd/pdf/hss.pdf>; (2017), 'Coordinated Portfolio Survey Guide', <file:///C:/Users/IllariaN/Downloads/CPIS%20Guide%20Third%20Edition.pdf>; (2015), 'Coordinated Direct Investment Survey Guide', [file:///C:/Users/IllariaN/Downloads/CDIS%20Guide%20\(English\).pdf](file:///C:/Users/IllariaN/Downloads/CDIS%20Guide%20(English).pdf); International Monetary Fund, Data Sharing and Confidentiality—Statistics Department, January, <https://www.imf.org/external/pubs/ft/bop/2012/12-16.pdf>.

⁵²⁵ https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html.

A2 Overview of equity markets in the EU: detailed trends

In section 2, we provided an overview of key trends in global and EU equity markets. This appendix presents some of the more detailed underlying data used to inform our analysis, and is set out as follows.

- Section A2.1 provides the underlying data on long-term global trends in listings, based on existing data, mainly from WFE and FESE. Although these datasets have some limitations, they are the most reliable sources for analysing long-term trends.
- Section A2.2 gives a more detailed overview of the trends in listings in the EU since 2010. This is based on a new and extensive data collection exercise that allows the stock and flow of listings in the EU to be traced.

A2.1 Global trends in equity markets

The change in the total number of listed companies on major EU and global stock exchanges between 1990 and 2018 is shown in Table A2.1.

Table A2.1 Global trends in the number of companies listed on the major stock exchanges

Exchange	Total number of companies		Change	
	End 1990	End 2018	Net	%
Europe				
Amsterdam Stock Exchange (Euronext Amsterdam)	498	133	-365	-73%
Borsa Italiana	229	339	+110	+48%
Frankfurt Stock Exchange	647	514	-133	-21%
London Stock Exchange	2,559	1,166	-1,393	-54%
Paris Stock Exchange (Euronext Paris)	669	500	-169	-25%
Rest of world				
NYSE	1,774	2,285	+ 511	+29%
Nasdaq	4,132	3,058	-1,074	-26%
Hong Kong	299	2,315	+2,016	+674%
Shanghai	8	1,450	+1,442	+18,025%
Tokyo and Osaka	1,752	3,657	+1,905	+109%
Total	12,567	15,417	+2,850	+23%

Note: Number of domestic and foreign listings on each exchange.

Source: Oxera analysis of data from stock exchange factbooks and WFE.

While the European trends are discussed in more detail in the next section, two additional points are worth highlighting:

- as discussed in section 2, there is a clear contrast in the trajectories of major European and Asian public markets. For the Asian exchanges, the significant increase in listed companies partly reflects the lower base of listed companies at the start of the period. In particular, the modern Shanghai Stock Exchange was established only in 1990;
- the negative net change in US listings since 1990 has largely been driven by Nasdaq; however, the decline in Nasdaq listings has not been consistent over the period. Between 1990 and 2013 the number of listings followed an inverted U-shaped pattern, with a peak of over 5,500 listed companies in 1996 and a low of approximately 2,500 listings in 2013. This was followed by a gradual increase in the number of listings after 2013.

Table A2.2 shows the key global trends in market capitalisation of the same exchanges.

Table A2.2 Global trends in the market capitalisation of major stock exchanges

Exchange	Market capitalisation (£m) ¹		Market capitalisation/GDP		CAGR 1990–2018 (%)	Annual growth rate of main index, ² 1990–2018 (%)
	End 1990	End 2018	End 1990	End 2018		
Europe						
Amsterdam Stock Exchange	119,825	990,185	38%	108%	8%	5% ³
Borsa Italiana	148,766	640,505	13%	31%	5%	n/a
Frankfurt Stock Exchange	355,311	1,755,173	20%	44%	6%	7% ⁴
London Stock Exchange	849,848	3,039,363	78%	106%	5%	4%
Paris Stock Exchange	311,687	2,441,187	25%	88%	8%	4% ⁴
Rest of world						
NYSE	2,692,123	20,679,477	45%	101%	8%	6%
Nasdaq	299,024	9,756,836	5%	47%	13%	10%
Hong Kong	83,386	3,819,215	108%	1,053%	15%	8%
Shanghai	258	4,073,008	0.1%	30%	41%	n/a
Tokyo and Osaka	2,928,534	5,296,811	93%	107%	2%	-1%

Note: ¹ Total capitalisation of domestic companies and exclusively listed foreign companies on each exchange. ² Respectively, AEX, DAX Performance, FTSE 100, CAC 40, NYSE composite, Nasdaq composite, Hang Seng, TOPIX. Borsa Italiana (FTSE MIB) and Shanghai (SSE 50) not included due to incomplete time series. ³ 1992–2018. ⁴ 1991–2018.

Source: Oxera analysis of data from stock exchanges factbooks, WFE and World Bank.

This data shows that, despite falls in the number of listed companies, European stock exchanges have grown in absolute terms and relative to GDP since 1990. It also shows that there is still considerable international variation in the size of stock exchanges relative to GDP. In the USA, market capitalisation of listed companies in 2018 was approximately 1.5 times larger than GDP, whereas in Italy market capitalisation was only one-third the size of GDP.

A2.2 Trends in EU equity markets

Table A2.3 below shows the number of listed companies on EU-28 stock exchanges in 2010 and 2018, based on data provided by stock exchange operators. This data includes both the main and junior markets for each stock exchange (e.g. Euronext Paris includes both Euronext, Euronext Growth and Euronext Access).

Table A2.3 Number of companies listed on EU-28 stock exchanges

	Total number of companies		Change 2010–18	
	End 2010	End 2018	Net	%
London Stock Exchange	1,817	1,439	-378	-21
Euronext Paris	893	764	-129	-14
Warsaw Stock Exchange	531	763	232	44
Nasdaq Stockholm	314	555	241	77
Frankfurt Stock Exchange	709	469	-240	-34
Borsa Italiana	271	323	52	19
Bulgarian Stock Exchange	313	192	-121	-39
Athex	266	173	-93	-35
Spotlight Stock Market	124	166	42	34
BME	133	158	25	19
Nasdaq Helsinki	129	157	28	22
Luxembourg Stock Exchange	267	141	-126	-47
Nasdaq Copenhagen	164	135	-29	-18
Zagreb Stock Exchange	247	124	-123	-50
Nordic Growth Market	26	117	91	350
Euronext Brussels	139	110	-29	-21
Euronext Amsterdam	124	105	-19	-15
Cyprus Stock Exchange	110	102	-8	-7
Bucharest Stock Exchange	74	87	13	18
NEX Exchange	161	75	-86	-53
Bratislava Stock Exchange	157	55	-102	-65
Vienna Stock Exchange	74	55	-19	-26
Euronext Dublin	59	54	-5	-8
Euronext Lisbon	52	49	-3	-6
Budapest Stock Exchange	52	43	-9	-17
Ljubljana Stock Exchange	64	28	-36	-56
Nasdaq Vilnius	37	25	-12	-32
Prague Stock Exchange	21	20	-1	-5
Malta Stock Exchange	17	17	0	0
Nasdaq Riga	29	17	-12	-41
Nasdaq Tallinn	15	13	-2	-13
Börse Stuttgart	3	7	4	133
Total EU-28	7,392	6,538	-854	-12

Note: Number of domestic and foreign listings on each exchange. Data includes main and junior market on each stock exchange (except for Ljubljana owing to data availability). Data for Bucharest Stock Exchange, Budapest Stock Exchange, Cyprus Stock Exchange, and Euronext Dublin from WFE. Data for Frankfurt Stock Exchange Scale sourced from Deutsche Börse factbook. Data for NEX Exchange sourced from PLUS Markets Group financial statements and NEX Exchange statistics. NEX Exchange data for 2010 is for PLUS Stock Exchange. Oxera panel data excludes investment funds, REITs, etc. Exchanges are ranked from largest to smallest in terms of number of companies in 2018.

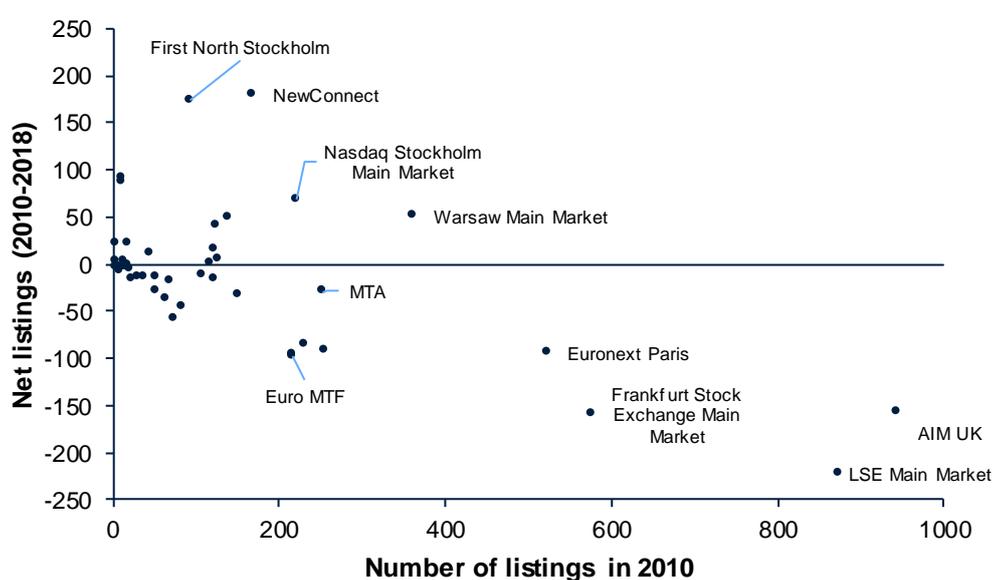
Source: Oxera analysis of data from stock exchanges; WFE.

Figure A2.1 below illustrates how the net change in listings varies by market, and highlights that:

- most of the markets in the EU have a small number of listed companies;

- much of the decline in the number of listings in the EU-28 has been driven by reductions on the main market in the large financial centres (Frankfurt, London and Paris), where alternative financing options are more readily available. For example, private equity and debt markets are a more viable long-term option and, in some cases, mature businesses are often already cash-rich;
- Nasdaq First North Stockholm and NewConnect in Warsaw have been notable markets in terms of growth. The success of Nasdaq First North and impact of tax incentives was discussed in section 5. As explained above, the high net change in listings on the Warsaw market is also partially a function of starting from a lower base;
- there is also a cluster of smaller financial centres where the number of listings has declined, particularly on MTFs (e.g. Bratislava). These trends are in line with the declines seen in the major financial centres.

Figure A2.1 Number of listings in 2010 versus net change, 2010–18



Note: See note to Table A2.3.

Source: Oxera analysis of stock exchange data; WFE.

Table A2.4 below shows the total market capitalisation over the same period for these exchanges. Mirroring the broader global trends described above, the exchange-level data for the EU-28 shows that there has been an overall increase in the value of listed companies, despite a fall in the number of listings.

Table A2.4 Market capitalisation of EU-28 stock exchanges

Exchange	Market capitalisation (€m)		CAGR 2010–18 (%)
	End 2010	End 2018	
London Stock Exchange	2,368,330	2,680,077	1.6
Euronext Paris	1,441,873	2,076,892	4.7
Frankfurt Stock Exchange	1,078,450	1,486,232	4.1
Euronext Amsterdam	498,757	838,462	6.7
BME	883,767	612,802	-4.5
Nasdaq Stockholm	443,481	579,367	3.4
Borsa Italiana	446,835	542,362	2.5
Nasdaq Copenhagen	177,722	314,631	7.4
Euronext Brussels	202,703	280,961	4.2
Nasdaq Helsinki	166,954	236,168	4.4
Warsaw Stock Exchange	143,851	135,892	-0.7
Vienna Stock Exchange	95,067	98,905	0.5
Euronext Dublin	45,536	93,276	9.4
Euronext Lisbon	61,851	54,148	-1.6
Prague Stock Exchange	54,897	40,730	-3.7
Luxembourg Stock Exchange	76,282	41,901	-7.2
Athex	50,981	32,491	-5.5
Bucharest Stock Exchange	23,892	30,658	3.2
Budapest Stock Exchange	20,901	24,510	2.0
Zagreb Stock Exchange	19,307	17,366	-1.3
Bulgarian Stock Exchange	4,777	13,124	13.5
Ljubljana Stock Exchange	7,028	6,349	-1.3
Bratislava Stock Exchange	3,106	4,841	5.7
Malta Stock Exchange	3,163	4,279	3.9
Nasdaq Vilnius	4,220	3,335	-2.9
Cyprus Stock Exchange	5,155	2,806	-7.3
Nasdaq Tallinn	1,685	2,566	5.4
NEX Exchange	2,973	1,531	-8.0
Nasdaq Riga	942	738	-3.0
Total EU-28	8,334,485	10,257,399	0.7

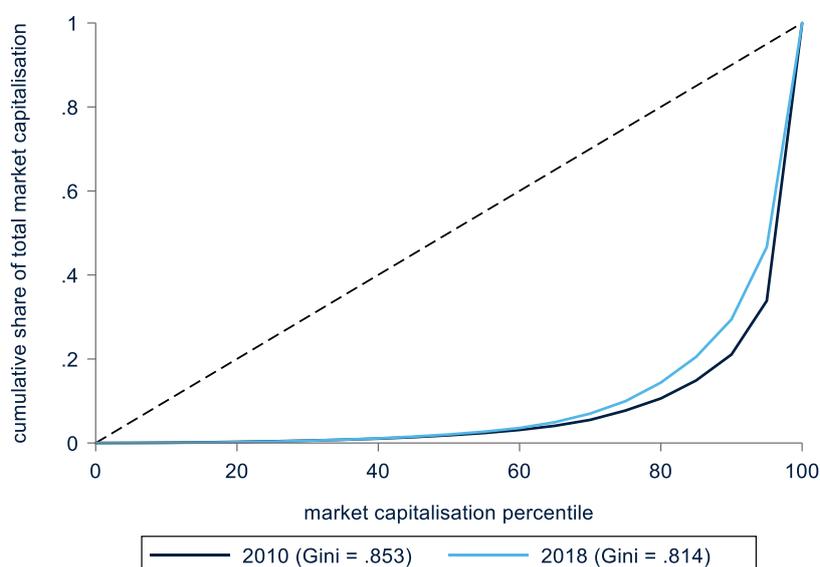
Note: Data for the following exchanges sourced from WFE: Athex, BME, Budapest Stock Exchange, Cyprus Stock Exchange, Euronext excluding Dublin (2010), Euronext Dublin, Frankfurt Stock Exchange, Luxembourg Stock Exchange, Malta Stock Exchange, Vienna Stock Exchange, Warsaw Stock Exchange, Zagreb Stock Exchange. WFE data includes market capitalisation of domestic and single foreign listings for both main and junior markets. Data for the following exchanges sourced from stock exchange factbooks: Borsa Italiana, Bratislava Stock Exchange, Bucharest Stock Exchange, Bulgarian Stock Exchange, Euronext excluding Dublin (2018), Nasdaq Nordics & Baltics, Prague Stock Exchange and London Stock Exchange. Data for Nasdaq Nordic and Baltic markets excludes First North. Data for Börse Stuttgart, Nordic Growth Market and Spotlight Stock Market not available.

Source: Oxera analysis of stock exchange data; WFE.

The size distribution of listed companies on main markets has also been analysed, using company-level data provided by Borsa Italiana (Figure A2.2) and Euronext Paris (Figure A2.3). These exchanges collect largely complete market capitalisation data. Data on the

market capitalisation of individual companies allows the Lorenz curve to be plotted and the Gini coefficient (as a measure of inequality in the distribution) to be calculated.⁵²⁶

Figure A2.2 Distribution of Borsa Italiana MTA market capitalisation, 2010 and 2018

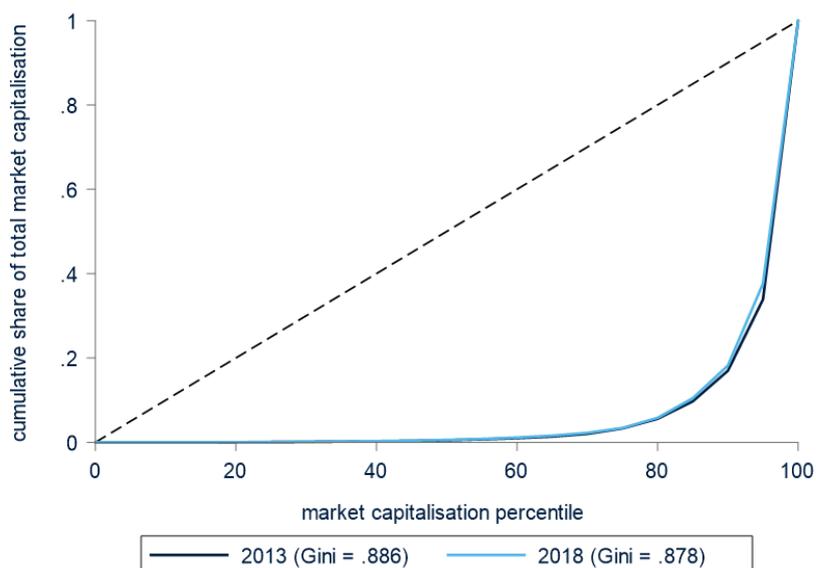


Note: The Gini coefficient is calculated as $G = A/(A+B)$, where A is the area below the 45° line and above the Lorenz curve, and B is the area below the Lorenz curve. $G=0$ implies that all companies have identical market capitalisation. $G=1$ implies that one company has positive market capitalisation and all others have zero market capitalisation.

Source: Oxera analysis of stock exchange data.

⁵²⁶ The Lorenz curve plots the cumulative percentage of total market capitalisation against the cumulative percentage of the corresponding population (listed companies on the exchange). The extent to which the curve sags below a straight diagonal line indicates the degree of inequality of distribution. The Gini coefficient (G) is a statistical measure of dispersion based on the Lorenz curve.

Figure A2.3 Distribution of Euronext Paris market capitalisation, 2013 and 2018



Note: See note to Figure A2.2.

Source: Oxera analysis of stock exchange data.

This data shows that:

- the distributions of total market capitalisation across these markets are highly unequal, with Gini coefficients of over 0.8. This unequal distribution is largely driven by a relatively small number of very large companies;
- the relative distributions of company sizes have remained largely unchanged in recent years.

A3 Regulation of primary markets

In section 6 the key differences in listing rules across member states were described, together with our initial observations on the impact of listing rules on issuers' decisions to list/delist. This appendix details the mapping of rules and practices that underpins our analysis, and is structured as follows:

- section A3.1 gives a brief background on the role of regulation in listing;
- section A3.2 outlines the regulatory framework for listing in the EU;
- section A3.3 presents a detailed mapping of rules and practices across EU member states;
- section A3.4 summarises key corporate governance requirements for listing on EU stock exchanges

A3.1 The role of regulation in listing

Listing is a system that imposes requirements on issuers to protect investors in their securities. This protection fosters market confidence, to the benefit of both investors and issuers. The regulation of primary markets is mainly based on the principle of full, timely and accurate disclosure of relevant information to investors. Over time, securities regulators have moved away from merit-based regimes to ones based on disclosure.⁵²⁷ The focus of the regulator today is ensuring that investors are given full, timely and accurate information so that they can make informed decisions. It is not the role of the regulator to determine whether an offer is too risky—that decision is probably better made by the investor, whose job it is to price risk.⁵²⁸

Given this focus on disclosure, much of the regulation in primary markets is centred around ensuring an effective flow of information, both at the time of listing and on a continuous basis, and addressing any conflicts of interest that may arise. Mechanisms of monitoring and enforcement are put in place to ensure the reliability of information provided by the issuers.

A regulatory regime that imposes strict disclosure regulation provides a signal of issuer quality and therefore attracts investors. At the same time, more stringent requirements can impose higher compliance costs and a burden on a company (as discussed in section 7). In general, these requirements imply higher administrative costs, thereby potentially reducing the relative benefits of listing. However, they may also reduce the cost of capital by providing reassurance to investors, and facilitate analysis for the evaluation of the asset.

The regulatory requirements are generally principles based and set with the objective of providing an appropriate balance between investor protection, practitioner certainty and flexibility.

At a high level, the key features of equity market regulation include requirements about:

- the application for a primary listing (listing rules)—including eligibility requirements for admission to listing and the ongoing obligations thereafter;

⁵²⁷ Carvajal, A. and Elliott, J. (2007), 'Strengths and Weaknesses in Securities Market Regulation: A Global Analysis', IMF Working Paper, November.

⁵²⁸ Although it could be argued that some of the listing requirements do in effect cut off the riskier tail of the distribution of possible listings.

- the publication of a prospectus (prospectus rules)—the prospectus forms the basis for marketing any offering to potential investors and must be published by a company before its securities can be listed and admitted to trading on a market;
- the continuing obligations after listing—as well as the initial disclosure and transparency requirements, there are requirements to disclose certain information on an ad hoc or ongoing (case-dependent) basis.

There are also typically requirements around the corporate governance, takeover, and share class structures of companies seeking to list.

These features are common to primary market regulation worldwide, although the specifics can differ by jurisdiction and exchange, as discussed in the next two sections.

Figure A3.1 Key features of listing regulation

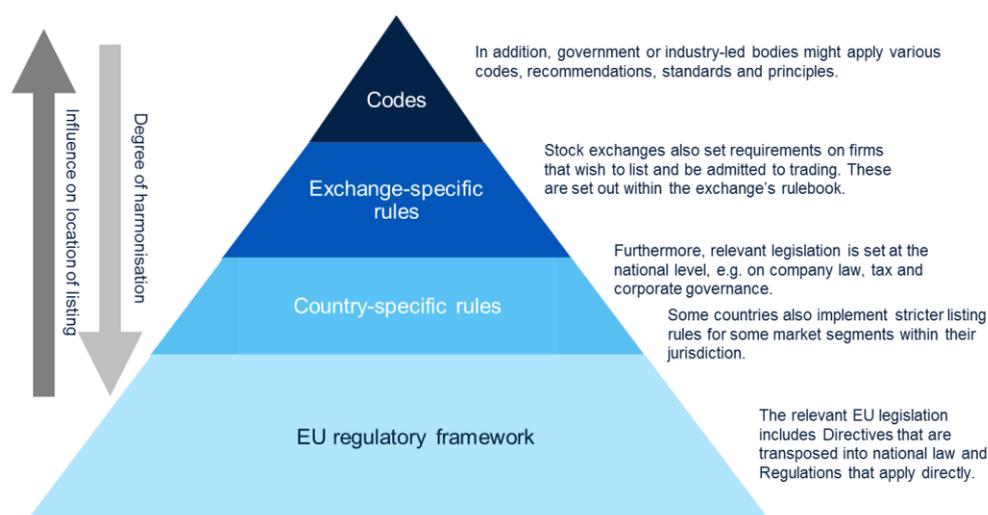


Source: Oxera, based on interviews with regulators and legal advisers.

How this role for regulation is formalised within the different layers of the regulatory framework for listing in the EU is examined next.

A3.2 Regulatory framework for listing in the EU

Listing rules are generally well-harmonised across the EU. While some differences do arise across markets (as set out in section 3.2), these tend to stem from country- and/or exchange-specific rules that are outside the scope of EU regulation. Figure A3.2 below illustrates the layers of the regulatory framework that applies to issuers in the EU.

Figure A3.2 Layers of the EU regulatory framework

Source: Oxera.

At the base of the regulatory framework is EU legislation applicable to issuers seeking to list on public markets in the EU, which includes the following:⁵²⁹

- the Listing Directive (2001/34/EC), setting the regulatory and supervisory framework for primary markets, including the designation of the NCAs for listing;
- the Transparency Directive (2004/109/EC) and amendments (2013/50/EU), setting the reporting rules for issuers with securities admitted to trading on regulated markets;
- the Prospectus Regulation (2017/1129), defining all the information that must be included in a prospectus, the threshold, and the conditions for prospectus exemption. (Some of the new EU prospectus rules took effect on 21 July 2019);
- the Market Abuse Regulation (MAR) (2014/596), applying regulation on market behaviour, and additional requirements on listed firms, governing the disclosure of information relating to insider information and market manipulation. There is also a sanctions regime with fines for lack of compliance;
- the Shareholders Rights Directive II (2017/828), setting out the rules that strengthen the position of shareholders and ensure that decisions are made for the long-term stability of a company;
- the Markets in Financial Instruments Directive (MIFID II) (2014/65/EU), setting out the authorisation requirements for regulated markets, regulatory reporting to avoid market abuse, the trade transparency obligation for shares, and rules on the admission of financial instruments to trading;
- the Markets in Financial Instruments Regulation (MiFIR) (2014/600), setting out requirements on transaction reporting and execution, pre- and post- trade transparency and clearing obligations.

⁵²⁹ Unlike the other legislation, neither MiFID II nor MiFIR has a particular focus on the obligations of issuers, but both have had significant impacts on the functioning of equity markets and are therefore included in this list.

Some of this legislation applies through EU Directives that member states then transpose into national law, and some through EU Regulations that apply directly.

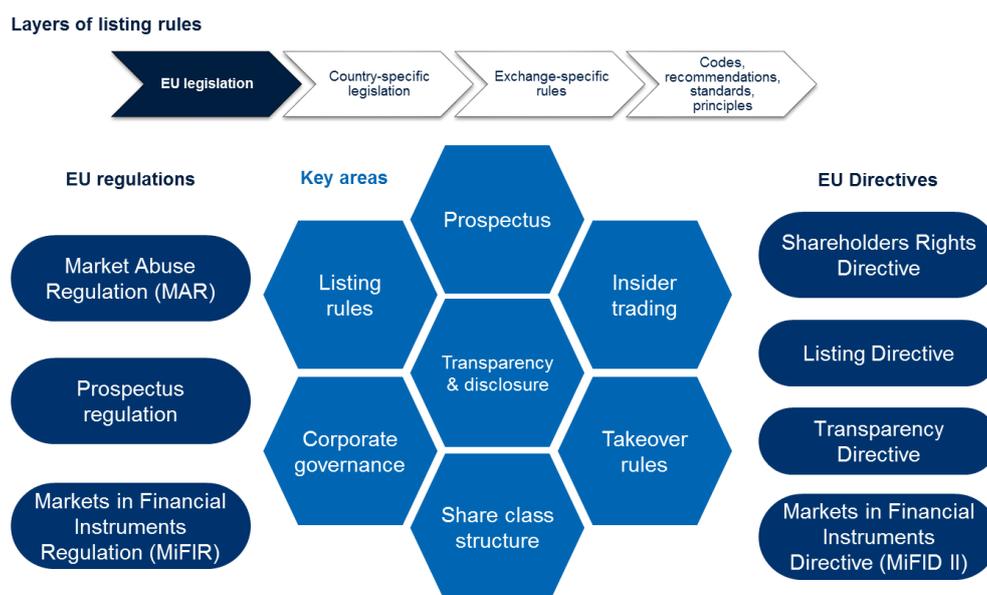
The next layer that applies to potential issuers is country-specific legislation. This includes, but is not limited to, legislation on company law, tax policies, and, in some cases, the corporate governance requirements. Some member states also implement stricter regulation for certain market segments within their jurisdiction. These apply on top of EU legislation.

The next layer is the exchange-specific rules, set out in the exchange rule books. These requirements must be met for the firm to be listed on the exchange.

Finally, there may be additional requirements or principles as set out in codes, recommendations and standards. These may be voluntary: firms may choose to adopt them to demonstrate high standards to their investors, potential investors, and other stakeholders.

It is important to note that the wider primary market landscape also involves other entities that play a significant role in shaping it. For example, although there is a connection between listing and indexation (e.g. having a premium listing is a prerequisite for admission to the FTSE indices), it is the index providers that create an index for a specific sector or group of issuers, and set the relevant entry requirements.

Figure A3.3 Overview of listing rules



Source: Oxera.

Furthermore, many exchanges provide for a variety of listing markets, each with different levels of admission standards and ongoing requirements. For example:

- Borsa Italiana has MTA (its main market), STAR, AIM Italia, and MIV, with varying degrees of requirements;
- Frankfurt Stock Exchange allows companies seeking a listing to choose between its regulated and unregulated markets. Firms seeking to list on the regulated market can choose to meet the General Standard or the Prime Standard (with higher transparency requirements). Firms can also list on the (unregulated) open market and, if the issuer meets certain additional transparency requirements, they could also list in the Scale market segment;

- Euronext has Euronext (its main market), Euronext Growth and Euronext Access.⁵³⁰ Euronext Growth (in Brussels, Dublin, Lisbon and Paris) and Euronext Access (in Brussels, Lisbon and Paris) are markets dedicated to SMEs and have less stringent requirements;
- similar market segments apply on most of the other European stock exchanges.

This set-up provides issuers with the choice to list on the market that is most suited to their needs and structure, and to the investor base they want to attract (the different segments tend to attract different investor types). Some of these markets are regulated by the national financial market authority and some are regulated by the exchange.

Regulated markets are those that meet the requirements set out in EU legislation⁵³¹ and to which the Prospectus Regulation, Transparency Directive and MAR apply. While EU regulation also applies to issuers of securities on exchange-regulated markets (see Table A3.1), notably the MAR and MiFID II/MiFiR, these markets have their own rule book set, which is monitored and enforced by the exchanges.

The main regulated market listing will generally be chosen by companies that are large in size and have relatively mature business models. The exchange-regulated market segments are typically targeted at companies that are smaller, and usually at an earlier or growing phase of their life.

Table A3.1 EU disclosure framework

	IPO/listing	Ongoing disclosure	Market abuse and ad hoc disclosure
Regulated market	Prospectus Regulation	Transparency Directive Shareholder Rights Directive	Market Abuse Directive/ MAR
MTF/alternative markets	Simplified prospectus rules	–	Simplified rules Market Abuse Directive/MAR

Source: Oxera, based on Centre for European Studies and European Capital Markets Institute (2019), 'Rebranding Capital Markets Union: a market finance action plan', report of the CEPS-ECMI Taskforce, June.

The regulatory framework provides issuers with considerable flexibility and choice. Depending on their size, growth objectives and funding needs, companies seeking to list can choose from different trading venues and market segments in the EU.

A3.3 Mapping of rules and practices of EU member states

As noted above, the EU regulatory framework on equity markets consists of several pieces of EU legislation that are directly addressed at issuers. Each piece of legislation is examined in turn below.

A3.3.1 Listing Directive

The Listing Directive (2001/34/EC) is the legislation underpinning the listing regime in European markets. It consolidates the measures concerning the admission of securities to an official stock exchange listing and the ongoing financial information that listed companies must make available to investors. It also sets out the regulatory and supervisory framework for European primary markets, including the designation of the NCAs for listing (competent authorities for listing, CALs).

⁵³⁰ Euronext website, 'Choosing your Market', <https://www.euronext.com/en/raise-capital/how-go-public/choosing-market>.

⁵³¹ MiFID II/MiFiR.

Table A3.2 summarises the conditions that issuers need to satisfy to be admitted to official listing (Articles 42–51) and the obligations that they need to fulfil once admitted to official listing (Articles 64–69).

Table A3.2 Specific conditions for the admission of shares and obligations of public listed companies

Subject matter	Condition
Company legal proposition	Laws and regulation of the member country in which the company seeks to list
Market capitalisation	At least €1m. A lower market capitalisation might be accepted if there is an adequate market for the shares concerned
Operating history and required financial reporting	Annual accounts for three financial years preceding the application for listing. Exceptions may be considered
Minimum free floating	25% of the subscribed capital represented by the class of shares concerned. Exceptions may be considered
Shareholders	Equal treatment of shareholders who are in the same position Sufficient facilities and information allowing shareholders to exercise their rights The public must be informed of any changes in the rights attached to the various classes of shares and in the structure (shareholders and breakdowns of holdings) of the company's major holdings in its capital
Annual accounts and annual report	The company's own and consolidated annual accounts must be made public as soon as possible. Half-yearly reports of activities and profits and losses must be published during the first six months of each financial year The public must be informed of any major new developments that are not already public knowledge

Source: Oxera, based on information available on the European Commission website.

Member states may subject issuers to more stringent conditions and obligations than those illustrated in Table A3.2, provided that these more stringent conditions apply generally for all issuers or for individual classes of issuer.

This Directive also defines the powers assigned to CALs, the national entities responsible for:

- deciding on the admission of securities to official listing on a stock exchange;
- requesting from issuers all the information deemed appropriate in order to protect investors or ensure smooth operation of the market;
- acting against an issuer failing to comply with the obligations resulting from admission;
- cooperating with other EU NCAs for the purpose of carrying out their duties, including exchanging information useful for that purpose.

Member states can appoint one or more CALs for the purposes of the Directive.

A3.3.2 Transparency Directive

The Transparency Directive, issued in 2004 and revised in 2013, aims to ensure transparency of information for investors through a regular flow of disclosure of periodic regulated information and its dissemination to the public. The required regulated information comprises financial reports; information on major holdings of voting rights; and information disclosed pursuant to the Market Abuse Directive (see section A2.4).

Financial reporting

The Directive sets specific requirements in relation to annual and half-yearly financial reports. While there may be additional requirements at a national level, member states

are not permitted to impose the requirement to publish financial information more frequently than that indicated above.⁵³²

One of the aims of the Directive is to simplify or abolish certain obligations on issuers in order to make regulated markets more attractive to SME issuers. To achieve this, obligations on the provision of interim management statements or quarterly reports have been revised. Such obligations also encourage short-term performance and discourage long-term investment.⁵³³

Since 2012, ESMA has defined European common enforcement priorities yearly in order to promote the consistent application of the EU securities and markets legislation and International Financial Reporting Standards, and especially the provisions of the Transparency Directive.

EU regulators are working with ESMA to develop a European Electronic Access Point at the EU level. This will be a web portal that provides easy and quick access to regulated information stored by all Officially Appointed Mechanisms.

Major shareholdings

A shareholder who is acquiring or selling shares must notify the issuer of such transactions as soon as the acquisition or disposal of shares bestows or removes voting rights that fall below, reach or exceed the thresholds of 5%, 10%, 15%, 20%, 25%, 30%, 50% and 75% of the total amount of voting rights issued. This notification must include the amount of voting rights held after acquisition/disposal, the day on which the transaction took place, the chain of controlled undertakings, or the name of the (directly invested) shareholder who has received the voting rights from the notifying party.

With a view to ensuring harmonisation in the regime for notification of major holdings of voting rights, member states are not allowed to adopt more stringent rules than those indicated in the Directive with regard to the calculation of the thresholds, the exemptions from the notification, and the aggregation of holdings of voting rights related to shares with those related to financial instruments. However, member states have the right to set lower and additional thresholds for notification. Moreover, they can apply laws and regulations related to takeover bids, merger transactions, and other transactions affecting the ownership or control of companies supervised by the authorities appointed by member states.⁵³⁴

Alternative Performance Measures

In 2015, ESMA published the Final Guidelines on Alternative Performance Measures for listed issuers. The guidelines set out the principles that issuers should follow when presenting Alternative Performance Measures in documents that qualify as regulated information. Their aim is to encourage European issuers to publish transparent, unbiased, and comparable information on their financial performance in order to give users a more comprehensive understanding of their performance.

A3.3.3 Prospectus Regulation

The EU prospectus regime harmonises requirements for the drafting, approval and distribution of the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market in an EU member state.

⁵³² Directive 2013/50/EU of the European Parliament and of the Council of 22 October 2013, p. 1, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32013L0050>.

⁵³³ Ibid., p. 1.

⁵³⁴ Directive 2013/50/EU of the European Parliament and of the Council of 22 October 2013, p. 3, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32013L0050>.

Applying to both equity and non-equity securities, the regime is designed to reinforce investor protection and market efficiency, while enhancing the internal market for capital. It ensures that all prospectuses, wherever issued in the EU, provide clear and comprehensive information while making it easier for companies, especially SMEs, to raise capital throughout the EU.

The process of harmonisation will allow the creation of a cross-border passport mechanism that facilitates the development and effective functioning of the internal market. The use of different approaches could result in a fragmentation whereby prospectuses approved in one member state could be prevented from being used in the others.

The Regulation does not prevent member states, CALs or exchanges from imposing other particular requirements related to the admission of trading securities to regulated markets. However, such additional requirements should not restrict the drawing up, the content and the dissemination of prospectuses approved by an NCA.⁵³⁵

The Regulation is not applied to offers of securities to the public with a total consideration in the EU of less than €1m, since the costs of producing the prospectus would be disproportionate. To cater for the different sizes of the financial markets across the EU, member states are allowed to set a national threshold between €1m and €8m.

From 21 July 2019, the new Prospectus Regulation (Regulation (EU) 2017/1129) essentially repealed and replaced the Prospectus Directive (EU Directive 2003/71/EC) and, as an EU regulation, is directly effective across all EU member states without any requirement for transposition into national law.

A valid prospectus provides sufficient information to investors to make sure they are in the position to make informed investment decisions. The areas covered by the prospectus and the most relevant changes introduced by the Regulation are summarised as follows.

- **Prospectus summary**—new content requirements and length restrictions will make the summary section more concise and accessible. The summary section should contain the key information that investors need in order to decide the options that they want to consider further by analysing the whole prospectus. Key information should therefore include the essential characteristics of the issuer and the securities, the general terms and conditions of the offer, and a limited selection of risk factors considered to be the most relevant. The summary comprises four sections: introduction, key information on the issuer, key information on the securities, and key information on the offer.⁵³⁶
- **Risk factors**—the issuer should assess the risk factors specific to the company or securities, and their materiality. Risk factors should be adequately described in the prospectus, and divided into categories depending on their nature. The new Prospectus Regulation is unequivocal in terms of seeking to influence a change of course when it comes to preparing risk factor disclosure, and focuses on the importance of the quality and clarity of the disclosure. On 29 March 2019, ESMA also published some final guidelines on risk factors that NCAs should incorporate as part of their review practices when scrutinising and approving a prospectus.
- **Simplified prospectus**—a new, reduced disclosure regime applies to secondary issues, such as rights issues. The simplified prospectus should contain a summary similar to that required for the ordinary prospectus, a specific registration document, and a specific securities note containing reduced disclosure requirements.⁵³⁷

⁵³⁵ Regulation (EU) 2017/1129 of the European Parliament and of the Council of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, p. 2, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32017R1129>.

⁵³⁶ Ibid., p. 22.

⁵³⁷ Ibid., p. 32.

- **Growth Prospectus**—certain issuers, mainly SMEs, can make public offers using an EU Growth Prospectus, with lighter disclosure requirements and a standardised format that is easier for issuers to complete.

A3.3.4 Market Abuse Regulation

Regulation No 596/2014 on market abuse (MAR), repealing the Market Abuse Directive 2003/6/EC, came into effect on 3 July 2016. It updated and strengthened the framework of the Market Abuse Directive by extending its scope to new markets and trading strategies, and by introducing new requirements.

Unlike the Market Abuse Directive, the MAR is applied not only to financial instruments admitted to trading on regulated markets, but also to those traded on MTFs and organised trading facilities.⁵³⁸ Its objective is to create a level playing field for all economic operators in the member states as part of the effort to combat market abuse, by:

- reinforcing market integrity;
- contributing to the harmonisation of the rules for market abuse throughout Europe;
- establishing a strong commitment to transparency and equal treatment of market participants;
- requiring closer co-operation and a higher degree of exchange of information between national authorities, thus ensuring the same framework for enforcement throughout the EU and reducing potential inconsistencies, confusion and loopholes.

The concept of market abuse within the framework of the Regulation is intended to include:

- **insider dealing**—where a legal or natural person in possession of inside information takes unfair advantage of that information by entering into market transactions or by amending or cancelling an existing order, to the detriment of third parties who are unaware of such information;⁵³⁹
- **unlawful disclosure of inside information**—where a person has inside information and discloses that information to any other person, except where the disclosure is legitimate;⁵⁴⁰
- **market manipulation** and attempted manipulation, which include, but are not restricted to:
 - entering into a transaction that gives false or misleading signals related to the supply, demand or price of financial instruments;
 - disseminating information that gives false or misleading signals related to the supply, demand or price of financial instruments.⁵⁴¹

Some exemptions from the application of the MAR are set out in the Regulation. These include:

⁵³⁸ Regulation (EU) 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse, p. 2, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R0596>.

⁵³⁹ Regulation (EU) 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse, p. 25.

⁵⁴⁰ *Ibid.*, p. 27.

⁵⁴¹ *Ibid.*, pp. 30 and 31.

- **buy-back programmes and stabilisation**, under the conditions indicated in the Regulation;⁵⁴²
- **monetary and public debt management activities and climate policy activities**—member states, members of the European System of Central Banks, ministries and other agencies and special-purpose vehicles of one or several member states, and the EU, are not restricted in carrying out monetary, exchange-rate or other public debt management policy as they are undertaken in the public interest and solely in pursuit of those interests.⁵⁴³

The MAR also sets disclosure requirements.

- **Public disclosure of inside information**—an issuer must report as soon as possible if they are in possession of inside information that directly or indirectly concerns that issuer. At the same time, an issuer may delay disclosure to the public of inside information when the immediate disclosure is likely to prejudice the legitimate interests of the issuer and the delay is not likely to mislead the public.⁵⁴⁴
- **Insider lists**—issuers should draw up a list of all persons who have access to inside information and who are working for them under a contract of employment.⁵⁴⁵
- **Managers' transactions**—people with managerial responsibilities must notify the issuer and the competent authority of every transaction conducted on their own account relating to the shares or debt instruments of that issuer.⁵⁴⁶
- **Investment recommendations and statistics**—people who produce or disseminate investment recommendations or other information recommending or suggesting an investment strategy must take reasonable care to ensure that such information is objectively presented, and to disclose their interests or indicate conflicts of interest concerning the financial instruments to which that information relates.⁵⁴⁷

A3.3.5 Shareholder Rights Directive

The Shareholder Rights Directive II (2017/828) sets out the rules that strengthen the position of shareholders and ensure that decisions are made for the long-term stability of a company. The Directive establishes requirements in relation to enabling issuer company identification of its shareholders and the exercise of certain shareholder rights attached to voting shares in general meetings of companies. It also establishes specific requirements to encourage shareholder engagement, in particular for the long term. The requirements apply in relation to the following.

- **Identification of shareholders**—one of the objectives of the Directive is to facilitate the process through which companies identify their shareholders, retained as a necessary condition to exercise shareholder rights and to promote shareholder engagement. To achieve this objective, a certain level of information on shareholders' needs to be transmitted to the company. This information includes at least the name and contact details of the shareholder and additional details in case the shareholder is a legal person. Member states have the right to exclude from the identification requirement shareholders holding only a small number of shares.⁵⁴⁸

⁵⁴² Ibid., p. 22.

⁵⁴³ Ibid., p. 23.

⁵⁴⁴ Regulation (EU) 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse, p. 34.

⁵⁴⁵ Ibid., p. 36.

⁵⁴⁶ Ibid., p. 38.

⁵⁴⁷ Ibid., p. 41.

⁵⁴⁸ Directive (EU) 2017/828 of the European Parliament and of the Council, p. 2, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017L0828>.

- **Transmission of information**—the Directive aims at improving the transmission of information along the chain of intermediaries, with a view of facilitating the exercise of shareholder rights.
- **Facilitation of the exercise of shareholders rights**—particular attention is given to intermediaries who, in light of their important role, are obliged to facilitate the exercise of rights by shareholders. Measures include those ensuring that shareholders know that their votes have been correctly taken into account. The Directive requires the confirmation of receipt of votes, in the case of electronic voting, and the possibility for shareholders to verify after the general meeting whether their vote has been recorded.⁵⁴⁹
- **Transparency of costs**—the Directive establishes a high degree of transparency with regard to charges for the services provided by the intermediaries, in order to promote equity investment and ensure the exercise of shareholders rights. The Directive also sets a prohibition of discrimination between the charges levied for the exercise of the shareholders' rights domestically and on a cross-border basis. Differences between the charges may constitute an obstacle to the efficient functioning of the internal market. Exemption from these rules is allowed when the difference in the charges is justified by an actual variation in the costs that the intermediaries incur in delivering the services.⁵⁵⁰
- **Public disclosure of information by institutional investors, asset managers, life insurers and proxy advisers**—the increased level of transparency required from institutional investors and asset managers, and the public disclosure information related to them, is expected to have a positive impact on investor awareness and to facilitate dialogue between companies and their shareholders. Institutional investors and asset managers are given the option to choose whether to develop and publicly disclose a policy on shareholder engagement or to explain why they have not done so. The policy should describe how shareholder engagement is integrated into the investment strategy. When institutional investors make use of asset managers, those managers are required to disclose to the investors how the investment strategy contributes to the medium- and long-term performance of their assets.⁵⁵¹
- **Remuneration of directors and related-party transactions**—with a view to ensuring that shareholders have an effective say on remuneration policy, they should be granted the right to hold a binding or advisory role in relation to that policy and be clearly informed of the policy that guides remuneration in the company. The Directive indicates the principles that should guide companies' remuneration policies, such as contribution to the long-term business strategy, and financial and non-financial criteria to evaluate directors' performance. The remuneration should be publicly disclosed. However, when exceptional circumstances apply, member states may allow companies a derogation to these rules.⁵⁵² Related-party transactions must be made public and be subject to approval by another corporate body of the company (either the shareholders or the Board of directors).

A3.4 Corporate governance requirements

As discussed in section 3.2.3, most member states have their own national corporate governance codes. To list on most of the main (top-tier) market segments, firms are required to comply with these additional requirements. Further detail on the specific corporate governance requirements across a range of member states is given in Table A3.3.

⁵⁴⁹ Ibid., p. 2.

⁵⁵⁰ Ibid., p. 3.

⁵⁵¹ Ibid., p. 16.

⁵⁵² Ibid., p. 19.

Table A3.3 Corporate governance requirements

Exchange	Corporate governance requirements
Borsa Italiana	<p>A firm listed on STAR must:</p> <ul style="list-style-type: none"> • disclose information on its website in both English and Italian; • involve an investor relator; • have independent directors on the Board of directors; • have internal committees on the Board of directors; • have a remuneration policy for the top management. <p>Firms listed on the Standard segment have less strict requirements.</p>
Euronext Amsterdam	<p>The Dutch Corporate Governance Code applies to Dutch N.V. companies with an official listing in the Netherlands or abroad.</p> <p>Listed companies must comply or otherwise explain any deviations in the annual report and to shareholders.</p> <p>Listed companies with a supervisory Board of more than four members must establish an audit committee.</p> <p>There are no Dutch residency requirements for directors or officers.</p> <p>There are no requirements for a listed foreign company to maintain a presence in the Netherlands.</p> <p>There is no requirement for any corporate records to be kept in the Netherlands.</p> <p>A listed company has disclosure and reporting obligations to both the AFM and to Euronext Amsterdam.</p> <p>All post-listing reporting obligations can be in English.</p>
Euronext Brussels	<p>The Euronext rule book and the local rules for Euronext Brussels do not contain specific corporate governance provisions.</p> <p>Separate corporate governance rules are set out in the Belgian Company Code and the Belgian Code on Corporate Governance for listed corporations and apply to Belgian companies only.</p> <p>There are no residency requirements for directors or officers.</p> <p>A company listed on Euronext Brussels must comply with the Belgian requirements implementing the European Transparency Directive.</p> <p>Additional disclosure and reporting obligations apply in relation to Euronext.</p> <p>The rules and guidelines specific to Belgian companies regard:</p> <ul style="list-style-type: none"> • the composition of the Board of directors, including in terms of gender diversity and independent directors; • the appointment of an audit committee, nomination committee and remuneration committee within the Board of directors; • the remuneration of directors and officers.
Euronext Paris	<p>The Euronext Rule Book and the local rule book for Euronext Paris do not contain specific corporate governance provisions.</p> <p>Corporate governance rules are set out in the French Commercial Code and the Association Française des Entreprises Privées–Mouvement des Entreprises de France (AFEP-MEDEF) code on corporate governance of listed corporations; these rules apply to French companies only.</p> <p>There are no French residency requirements for directors or officers.</p> <p>There are no requirements for a listed foreign company to maintain a presence in France.</p> <p>There is no requirement for any corporate records to be kept in France. However, a foreign company listed on Euronext Paris must appoint a paying agent that is a member of Euroclear France.</p> <p>A listed company has disclosure and reporting obligations both to the Autorité des marchés financiers and to Euronext Paris.</p> <p>All post-listing reporting obligations can be in English.</p>
Frankfurt Stock Exchange	<p>There are no corporate governance requirements for a foreign company in order to list on the Frankfurt Stock Exchange. However, if the foreign enterprise is listed via a special listing vehicle in the form of a German AG or SE, the German Corporate Governance Code applies.</p> <p>Compliance with the recommendations of the Code is voluntary, but firms must give a declaration of adherence in which they must disclose which recommendations of the Code have not been observed and explain why.</p>

Exchange	Corporate governance requirements
	<p>As it would be complex for a foreign company to follow the Code, it is preferable if the company follows instead any corporate governance code or best practice established in its home jurisdiction.</p> <p>A company listed on the General Standard or Prime Standard or included in the Entry Standard must observe transparency obligations.</p> <p>No transparency obligations apply to an issuer included in the Quotation Board as a secondary trading venue.</p>
Irish Stock Exchange	<p>A company with a primary listing of shares must comply with the UK Corporate Governance Code and the Irish Corporate Governance Annex, or explain and justify why it has not done so.</p> <p>A foreign company with a primary listing must state in its annual report whether it has complied with the corporate governance requirement of its country of incorporation, and the significant ways those corporate governance practices differ from those set out in the UK Corporate Governance Code and/or the Irish Corporate Governance Annex.</p> <p>The UK Corporate Governance Code consists of principles of good governance, dealing with leadership, effectiveness, accountability, remuneration, and relations with shareholders.</p>
London Stock Exchange (AIM)	<p>Companies listed on AIM are not formally required to adhere to any corporate governance regime, but must state in their Admission Documents and on their websites whether they comply with their country of incorporation's corporate governance regime.</p> <p>However, the Quoted Companies Alliance publishes a set of voluntary Corporate Governance Guidelines for Small and Mid-Size Quoted Companies (including AIM companies). These guidelines include recommendations on the internal governing structure of a company and the reporting and disclosure of corporate governance-related matters.</p> <p>These recommendations are drawn from the UK Corporate Governance Code which consists of principles of good governance, dealing with leadership, effectiveness, accountability, remuneration, and relations with shareholders.</p>
London Stock Exchange (main market)	<p>A company with a premium listing of shares must comply with the UK Corporate Governance Code or explain and justify why it has not done so.</p> <p>The UK Corporate Governance Code also includes provisions relating to Board and committee structure and the independence of directors.</p> <p>A company with a standard listing of shares must include a corporate governance statement in its directors' report detailing its compliance with any applicable corporate governance code, explaining any non-compliance, describing the company's internal corporate governance structures.</p> <p>The company may choose to include that statement as a specific section of the directors' report, as a separate report or disclosed on the issuer's website to which reference is made in the directors' report, provided that all relevant content requirements are satisfied.</p> <p>The UK Corporate Governance Code consists of principles of good governance, dealing with leadership, effectiveness, accountability, remuneration, and relations with shareholders.</p>
Luxembourg Stock Exchange	<p>Foreign issuers have no obligation to comply with Luxembourg corporate governance rules, but must comply with their home jurisdiction corporate governance obligations.</p> <p>Luxembourg issuers of shares listed on the regulated market are subject to the Ten Principles of Corporate Governance of the LxSE.</p> <p>Luxembourg issuers of securities listed on the regulated market have, among others, the obligation to establish an audit committee, unless they qualify as an SME, undertaking for collective investment, issuer of asset-backed securities, or a subsidiary of an entity that has established an audit committee.</p> <p>Luxembourg issuers of securities listed on the Euro MTF (Luxembourg or foreign) are not subject to Luxembourg corporate governance obligations.</p>
Nasdaq Sweden	<p>Swedish issuers must comply with the Swedish Corporate Governance Code or explain any deviations from this.</p> <p>Foreign companies must comply with the Swedish code or the code of their national jurisdiction.</p> <p>Nasdaq Stockholm also has a Rule Book for Issuers.</p> <p>The Swedish Code provides specific requirements on shareholder meetings; nominating companies and their composition; the Board of directors and its</p>

Exchange	Corporate governance requirements
	<p>composition; audit committees, remuneration committees; and executive compensation.</p> <p>Corporate governance disclosure requirements.</p>
Prague Stock Exchange	<p>There are no corporate governance requirements that a company must meet in order to qualify to list its securities on the Prague Stock Exchange. The only relevant obligation is that the issuer applying to list its shares on the Prime or Standard Market must submit any codes of corporate control and management that are mandatory or voluntarily compiled with the issuer.</p> <p>However, a foreign issuer's legal status must comply with the legal framework of the country where the issuer has its registered office.</p> <p>Companies listed on the Prime or Standard Market are subject to a number of continuing reporting obligations, including the obligation to publish notices of general meetings and certain related information, dividend distributions, or the issuance of new shares.</p> <p>After being listed on the Prague Stock Exchange, the company's securities become subject to the prohibitions on insider dealing and market manipulation. These apply to both the Prime and Standard Markets.</p> <p>Any market manipulation—meaning conduct by a person that might distort capital market participants' view on the value of, supply of or demand for a financial instrument, or that might otherwise distort the price of a financial instrument—is also expressly prohibited under Czech law.</p>
Spanish Stock Exchange	<p>A listed company in Spain must comply with the Corporate Governance Code or explain why it has not done so.</p> <p>Additionally, listed companies must issue annually a corporate governance report, which must be submitted to the Comisión Nacional del Mercado de Valores (CNMV).</p> <p>The Code consists of principles of good governance, dealing with by-laws and general meetings; the Board of directors. the members of the Board of directors; and committees.</p>
Vienna Stock Exchange	<p>The Austrian Code of Corporate Governance primarily addresses Austrian listed companies including listed European companies registered in Austria.</p> <p>All Austrian companies listed on the Official Market, the Second Regulated Market or the Third Market/MTF are called upon to make a public declaration of their commitment to the Austrian Code of Corporate Governance.</p> <p>All companies listed in the Prime Segment must publish a corporate governance report, including a declaration on any deviations from the Austrian Code of Corporate Governance.</p> <p>Companies listed on the Vienna Stock Exchange that are subject to the company law of another EU or EEA member state are called upon to commit themselves to adhere to a corporate governance code recognised in this economic area, and to publish this commitment on their website, including a reference to the code complied with.</p> <p>Companies that are subject to the company law of a non-EU or non-EEA country and are listed on the Vienna Stock Exchange are called on to commit themselves to comply with the ACCG. In this case, non-mandatory L-rules of the Austrian Code of Corporate Governance are interpreted as C-rules.</p> <p>Categories of rules defined in the Austrian Code of Corporate Governance include:</p> <ul style="list-style-type: none"> • L-rules—referring to mandatory legal requirements; • C-rules—referring to non-mandatory rules but any deviation must be explained and reasoned; • R-rules—referring to non-binding recommendations.
Warsaw Stock Exchange	<p>Corporate governance rules are on a 'comply or explain' basis.</p> <p>A listed company has disclosure and reporting obligations to the WSE, the Polish Financial Supervision Authority and the public.</p> <p>There are no Polish residency requirements for directors or officers.</p> <p>Requirements for public companies include:</p> <ul style="list-style-type: none"> • pursuing a transparent and effective disclosure policy—for example, through operation of the company website; • maintaining efficient internal control, risk management and compliance systems, and an audit committee with an independent director; • at least two members of the supervisory board must be independent; • transparent procedures for preventing conflicts of interest and related-party transactions—for example, approval of the supervisory board for the execution of transactions with a related entity. <p>Remuneration and policy applicable to directors and key managers.</p>

Source: Oxera, based on analysis of member state corporate governance requirements.

A4 SME growth markets: current trends and barriers to future development

In section 5 we discussed the economics of small cap listings and presented policy ideas to boost SME listings. In this appendix further detail is provided on recent developments in market segments focused on SME listings, together with more detailed discussion of some of the barriers to the development of SME growth markets. Mapping recent trends (particularly the experience of more successful member states) and identifying barriers to further developments in SME-focused market segments has informed the policies presented in section 14.

The appendix is structured as follows:

- section A4.1 gives a brief overview of the regulatory landscape for listing on SME growth markets;
- section A4.2 describes developments in SME-focused market segments, including registrations of SME growth markets and fundraising on SME-focused market segments;
- section A4.3 discusses barriers to the further development of SME growth markets.

A4.1 What is an SME growth market?

One of the biggest challenges for SMEs seeking to list is the regulatory burden associated with being a public company. Policymakers have recognised that the level of regulation applied to the main market is often not appropriate for small start-up companies.

A 'SME growth market' is a new category of MTFs introduced by MIFID II.

The creation of equity markets focused on SMEs is not a new phenomenon in Europe. Specialised markets for SMEs have existed for some time. According to some sources, junior markets already existed in Europe in the late 1970s (i.e. the Mercato Ristretto in Italy and Compartiment Spécial in France). These markets had lighter listing requirements, consistent with the aim of screening potential issuers with a view to their future listing on the main market.⁵⁵³ The UK AIM was founded in 1995.

These markets originally operated as a separate Board within an exchange or as an entirely separate market. However, as noted by the World Bank,⁵⁵⁴ merely creating a new Board within the exchange does not ensure a vibrant exchange for SMEs. Policymakers therefore called for stakeholders to work together to develop an infrastructure suited to the needs of SMEs, through targeted policies.

The SME growth market concept was introduced to help alleviate the administrative burden on small issuers of equity instruments and to make the listing of companies on SME growth markets more attractive. The first step to this policy approach was to set out a definition in the legislation, which was done with MiFID II. Box A4.1 below describes the main criteria for registering as an SME growth market. These rules entered into force in January 2018.

⁵⁵³ Posner, E. (2005), 'Stock exchange competition and the Nasdaq bargain in Europe', in C. Parsons and N. Jabko (eds.), *With US or against US? European trends in American perspective*, Oxford University Press.

⁵⁵⁴ Yoo, J. (2007), 'Financing innovation: How to Build an Efficient Exchange for Small Firms', The World Bank Group, viewpoint.

Box A4.1 SME growth market: key criteria for registration

- MiFID II introduced the SME growth market as a new sub-category of MTF.
- One of the conditions to qualify as an SME growth market is that at least 50% of the issuers whose financial instruments are admitted to trading on the MTF are SMEs at the time when the MTF is registered as an SME growth market. SMEs are defined as firms with an average market capitalisation of less than €200m according to end-year quotes for the previous three calendar years.
- The other criteria relate to the appropriateness of the initial and ongoing listing and reporting requirements, and the systems and controls to prevent and detect market abuse.
- Where an issuer is admitted to trading on one SME growth market, the shares may also be traded on another SME growth market only where the issuer has been informed and has not objected to it. In this case, the issuer is not required to meet any corporate governance or disclosure requirements of the second SME growth market.
- Registration as an SME growth market is voluntary. Operators of markets aimed at SME issuers can choose to run the market in accordance with the requirements of MiFID II without seeking registration as an SME growth market. An issuer that is an SME is not required to apply to have its shares admitted to trading on an SME growth market.

Source: MiFID II Article 33.

The second step was to use this definition in specific legislation to incentivise small issuers to list and to attract more investment into publicly listed SMEs.

The SME growth market concept has been used to alleviate the regulatory burden on SMEs through amendments to the MAR and the Prospectus Regulation.⁵⁵⁵ For example, issuers obtain regulatory relief in terms of an exemption from the requirement to produce insider lists on an ongoing basis; and the option of posting inside information on the SME growth market trading venue instead of the issuer's own website.

In addition, issuers with a market capitalisation below €500m can use the EU Growth Prospectus format for IPOs of companies seeking admission to trading on SME growth markets.⁵⁵⁶

As we see in the next section, the uptake of SME growth markets was initially quite slow, but has since increased. The general view from the market is that the EU has so far been very cautious in considering the relaxation of existing rules for SME growth markets.⁵⁵⁷

⁵⁵⁵ Regulation (EU) 2019/2115 of 27 November 2019 amending Directive 2014/65/EU and Regulations (EU) No 596/2014 and (EU) 2017/1129 as regards the promotion of the use of SME growth markets, OJ L 320, 11/12/2019, p. 1, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.320.01.0001.01.ENG&toc=OJ:L:2019:320:TOC.

⁵⁵⁶ No prospectus is required in the case of admission to trade on an MTF, and hence on an SME growth market, when, as is common practice, the issuer does not also engage in a public offering of its shares.

⁵⁵⁷ Enriques, L. (2018), 'What should qualify as a "SME growth market"?' , Blog Post, University of Oxford, Faculty of Law, 26 January, <https://www.law.ox.ac.uk/business-law-blog/blog/2018/01/what-should-qualify-sme-growth-market>, accessed 26 September 2019.

A4.2 Market developments

This section gives a brief overview of the recent market developments in market segments focused on SME listings.

A4.2.1 Registrations of SME growth markets

The concept of an SME growth market began in January 2018 with only two registrations: AIM and AIM Italia (LSEG's two growth markets). Now, 16 trading venues are registered as SME growth markets, as shown in Table A4.1

Table A4.1 SME growth markets registered with ESMA

	Country	Date of registration	Number of listed companies	Market capitalisation (€bn)
AIM Italia	Italy	3/1/2018	108	6.3
LSE AIM	UK	3/1/2018	752	93.4
Bulgaria SE BEAM	Bulgaria	20/12/2018	0	0
Progress	Croatia	28/01/2019	4	0.1
Nasdaq First North Denmark	Denmark	16/6/2019	20	0.8
Nasdaq First North Sweden	Sweden	26/6/2019	275	19.9
Nasdaq First North Finland	Finland	8/7/2019	26	2.2
Euronext Growth Brussels	Belgium	15/10/2019	7	0.4
Euronext Growth Paris	France	9/10/2019	198	10.7
Euronext Growth Lisbon	Portugal	11/10/2019	1	0.04
Euronext Growth Dublin	Ireland	11/10/2019	22	4.8
NewConnect	Poland	26/07/2019	349	2.3
Deutsche Börse Scale	Germany	16/12/2019	49	7.1
NGM	Denmark, Finland, Sweden	26/06/2019	80	1.9
Budapest SE Xtend	Hungary	01/06/2019	4	0.03
NEX Growth Market	UK	14/05/2018	n/a	n/a
Total			1,895	149.97

Note: Euronext and Deutsche Börse data correct as at November 2019. AIM Italia data correct as at June 2019. LSE AIM data correct as at September 2019. Nasdaq Nordic, NGM, Budapest Stock Exchange and Warsaw Stock Exchange data correct as at December 2019. Listed company and market capitalisation data for NEX Growth Market not available. All figures converted into euros using the 2019 average ECB reference exchange rate with the relevant currency.

Source: Oxera analysis of stock exchange data (number of listed companies and market capitalisation); ESMA (date of registration).

Table A4.2 summarises some of the other MTFs in Europe that focus on attracting the listing of smaller issuers but have not so far chosen to register as SME growth markets (recall that registration is voluntary).

Table A4.2 Other SME-focused MTFs in Europe

	Country	Number of listed companies	Market capitalisation (€bn)
Dritter Markt	Austria	33	1.2
Start Market Prague	Czech Republic	6	0.1
Euronext Access	Paris, Brussels, Lisbon	153	8.6
EN.A	Greece	9	0.1
AeRO	Romania	298	1.9
Bratislava MTF	Slovakia	16	0.6
SI Enter	Slovenia	0	0
MAB Growth Companies	Spain	41	2.0
Spotlight	Sweden	170	n/a
Euro MTF	Luxembourg	113	1.7
Emerging Companies Market	Cyprus	45	1.9
Prospects Market	Malta	2	0.01
Total		886	18.11

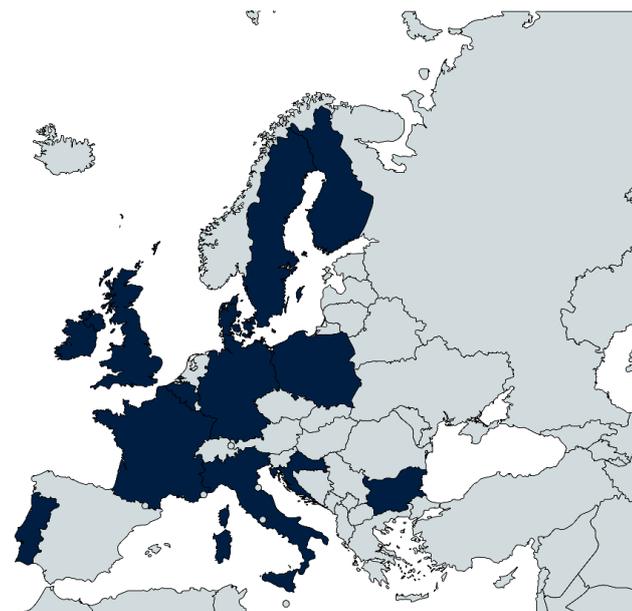
Note: All market capitalisation data correct as at December 2019. Market capitalisation for Spotlight Stock Market not available.

Source: Oxera, based on data provided directly by stock exchanges, FESE and stock exchange factbooks.

Based on the data in these tables, the following can be observed.

- The largest SME-focused markets in the EU have all registered as SME growth markets. This means that, in terms of market capitalisation, the SME growth market designation covers approximately 90% of the value of SME-focused markets in the EU.
- In the UK and Nordic countries, where there are multiple SME-focused markets, not every market operator has chosen to register as an SME growth market.
- SME growth market registrations have generally been concentrated in the larger financial centres (see Figure A4.1 below). Relatively few SME-focused markets in Central and Eastern European member states have registered.

Figure A4.1 SME growth markets



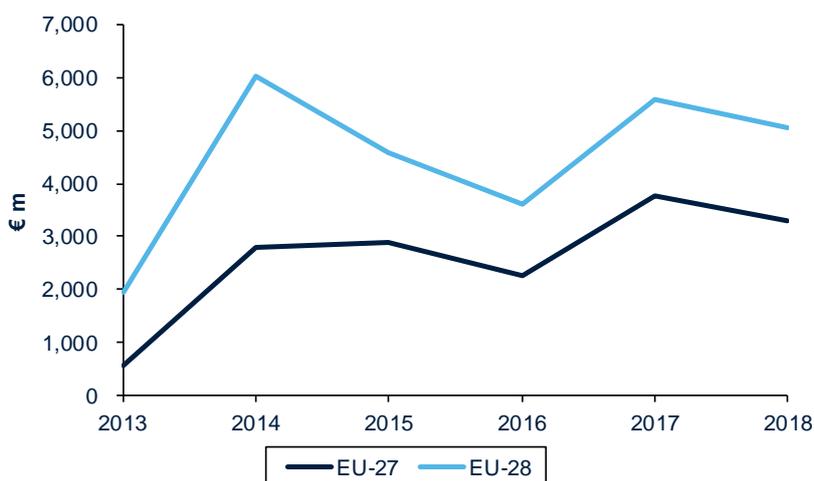
Note: Darker shaded countries are those with an SME growth market. Slovenia has not been highlighted because the Progress Market is based in Zagreb in Croatia, despite offering listing to Slovenian companies.

Source: Oxera, based on ESMA database.

A4.2.2 Trends in fundraising and number of listed companies on SME growth markets

Figure A4.2 shows the amount of funds raised on SME growth markets and SME-focused junior markets.

Figure A4.2 Funds raised on EU junior markets, 2013–18



Note: Data covers the following markets: AIM, BME MAB, Prague START MTF, Euronext Growth, First North, Irish SE ESM, NewConnect, Deutsche Börse Scale, Euro MTF and Cyprus SE ESM.

Source: FESE IPO database; London Stock Exchange; Borsa Italiana.

Table A4.3 shows how the number of listed companies on SME-focused markets changed between 2010 and 2018.

Table A4.3 Change in the number of listed companies, 2010–18

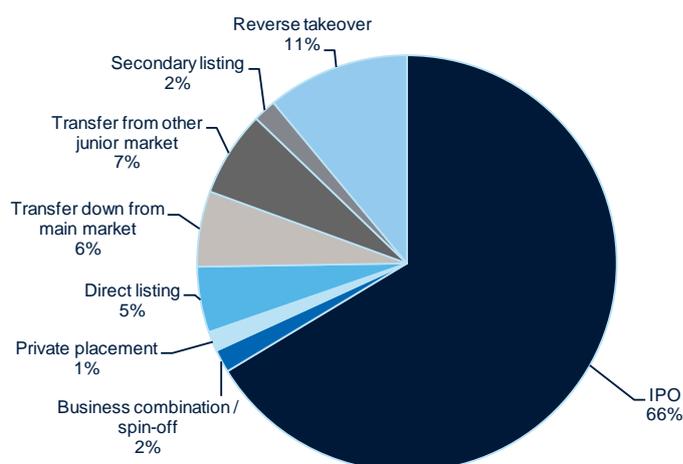
Market ¹	Member state	Number of listed companies	
		End 2010	End 2018
SME growth markets			
AIM Italia	Italy	11	99
LSE AIM	UK	943	786
Bulgaria SE BEAM	Bulgaria	n/a ²	0
Progress (CE Enter)	Croatia	32	4
Nasdaq First North Denmark	Denmark	14	17
Nasdaq First North Sweden	Sweden	92	265
Nasdaq First North Finland	Finland	3	26
Euronext Growth Brussels (Alternext)	Belgium	8	6
Euronext Growth Paris (Alternext)	France	125	189
Euronext Growth Dublin (ESM)	Ireland	23	24
Euronext Growth Lisbon	Portugal	0	1
DBAG Scale	Germany	132	51
NewConnect	Poland	169	349
NGM	Denmark, Finland, Sweden	11	80
Total		1,563	1,897
Other SME-focused markets			
Dritter Markt	Austria	5	3
Euronext Growth Amsterdam (Alternext)	Netherlands	2	0
Euronext Access Paris (Marché Libre)	France	174	146
Euronext Access Brussels (Marché Libre)	Belgium	15	7
Euronext Access Lisbon	Portugal	0	9
Start Market Prague	Czech Republic	0	5
EN.A	Greece	12	10
AeRO	Romania	n/a ²	n/a ²
Bratislava MTF	Slovakia	74	16
MAB Growth Companies	Spain	17	41
Spotlight (Aktietorget)	Sweden	124	170
Euro MTF	Luxembourg	215	117
Budapest SE Xtend	Hungary	n/a ²	26
Emerging Companies Market	Cyprus	6	34
Prospects Market	Malta	n/a ²	1
NEX Growth Market	UK	n/a ²	86
Total		644	671

Note: ¹ Where market names have changed due to a restructuring, data for the 2010-equivalent market is shown, with the previous name in brackets. ² Data not available.

Source: Oxera analysis of stock exchange data. Data for Budapest SE Xtend, Cyprus SE Emerging Companies Market, Deutsche Börse Scale, Euronext Dublin, and Malta SE Prospects Market taken from FESE Monthly Statistics for December 2010 and December 2018.

Figure A4.3 shows the types of new listing on the main SME growth markets between 2017 and 2019, based on stock exchange data.

Figure A4.3 Types of new listing on the largest SME growth markets, 2017–19



Note: Includes new listings on AIM Italia, Euronext Growth Brussels, Euronext Growth Paris, First North Stockholm and First North Denmark and LSE AIM. Total sample size of 392 listings (excluding four technical listings within the Oxera panel).

Source: Oxera analysis of stock exchange data.

The following can be observed:

- there has been a sharp reduction in the value of fundraising on junior markets since the 2008 financial crisis;
- the majority of public equity fundraising on junior markets is on the AIM UK market;
- First North and AIM Italia have seen higher levels of fundraising in recent years;
- the number of new listings has fallen from a pre-crisis peak of around 500 a year to around 250 a year;
- the majority of new listings in recent years have been IPOs, although a significant minority have been transfers from other markets (6% from main markets and 7% from other junior markets).⁵⁵⁸

Despite the reduction in listings seen in Table A4.3, the UK AIM market remains the largest market in Europe for SME listings. Several papers have discussed the success of AIM in the UK,⁵⁵⁹ with key reasons for this success including the following.

- Tax incentives—investments in AIM in the UK are exempt from inheritance tax if held for more than two years. Investors may also qualify for income and capital gains tax relief when the investments are held in certain tax structures (for example, through

⁵⁵⁸ The majority of transfers from other junior markets were driven by Nasdaq Stockholm attracting transfers from other Swedish listing venues, such as NGM and Spotlight Stock Market. The remaining transfers from other junior markets were from Euronext Access to Euronext Growth.

⁵⁵⁹ See, for example, Jenkinson, T. and Ramadorai, T. (2013), 'Does one size fit all? The consequences of switching markets with different regulatory standards', *European Financial Management*, **19**:5, pp. 852–886; and Doukas, J.A. and Hoque, H. (2016), 'Why firms favour the AIM when they can list on main market?', *Journal of International Money and Finance*, **60**, pp. 378–404.

Enterprise Investment Schemes, individual savings accounts, venture capital trusts).⁵⁶⁰ Most of these tax benefits are not available to investments on the main markets of the London Stock Exchange.

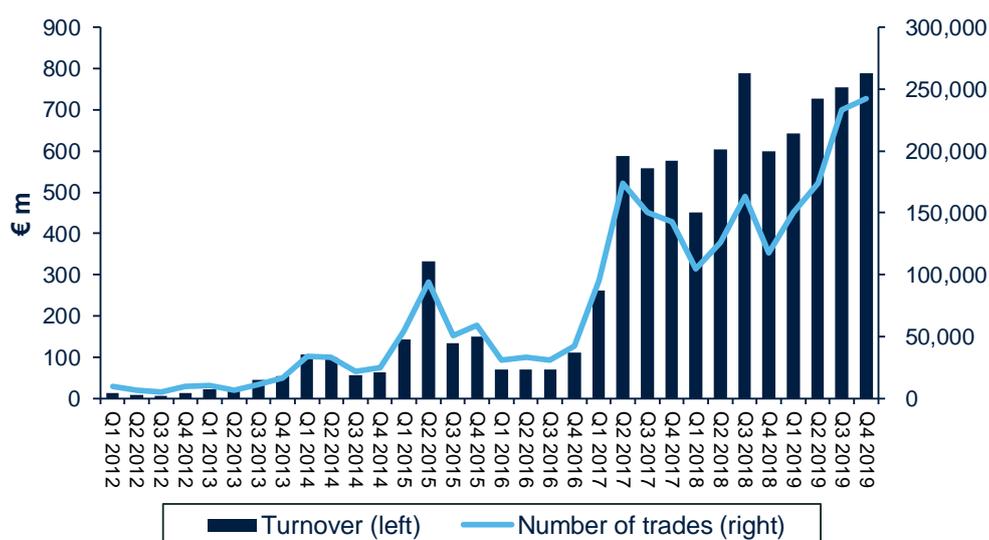
- Lighter listing requirements—the main difference between the London main market and AIM is that the former involves higher levels of ongoing corporate governance obligations regarding disclosure and transparency (see section A3.4 for more detail).
- Transfers from the main market—these switches can be positive for investors. Analysing the returns of companies that switch to AIM, Jenkinson and Ramadorai (2013) find a negative announcement effect followed by a prolonged and significant positive drift upwards in operating performance and share price.⁵⁶¹
- Cheaper fees—Doukas and Hoque (2015) identify that (younger) companies meeting the London main market listing requirements opted to make their IPO on AIM instead due to the lower admission fees.
- More flexibility with future equity financing—Doukas and Hoque (2015) analyse the corporate actions following IPOs on AIM and identify that firms listed on AIM were more likely to conduct follow-on issuances and pay out smaller dividends than their counterparts on the London main market.

AIM Italia has also seen some success, due in part to the ELITE programme and some favourable fiscal incentives from the Italian government.⁵⁶² Following the introduction of individual savings plans (Piano Individuale di Risparmio), introduced in the 2017 Budget Law, and the creation of funds focused on SMEs that followed, there was a sharp increase in liquidity on AIM Italia (see Figure A4.4 below). The Budget Law 2018 provided further support by approving tax credits, up to €500,000 in value until 31 December 2020, on 50% of advisory costs related to an SME IPO. According to feedback from market participants, the main barrier to further growth of AIM Italia is the level of investor interest in the SME asset class.

⁵⁶⁰ See London Stock Exchange (2015), 'A guide to AIM tax benefits', <https://www.londonstockexchange.com/companies-and-advisors/aim/publications/a-guide-to-aim-tax-benefits.pdf>.

⁵⁶¹ Jenkinson and Ramadorai (2013), *op. cit.*

⁵⁶² See, for example, a recent study that analyses the success of companies listed on AIM Italia: Politecnico di Milano (2019), 'AIM ITALIA 2009-2019: 10 anni di storie imprenditoriali', October, https://www.borsaitaliana.it/speciali/decennale-aim-italia/keystatistics/ricercapolitecnicoDIMILANO_pdf.htm.

Figure A4.4 Liquidity on AIM Italia, 2012–19

Source: Oxera analysis of Borsa Italiana data.

Nasdaq First North has also been seen as a success. The Nordic market is unique, in that a large amount of retail investors have a long tradition in trading growth companies, which contributes to a liquid market (see the case study on Sweden in Box 3.1 for more detail). Similar to the NOMAD regime of the AIM market, Nasdaq First North operates a mandatory certified adviser regime.

Some puzzling facts challenge the conventional understanding of the role of junior markets as a stepping stone in the funding escalator:

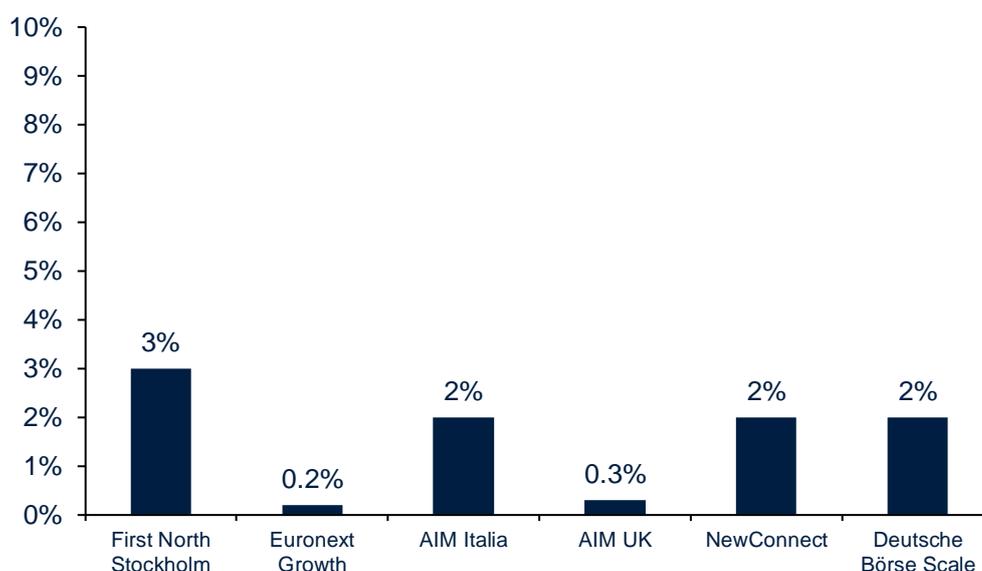
- some firms listed on the junior markets could have been listed on the main segment but deliberately chose to be listed on the junior segment for strategic reasons.⁵⁶³ A study of listings of several European junior markets (including Alternext in France, AIM Italia in Italy, and AIM in the UK) between 1995 and 2009 identified that 29% of firms would have been able to list on the main market (71.5% of the whole sample would not have failed to meet at least one listing requirement);⁵⁶⁴
- there are few transfers from the junior markets to the main market.⁵⁶⁵ Within our panel data, less than 2% of companies listed on the junior markets between 2010 and 2018 transferred to the main market of their respective stock exchange (see Figure A4.5 below).

⁵⁶³ See, for example, Doukas and Hoque (2015), *op. cit.*; and Jenkinson and Ramadorai (2013), *op. cit.*

⁵⁶⁴ See Vismara, S., Paleri, S. and Ritter, J.R. (2012), 'Europe's second markets for small companies', *European Financial Management*, **18**:3, 352–388. The three listing requirements studied in the paper are minimum free float, minimum market capitalisation, and age.

⁵⁶⁵ These trends are documented in Vismara, Paleri and Ritter (2012), *op. cit.*; Kashefi Pour, E. and Lasfer, M. (2013), 'Why do companies delist voluntarily from the stock market?', *Journal of Banking & Finance*, **37**:12, pp. 4850–4860; and Granier, C., Revest, V. and Sapio, A. (2019), 'SMEs and junior stock markets: A comparison between European and Japanese markets', *Journal of Innovation Economics & Management*, **29**, pp. 43–67.

Figure A4.5 Average proportion of companies transferring up each year, 2011–19



Note: Figures are calculated as a simple average of the number of transfers from the junior market to the main market in a given year divided by the number of listed companies on the junior market at the end of the previous year. Figures for Euronext Growth are based on transfers to Euronext Main Market. Sample period for NewConnect is 2011–18.

Source: Oxera analysis of stock exchange data.

The figure shows that:

- companies already listed on the main regulated market can opt to switch to MTF or SME growth markets. Notably, in our panel dataset, more companies were transferring down from the LSE and Euronext main markets to respective MTFs than companies transferring up. Previous academic studies emphasise lower regulatory burden as a key reason for these types of transfer;⁵⁶⁶
- there are a significant number of voluntary delistings from junior markets. Kashefi Pour and Lasfer (2013) estimate that 41% of delistings from AIM between 1995 and 2009 were voluntary, and 30% were required to delist for regulatory reasons.⁵⁶⁷ They also find that companies choosing to delist were usually unable to raise further equity, and had limited growth opportunities and low profitability.

Overall, the research suggests that companies going public on markets similar to MTFs or SME growth markets do not choose these as a default option, but instead select such markets as they favour the lighter regulatory environment of these markets, which are also best suited to their needs and business models.

However successful some of those junior markets may be (and among them some SME growth markets), barriers remain that hinder their development, as explored below.

⁵⁶⁶ Vismara, Paleri and Ritter (2012) observe, for example, that 32% of firms that transferred to AIM between 1996 and 2009 cited lower costs, while 20% cited flexibility as the reason for transferring. Similar findings are reported by Jenkinson and Ramadorai (2013), who also find an improvement in the returns of companies that had switched markets to a lighter regulatory environment.

⁵⁶⁷ In their dataset, firms gave four reasons for delisting: transfer to the main market, regulatory decision, takeover, and 'voluntary' delisting. This last category covers companies that chose to delist for any reason other than the three mentioned before. The takeover category comprises companies that bought another target and subsequently traded under the name of the target.

A4.3 Barriers to the development of SME growth markets

Despite the changes introduced in EU law in recent years to favour the development of SME-focused market segments, there have been issues that show the difficulties of balancing lighter regulatory requirements to attract SMEs while maintaining reassurance for investors.

While some markets appear to function reasonably well (e.g. AIM Italia, AIM UK and First North, as described in the previous section), other SME-focused markets have attracted fewer listings. For example, the number of listed companies on the Scale, a German SME growth market, has halved since 2010. One of the reasons for this may be the tighter listing requirements, which investors had pushed for (see Box A4.2).

Box A4.2 The issues of the Deutsche Börse 'Entry Standard' market

Deutsche Börse's Scale is a German SME growth market that replaced the Entry Standard segment on March 2017. Compared with the Entry Standard segment, Scale has tighter regulatory requirements, in terms of admission thresholds and requirements, and ongoing obligations. The introduction of those tighter requirements was a response to issues met by investors with Entry Standard issuers. As Scope Ratings pointed out in February 2017, more than 20% of issues in the German SME bond segments had defaulted up to that date.

Source: Scope Ratings, 'Scale replaces Entry Standard. Will this rehabilitate SME Bond Financing?', 20 February.

As described above, there have been some successful examples of SME-focused markets, but other similar markets have been less successful. Based on insights from stakeholder interviews and best-practice case studies, we identify the following main barriers to the wider development of SME growth markets.

- Issuer awareness—the European Economic and Social Committee has previously suggested that communication of the benefits associated with SME growth markets has not been sufficiently targeted at SMEs.⁵⁶⁸
- Issuer equity culture—micro, small and medium-sized companies seldom resort to market-based financing instruments, preferring private debt instruments, such as bank loans or leasing, when raising external finance.⁵⁶⁹
- Regulatory burden—a number of commentators have suggested that the Commission should go further in reducing the regulatory and administrative burdens in SME growth markets to promote a more attractive environment for SME listings.⁵⁷⁰
- Reluctant investors—partly driven by structural barriers, such as a lack of liquidity, research and the increased investment risk inherent to SMEs.⁵⁷¹ Some have also highlighted that there is limited commercial incentive to invest in SMEs.⁵⁷² As noted above, investors in AIM UK companies benefit from a range of tax reliefs. The recent

⁵⁶⁸ European Economic and Social Committee (2018), 'Opinion of the European Economic and Social Committee on the Proposal for a Regulation of the European Parliament and of the Council amending Regulations (EU) No 596/2014 and (EU) 2017/1129 as regards the promotion of the use of SME growth markets', 19 September, para. 4.3.

⁵⁶⁹ Thomadakis, A. (2017), 'Developing EU Capital Markets for SMEs: Mission impossible?', 4 September.

⁵⁷⁰ European Economic and Social Committee (2018), op. cit., paras 4.1 and 4.5–4.12.

⁵⁷¹ See London Stock Exchange Group (2018), 'LSEG response to the European Commission consultation on building a proportionate regulatory environment to support SME listing'.

⁵⁷² See, for example, European Economic and Social Committee (2018), op. cit.

growth of AIM Italia and Nasdaq First North Stockholm have also been linked to recent tax changes.⁵⁷³

- Definition of SME—some market operators have argued that the threshold definition for SMEs should be increased to attract a wider range of companies and increase liquidity.⁵⁷⁴ Some academics have suggested basing the SME growth market label on SME market capitalisation at the time of listing, regardless of how much the SMEs grow after listing.⁵⁷⁵
- Competition with private markets and alternative funding options.⁵⁷⁶

There have been various initiatives to reduce the barriers, as described below.

- The Commission has started to amend regulations to alleviate the regulatory burden borne by SMEs in particular, focusing on the MAR and the Prospectus Regulation.
- EBRD and other institutions have provided technical assistance to help design SME growth markets. For example, the EBRD, in collaboration with the Taipei Stock Exchange and other consultants, helped the Zagreb Stock Exchange create an SME growth market for Croatia and Slovenia in 2016–17. This resulted in the creation of the Progress Market, the SME trading platform of the Zagreb Stock Exchange, which is also open for Slovenian companies to trade on.⁵⁷⁷
- The LSEG launched its ELITE programme in 2012 in Italy, through Borsa Italiana. The programme is designed to help companies navigate the financing ecosystem, prepare them for growth, and to advise them on their possibilities and opportunities.⁵⁷⁸ Euronext has launched similar initiatives, with programmes such as IPOready, TechShare and FamilyShare aimed at raising awareness of equity financing for smaller companies and informing them about the opportunities presented by public markets.⁵⁷⁹ Deutsche Börse has established a Venture Network scheme focused on matching high-growth pre-IPO companies with investors.

⁵⁷³ The London Stock Exchange Group (2018) notes that of the €2.3bn capital raised since the creation of AIM Italia in 2008, €1.3bn was raised in 2017 alone, linking this to the introduction of a fiscally incentivised investment product that year.

⁵⁷⁴ Euronext (2018), 'Position Paper on the EU SME growth markets Consultation', April; London Stock Exchange Group (2018), 'LSEG response to the European Commission consultation on building a proportionate regulatory environment to support SME listing'.

⁵⁷⁵ Enriques, L. (2018), 'What should qualify as a "SME growth market"?', Blog Post, University of Oxford, Faculty of Law, 26 January, <https://www.law.ox.ac.uk/business-law-blog/blog/2018/01/what-should-qualify-sme-growth-marketn>, accessed 26 September 2019.

⁵⁷⁶ European Investment Fund (2019), 'European Small Business Finance Outlook, Working Paper 2019/57', p. 24.

⁵⁷⁷ European Bank for Reconstruction and Development (2017), 'EBRD in Croatia, Developing capital markets for sustainable economies', presentation by the EBRD, November.

⁵⁷⁸ London Stock Exchange Group (2018), 'LSEG response to the European Commission consultation on building a proportionate regulatory environment to support SME listing', p. 4.

⁵⁷⁹ See Euronext website, 'How to go public', <https://www.euronext.com/en/raise-capital/how-go-public>.

A5 Identification of unlisted companies eligible to list

In section 7 we gave an overview of unlisted large companies that might be eligible to list and looked at why they may not have done so. This appendix presents our empirical analysis of large unlisted companies that might be eligible to undertake an IPO, and is structured as follows:

- section A5.1 and A5.2 set out our choice of database for the empirical analysis and search criteria used to identify large unlisted companies;
- section A5.3 presents our main empirical findings regarding the characteristics of large unlisted companies.

A5.1 Choice of database

To yield useful results, the analysis of unlisted companies needed to be conducted using a database with a substantial depth and breadth of company characteristics. Orbis was identified as the best database for this. Orbis collects corporate information on more than 310m companies around the world, from more than 160 sources.⁵⁸⁰ The data is from national registries and public authorities, and from companies themselves (when they publish data) as a consequence of reporting requirements. Orbis also allows the user to input multiple filters and search criteria, which was important in devising a search strategy to identify potential unlisted companies.⁵⁸¹

There are some limitations to Orbis: some data entries are incomplete submissions and data availability is sometimes limited for firms in jurisdictions where the national reporting requirements are less stringent, or for firms whose size or legal form enables them to submit less documentation. Despite this, Orbis appears to be the best database for the task at hand.

A5.2 Search criteria

To identify companies eligible to apply to be listed, a pan-European search was undertaken.⁵⁸² The first step was to define and identify 'large' companies. Taking the Commission's definition of SMEs (see Table A5.1 below),⁵⁸³ all SMEs were filtered out, leaving only 'large' companies in the database. More precisely, a large company was defined as having:⁵⁸⁴

- either a staff headcount above 250 employees; *or*
- a turnover above €50m *and* a balance sheet total above €43m.

⁵⁸⁰ Orbis website, <https://www.bvdinfo.com/en-gb/our-products/data/international/orbis>, accessed 26 November 2019.

⁵⁸¹ For example, the user can specify in their search criteria that they are looking for companies above a user-defined threshold for a certain financial metric over a certain number of years. They can also specify the industry sector, whether the company is active or not, listed or not, etc. Boolean operators (simple words used as conjunctions to combine or exclude keywords in a search) were used to make the search strategy flexible and adaptable.

⁵⁸² Data was downloaded on 17 September 2019.

⁵⁸³ European Commission (2003), 'Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises'.

⁵⁸⁴ While market capitalisation-based thresholds are commonly used for analysis of listed companies, unlisted companies do not have a market capitalisation.

Table A5.1 European Commission's definition of SMEs

Category	Staff headcount	<i>and either</i>	Turnover	<i>or</i>	Balance sheet total
Medium-sized	< 250		< €50m		< €43m
Small	< 50		< €10m		< €10m
Micro	< 10		< €2m		< €2m

Source: European Commission website, 'What is an SME?', https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en, accessed 16 September 2019.

The second stage filtered out companies that:

- were not relevant to the analysis—for example, listed companies, companies held by listed companies, and state-owned companies; or
- would not meet the typical listing rules—for example, companies not meeting financial thresholds; or
- were unlikely to be suitable for listing—for example, companies operating in the agriculture, public administration, health and education sectors.⁵⁸⁵

The full list of filters and criteria applied are outlined in Table A5.2.

Table A5.2 Filters in the Orbis search strategy

Category	Sub-category	Filter	Filter number
Status	n/a	Active companies	1
Location	World region/country/ region in country	14 countries	2
Industry	Type of entity	Corporate companies	3
	Industry classification	NACE Rev. 2 main sections, B–J and L–N (inclusive)	4
Stock data	Listed/unlisted company	Unlisted companies	5
Ownership data	Company owned by an ultimate owner	Companies owned by a listed ultimate owner ¹	6
		Companies owned by a state-related ultimate owner	7
Number of employees	n/a	Number of employees >250 in 2018	8
Financial data	Key financials	Turnover >€50m in 2018	9
		Total assets >€43m in 2018	10

Note: Using these filters, the search strategy was defined using the following Boolean formula: 1 AND 2 AND 3 AND 4 AND 5 AND NOT 6 AND NOT 7 AND (8 OR (9 AND 10)) . ¹ Ultimate owners were defined as having a >50% stake in the company (and therefore being able to take major and strategic decisions, such as listing, alone).

Source: Oxera analysis.

This search strategy yielded 17,512 companies, and their characteristics are reviewed below.

⁵⁸⁵ We have included only companies that are classified within the structural business statistics, as defined by Eurostat (<https://ec.europa.eu/eurostat/web/structural-business-statistics>). This excludes companies in sectors such as agriculture, public administration and non-market services (e.g. health and education).

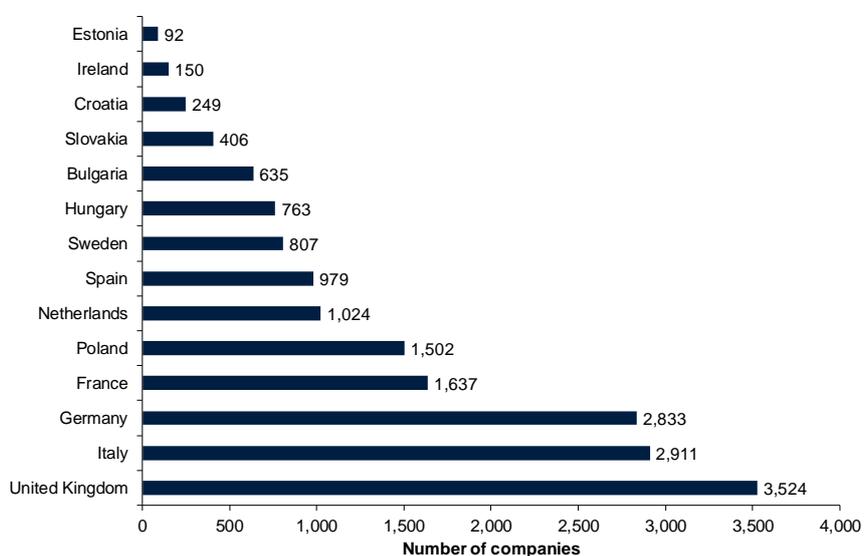
A5.3 Characteristics of identified sample

Figure A5.1 presents some descriptive statistics of the 17,512 companies based on their country of incorporation, the sectors they operate in, and their ultimate owners. From this, it can be observed that:

- the large unlisted companies mainly come from the largest EU economies, with three countries representing more than 50% of the companies;
- the majority of large unlisted companies (53.5%) operate in two economic sectors: manufacturing, and wholesale and retail trade;⁵⁸⁶
- a significant share of those large unlisted companies (more than one in four) are family-owned. Also, many of them are held by financial companies (such as private equity firms or banks).

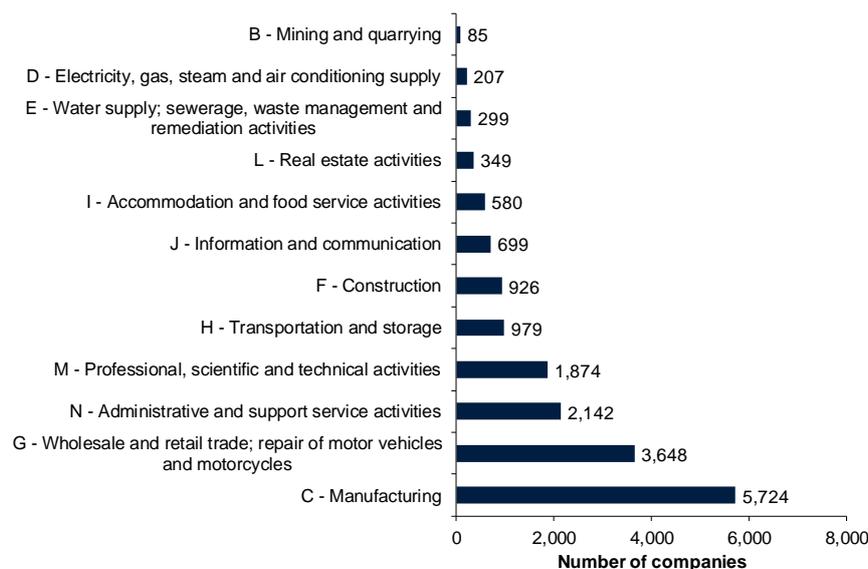
Figure A5.1 Descriptive statistics

By country

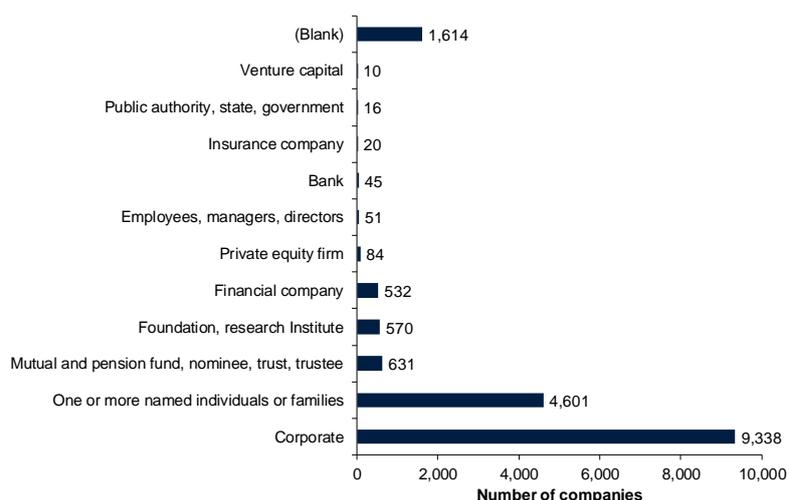


⁵⁸⁶ In the analysis, 'manufacturing' refers to NACE code C (manufacturing) and 'wholesale and retail trade' refers to NACE code G (wholesale and retail trade; repair of motor vehicles and motorcycles), as defined by Eurostat.

By industry



By owner



Note: Ultimate owners defined as having a >50% stake in the company (and therefore being able to take major and strategic decisions, such as listing, alone). A company held by a corporate ultimate owner is the subsidiary of another company.

Source: Oxera analysis from Orbis data.

Large unlisted companies mainly come from the largest EU economies. A closer look shows that, all else equal (particularly the size of the economy), large unlisted companies come mainly from countries where public equity financing is more limited as a financing means, and where public equity market capitalisation is small compared with the size of the economy. For example, this might partly explain why there are more large Italian unlisted companies than German or French ones.

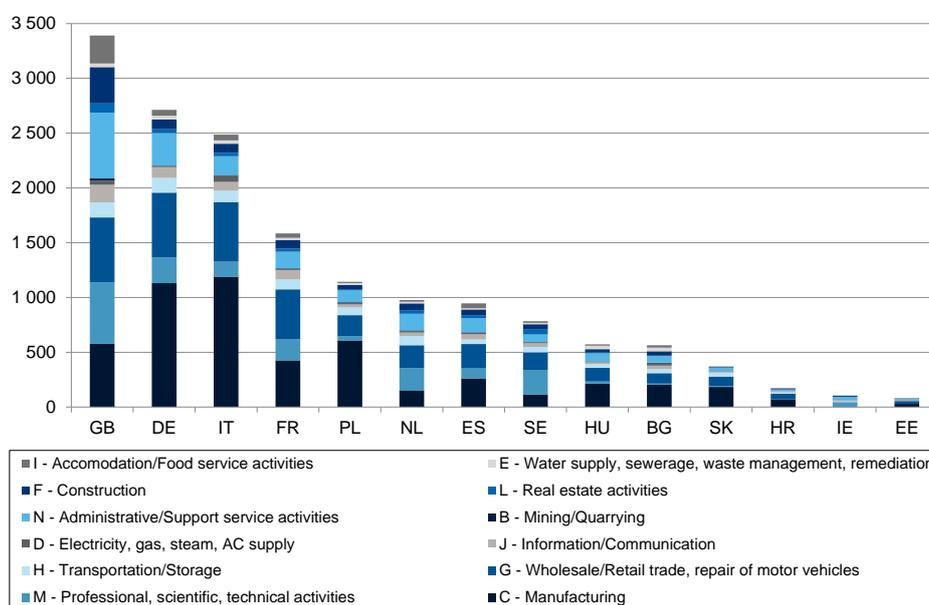
The sectoral split of large unlisted companies is very different from that of all companies. Indeed, while close to one-third of large unlisted companies operate in the manufacturing sector, less than 10% of the firms from the full sample of companies do. Other sectors show significant variations as well. This tends to indicate that large unlisted companies do not necessarily reflect the economy as a whole, but instead come from specific sectors where they can reach a significant size.

The significant proportion of family or individual ownership (representing one-quarter of large unlisted firms), as well as the large share of those companies being held by financial companies, means that there is indeed a large pool of companies for which an IPO would be a credible exit option.

Figure A5.2 and Figure A5.3 show the distribution of large unlisted companies in the sample in each country by sector and type of owner respectively.⁵⁸⁷ The same observations regarding the sectoral and ownership splits of large unlisted companies broadly hold in each country, with some exceptions (e.g. the significant level of foundation ownership in the Netherlands, or the more even sectoral split of large unlisted companies in the UK).

The pattern of company ownership for the remaining types of owner tends to match the financing structures in these countries. For example, in countries where private equity investment is proportionately high (e.g. France, Spain, Sweden), the share of unlisted companies held by financial companies, mutual and pensions funds, banks and private equity firms is more significant.

Figure A5.2 Distribution of unlisted companies across industries in each country

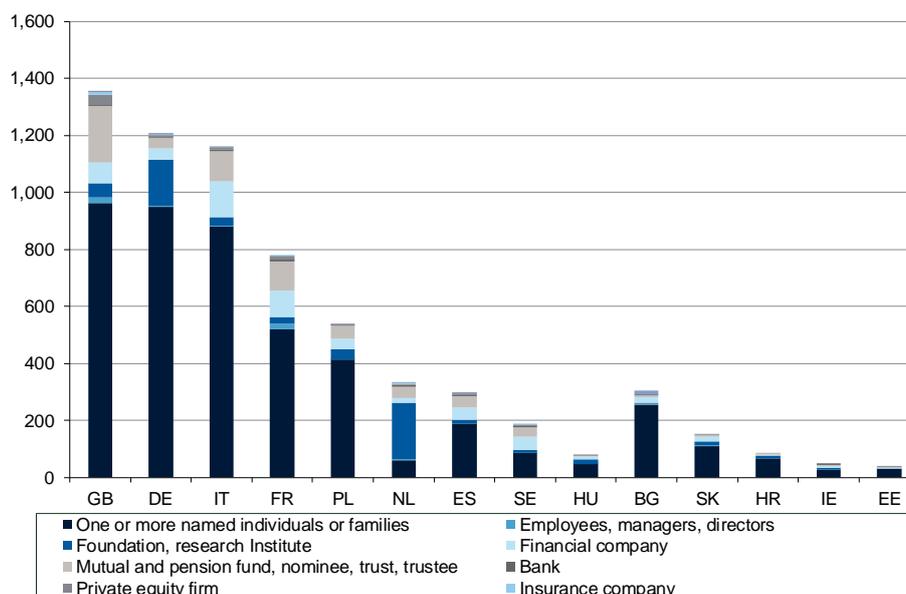


Note: Companies in the sample with a blank ultimate owner are excluded. Industries are classified following the Eurostat's NACE Rev. 2 main sections classification. Only industries belonging to the non-financial economic sectors are included.

Source: Oxera analysis from Orbis data.

⁵⁸⁷ Unlisted firms where the ultimate owner is '(blank)' have been removed from Figure A5.2 and Figure A5.3, and companies held by 'corporates' have been removed from Figure A5.2.

Figure A5.3 Distribution of unlisted companies depending on the type of ultimate owner in all countries



Note: Companies in the sample with a blank ultimate owner are excluded. Ultimate owners are defined as those owners that have a >50% stake in the company (and therefore can take major and strategic decisions, such as listing, alone).

Source: Oxera analysis from Orbis data.

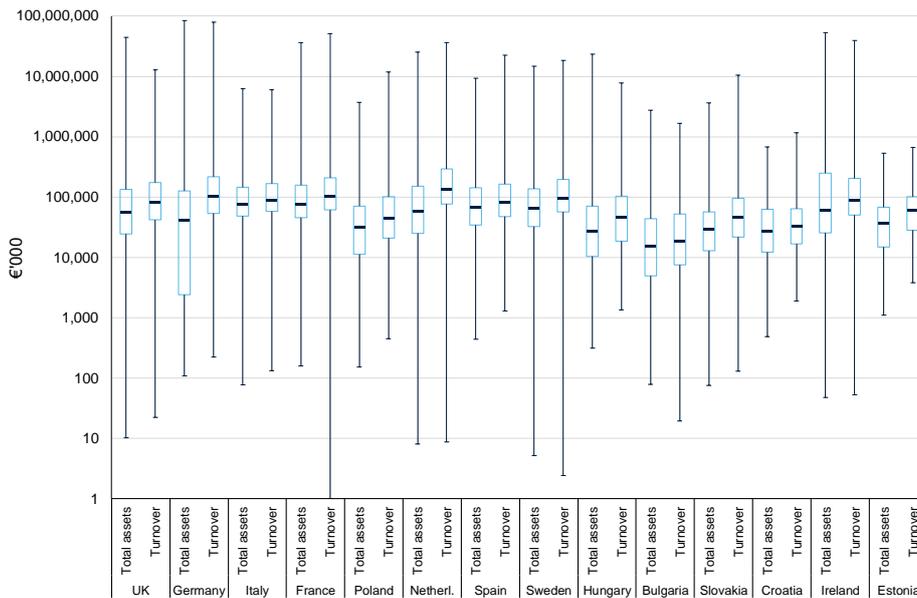
Figure A5.4 and Figure A5.5 give an overview of the financial and operational performance of large unlisted companies for the 14 in-depth countries included in our study. These box plots inform our understanding of the distribution of the sample across member states.

The following observations can be made.

- The companies with the highest total assets and turnover are in the biggest EU economies (e.g. Germany, the UK or France). The firm with the highest average total assets and turnover is in Ireland.
- The sample of large unlisted companies is more homogeneous in terms of the number of employees than in terms of assets and turnover. The average in most countries is around 600–700 employees, although there are also several outliers in each country.
- While the distributions are fairly similar (partly as a result of the search criteria, with small companies excluded), there is more variation in terms of the total value of the assets of the large unlisted companies, particularly in Germany. This reflects the diversity of businesses in the sample.
- There are a number of very large companies in all countries that remain unlisted.⁵⁸⁸ This is an important observation as these are companies that, if listed, could play a crucial anchor role and encourage more liquidity into their respective markets.

⁵⁸⁸ This is demonstrated by the positive skewness in the total assets in Figure A5.6. Note the log scale on the y axis.

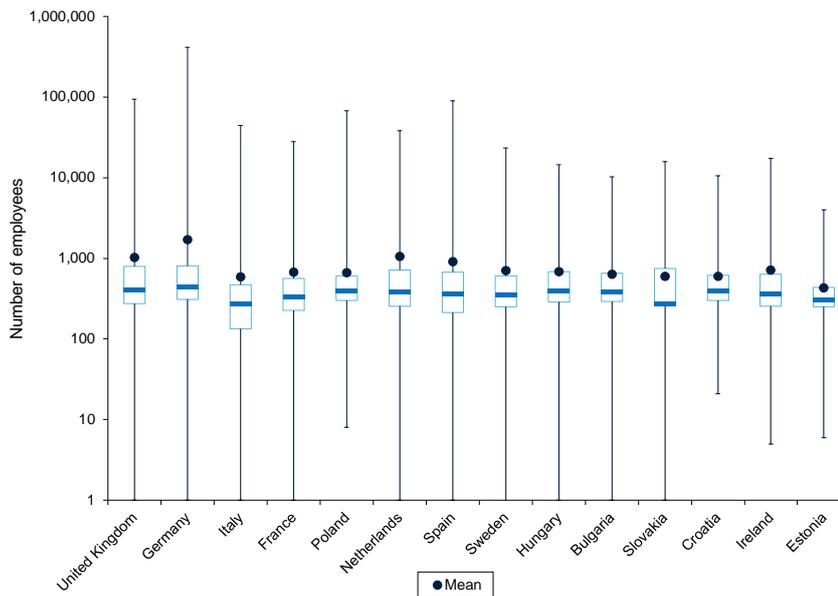
Figure A5.4 Box plots of total assets and turnover of large unlisted companies



Note: For presentation purposes, this graph uses a logarithmic scale.

Source: Oxera analysis from Orbis data.

Figure A5.5 Box plots of number of employees of large unlisted companies



Note: For presentation purposes, this graph uses a logarithmic scale.

Source: Oxera analysis from Orbis data.

These observations lead us to the following conclusions.

- Large unlisted companies are fairly homogeneous in a given country.
- A number of very large companies (those on the right-side tail of the distribution) remain unlisted, despite being significantly larger than the average unlisted company, and possibly larger than some companies that are already listed. Given where these companies are on the funding escalator, it is highly likely that, despite their size, they

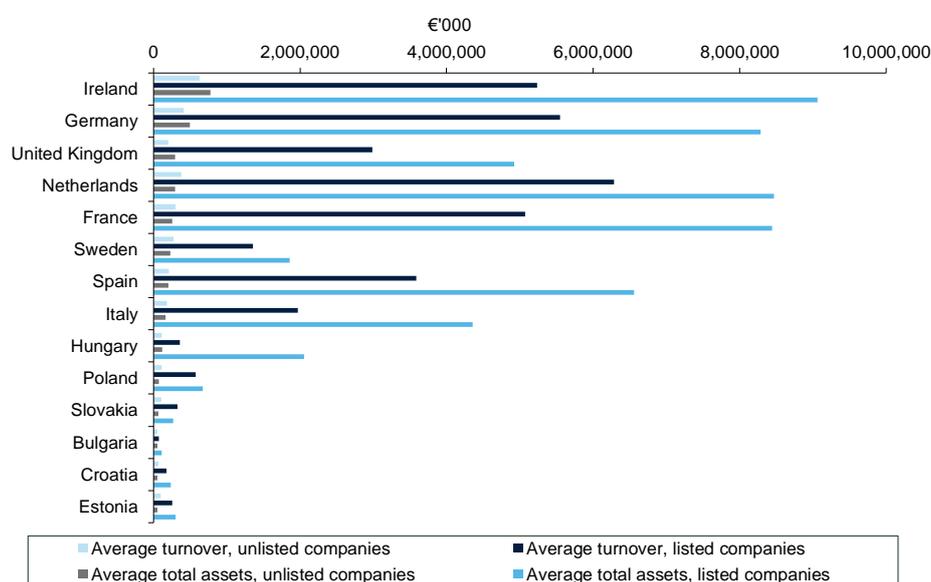
can meet their financing needs via alternative sources (e.g. own funds, bank credit lines, debt markets or private equity).

Another way to inform our understanding of large unlisted companies and their listing potential is to consider them alongside their listed counterparts originating from the same countries. Figure A5.6 compares the average total assets and average turnover of large unlisted companies and listed companies in each country.

In Western Europe, unlisted companies are small compared with their listed counterparts—the average total assets and turnover of unlisted companies are generally less than 10% of the corresponding averages for listed companies, except in Sweden. In Eastern Europe, unlisted companies are much more similar to listed companies.

Overall, total assets is a more significant differentiator between large unlisted and listed companies than turnover.

Figure A5.6 Average total assets and turnover of large unlisted companies compared to those of listed companies



Note: Listed companies are those operating in the same industries (as identified by their NACE Rev. 2 main sections) as the large unlisted companies.

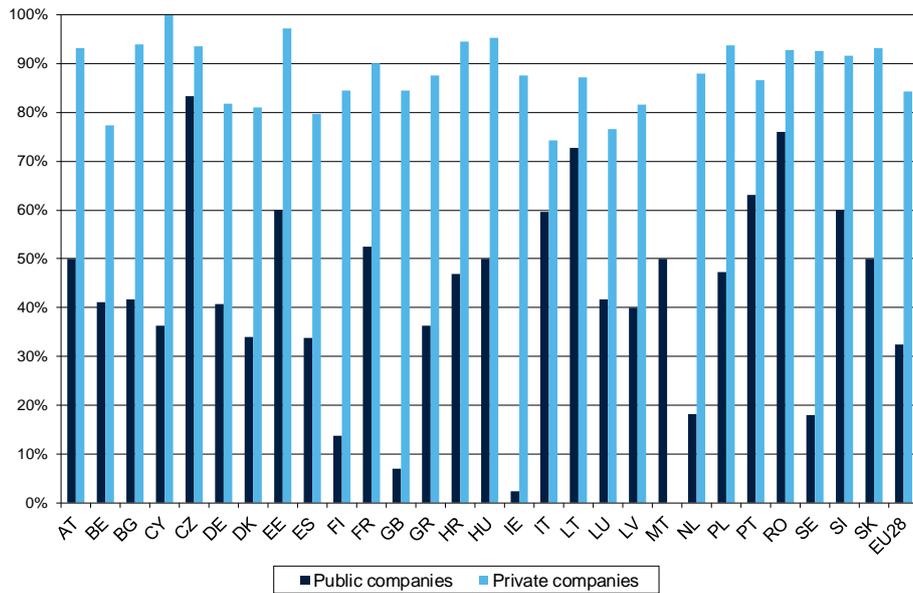
Source: Oxera analysis from Orbis data.

The levels of ownership concentration between public and private firms can also be compared. Figure A5.7 and Figure A5.8 below show the percentage of large public and private companies with a blockholder owning more than 50% and 25% respectively.

Majority shareholders (or blockholders) can reduce agency costs, but have an incentive to use their voting power to consume corporate resources and/or enjoy corporate benefits that are not shared with minority shareholders (see section 7).⁵⁸⁹

⁵⁸⁹ Holderness, C.G. (2003), 'A Survey of Blockholders and Corporate Control', *Economic Policy Review*, 9:1, April.

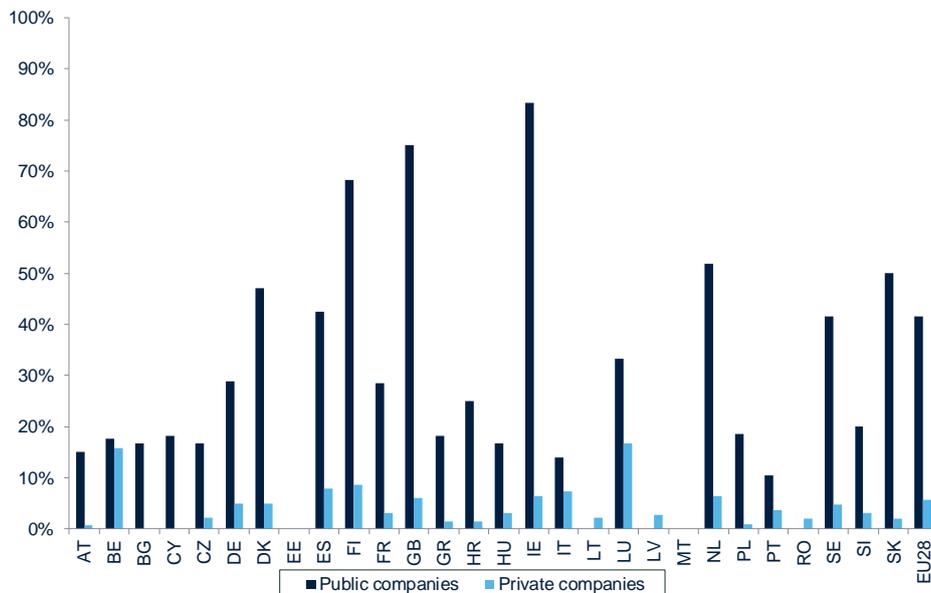
Figure A5.7 Percentage of large EU firms with a blockholder owning more than a 50% stake



Note: Percentages calculated using the BvD independence indicator, obtained via Orbis. There are five indicators: A, B, C, D and U. 'A' companies have no shareholders with more than 25% of total/direct ownership. 'B' companies have at least one shareholder owning more than 25% but less than 50% of the company. 'C' companies have one shareholder with more than 50% of total/direct ownership, while 'D' companies have one shareholder with more than 50% of direct ownership. For 'U' companies, the shareholding split is unknown; these companies are excluded from the calculations. Only large companies are included in the sample of listed and unlisted companies.

Source: Oxera analysis from Orbis data.

Figure A5.8 Percentage of large EU firms with no blockholder owning more than a 25% stake



Note: See Figure A5.7.

Source: Oxera analysis from Orbis data.

This data shows that:

- the proportion of large private companies in the EU-28 with a blockholder owning a majority stake is around 85%. Although there is some variation across member states, the proportion is consistently above 70% in all member states where data is available;
- as would be expected, public companies have a more dispersed ownership structure than private companies. This is the case in all member states where data is available;
- the level of block ownership among public companies is much more varied than for private companies.

Overall, based on our analysis, we draw the following conclusions from the comparison between large unlisted and listed companies.

- Despite being rather homogeneous and well-advanced on the funding escalator, large unlisted companies in Western Europe are much smaller than large listed companies. It may be that only very large companies in those countries seek to list, or that large unlisted companies are able to meet their financing needs without turning to public equity markets.
- In Central and Eastern Europe, large unlisted companies are not as big as the listed companies, but are comparatively closer to the size of the listed companies than their unlisted Western Europe counterparts. This tends to indicate that they are closer to listing than firms in Western Europe, but are not currently doing so. This may be linked to the fact that capital markets in Eastern Europe are less liquid and have less access to debt markets than in Western Europe.
- High levels of block ownership will be an important factor in encouraging large unlisted companies to consider a listing (this is discussed in more detail in section 7). Policymakers will need to adopt a balance between facilitating the existence of blockholders in the ownership structure, thereby reducing agency costs, and ensuring that there are rules to restrain some of the negative private benefits of concentrated ownership and to manage potential conflicts of interest.

A6 Relevant economic frameworks for secondary markets

A6.1 The economics of trading, clearing, and settlement

In section 9 we gave an overview of the design and functioning of secondary markets, including trading, clearing, and settlement. We also considered the relevant economic features in each market and their implications for the optimal market design.

Secondary markets allow markets participants to price and fund investments that require a long-term commitment of wealth, while retaining the opportunity to access that wealth when needed.⁵⁹⁰ More efficient secondary markets also lower the cost of raising capital for issuers in the primary markets.

Measuring market efficiency is complex. First, the efficient market hypothesis—which states that prices fully reflect available information—is so general that it can be manifested through multiple forms, based on what is considered ‘available information’. Second, there is no consensus on what the best metrics for market efficiency are. Showing that the market does not follow a random walk, for example, does not imply market inefficiency, while the reciprocal holds. Third, market prices feature many related patterns, such as long-memory property, interdependence across markets, and calendar anomalies, including the January and weekdays effects,⁵⁹¹ all of which seem to breach the efficient market hypothesis. (For more information on the market efficiency theory, see Box A6.1).

Box A6.1 Market efficiency theory

Fama (1970) sets out three forms of market efficiency:

- a weak form: current stock prices reflect all the information provided by past price (or return) histories, based on the random walk literature;
- a semi-strong form: security prices reflect both the time series of past price variations and additional information made available to the public, such as announcements of stock splits, annual report;
- a strong form: stock prices instantly reflect not only all public information, but also information available only to insiders of firms.

Most of the empirical research concerned with the weak form is based on the random walk literature—i.e. successive price changes or successive one-period returns are independent; however, literature on the semi-strong form investigates the speed of price adjustment to other publicly available information.

A number of studies attempt to rank the efficiency of different markets, accounting for long-range dependence (or long-term memory)—i.e. dependencies are tracked back far into the past. Most of these studies use a combination of several measures to calculate a relative efficiency index.⁵⁹² To avoid using a strict cut-off date, which is usually subject to criticism, existing literature employs a rolling-sample approach to investigate the dynamic rejection status of efficiency over time. The general finding is that market

⁵⁹⁰ Foucault, T., Pagano, M and Roel, A. (2013), ‘Market Liquidity: Theory, Evidence and Policy’, Oxford University Press.

⁵⁹¹ See, for example, Rossi, M. and Gunardi, A. (2018), ‘Efficient market hypothesis and stock market anomalies: Empirical evidence in four European countries’, *Journal of Applied Business Research*, **34**:1, pp. 183–192.

⁵⁹² See, for example, Kristoufek, L. and Vosvrda, M. (2014), ‘Measuring capital market efficiency: Long-term memory, fractal dimension and approximate entropy’, *The European Physical Journal B*, **87**:7.

efficiency is positively correlated with the development of the specific countries and stock markets. For example, Sensoy and Tabak (2015)⁵⁹³ compute a relative efficiency index for 27 markets in the EU from 1999 to 2013, using a time-varying approach to account for the dynamic nature of efficiency. While market efficiency is positively corrected with market maturity,⁵⁹⁴ they find that mature markets tend to take longer to recover from crisis.⁵⁹⁵

Source: Oxera.

As we see in the main report, the purpose of primary markets is to connect those wanting to raise capital with appropriate investors. The purpose of secondary markets is to enable investors to enter capital markets and alter their portfolios as their portfolio requirements and perceptions of assets change. Thus, for secondary markets to be successful, they need to offer reliable prices (i.e. an efficient price-formation process and limited market abuse), rapid transactions (liquidity), safe transactions (clearing, settlement, custody, and exclusion of fraudsters) and fair prices (the total costs of trading, including explicit and implicit costs). In some cases, market discipline might bring about many of these characteristics; however, securities markets are prone to information asymmetry (and related agency problems) and, due to economies of scale in some functions, market power. They might also be able to impose negative externalities in the form of systemic events.

Where markets fail in any of these ways, there is an important role for regulation. In this report, we consider statistical, academic and survey evidence on the functioning of the EU's secondary markets in equity, and assess whether there are areas in which their functioning is sub-optimal in any way that could reasonably justify intervention.⁵⁹⁶ It is important to note, however, that in some cases sub-optimal operation of markets may be a fact of life. For example, where fundamental uncertainty affects the value of a security, the security is likely to have a wide bid–ask spread, and regulatory attempts to narrow this might result solely in a withdrawal of market-making. Similarly, if a security has characteristics that stifle demand for it, regulation can do little to make the stock liquid. Again, in a small market featuring local securities of companies whose growth is limited by macro conditions, regulation can do little to create investor demand (once the market is clean and efficient).

While this study focuses on equity trading, post-trading arrangements (including clearing and settlement) can have a significant impact on the functioning of equity trading markets. Section 9.3 discussed the economic features of both equity trading and post-trading to provide a well-rounded analysis of the relevant market design considerations.

As highlighted in section 9.3, both trading and post-trading as economic goods exhibit strong *network effects*—i.e. the benefit gained by users grows with the total number of users participating in the market. In Box A6.2 the relevant economic features of network markets are described.

⁵⁹³ Sensoy, A. and Tabak, B.M. (2015), 'Time-varying long term memory in the European Union stock markets', *Physica A: Statistical Mechanics and its Applications*, **436**:C, pp. 147–158.

⁵⁹⁴ Two exceptions are the UK and France, which are found to be inefficient relative to mid-sized markets in the EU. This contradicts Smith (2012), who found the UK to be one of the most efficient markets in Europe. See Smith, G. (2012), 'The changing and relative efficiency of European emerging stock markets', *The European Journal of Finance*, **18**:8, pp. 689–708.

⁵⁹⁵ The studied timeline includes two major economic crises: the 2008 global financial crisis and the euro area sovereign debt crisis.

⁵⁹⁶ We consider mainly the developments that have had significant impacts in the market. While considerable attention is paid to the possibility of new technologies such as DLT (see Box 12.4), it is uncertain how exactly the real prospects of DLT and their implications for the EU markets would take shape at this point.

Box A6.2 Relevant economic features of network markets

Despite the possibility of ‘tipping points’ arising in certain situations, an empirical observation is that various types of network industry do appear to support several or many competing networks.⁵⁹⁷ In particular, it matters whether:

- networks are **one-** or **two-sided**—platforms with two distinct user groups that provide each other with positive network effects are two-sided. For example, payment cards enable transactions between payers and payees, with benefits for one group increasing with the size of the other group joining the same card scheme. Another example is newspapers being free of charge in order to maximise readership, making it attractive to advertisers, who are the main revenue source for newspapers;
- there are large benefits to **universal reach**—in some industries, there is a high level of demand for users to reach every other potential user in the market. For example, it must be possible for anyone to make a phone call to whichever number they like, regardless of which networks the caller and the receiver use;
- there is a **central record**—for some networks to operate, there must be a record that stores information of ownership of the goods traded in the network. For example, separate land registries offering disjointed or even misaligned records of ownership would lead to substantial inefficiencies.

When the latter two effects are present, more concentrated or monopolistic market outcomes tend to result, at least in some parts of the network (see the figure below). Where universal reach and central storage are not important, the economics literature suggests that competition between network firms is possible and common in practice for both one- and two-sided networks.⁵⁹⁸ Real-world examples of such industries, such as the market for homes through real estate agents and the market for video-game consoles, are characterised by significant levels of competition.⁵⁹⁹

Networks with different economic features

		Credit/ debit cards Trading platforms	Post Air traffic control	Telecoms Payments (clearing) CCPs	CSDs Land registries
1	Two-sided	✓	✗	✗	✓
2	Universal reach	✗	✓	✓	✓
3	Central storage	✗	✗	✗	✓

⁵⁹⁷ In mobile telephony, competition is sustained between different mobile phone networks and handset operating systems, despite strong network effects and scale economies. In payment systems, the overall competitive picture is that multiple card networks have operated alongside each other in Europe along with a number of rival payment methods. In other words, the fact that an industry exhibits network effects does not in itself mean that the market cannot sustain multiple providers, as is well-documented in the academic literature. See Armstrong, M. (2006), ‘Competition in Two-Sided Markets’, *The Rand Journal of Economics*, **37**:3, pp. 668–691.

⁵⁹⁸ See, for example, Suleymanova, I. and Wey, C. (2008), ‘Bertrand Competition in Markets with Network Effects and Switching Costs’, DIW Berlin Discussion Paper No. 796, May.

⁵⁹⁹ See, for example, Armstrong, M. (2006), ‘Competition in Two-Sided Markets’, *The Rand Journal of Economics*, **37**:3, pp. 668–69; and Financial Conduct Authority (2015), ‘Credit Card Market Study: Interim Report’, November.

Source: Oxera.

Importantly, even where the structure of the market as a whole is of a form that would tend to lead to monopoly (for example, as a result of the importance of 'universal reach'), particular forms of industry practice or regulatory remedies can still result in markets that support competition. Here, the examples of interoperability, multi-homing and unbundling are examined.

Multi-homing

A user who joins only one network is said to single-home, whereas a user who joins more than one network is said to multi-home. Widescale multi-homing can increase competition between platforms. Consider online marketplaces; a seller may list a product for sale on Amazon, where a buyer sees it and wants to make a purchase. However, this does not result in significant market power to Amazon if the good is also listed on eBay. As both platforms are accessible to the buyer, it is straightforward for the buyer to check both options and select the better deal. Multi-homing ensures that network effects enjoyed by one platform do not preclude other platforms benefitting from the same network effects.

In general, the literature suggests that factors such as the extent of platform differentiation and the cost of joining the platform can determine the extent of multi-homing on either side of the market.⁶⁰⁰ If platforms offer very different products (such as Facebook and LinkedIn) or the cost of joining is low, users are more likely to multi-home.

Multi-homing is an important determinant of competition in two-sided networks in general. With the rise of MTFs and other trading venues competing for order flows with regulated exchanges, increasing multi-homing is observed in trading: a significant number of brokers have access to multiple trading venues. The choice of venue normally depends on the type and size of the trade, and best execution is guided by factors such as trading fees, transparency requirements, and various liquidity priorities, for example measured by spreads and market impact costs.

Interoperability and common standards

Interoperability and the application of common standards can have a significant impact on market outcomes. Take email, for example. The user of an email service needs to be able to contact any email address they choose, regardless of the email provider they are using. On the face of it, one might suppose that this would result in a tendency towards everyone using the same email service. However, in practice, due to the existence of a common standard for email, all email services are **interoperable** (emails from different services, say Gmail and Outlook, can be easily exchanged), making them highly competitive.

The effect of such interoperability is to ensure that network effects apply to the system and not to individual firms providing access to that system. As the popular nature of email makes it an attractive mode of communication, network effects apply; however, because a small provider of email services still gives the user access to the whole system, these network effects do not lead to competitive disadvantage. In the case of CCP clearing houses in Europe, traders using different CCPs can clear securities through an interoperability link between their CCPs.⁶⁰¹

⁶⁰⁰ See, for example, Evans, D. and Schmalensee, R. (2005), 'The industrial organization of markets with two-sided platforms', NBER Working Paper No. 11603, September.

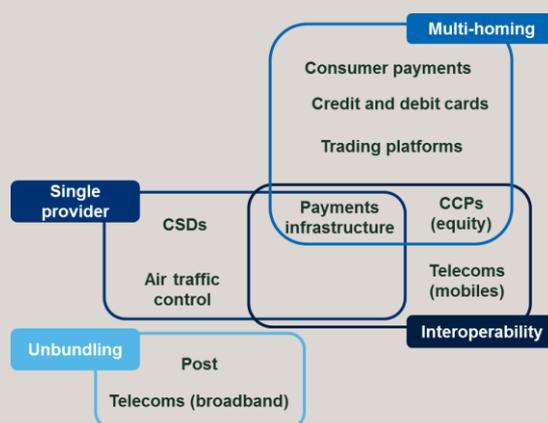
⁶⁰¹ See Barnes, R. (2010), 'Counterparty clearing house user choice: an evolving European landscape', *Agenda*, Oxera, March.

Economies of scale

Economies of scale are an important determinant of market outcomes in nearly all markets. A water network, for example, requires neither universal reach nor a central information repository, but it will tend towards a monopolistic outcome due to the prohibitive costs of connecting a household to an alternative network.⁶⁰²

However, these considerations are not fixed over time. For example, technological progress has significantly reduced the costs of developing the required infrastructure to trade and clear securities. This has facilitated entry and resulted in competition between multiple trading and clearing platforms (CCPs) competing with each other, whereas 20 years ago most countries had only one stock exchange.⁶⁰³

Models of comparison in network industries can differ considerably



Source: Oxera.

A6.2 The economics of market-making

Market-makers also play an important role in a well-functioning and efficient secondary market, especially as they can have a significant impact on the liquidity level and thus the total cost of trading. In perfect markets, buyers and sellers immediately find each other and benefit from trade at frictionless prices. However, owing to frictions, real markets can fall short of delivering such welfare improvements—indeed, market frictions can prevent final sellers from rapidly locating final buyers. In this context, intermediaries can provide liquidity to impatient sellers, by purchasing their assets and holding inventories, until they find final buyers.⁶⁰⁴

Market-makers predominantly contribute to the robustness of market liquidity by:

⁶⁰² Where substantial economies of scale preclude competition in one part of the market, this need not preclude competition in the market as a whole. In fixed-line telecoms, for example, economies of scale may preclude multiple competing networks being connected to people's homes (the 'last mile'). However, unbundling that part of the service from the core network, and providing access to the last mile on an equivalent basis, allows for competition across the rest of the network.

⁶⁰³ See Oxera (2011), 'Monitoring prices, costs and volumes of trading and post-trading services', prepared for European Commission, DG Internal Market and Services, May; Oxera (2011), 'Securities trading and post-trading in the EU: what impact has competition had?', *Agenda*, May; Niels, G., Barnes, F. and Van Dijk, R. (2003), 'Unclear and Unsettled: The Debate on Competition in Clearing and Settlement of Securities Trades', *European Competition Law Review*, **24**:12, pp. 634–9; Van Dijk, R. and Correia da Silva, L. (2012), 'Competition: the Costs and Benefits', *The Financial Times*, 2 October.

⁶⁰⁴ Market-making services have been analysed theoretically by Ho, T.S.Y. and Stoll, H.R. (1983), 'The Dynamics of Dealer Markets Under Competition', *The Journal of Finance*, **38**:4, pp. 1053–1054, September; Grossman, S.J. and Miller, M.H. (1988), 'Liquidity and Market Structure', *The Journal of Finance*, **43**:3, July; and Weill, P.O. (2007), 'Leaning against the Wind', *The Review of Economic Studies*, **74**:4, pp. 1329–1354.

- providing immediacy services to clients and other market participants, ensuring market liquidity and supporting price discovery;
- absorbing temporary supply and demand imbalances, dampening the impact of shocks on market volatility, and quoting prices to support investors in valuing assets.

A6.2.1 What are the characteristics of intermediaries that enable them to supply liquidity?

In fragmented markets, intermediation services can be provided by those agents with the best network links and the greatest search ability, which can be enhanced by high-frequency trading technology. Even if the market is centralised, delays can arise, reflecting that not all potential buyers and sellers are permanently monitoring the market, and that it takes time for investors to identify their trading needs. Different from arbitrageurs taking positions and providing liquidity in the markets, market-makers bear costs when *holding inventories*—for example, because they are risk-averse and reluctant to carry unbalanced inventory positions, or because the principals of market-makers set position limits to discipline their agents.⁶⁰⁵

Another market friction that restricts liquidity is *adverse selection*, which can magnify the price impact of trades and even lead to market breakdown.⁶⁰⁶ As shown by Glosten and Milgrom (1985) and Kyle (1985), adverse selection leads market-makers to post relatively high ask prices, and relatively low bid prices.⁶⁰⁷

Another factor affecting quotes at the individual dealer level is the difference between the current and the desired inventory. The latter reflects current and expected customer order flows, as well as limits imposed by the dealer's risk management framework. Dealers whose positions approach the limits set by their institution's risk management framework are thus incentivised to adjust their quotes to realign their inventory. Reduced tolerance for risk at the firm level will also affect the amount of capital dedicated to market-making activities.⁶⁰⁸

What are the costs of market-making?

The costs of market-making include:⁶⁰⁹

- market risk: the possibility of prices moving against their positions that cannot be hedged efficiently or at reasonable cost;
- capital/funding costs: to finance the trade and hold equity to guard against potential losses;
- other costs, such as data, compliance and IT costs.

These costs would be reflected in the implicit costs of trading.

More specifically, market-makers can respond to changes in the market environment and sentiment by adjusting their bid-ask spreads, the quantities they are willing to trade at

⁶⁰⁵ Bank for International Settlement (2016), 'Who supplies liquidity, how and when?', Working Papers No 563, May, p. 2, <https://www.bis.org/publ/work563.pdf>.

⁶⁰⁶ Akerlof, G. A. (1970), 'The market for 'lemons': quality uncertainty and the market mechanism', *The Quarterly Journal of Economics*, **84**:3, August, pp. 488–500.

⁶⁰⁷ Glosten, L. and Milgrom, P. (1985), 'Bid, ask and transaction prices in a specialist market with heterogeneously informed traders', *Journal of Financial Economics*, **14**:1, pp. 71–100; Kyle, A. (1985), 'Continuous Auctions and Insider Trading', *Econometrica*, **53**:6, pp. 1315–1335.

⁶⁰⁸ Committee on the Global Financial System (2014), 'Market-making and proprietary trading: industry trends, drivers and policy implications', Papers No 52, November, p. 9, <https://www.bis.org/publ/cgfs52.pdf>.

⁶⁰⁹ Bank of England (2015), 'The resilience of financial market liquidity', Financial Stability Paper No 34, October, Box 1, p. 9, <https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-paper/2015/the-resilience-of-financial-market-liquidity>.

these prices, or their quoting behaviour. For example, in response to rising volatility, markets could then witness a widening of bid–ask spreads and a decline in quoted depth (i.e. the quantities that can be traded at the best bid and ask price), before market-makers eventually discontinue quoting on an ongoing basis and only passively respond to clients' requests for quotes.

While technological developments help lower costs and improve efficiency in risk management, a significant portion of the market-making cost will still lie within the first two categories: market risk and capital/funding costs.

A6.3 The economics of equity research

For equity markets to function effectively, the market participants need to have accurate and timely information. However, the volume and complexity of the information about companies' future prospects make it extremely costly, if not impossible, for each investor to filter through and interpret every piece of available information.

There are economies of scale and specialisation in the analysis of company information. It could therefore be efficient to have a market in which a number of specialised analysts research the raw data on firms and industries, form an opinion on the firms' future prospects, and disseminate that analysed information to investors. In this way, costly duplication of research efforts could be avoided, while the number of analysts covering a particular company and industry could still be large enough to allow for different views on the more subjective aspects of the research.

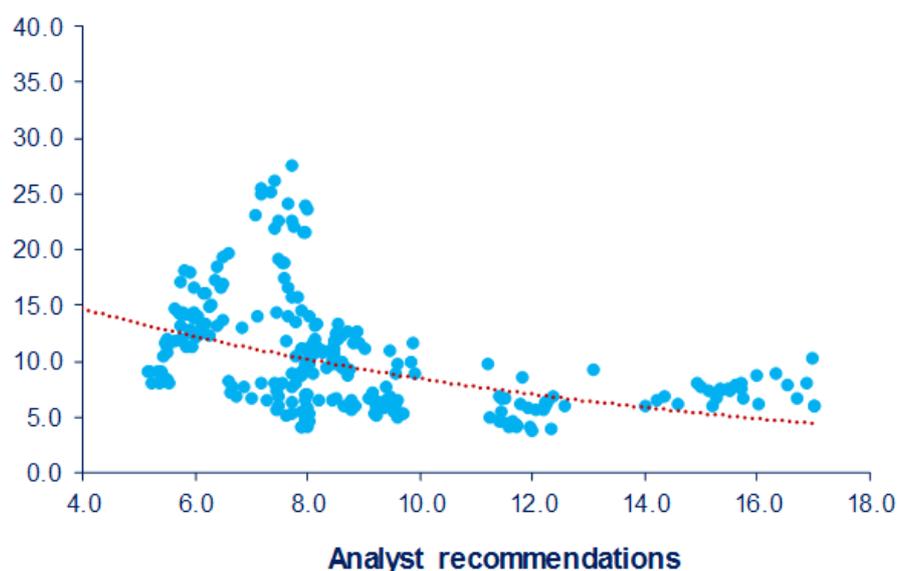
Indeed, this is very similar to the way in which the market has evolved over the years, in that research is currently produced by brokers, independent research houses, and in-house fund managers.

The external benefits stemming from greater research coverage include the improved market liquidity and lower cost of capital for companies. This is supported by empirical analysis, which suggests that coverage positively affects company prospects and valuation.⁶¹⁰ In particular, higher analyst coverage increases the overall amount of information available to the market and the informational content of market prices. This in turn reduces the extent of information asymmetry, reducing the illiquidity of the firm's stock.⁶¹¹ Empirical analysis indicates that reductions in equity research coverage are associated with higher average bid–ask spreads, indicating a lower level of liquidity (see below).

⁶¹⁰ Kelly and Ljungqvist (2008) find that, upon announcement that a stock has lost all coverage, share prices fall on average by 110bp or \$8.4m. Overall, the authors conclude that the information environment of those firms that lose coverage suffers. Kelly, B. and Ljungqvist, A. (2008), 'The value of research', NYU Working Paper, <https://ssrn.com/abstract=1293615>.

⁶¹¹ Frenkel, S, Guttman, I. and Kremer, I. (2019), 'The Effect of Exogenous Information on Voluntary Disclosure and Market Quality', *Journal of Financial Economics*, forthcoming.

Figure A6.1 Correlation between equity research coverage and average bid–ask spreads, 2013–19 (bp)



Note: Each data point represents a quarterly-average analyst recommendation and corresponding quarterly bid–ask spreads observed at the individual country level, across the EU-14 from 2013 to 2019 (no data for Slovakia from February 2016 to April 2017). Virtu’s country-specific cost calculations have been supplied based on a weighted notional average. There is a significant negative correlation of -0.61 .

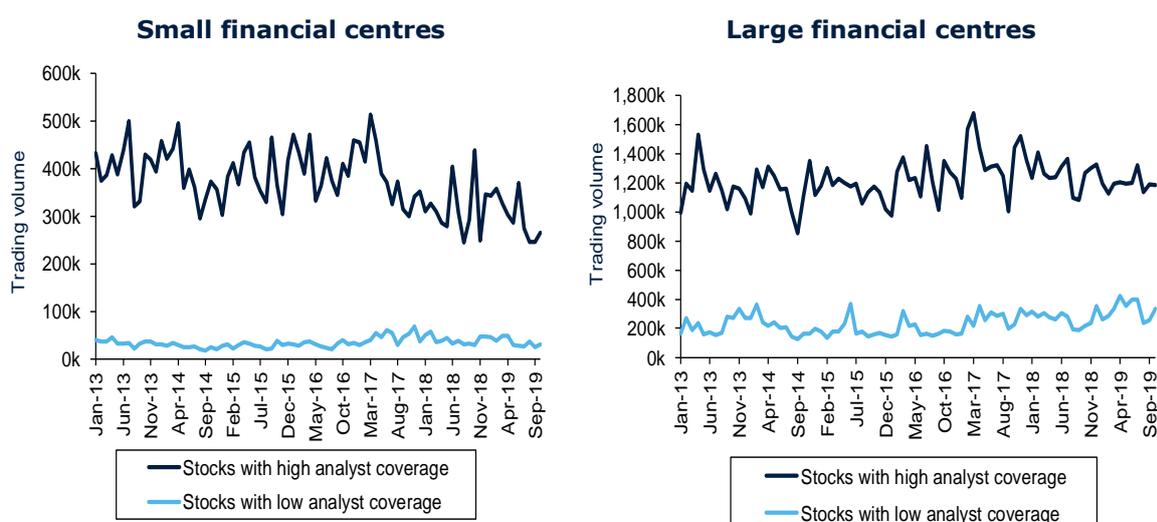
Source: Oxera analysis of bid–ask spread data from Virtu Global Peer Database and Bloomberg analyst recommendations data.

In normal market conditions, where market participants do not take into account such positive externalities, there would be a risk of under-provision of research.

As explained in the Commission’s economic analysis on a CMU,⁶¹² equity research is particularly important for SMEs given that it is more difficult for potential investors to access information, and that the information available is more opaque and scarce for SMEs than for other companies. The Commission’s report describes how, despite the clear need for equity research on SMEs, a market failure exists because analysts tend to ‘orient their coverage to large caps as research on large caps is more profitable’. Many SMEs, particularly with smaller market capitalisation, have little research other than from their broker. A lack of research then reduces the likelihood of attracting investment.

Moreover, high coverage stocks—those with more analyst recommendations than their country average—are associated with around 10.7 times more trading activity in small centres compared with low coverage stocks (see Figure A6.2 below). For large financial centres, the differential in trading activity is significantly lower than for smaller centres.

⁶¹² European Commission (2017), ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on reform recommendations for regulation in professional services’, SWD(2016) 436, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016SC0436&from=DE>.

Figure A6.2 Trading volumes and analyst coverage, 2013–19 ('000s)

Note: This covers the EU-14; no data for stocks with high analyst coverage in Croatia.

Source: Oxera analysis of Bloomberg data.

To examine the importance of analyst coverage on liquidity provision:

- we divided the universe of stocks domiciled in the EU-14 member states into two separate groups for each country: high coverage stocks refer to individual stocks with a number of analyst recommendations greater than the country-level average; low coverage stocks are stocks with a number of analyst recommendations lower than the country-level average. Observations more than three standard deviations away from the mean were disregarded;
- we estimated trading activity (as the average volume traded) and liquidity provision (measured on the basis of the average bid–ask spread), for both groups.

In section 13.2.1, we discuss the impact of unbundling trade execution and research fees on SMEs, which generally have lower coverage than large caps as seen above. Therefore, a further reduction on research coverage would have a significant impact on SME liquidity.

The implication of unbundling rules for the provision of research coverage for stocks of different sizes has been explored in the recent literature. The comparison of the impacts of unbundling between SMEs and large-cap stocks depends heavily on how these two categories have been defined.

Guo et al. (2020)⁶¹³ find that the post-MiFID II overall decrease in analyst coverage does not come from small- or mid-cap firms but is concentrated in large firms. Their explanation is that competition drives inferior research out of the market. Since large firms have much more coverage than small firms, research with low marginal value is more likely to exist. If investors opt out of inferior research, large firms are more affected. On the other hand, Fang et al. (2020)⁶¹⁴ conclude that the reduction in research coverage is more pronounced for small-cap stocks. More specifically, small firms, those having less institutional ownership, those not issuing financing, and those with lower trading volume are less

⁶¹³ Guo, Y. and Mota, L. (2020), 'Should information be sold separately? Evidence from MiFID II', p. 19.

⁶¹⁴ Fang, B. Hope, O.-K., Zhongwei Huang, and Moldovan, R. (2020), 'The effects of mifid ii on sell-side analysts, buy-side analysts, and firms', forthcoming, *The Review of Accounting Studies*.

important for the sell side, and therefore more likely to suffer coverage losses.⁶¹⁵ The different conclusions are, however, likely to be driven by how small-cap stocks have been defined differently in the two papers.⁶¹⁶

⁶¹⁵ Fang. et al (2020), 'The effects of mifid ii on sell-side analysts, buy-side analysts, and firms', p. 35, forthcoming in *The Review of Accounting Studies*.

⁶¹⁶ In Guo et al. (2020), small firms are defined as firms whose average market capitalisation before MiFID II falls below the median. In Fang et al. (2020), the authors first regress firm size on analyst coverage and then take the residual size. Small firms are those with a residual firm size in the first tertile by country-year.

A7 Trends in equity trading

In section 10, we examined the trends in i) trading and cross-border trading volumes over time and across financial centres; ii) trading activities on regulated stock exchanges versus alternative trading venues; and iii) trading by different types of investor based on country of origin and investor sector.

This appendix details the fragmentation of trading activity across different venues and provides further insights on country-level trends. It is structured as follows:

- section A7.1 presents the role of alternative trading venues across different European markets and provides detail on the concentration of trading activity in small and large financial centres;
- section A7.2 provides further empirical evidence on the number of trading venues by country of domicile;
- section A7.3 summarises country-level data on equity trading in the EU.

A7.1 Fragmentation of trading across different venues

In section 10.1, we observed that trading volume has remained fairly stable in recent years and turnover value has increased slightly. However, since MiFID I, alternative trading venues, including MTFs, have been playing an increasingly important role, especially in large financial centres.

Prior to the implementation of MiFID I, trading in equities was concentrated on large national stock exchanges. Since then, equity trading has been available on:

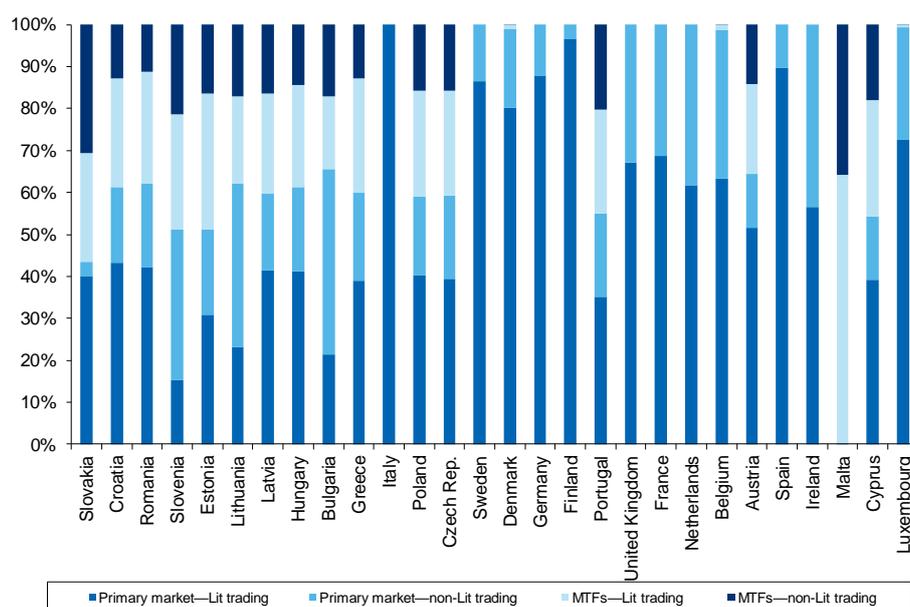
- regulated markets—venues that bring together third-party buyers and sellers (on a non-discriminatory basis) in financial instruments that have been admitted to trading under the rules of the trading venue. These trading venues are generally the traditional national stock exchanges;
- MTFs—similar to regulated markets, except that these venues initially operated under a lighter set of rules and are not generally used for listing financial instruments (with the exception of junior markets);
- SIs—investment firms that regularly deal on their own account by executing client orders outside a regulated exchange or an MTF. They are generally large banks and brokers that trade bilaterally by executing orders directly against their own books.⁶¹⁷

A7.1.1 The rise of MTFs and alternative trading venues

Since MiFID I, alternative trading venues, including MTFs, have been playing an increasingly important role, especially in large financial centres. Figure A7.1 below shows the breakdown of lit and non-lit trading on regulated markets and MTFs

⁶¹⁷ As an SI trades on its own account, trading occurs on a bilateral basis, with the SI acting as a counterparty to a client order. This contrasts with regulated markets and MTFs, which organise trading on a multilateral basis—bringing together different buyers and sellers. More specifically, an SI is 'an investment firm that, on an organised, frequent systematic and substantial basis, deals on own account when executing client orders outside a regulated market, an MTF or an OTF without operating a multilateral system' (Article 4(1)(20) of MiFID II). MiFID II prohibited the use of less strictly regulated BCNs.

Figure A7.1 Breakdown of turnover value in lit and non-lit trading on regulated markets and MTFs, 2013–19 (%)



Note: MTFs are identified following the ESMA registers for trading venues, SIs, and data reporting service providers. Non-lit trading includes OTC, OTC reported to platforms, SIs, auctions, periodic auctions, and dark trading. The percentages refer to the equity turnover registered on the venue (either the primary venue or MTF) with respect to the total equity turnover in the country. Equity trading occurring on alternative trading venues is not shown.

Source: Oxera analysis of Refinitiv Market Share Reporter data.

We discuss the choices in trading mechanisms and venues in more detail in section 11.

A7.1.2 Most trading activities concentrated on a small number of venues in large financial centres

LSEG and Euronext are the two largest stock exchange groups, with total market capitalisation of €3.22tn and €3.34tn in 2018 respectively (see Appendix A2.1).⁶¹⁸

As seen in section 2.4, larger equity markets consistently have a total value of equity traded above €35bn (see Table 2.1). Conversely, smaller exchanges exhibit a total equity value traded below €15bn. Moreover, the value traded on larger markets is growing, while it is declining on smaller markets. Between 2013 and 2018 the total value traded grew by around 3% on average for the larger exchanges and decreased by around 3% on average for the smaller exchanges. Table 2.1 also showed that DB Group, Euronext and the London Stock Exchange covered 70% of total equity turnover in the EU-28 in 2018; and, together with Borsa Italiana, BME, Nasdaq Nordic, and Warsaw SE, they covered 99% of total equity turnover in the EU-28 in 2018. Similarly, Table 2.2 showed that 93% of the total number of shares traded in Europe are concentrated among six stock exchanges: BME, Borsa Italiana, DB Group, Euronext, the London Stock Exchange, and Nasdaq Stockholm.

Among MTF venues, Cboe accounts for the large part of total MTF turnover trading (77%), along with Turquoise (12%) and UBS (2%).⁶¹⁹

⁶¹⁸ Oxera analysis of data from stock exchange factbooks and WFE.

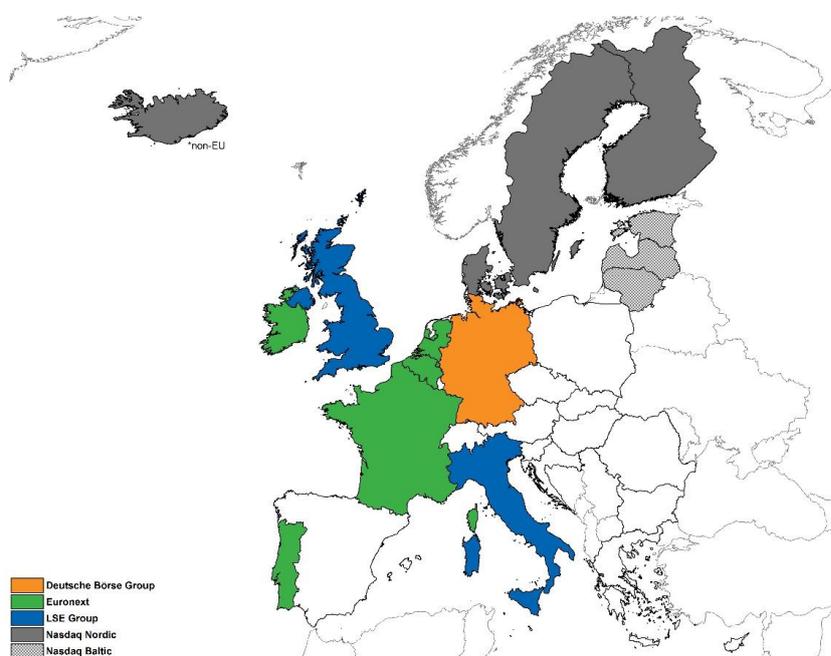
⁶¹⁹ Based on Oxera analysis of Refinitiv Market Share Reporter data.

A7.1.3 Consolidation of ownership

With the development of a single European capital market, several stock exchanges have merged to form pan-European exchanges.⁶²⁰ Pan-European platforms offer trading services with respect to securities issued by companies domiciled in several member states.

Stock exchange consolidation in Europe has been observed mainly in Northern and Central Europe with the formation of Euronext (the latest acquisition was the Dublin stock exchange in 2018),⁶²¹ LSEG (with the acquisition of Borsa Italiana in 2007) and Nasdaq Nordic (the consolidation of which was completed in 2008 with the acquisition of OMX) (see Figure A7.2).⁶²² In contrast, the stock exchanges of Central and Eastern European countries tend to be independently owned and operated (e.g. the stock exchanges of Bulgaria, Croatia, Hungary and Slovakia). The stock exchanges in Baltic countries (Estonia, Latvia and Lithuania) represent an exception to this trend, as they have been consolidated under Nasdaq Baltics and are thus more connected to the EU-wide market.

Figure A7.2 Geographical locations of the consolidated stock exchanges in Europe, 2018



Source: Oxera.

In addition, pan-European platforms (stock exchanges and MTFs) consistently cover securities domiciled in large financial centres in Western Europe, while this is not the case for the majority of securities domiciled in smaller financial centres in Central and Eastern Europe (Bulgaria, Hungary, Poland, Romania, Slovakia and Slovenia) (see Table A7.1).

⁶²⁰ McAndrews, J. and Stefanidis, C. (2002), 'The consolidation of European stock exchanges', *Current Issues in Economics and Finance*, **8**:6, June, <https://pdfs.semanticscholar.org/34a0/99d91799b899add99adde6ba2f2aacce76d.pdf>.

⁶²¹ Amsterdam, Brussels and Paris merged into Euronext in 2000. Lisbon was acquired in 2002. Dublin was the last acquisition in 2018.

⁶²² BME in Spain operates a consolidated Spanish electronic outcry platform that allows for the trading of securities across Spain.

Table A7.1 Geographical scope of securities traded on pan-European venues in a selection of 14 EU countries, 2018

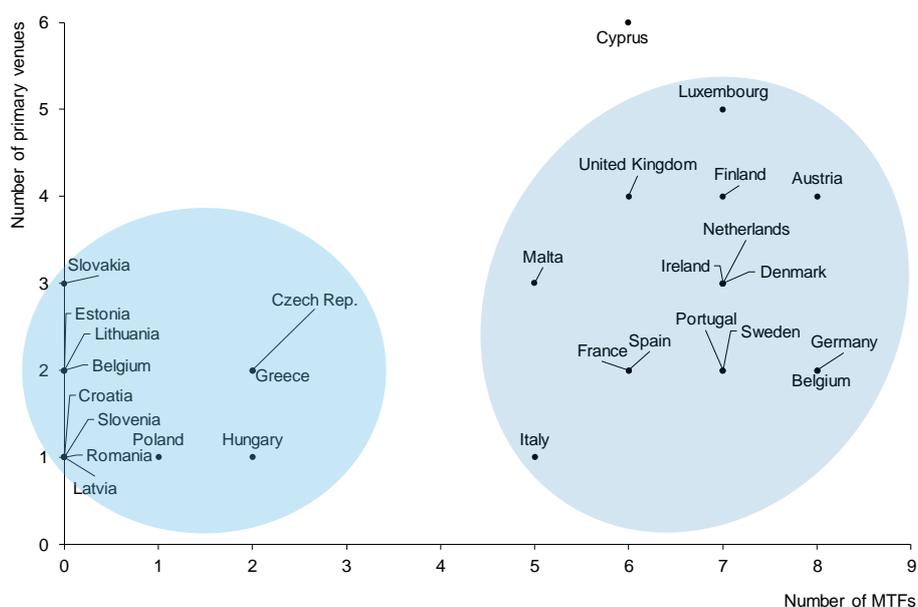
Type of venue	Owner	Countries of domicile of traded securities
Regulated exchanges		
Euronext	Euronext	Major Western European markets, Bulgaria and Poland
LSEG	LSEG	Major Western European markets, Hungary, Poland
Nasdaq Nordic	Nasdaq, Inc.	Major Western European markets, Bulgaria, Estonia and Hungary
Deutsche Börse Xetra	Deutsche Börse Group	Major Western European markets
MTF		
Aquis	Independent	Major Western European markets, Bulgaria
CBOE—CXE	Cboe European Equities	Major Western European markets, Bulgaria
Turquoise	LSE Group	Major Western European markets, Bulgaria, Hungary and Poland
Turquoise Plato	LSE Group	Major Western European markets, Bulgaria
UBS	Independent	Major Western European markets, Bulgaria
Alternative venue		
CBOE—BXE	Cboe European Equities	Major Western European markets, Bulgaria
Equiduct	Independent	Major Western European markets, Bulgaria
EURO TLX	Independent	Major Western European markets except for Italy
Instinet's BlockMatch	Instinet Europe Limited (a Nomura company)	Major Western European markets, Bulgaria
Liquidnet	Independent	Major Western European markets, Bulgaria
MOEX Main	Independent	Netherlands and UK
POSIT	Independent	Major Western European markets, Bulgaria
SIGMA-X	Goldman Sachs	Major Western European markets, Bulgaria
Tradegate	Independent	Major Western European markets, Bulgaria

Note: Major Western European markets are France, Germany, Italy, the Netherlands, Spain Sweden, and the UK.

Source: Based on Refinitiv equity turnover data in 2018.

A7.2 Number of trading venues by country of domicile of the securities

Over the last decade, MTFs have emerged as strong competitors to the traditional stock exchanges, capturing significant market share. This has inadvertently resulted in increased fragmentation of trading activity. While this is more prevalent in large financial centres, considerable variations exist across countries. First, the number of lit trading venues—MTFs and regulated markets—increased over the period 2013–18 in large and mid-size financial centres (see Figure A7.3).

Figure A7.3 MTFs and primary venues, 2013–18

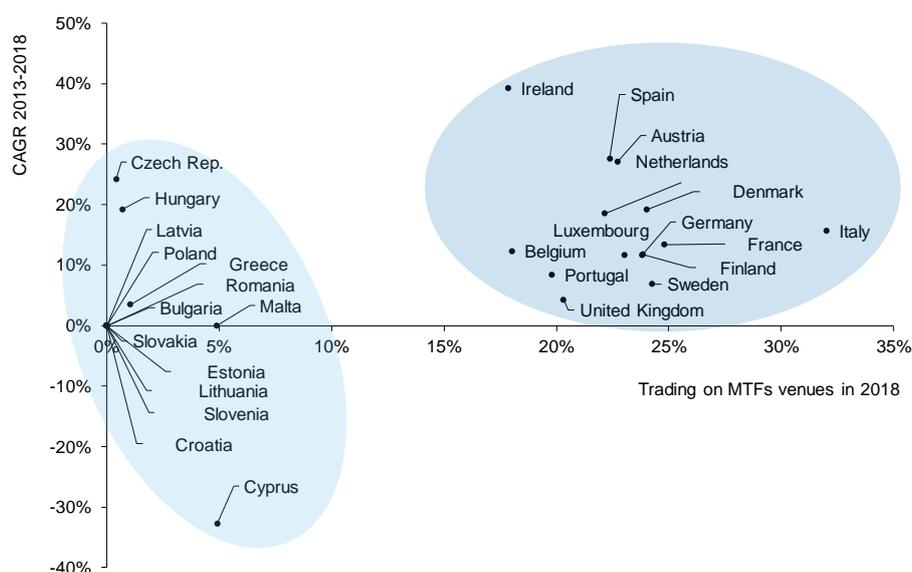
Note: The country of reference is defined as the country where the stocks are listed. The number of MTF venues is based on the list of MTFs provided by the ESMA registers for trading venues, SIs and data reporting service providers. Only MTFs with a total yearly lit turnover within the country of reference greater than 0.5% are included in the calculation. Similarly, only primary venues with a lit yearly turnover within the country of reference of greater than 0.5% are included. Total refers to the total of MTF and primary venues within the country of reference. CAGR 2013–18 is computed on the basis of the totals in 2013 and 2018.

Source: Oxera analysis of Refinitiv data.

Figure A7.4 below shows that the increase of MTFs was not homogeneous across the EU-28. The percentage of trading on MTF venues has mainly increased for stocks domiciled in large and mid-size financial centres (totalling over 15% in 2018), rather than in small financial centres (around 5%, with minimal growth during the 2013–18 period).⁶²³

⁶²³ Here, we followed the official list of MTFs provided by ESMA (https://www.esma.europa.eu/sites/default/files/tv_si_drsp_file.xls), which does not include some of the MTFs (which seem not to be officially registered). In general, MTFs account for around 23% for stocks from large financial centres.

Figure A7.4 Percentage of trading on MTFs venues and growth rate, 2013–18 (%)



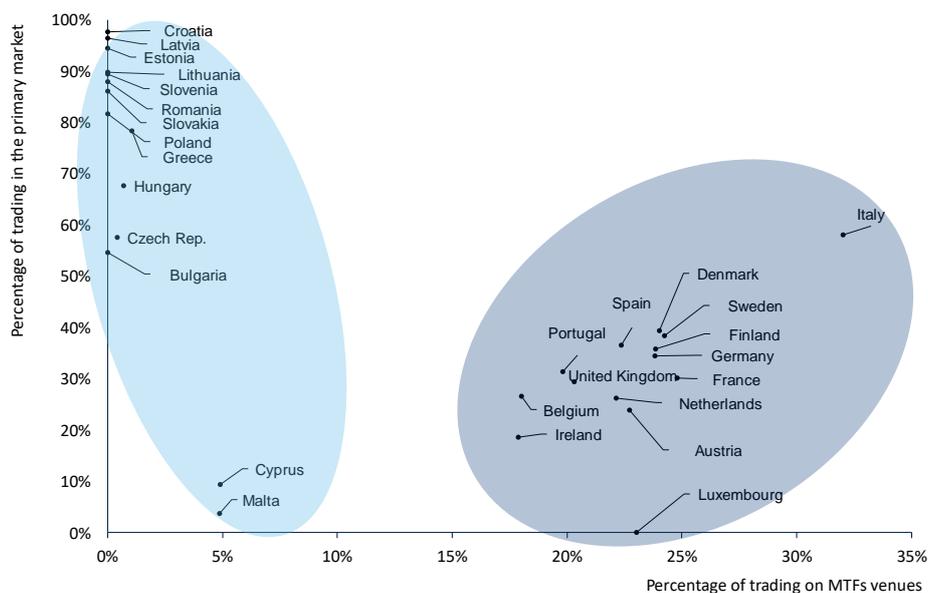
Note: Excludes Hungary, which is an outlier. The chart exhibits a high CAGR during the 2013–18 period because it moves from 0% traded on MTF venues to roughly 1% in 2018. MTFs have been identified from the ESMA registers for trading venues, SIs and data reporting service providers. This means that MTFs not registered are not considered in the analysis.

Source: Oxera analysis of Refinitiv data.

Figure A7.5 below shows that, in 2018, the MTF market shares in large and mid-size financial centres were around 23%, ranging from 18% in Ireland to 32% in Italy. The share of the traditional stock exchanges in these countries does not exceed 50% (with the exception of Italy). In particular, Luxembourg exhibits only 0.02% of equity traded on the primary stock exchange. A large share of Luxembourg stocks is traded on Cboe (48% in 2018).

In smaller financial centres, the share of the domestic primary market is very high, exceeding 50% in almost all the countries—and above 75% in 9 of the 14 countries analysed. This is coupled with a low share of trading in MTFs, lower than 5% for most countries. The exceptions in this group are Cyprus and Malta, where the share of the domestic primary market as well as of MTFs is low. A significant proportion of the trading in these markets takes place in other trading venues: in 2018, 54% of the trading in Cypriot equity took place on the Oslo Stock Exchange, while 31% of the trading in Maltese equity took place on Nasdaq Nordic.

Figure A7.5 Percentage of equity trading within the domestic primary market and on MTFs, 2018 (%)



Note: MTFs have been identified following the ESMA registers for trading venues, SIs and data reporting service providers. This means that MTFs not registered are not considered in the analysis.

Source: Oxera analysis of Refinitiv data.

A similar trend is observed when considering all alternative trading venues, including SIs, across all trading mechanisms. Trading on venues other than the regulated markets, in general, accounted for 63% of the total turnover value in the EU in 2018,⁶²⁴ and has been increasing since 2013. The average proportion of turnover on alternative venue is around 61% among large financial centres, compared to the average of 16% in small financial centres.⁶²⁵

Figure A7.6 below shows the fragmentation index across the EU countries, calculated using the Fidessa Fragmentation Index (FFI).⁶²⁶ Overall, markets in Europe seem fairly fragmented, with the average FFI in the EU-28 at around 2.2 in 2018. However, there has been a small reduction in fragmentation in recent years owing to an increase in the concentration of trading within the major venues in most European countries.

In addition, the level of market fragmentation is not homogeneous across the EU. Large and mid-size financial centres exhibit greater fragmentation, especially Ireland, Luxembourg and the Netherlands, with an FFI above 3. The high level of fragmentation in these markets is driven by the high percentage of trading on MTF venues (around 30%), the low percentage of trading on the primary market (below 40%),⁶²⁷ and the high level of trading on alternative venues such as Posit and Equiduct.

⁶²⁴ Estimated at the aggregate EU-28 level for year 2018.

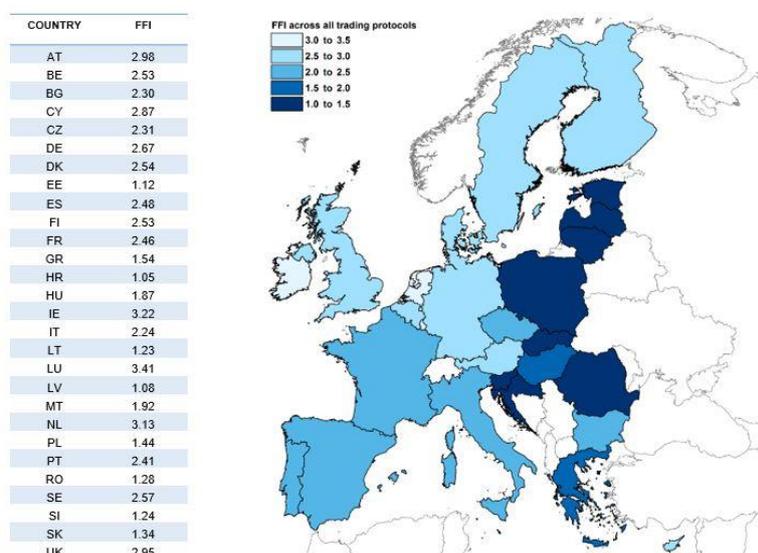
⁶²⁵ Estimated as the average of country-level observations for the underlying countries within the sample of small and large financial centres.

⁶²⁶ This is essentially the inverse of the Herfindahl–Hirschman index. The FFI departs from the recognition of all possible venues where trading of an instrument takes place, and measures the efficiency with which the market participants use all available channels to route their orders. In short, the index shows the average number of venues that an investor would need to visit to achieve best execution when completing an order. An index of 1 means that the stock is traded at one venue. Once a stock's FFI exceeds 2, the liquidity in that stock has fragmented to the extent that it no longer belongs to its originating venue.

⁶²⁷ Italy is an exception; 58% of trading takes place on the primary market.

Smaller financial centres exhibit lower level of fragmentation. In particular, there is a high level of concentration within lit markets, with more than 80% of lit trading occurring within the primary market; and a low level of trading on MTFs venues—between 0% and 5%.

Figure A7.6 The FFI across all types of trade in each of the EU-28, 2018



Source: Oxera analysis of Refinitiv data.

A7.3 Country-level data on equity trading in the EU

This section provides detailed country-level data on the turnover and trading volumes in equity markets (Table A7.2), the number of trading venues (Table A7.3), and commission rates (Table A7.4), as a complement to the discussion in sections 10 and 11.

Table A7.2 Trading volume and turnover value across EU-28, 2013–18

Country	Trading volume (m)			Turnover value (€bn)		
	2013	2018	CAGR 2013–18	2013	2018	CAGR 2013–18
UK	1,095,303	1,170,367	1%	3,582	4,875	5%
Germany	101,548	111,415	2%	3,074	4,210	5%
France	97,053	122,203	4%	2,093	3,693	10%
Netherlands	56,370	100,953	10%	664	1,584	16%
Spain	242,062	289,140	3%	1,210	1,549	4%
Sweden	92,751	136,539	7%	710	1,057	7%
Italy	489,731	402,697	-3%	834	933	2%
Belgium	10,708	10,353	-1%	396	496	4%
Denmark	11,283	14,307	4%	264	488	11%
Finland	39,304	42,494	1%	254	451	10%
Austria	3,864	4,706	3%	141	300	13%
Ireland	72,098	30,130	-14%	92	273	20%
Luxembourg	15,676	16,043	0%	138	218	8%
Portugal	79,629	39,731	-11%	67	76	2%
Poland	34,231	14,988	-13%	76	57	-4%
Greece	12,981	11,813	-2%	26	18	-6%
Hungary	1,525	1,754	2%	12	13	2%

	Trading volume (m)			Turnover value (€bn)		
	2017	2018	% change	2017	2018	% change
Czechia	514	831	8%	12	8	-7%
Romania	14,086	8,097	-9%	2.5	2.3	-1%
Malta	180	324	10%	0.1	2.3	61%
Cyprus	3,123	5,948	11%	2.4	0.7	-18%
Bulgaria	584	362	-8%	0.7	0.3	-10%
Slovenia	17	9	-10%	0.3	0.3	0%
Estonia	136	122	-2%	0.2	0.2	1%
Croatia	N/A	31	N/A	N/A	0.2	N/A
Lithuania	158	134	-3%	0.1	0.1	-1%
Latvia	10	5	-11%	0.0	0.0	-2%
Slovakia	2	0	-31%	0.0	0.0	-25%
Total EU-28	2,474,926	2,535,498	0.4%	13,579	20,157	7%

Note: The yearly values are the sum of the monthly values. Countries are presented in descending order based on 2018 turnover. Volume is the number of shares that traded in the trade year.

Source: Oxera analysis of Refinitiv Market Share Reporter data.

Table A7.3 Number of trading venues, by country, 2013–18

Country	MTF		Primary venues		Primary domestic venue	Total 2018	CAGR 2013–18
	2013	2018	2013	2018			
Cyprus	3	6	5	6	36% ¹	12	7.0%
Luxembourg	4	7	6	5	0.08% ²	12	3.1%
Austria	4	8	4	4	73%	12	7.0%
Finland	4	7	3	4	90%	11	7.8%
United Kingdom	3	6	4	4	93%	10	6.1%
Netherlands	4	7	3	3	68%	10	6.1%
Denmark	3	7	3	3	91%	10	8.9%
Ireland	4	7	2	3	31% ³	10	8.9%
Germany	4	8	2	2	90%	10	8.9%
Belgium	3	8	2	2	90%	10	12.2%
Sweden	3	7	2	2	92%	9	10.3%
Portugal	3	7	2	2	91%	9	10.3%
Malta	0	5	2	3	6% ⁴	8	26.0%
Spain	3	6	2	2	82%	8	8.1%
France	3	6	2	2	84%	8	8.1%
Italy	3	5	1	1	100%	6	7.0%
Greece	1	2	1	2	99%	4	12.2%
Czechia	2	2	2	2	99%	4	0.0%
Slovakia	0	0	3	3	93%	3	0.0%
Hungary	1	2	2	1	100%	3	0.0%
Bulgaria	0	0	1	2	94%	2	12.2%
Estonia	0	0	2	2	99%	2	0.0%
Lithuania	0	0	2	2	88%	2	0.0%
Poland	0	1	1	1	100%	2	12.2%
Latvia	0	0	1	1	100%	1	0.0%
Slovenia	0	0	2	1	100%	1	-10.9%
Croatia	0	0	0	1	100%	1	n.a.
Romania	0	0	1	1	100%	1	0%

Note: The country of reference is defined as the country where the stocks are listed. The number of MTF venues is based on the list of MTF provided by the ESMA registers for trading venues, SIs and DRSPs. Only MTFs with a total yearly lit turnover within the country of reference greater than 0.5% have been included in the computation. Similarly, only primary venues with a lit yearly turnover within the country of reference greater than 0.5% have been included. Total refers to the total of MTF and primary venues within the country of reference. CAGR 2013–18 is computed on the basis of the totals in 2013 and 2018. The table is sorted by total 2018. ¹ 41% of lit trading on primary venues takes place on the Warsaw Stock Exchange. ² 53% of lit trading on primary venues takes place on Euronext. ³ 59% of lit trading on primary venues takes place on LSEG. ⁴ 93% of lit trading on primary venues takes place on Nasdaq Nordic. However, in 2013 97% of lit trading on primary venues took place on the Malta Stock Exchange.

Source: Oxera analysis of Refinitiv data.

Table A7.4 Breakdown of commission rates by country, 2009–19 (bp)

Country	Q1 2009	Q1 2019
Hungary	27.51	10.85
Czech Republic	21.71	9.64
Poland	28.66	9.10
Greece	19.69	8.98
Ireland	12.53	5.21
UK	10.87	5.13
Belgium	9.95	5.09
Denmark	11.85	5.03
Austria	10.44	5.01
Netherlands	10.50	4.99
Sweden	9.82	4.92
France	10.45	4.91
Portugal	10.90	4.86
Italy	10.07	4.83
Germany	11.25	4.81
Spain	9.80	4.77
Finland	10.88	4.64

Note: Financial centres are sorted by commission rates in Q1 2019. Virtu's underlying country-specific cost calculations were supplied based on a weighted notional average.

Source: Oxera analysis of Virtu Global Peer database.

A8 Choices in trading mechanisms

As discussed in section 11, the increased competitive pressure from alternative trading venues on the regulated stock exchanges has resulted in a reduction in trading fees, and innovations in trading mechanisms that cater to specific trading needs. In this appendix, further detail is provided on trading mechanisms available across EU secondary markets, as a complement to the discussion in section 11.

Table A8.1 summarises key features of various trading mechanisms in European secondary markets, based on order type and order matching system; pre- and post-trade transparency requirements; the price-determination process and contribution to price formation; speed of execution; and type of interaction between market participants (multilateral versus bilateral trade).

Table A8.1 Features of trading mechanisms in the EU

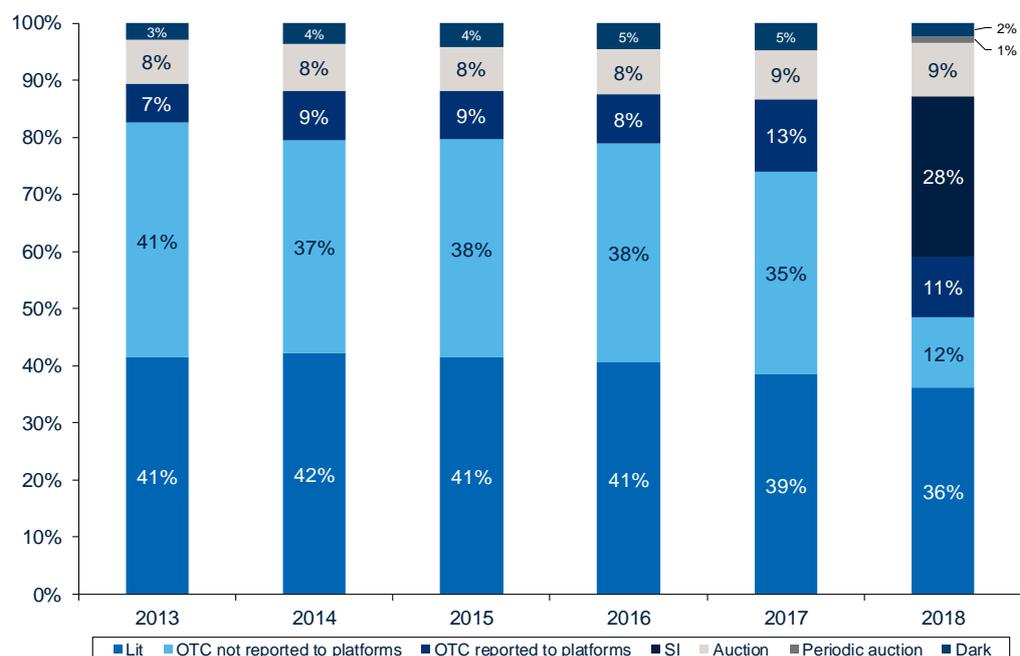
	Lit trading	Periodic auctions	Auctions	Dark trades	SIs	OTC
Order types	Market/limit	Market/limit/mid-EBBO (European Best Bid and Offer) pegged	Market/limit/stop	Buy/sell/immediate-or-cancel/fill-or-kill	Market/limit/pegged	Market/limit
Order matching system	Market—Immediate matching	Any order type can match with any other order type	Price—volume—time priority—member priority	Continuous crossing or scheduled crossing	Market—at any price Limit—at limit or better	Perfect match for internal execution
Price determination	$P_{\text{sell}} =$ highest bid price $P_{\text{buy}} =$ lowest ask price	$P =$ best bid—ask offer Pegged auction at midpoint	Equilibrium price	Primary exchanges as reference point	Primary exchanges as reference point	Trade size/price negotiable
Contribution to price formation	✓	Partial	Partial	×	×	×
Speed of execution	Immediate	25–150 minutes	Several minutes	Variable	82 minutes average	n/a
Multilateral	✓	✓	✓	✓	✓	✓
Pre-trade transparency requirements	✓	Dependent on periodic auction system	✓	×	Limited	×
Post-trade transparency requirements	✓	Dependent on periodic auction system	✓	✓	✓	OTC seller reports
Best-execution data provided	✓	Dependent on periodic auction system	✓	×	✓	✓
Reference data provided	✓	Dependent on periodic auction system	✓	×	✓	×

Note: Definitions of market mechanisms and trading models taken from the Market Model Typology project organised by FESE, Market Model Typology Mapping Matrix – v3.04, <https://www.fixtrading.org/packages/mmt-initiative-mapping-matrix-v3-04/?wpdmdl=44716&refresh=5d40745ad20961564505178>.

Source: Oxera.

Figure A8.1 summarises the average annual market share in turnover value by trading mechanism.

Figure A8.1 Average annual market share in turnover value by trading mechanisms at the aggregate European level, 2013–18 (%)



Note: Annual averages of market share estimated based on monthly turnover value of trading across different mechanisms.

Source: Oxera analysis of Refinitiv Market Share Reporter data.

OTC and SI trading stand out as two bilateral execution mechanisms with limited to no pre-trade transparency requirements. Their market share has been affected the most by the introduction of MiFID II, albeit in opposite directions. While OTC trading decreased post-MiFID II, SI market share rose sharply. However, the magnitude of the impact varies for different categories of OTC and SI trading.

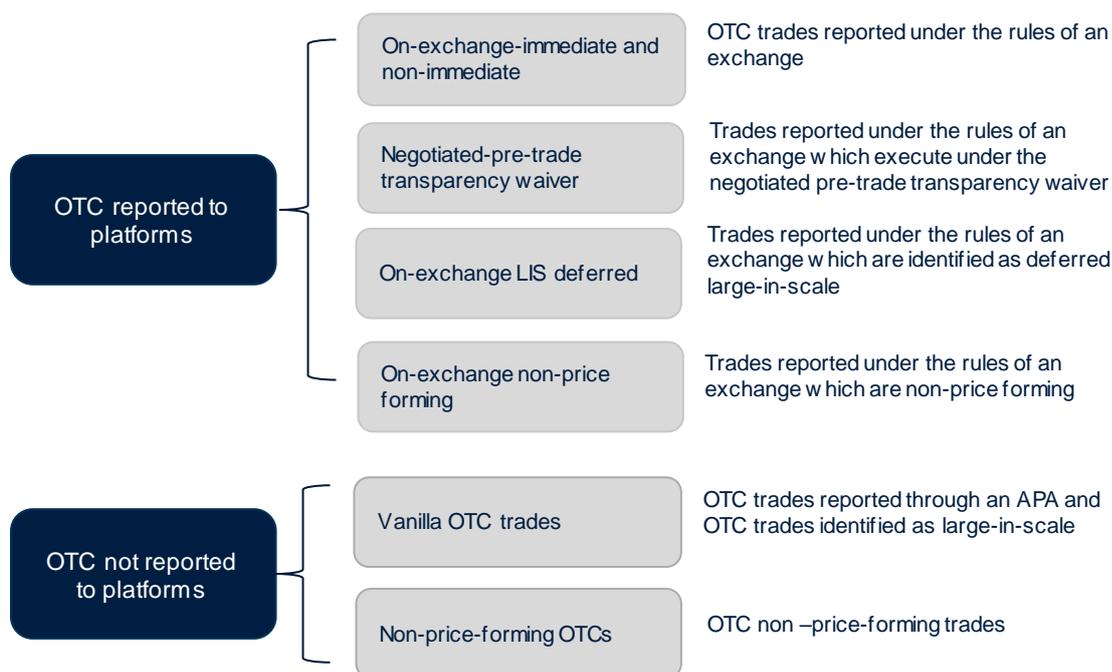
A8.1 Categories of OTC trading

As explained above, the MiFID II share trading obligation, which in effect prohibited trading via BCNs on an OTC basis, resulted in a significant reduction in OTC trading. This has affected more significantly OTC trades reported through an APA (i.e. OTC trades not reported to platforms), compared to OTC trades reported to platforms.

Figure A8.2 below explains the difference between these two categories. For the purpose of this analysis, OTC trades are split into two categories based on their reporting standards: trades reported under the rules of an exchange (OTC trades reported to platforms);⁶²⁸ and trades reported through an APA⁶²⁹ (OTC trades not reported to platforms).

⁶²⁸ For instance, to assist market participants with meeting their OTC trade reporting obligations, LSEG, in partnership with Boat Services Limited, launched TRADEcho to provide MiFID II-compliant OTC trades reporting across all asset classes.

⁶²⁹ APAs are responsible for publishing details of executed trades to the market on behalf of firms as close to real time as possible, on a reasonable commercial basis. The data should be made available free of charge 15 minutes after publication. APAs must disseminate information in a manner that ensures fast market-wide access on a non-discriminatory basis. They must also check a firm's trade messages for accuracy and completeness (requesting the resubmission of any identified erroneous messages).

Figure A8.2 Breakdown of OTC trades

Note: OTC reported to platforms refers to the total of OTC trades and prearranged orders (also called off-book on-venue or negotiated trades). As these trades are reported to platforms, they are deemed to be executed on a platform despite their bilateral negotiation. Negotiated pre-trade transparency waiver, on-exchange LIS deferred, and on-exchange non-price-forming trades all emerged after the introduction of MiFID II.

Source: Oxera analysis of Refinitiv Market Share Reporter trade types.

A8.2 Categories of SI trading

Post-MiFID II, trading in SIs gained market share sharply, to around 24% of total turnover value.⁶³⁰ There are two types of SI operator:

- new independent liquidity centres, operated by proprietary trading firms (referred to as electronic liquidity providers).⁶³¹ In September 2018 these accounted for €1.1bn average daily volume on European securities, or 5% of all SI reported activity,⁶³² and increased significantly in Q1 2019;⁶³³
- the vast majority of SI reported volumes are executed by investment banks. Within this category, a further distinction can be made between price-forming and non-price-forming transactions (see Figure A8.3).⁶³⁴

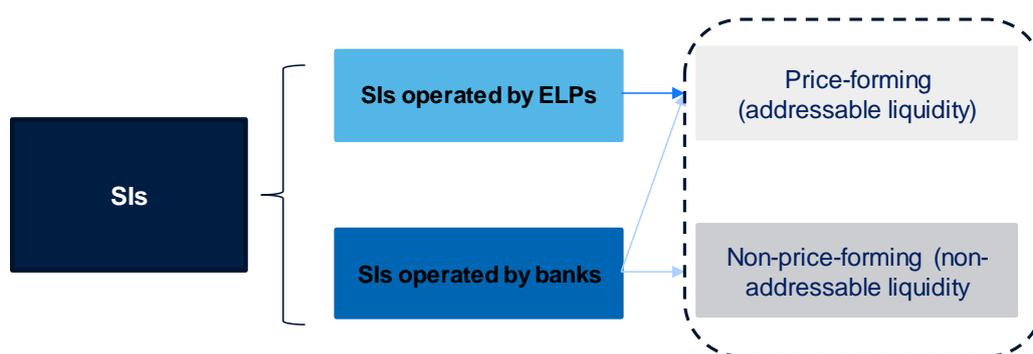
⁶³⁰ Following the introduction of MiFID II, 24% is the average market share of European SI trading based on total monthly turnover values from January 2018 to July 2019.

⁶³¹ Examples include SIs operated by Hudson River Trading, Citadel Securities, Jane Street and Tower Research.

⁶³² European Commission (2016), 'Commission Delegated Regulation (EU) of 8.6.2016, supplementing Directive 2014/65/EU', *Official Journal of the European Union*, June. Such a market structure, in which liquidity providers compete based on pricing and functionality, offers some advantages to investors (e.g. lower explicit transaction costs, potentially lowering market impact costs, and a price advantage over the best bid–ask on exchanges). However, it also has many unintended consequences for price discovery, liquidity distribution, transparency and market integrity.

⁶³³ Euronext (2019), 'Extension of the tick size regime to systematic internalisers (SIs)', February.

⁶³⁴ Some non-price-forming transactions are reported through bank SIs. These transactions are not subject to the trading mandate and can be exempted from any tick-size regime if they occur OTC.

Figure A8.3 Categories of SI trades

Note: Price-forming (i.e. addressable SI activity) excludes trades with any of the following conditions: non-price-forming trade (trade not contributing to the price-discovery process); technical trade; duplicative trade report; trade with conditions; give-up/give-in trade. Non-price-forming trades (technical trades) are identical to the list of transactions that are exempted from the share trading obligation. As such, these 'technical' trades, including volume-weighted average price transactions, are still allowed for OTC execution and not subject to any tick-size requirement when executed OTC. Non-price-forming trades are denoted by the NPFT transaction flag, under RTS1. See European Commission (2016), 'Commission delegated regulation (EU) of 14.7.2016', https://ec.europa.eu/finance/securities/docs/isd/mifid/rts/160714-rts-1_en.pdf. These are defined as transactions where the exchange of financial instruments is determined by factors other than the current market valuation of the financial instrument as listed under Article 13. This category also refers to trades not contributing to the price-discovery process denoted by the TNCP transaction flag, and are defined for the purpose of Article 23 of Regulation (EU) No 600/2014 and as set out in Article 2.

Source: Euronext (2019), 'Extension of the tick size regime to systematic internalisers (SIs)', February.

A9 Liquidity in secondary markets in the EU

Liquidity across the EU markets and over time was examined in section 12 by analysing trends in activity-based metrics (trading volume and turnover value) and price-based metrics (bid–ask spread and the implementation shortfall across the EU markets). We explain that the implementation shortfall provides a more holistic picture of how liquidity has changed over time, as this metric reflects not only the bid–ask spread but also the impact on price while the order is being executed.

This appendix provides further explanation of the multidimensional nature of liquidity, and presents analysis of the bid–ask spread, as well as the trading volume and turnover value, to complement that in section 12 based on the implementation shortfall. The appendix is structured as follows:

- section A9.1 describes the dimensions to market liquidity and the metrics that can be analysed for each dimension;
- section A9.2 examines liquidity trends across financial centres and market capitalisation groups using the bid–ask spread, trading volume and turnover value.

A9.1 Summary of liquidity dimensions and metrics

As explained in section 12, a liquid market enables participants to buy and sell securities of any reasonable order size for similar prices without delay and without significant impact on prevailing prices. Given the complex and multifaceted nature of liquidity, the liquidity of a market can be gauged in various ways, as summarised in Table A9.1.

Table A9.1 Summary of liquidity dimensions and metrics

Dimensions of liquidity	Description	Metrics
Width	Represents the cost of the immediate consumption of liquidity. Usually measured through the bid–ask spread, width typically refers to the financial cost of completing a transaction. A low or narrow bid–ask spread reflects a more liquid market, where participants face small transaction costs when they buy or sell an asset.	Bid–ask spread Implementation shortfall
Depth	Represents the volume of orders posted at the best prices in order-driven markets (i.e. trade in a limit order book). Best-limit depth is the sum of the quantities associated with the best bid and ask prices. It is the quantity of shares that can be instantaneously traded with no impact on quoted prices.	Trading volumes at best-bid ask Amihud ratio Implementation shortfall
Immediacy	Measures the time required for the reasonable execution of a large order at a given price. It is commonly measured by the elapsed time between trade placement and trade execution. A market is more immediate if transactions of a given size between buyers and sellers can be executed in a brief period of time, at a given cost. ⁶³⁵	Number of market-makers Number of market participants Implementation shortfall Average frequency of transactions and transaction sizes
Resiliency	The market's capacity to return to its initial state after liquidity has been consumed. Resiliency is a characteristic of markets in which new orders flow quickly to correct order imbalances, which tend to move prices away from what is warranted by	Price volatility Amihud ratio

⁶³⁵ Based on the definition of immediacy in Autorité des marchés financiers (2019), 'Measuring Liquidity on the Corporate Bond Market', March, https://www.amf-france.org/en_US/Publications/Lettres-et-cahiers/Cahiers-scientifiques/Archives?docId=workspace%3A%2F%2FspacesStore%2F3ec880aa-ef93-4518-8539-24a99d5070b6; and Hachmeister, A. (2007), 'Informed traders as liquidity providers: evidence from the German equity market', *Springer Science & Business Media*, 66.

Dimensions of liquidity	Description	Metrics
	fundamentals. A market is resilient if liquidity-providing orders arrive quickly to replenish the limit order book.	
Breadth	Breadth refers to the existence of both numerous and large liquidity-providing orders in volume which would minimise transaction price impact. A market is broad when larger volumes of orders can be satisfied with minimal impact on prices and when the price impact of large orders occurs at greater volumes.	Volume-based measures such as trading volume and turnover

Note: While defined here separately, the various liquidity dimensions are interdependent. Width and depth are determined together. This is because, for a given point in time, bid–ask spread components (such as inventory costs; order-processing costs and asymmetric information costs) tend to be higher for larger orders. An increase in liquidity is reflected in the fact that, for a given volume, the respective spread is smaller, or, for a given spread, a larger volume is provided. Both dimensions depend on immediacy as patient traders could possibly realise a different price for a given volume when deciding to delay their transactions.

Source: Oxera summary of the literature. See Autorité des marchés financiers (2019), 'Measuring Liquidity on the Corporate Bond Market', March, https://www.amf-france.org/en_US/Publications/Lettres-et-cahiers/Cahiers-scientifiques/Archives?docId=workspace%3A%2F%2FSpacesStore%2F3ec880aa-ef93-4518-8539-24a99d5070b6; Hachmeister, A. (2007), 'Informed traders as liquidity providers: evidence from the German equity market', *Springer Science & Business Media*, **66**; International Monetary Fund (2002), 'Measuring Liquidity in Financial Markets', Working Paper, No. 02:232, <https://www.imf.org/en/Publications/WP/Issues/2016/12/30/Measuring-Liquidity-in-Financial-Markets-16211>.

A9.2 Liquidity trends across EU equity markets

In section 12 we discuss liquidity trends across the EU markets, focusing on the implementation shortfall as a measurement of liquidity performance. However, liquidity is a multidimensional concept, and various metrics can be used to capture different aspects. Therefore, we have conducted complementary analysis, examining trends using other metrics, such as the bid–ask spread, trading volume, and turnover value. The results obtained are reported below. Information on the data used here is presented in Appendix A1.3.

A9.2.1 Overall improvement in European liquidity

The bid–ask spread⁶³⁶ averaged across the EU has reduced from 23.3bp to 7.1bp over the last ten years (based on a comparison of quarterly average spread estimates in the first half of 2009 with those in the first half of 2019).⁶³⁷

Despite being a widely used metric of liquidity by industry practitioners and in the academic literature, as a metric, bid–ask spreads have some drawbacks.

- They express the transaction cost only for those who wish to execute a marginal trade in the market, and do not provide information about how many units will be absorbed (which depends on the depth of the order book) or about the extent to which a price will move after limit orders at the best-quoted price have been executed (price continuity of

⁶³⁶ In order-driven markets, the spread is given by the order book, and is equal to the difference between the best price associated with a selling limit order (the ask price) and the best price associated with a buying limit order (the bid price).

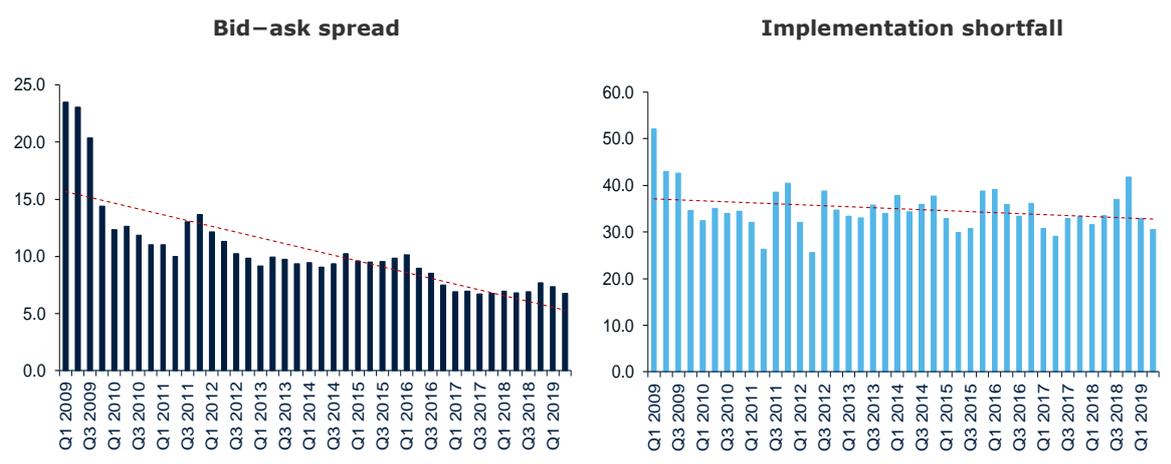
⁶³⁷ Aggregate European values are estimated as a weighted-average approach on the basis of the available number of orders (a higher weight is given to markets displaying higher-quality data). The number of orders submitted for each category is used as an approximation of data quality.

order book).⁶³⁸ Thus, bid–ask spreads might understate the liquidity risk for larger trading positions and therefore can only be a poor proxy for the level—and especially the variation—of liquidity costs for larger orders.⁶³⁹ Moreover, closing prices often deviate from the bid–ask quotes, as trades are likely to be completed at different prices from, or even outside, the quotes. In addition, quotes are not always available in all markets and for all time periods. Lit venues also often have designated market-makers who are obliged to quote bid–ask spreads in a prespecified range and for a prespecified volume. This further confounds the information contained in the spread.

- The increasing number and variety of trading venues and MTFs have contributed to an increase in liquidity fragmentation, when the same stock is traded on several different venues, so the price and the amount of stock can vary between them. As such, the same financial instrument may have different prices—contingent on transaction size and trading venue—leading to various bid–ask prices for the same instrument.

To complement the analysis of bid–ask spreads while simultaneously capturing the dimension of depth, we look at the implementation shortfall. The results based on bid–ask spreads are consistent with the observed reduction of the implementation shortfall at the aggregate European level (see Figure A9.1).

Figure A9.1 Bid–ask spreads and implementation shortfall: weighted average of EU-17, 2009–19 (bp)



Note: Country-level costs provided by Virtu were aggregated into regional costs (at the EU level) based on a number of orders-weighted average. Weights are assigned based on the number of orders submitted for each country. Thus, countries with higher numbers of orders each quarter will have more weight in the averages.

Source: Oxera analysis of Virtu Global Peer database.

A9.2.2 Trends in liquidity for small and large financial centres

As explained in section 12.2.2, as trends in liquidity vary significantly across small and large financial centres, it is useful to look separately at trends in liquidity for large financial centres and small financial centres.

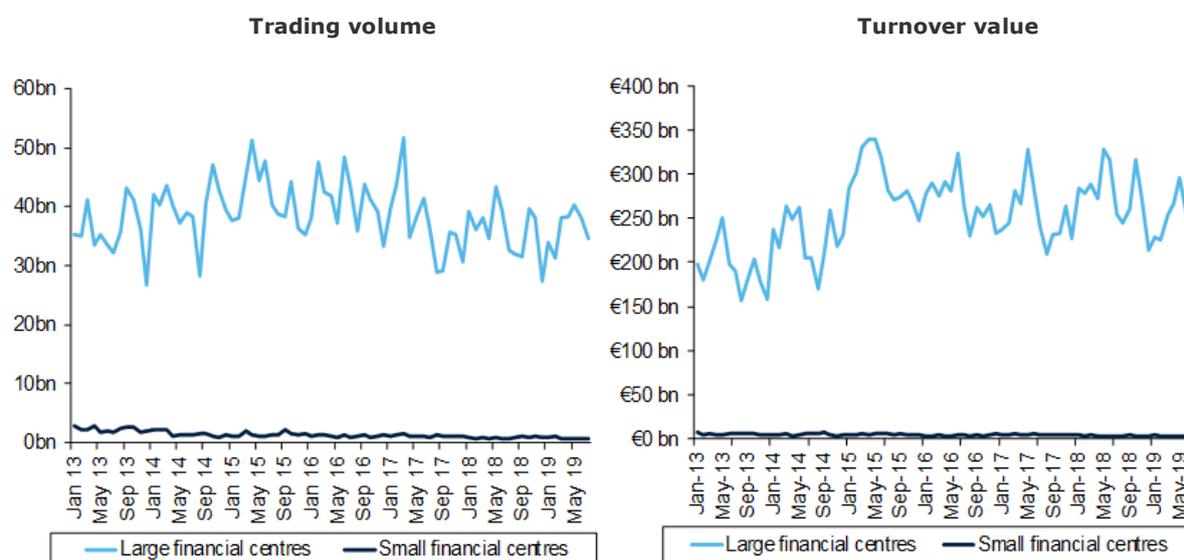
Figure A9.2 below shows that while trading volume and turnover value have been generally stable or increased in large financial centres (monthly average trading volume is around

⁶³⁸ Muranga and Bank of Japan (1999), 'Dynamics of market liquidity of Japanese stocks: An analysis of tick-by-tick data of the Tokyo Stock Exchange', Institute for Monetary and Economic Studies, IMES Discussion Paper No. 99-E-16, May.

⁶³⁹ See Kaserer, C. and Rosch C. (2013), 'Market liquidity in the financial crisis: The role of liquidity commonality and flight-to-quality', *Journal of Banking and Finance*, **45**, pp. 152–170.

35bn–36bn trades, and monthly average turnover value has increased by 22%, from €208bn in the first half of 2013 to €254bn in the first half of 2019), small financial centres display a considerable reduction in both of these metrics in the same period (monthly average trading volume has decreased by 64% from 2,309m to 822m trades and monthly average turnover value has decreased by 36% from €5.2bn to €3.3bn).

Figure A9.2 Total trading volume (bn) and turnover value (€bn) for large and small financial centres, 2009–19



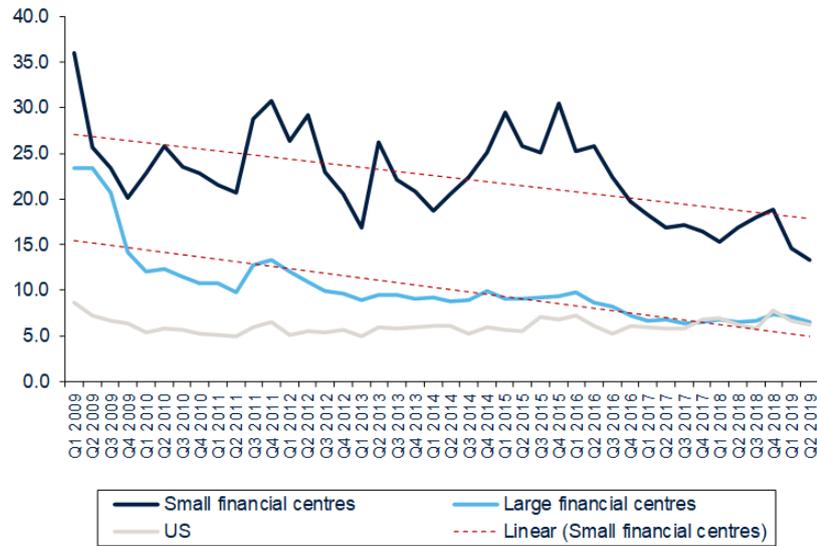
Note: Total annual trading volume and turnover are estimated as the sum of the corresponding monthly values observed at the country level.

Source: Oxera analysis of Refinitiv, Market Share Reporter data.

Figure A9.3 below presents the bid–ask spreads for large and small financial centres, and the USA, and shows the following:

- liquidity measured by bid–ask spread has improved considerably across the sample of large financial centres in Europe, from 23.4bp in the first half of 2009 to 6.8bp in the first half of 2019;
- although there is still a difference in liquidity between large financial centres in Europe and the USA, the gap between the EU and the USA spreads has narrowed significantly;
- while having improved over time, from 30.8bp in the first half of 2009 to 14.0bp in the first half of 2019, liquidity in small financial centres is significantly lower than in large financial centres. In Q2 2019 the bid–ask spread was on average 2.1 times larger in small financial centres than in large financial centres.

Figure A9.3 Bid-ask spreads in small and large financial centres in the EU and the USA, 2009-19 (bp)

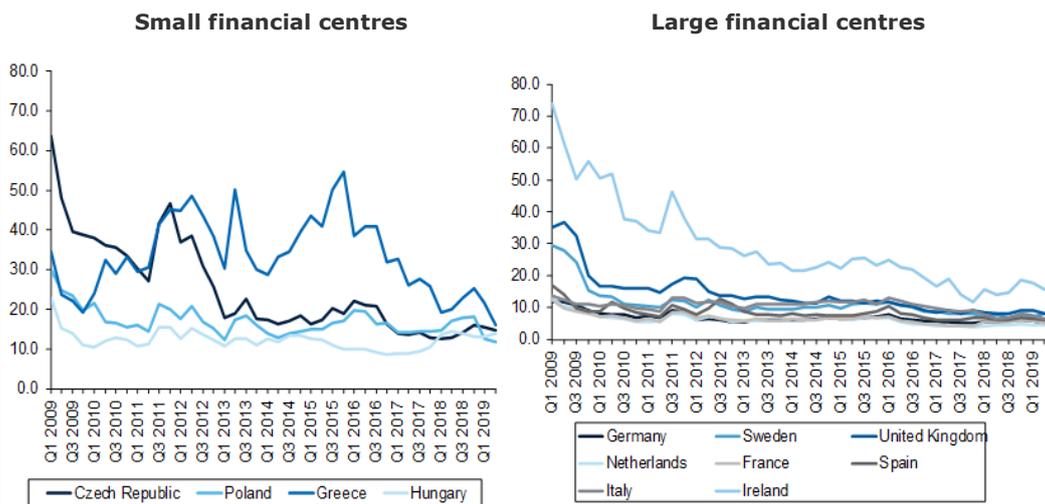


Note: Country-level costs provided by Virtu were aggregated into regional costs (at the financial centre level) based on a number of orders-weighted average. Weights are assigned based on the number of orders submitted for each country. Thus, countries with higher numbers of orders each quarter will have more weight in the averages.

Source: Oxera analysis of Virtu Global Peer Database.

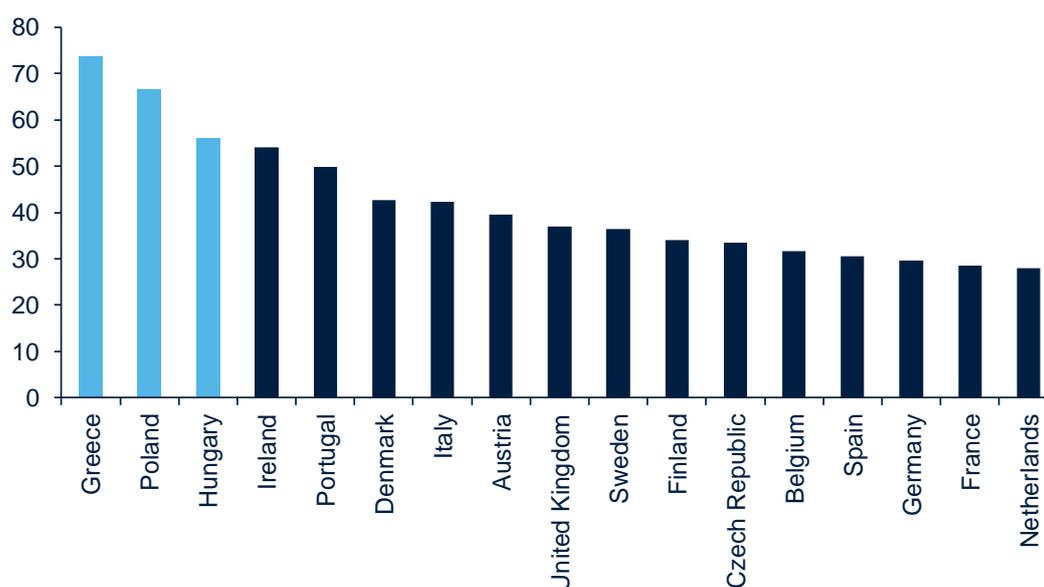
Figure A9.4 and Figure A9.5 show country-specific liquidity performance. It can be seen that country-specific trends are comparable with liquidity performance at the financial centre level when using both bid-ask spreads and the implementation shortfall.

Figure A9.4 Bid-ask spreads across large and small financial centres in the EU, 2009-19 (bp)



Note: Virtu’s underlying country-specific cost calculations have been supplied based on a weighted notional average.

Source: Oxera analysis of Virtu Global Peer database.

Figure A9.5 Average implementation shortfall, 2016–19 (bp)

Note: The average implementation shortfall is estimated as a simple average of quarterly observation at the country level from Q1 2016 to Q2 2019.

Source: Oxera analysis of Virtu Global Peer database.

A9.2.3 Liquidity improvement varies based on the market capitalisation

Liquidity has improved for both large- and small-cap stocks; nonetheless, the former remain substantially more liquid than the latter. This observation is consistent when using different liquidity metrics. Moreover, liquidity improvement varies across different categories of market cap. For instance, while trading volume was relatively stable during 2009–19 period at the aggregate European level, significant differences can be observed across market capitalisation groups (Figure A9.6 below). Trading volume is significantly higher for large-cap stocks. For stocks with a market capitalisation greater than €5bn, trading volume has decreased by 15.5%, from a monthly average of 767m in the first half of 2014 to 648m in the first half of 2019, compared to the 26.6% decrease observed for stocks with a market capitalisation between €500m and €5bn, from 161m to 118m, and the 74.1% increase for smaller stocks (i.e. with market capitalisation less than €500m), from 114m to 198m over the same period.

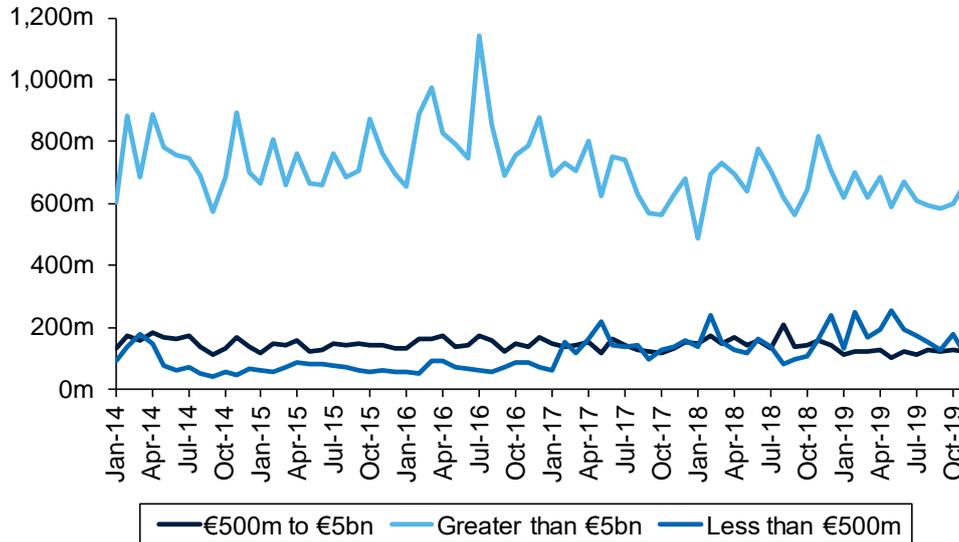
This is consistent with the fact that bid–ask spreads have reduced by different rates across market capitalisation groups. We observe that the gap in spreads between large and small cap stocks has decreased over time (from around 136bp in the first half of 2009 to 79bp in the first half of 2019, see Figure A 9.).⁶⁴⁰ However, small cap stocks started out with much higher spreads than large cap, and while reducing, their spreads are still significantly higher (see Figure A9.7). In particular:

- for stocks with a market cap value over €500m, bid–ask spreads were around 14.4–46.6bp in the first half of 2009 compared to 4.9–18.5bp in the first half of 2019;

⁶⁴⁰ For the purpose of this analysis, the large-cap category refers to stocks with a market capitalisation greater than €5bn and the small-cap category refers to stocks with a market capitalisation less than €500m.

- for stocks with a market cap value less than €500m, bid-ask spreads were around 150.8–290.0bp in the first half of 2009 compared to 84.2–138.9bp in the first half of 2019;

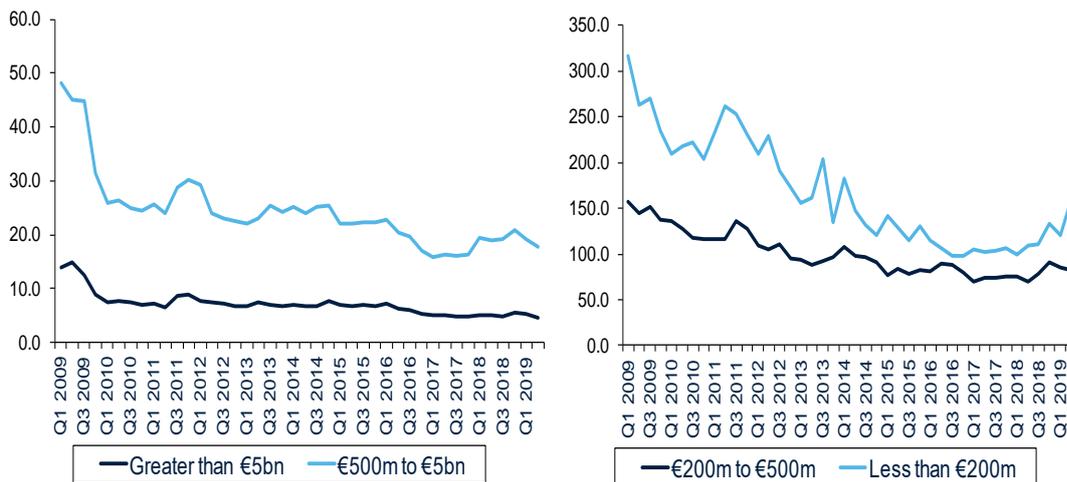
Figure A9.6 Total trading volume for the EU-14 by market capitalisation, 2014–19 (m)



Note: Trading volume reported at the aggregate European level for each category of market cap is estimated as the sum of total monthly trading volumes across the EU-14. No data for stocks larger than €5bn in Estonia and Slovakia; no data for stocks between €500m and €5bn in Bulgaria and Croatia.

Source: Oxera analysis of Bloomberg data.

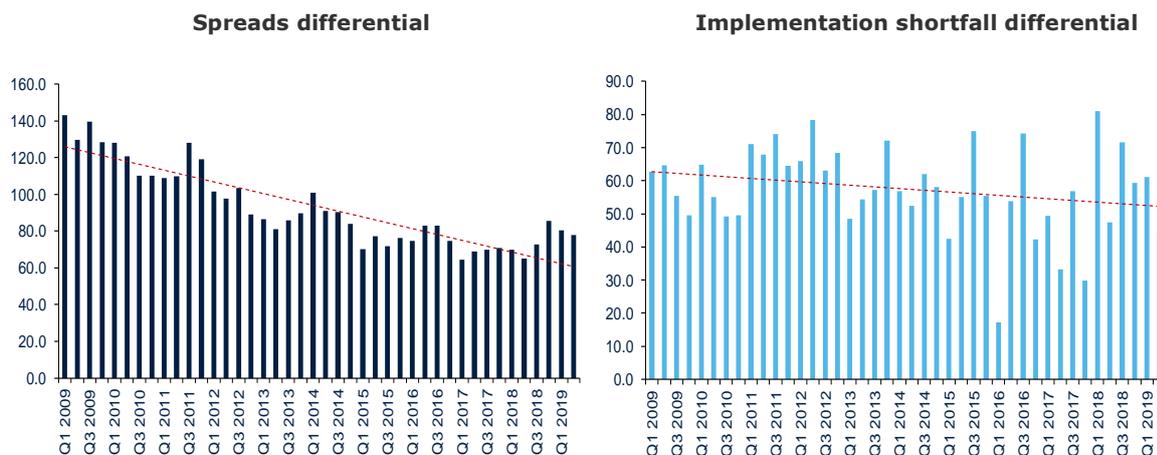
Figure A9.7 Bid-ask spread averaged for the EU-17 by market capitalisation, 2009–19 (bp)



Note: Country-level costs provided by Virtu were aggregated into regional costs (at the EU level) based on a number of orders-weighted average. Weights are assigned based on the number of orders submitted at the country level for each category of stock size. Thus, countries with higher numbers of orders for each category of stock size will have more weight in the averages. No data for stocks between €200m to €500m in Hungary; no data for stocks less than €200m in Czech Republic and Hungary.

Source: Oxera analysis of Virtu Global Peer Database.

Figure A9.8 Liquidity differential between small- and large cap stocks at the EU level, 2009–19 (bp)



Note: The liquidity differential is measured as the absolute difference of the bid–ask spread and the implementation shortfall values between small- and large-cap stocks, at the EU-wide level from Q1 2009 to Q2 2019.

Source: Oxera analysis of Virtu Global Peer database.

A10 Drivers of liquidity trends

In section 12.3, we identify several drivers that contribute to our findings on liquidity trends.

- Increased competition among trading venues has led to lower explicit trade execution costs and potentially implicit costs, as traders have the flexibility to choose the best trading mechanism to execute their trades. On the other hand, having access to multiple trading platforms has resulted in an increase in costs, such as the costs of developing SOR systems to search across multiple markets for the best available price.
- Algorithmic trading—in particular high-frequency trading—has increased significantly over time, resulting in tighter bid–ask spreads and more efficient price formation, but is also likely to have led to a reduction in market depth due to a tendency to trade in smaller orders.
- Other market developments, such as the reduction in proprietary trading by investment banks after the 2008 financial crisis and the rise in passive investment, may have led to lower trading activities, potentially affecting liquidity.

This appendix provides further detail on the drivers of liquidity trends and is structured as follows, to complement the discussion in section 12.3:

- section A10.1 outlines how our findings on liquidity trends across the EU fit in with the existing literature on the topic;
- section A10.2A9.2 provides empirical evidence on the reduction of investment banking activity, inducing proprietary trading. This suggests that the cost of providing immediacy services in equity markets may have increased;
- section A10.3 focuses on the implications of distributed ledger technology (DLT), such as initial coin offerings (ICOs) and other DLT solutions; and
- section A10.4 gives an overview of liquidity in the US equity market.

A10.1 Literature review on the impact of fragmentation on liquidity in equity trading

A significant number of liquidity studies find an improvement in the liquidity of equity markets, using various metrics of liquidity, from a simple bid–ask spread, price impact, quoted and effective spreads, to proprietary metrics produced by stock changes. Others have found, in general, no impact or positive impacts of market fragmentation on liquidity.

This section gives an overview of the academic literature on the impact of fragmentation on liquidity in equity markets in the EU and the USA.

Gomber et al. (2004) use a volume-weighted spread metric from Xetra’s limit order book on a sample of 21 German stocks (12 of which are included in the blue-chip index DAX), covering the 21 trading days from 2 to 31 August 2002. The authors show that resiliency is generally high after liquidity shocks (i.e. liquidity quickly reverts to normal levels), and public information has negligible impact on liquidity. Their study indicates a general improvement in liquidity. They also show that large transactions are timed on periods with high liquidity.⁶⁴¹

O’Hara and Ye (2011) focus on the impact of market fragmentation on market quality for US stocks, using data covering 150 Nasdaq stocks and 112 NYSE stocks from 2005 to

⁶⁴¹ Gomber, P., Schweickert, U. and Theissen, E. (2004), ‘Zooming in on Liquidity’, EFA 2004 Maastricht Meetings Paper No. 1805.

2009. Their findings indicate that fragmentation is largely beneficial to market quality in various respects. More fragmented stocks have lower transaction costs in terms of effective spreads, and faster execution speeds. Small stocks are particular beneficiaries from this effect. While short-term volatility was found to increase with fragmentation, overall price efficiency improved in that prices tend to be closer to a random walk.⁶⁴²

Degryse et al. (2015) study the effect of dark trading and fragmentation on market quality, using order book data for 51 Dutch stocks from 2006 to 2009 for several lit and dark markets. The authors distinguish between consolidated liquidity—aggregated over all trading venues—and liquidity on the traditional market (i.e. the incumbent trading venue). Consolidated liquidity is available to investors using SOR technology, while non-SOR technology investors tap the traditional market only. Degryse et al. (2015) indicate that lit fragmentation improves liquidity aggregated over all visible trading venues. However, liquidity is lowered in the traditional market. This suggests that the benefits of fragmentation are not enjoyed by investors who send orders only to the traditional market. The authors study liquidity employing different market quality metrics such as depth (the number of shares available for a different set of basis points around the mid-quote), the quoted spread, the realised spread, and the effective spread, for the consolidated order book and the order book of the regulated market.⁶⁴³

Kaserer et al. (2013) examine the evolution from January 2003 to December 2009 of liquidity behaviour of 160 companies listed in one of the four major German stock indices (DAX, MDAX, SDAX, and TecDAX), which are all traded on Xetra. As a measurement of liquidity costs—more precisely the round-trip price impact—the authors use an order-size-dependent, volume-weighted spread measurement called XLM (Xetra Liquidity Measure). XLM measures the order-size-dependent liquidity costs of a round-trip trade. Daily values of the XLM are calculated by Xetra as the equal-weighted average of all available minute-by-minute volume-weighted spread data points for each standardised volume class. Their empirical analysis show a considerable reduction in liquidity costs (post-financial crisis). The spreads began to slowly recover (i.e. spreads became tighter) in 2009 and almost reached pre-crisis levels for the larger indices at the end of 2009. Moreover, larger volume classes seem to have suffered more than smaller order sizes from the financial crisis, and therefore the impact of the financial crisis on market liquidity becomes stronger deeper in the limit order book.⁶⁴⁴

Van Kervel (2015) find that market quality improves as a result of increased market fragmentation, but there is evidence that order duplication might bias traditional measures of liquidity and high-frequency trading activity reduces bid–ask spreads. The author uses order book data for ten FTSE100 stocks that are cross-listed on five venues. He first develops a theoretical model of competition between two centralised limit order books. In this context, he shows that HFTs, who can access both trading venues simultaneously, have an incentive to duplicate limit orders on both venues. A trade on one venue is then followed by a cancellation on the other venue. This implies that depth aggregated across venues overestimates true liquidity, since a trade on a given venue reduces aggregate depth by more than its own size.⁶⁴⁵

Holden and Jacobsen (2014) use a sample of DTAQ and MTAQ datasets from 1 April to 30 June 2008, and highlight how cancelled limit orders in current fast, competitive markets

⁶⁴² O'Hara, M. and Ye, M. (2011), 'Is market fragmentation harming market quality?', *Journal of Financial Economics*, **100**:3, pp. 459–474.

⁶⁴³ Degryse, H., Jong, F. and Van Kervel, V. (2015), 'The Impact of Dark Trading and Visible Fragmentation on Market Quality', *Review of Finance*, **19**:4, July, pp. 1587–1622.

⁶⁴⁴ Rösch, C.G. and Kaserer, C. (2013), 'Market liquidity in the financial crisis: The role of liquidity commonality and flight-to-quality', *Journal of Banking & Finance*, **45**:7, pp. 152–170.

⁶⁴⁵ Van Kervel, V. (2015), 'Competition for order flow with fast and slow traders', *Review of Financial Studies*, **28**:7, pp. 2094–2117.

contribute to increased difficulties and biases of liquidity measurement. The authors use various measurements of liquidity, such as the quoted and effective spreads; the realised spread; and the price impact, which evaluates dollar and share bid and ask depth.⁶⁴⁶

Aitken et al. (2015) investigate the effects of algorithmic trading and dark venues on US security market quality using data on listed Nasdaq securities. Employing a simultaneous equations model, they find that fragmentation of the lit market order flow, with the ensuing increase in competition, particularly from high-frequency and algorithmic trading firms, had been largely beneficial for financial markets. Effective spreads and end-of-day manipulation both fell as a result of increased fragmentation.⁶⁴⁷ Similar to Degryse et al. (2015), the effect of dark market fragmentation is found to be detrimental to market quality measured by effective spreads.

Aitken et al. (2016) use data on ASX200 constituents between 9 November 2011 and 8 November 2012, and find that fragmentation significantly improves market quality with benefits increasing with greater fragmentation. Fragmentation significantly reduces spreads for stocks that are least constrained by the minimum tick size, while constrained stocks experience significant increases in depth. The authors explore various market quality metrics including: i) quoted spreads; ii) effective spreads that calculate the cost of a transaction for the liquidity demander and are the difference between the transaction price and the midpoint at the time of the transaction; iii) the five-minute price impact, assuming that liquidity providers are able to reverse any position they have accrued at the midpoint five minutes subsequent to the trade; and iv) Amihud's measure of illiquidity to determine whether there has been a change in the market impact of trades.⁶⁴⁸

Haslag et al. (2016) find that fragmentation causes reduced bid–ask spreads and better price efficiency for large stocks, whereas, for small stocks, fragmentation causes increased bid–ask spreads, worse price efficiency, and more variability in liquidity. To investigate the impact of market fragmentation on liquidity, the authors combine data from the Center for Research in Security Prices, the New York Stock Exchange Trade and Quote database, and the Securities and Exchange Commission over the period 2004–13. Using the national best bid and offer (NBBO) prices,⁶⁴⁹ they calculate the bid–ask spread at every second by taking the difference of the ask and bid price scaled by their midpoint; and consolidated depth at the NBBO, which indicates the number of shares a trader could access at the NBBO price.⁶⁵⁰

Gresse (2017) argue that neither dark trading nor fragmentation between lit order books is found to harm liquidity. Lit fragmentation improves spreads and depth across markets and locally on the primary exchange, or at worst does not affect them. Benefits are greater for large stocks and stocks with less electronic trading. Liquidity is measured for two categories of traders: local traders who connect to the primary exchange only, and cross-market traders who are connected to all trading venues or use SOR technology that enables them to distribute their orders across several marketplaces. The analysis is based on data from eight stock exchanges and a trade reporting facility for equities listed on the London Stock Exchange and Euronext examined during the pre-MiFID period of October 2007 and the three post-MiFID one-month periods: January, June and September 2009.

⁶⁴⁶ Holden, C.W. and Jacobsen, S. (2014), 'Liquidity measurement problems in fast, competitive markets: expensive and cheap solutions', *The Journal of Finance*, **69**:4, pp. 1747–1785.

⁶⁴⁷ Aitken, M.J., Harris, D. and Harris, F.H. (2015), 'Fragmentation and Algorithmic Trading: Joint impact on Market Quality', <http://ssrn.com/abstract=2587314>.

⁶⁴⁸ Aitken, M.J., Chen, H. and Foley, S. (2016), 'The impact of fragmentation, exchange fees and liquidity provision on market quality', *Journal of Empirical Finance*, **41**, pp. 140–160.

⁶⁴⁹ NBBO is a SEC regulation that requires brokers to execute customer trades at the best available ask price when buying securities, and the best available bid price when selling securities, as governed by the Reg NMS.

⁶⁵⁰ Haslag, P., and Ringgenberg, M.C. (2016), 'The Causal Impact of Market Fragmentation on Liquidity', Working Paper, Centre for Finance and Accounting Research, Washington University of St. Louis, https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=AFA2016&paper_id=1572.

Three metrics of liquidity are considered: quoted spreads, effective spreads, and depth displayed at best quotes.⁶⁵¹

Johann et al. (2018) study the evolution of liquidity for a sample of 982 stocks of the German CDAX index between 2000 and 2018, using price- and activity-based liquidity measures; namely, i) trading value estimated as the daily sum of all trading volume either during the continuous trading session or during all auctions of that day; ii) quoted spread, defined as the time-weighted spread as a percentage of the quote midpoint; iii) effective spread, defined as the value-weighted effective spread as a percentage of the quote midpoint, iv) price impact, estimated as twice the signed change in the quote midpoint from immediately prior to a trade until five minutes after the trade, expressed as a percentage of the quote midpoint; and v) time-weighted average depth at the best bid and ask. They conclude that liquidity has generally increased over time. This result is substantiated by declining bid–ask spreads and price-impact measurements since the early 2000s. Moreover, the authors find that in times of crisis, liquidity is lower and the volatility of liquidity is significantly higher. Commonality in liquidity was highest during the financial crisis. They also find significant commonality between liquidity in the US and German equity markets.⁶⁵²

Research from various regulatory bodies has also found improvements in liquidity in recent years. A 2016 ESMA study covering a sample of 100 stocks on 12 trading venues in nine EU countries for May 2013 finds that order duplication—a practice that has become increasingly popular as a result of traders looking to match orders across multiple trading venues—is likely to lead to overestimation of available liquidity. The relevant metric in this case is the net liquidity, measured by the aggregated volume of displayed orders across markets excluding duplicated orders.⁶⁵³

An FCA article in 2016 indicates that trading costs in UK equity markets appeared to be trending downwards, measured throughout a three-year period ranging from 2012 to 2015. The analysis focuses on trading in FTSE 100 shares, as well as Euronext Paris and the NYSE for comparison. The authors find that execution quality had improved since 2012 on the major UK equity trading venues. They look at five metrics: i) volume estimated as the average number of shares traded per FTSE100 stock per day; ii) quoted spreads estimated as the difference between the best bid and offer order prices on a venue; iii) effective spread factors in part of the trading costs of brokers at the point they demand liquidity (i.e. cross the spread) when executing trades; iv) price impact, which quantifies the ability of a market to absorb the execution of large orders without the price moving significantly; and v) depth, which refers to the average volumes at the best bid and ask. While depth had been stable, the FCA analysis shows that the three peer markets (France, the UK and the USA) had observed a reduction in price impact during the period studied.⁶⁵⁴

A10.2 Reduction in proprietary trading

This section provides empirical evidence on the reduction of investment banking activity, including proprietary trading. This suggests that the cost of providing immediacy services in equity markets might have increased.

⁶⁵¹ Gresse, C. (2017), 'Effects of lit and dark market fragmentation liquidity', *Journal of Financial Markets*, February, pp. 1–20. The author's selection procedure results in a pre-/post-MiFID-comparison sample of 140 stocks, of which 51 pertain to the FTSE100, 32 to the CAC40, and 57 to the SBF80, and in a post-MiFID time-series-analysis sample of 152 stocks distributed between 64 FTSE100 components, 32 CAC40 components, and 56 SBF80 components.

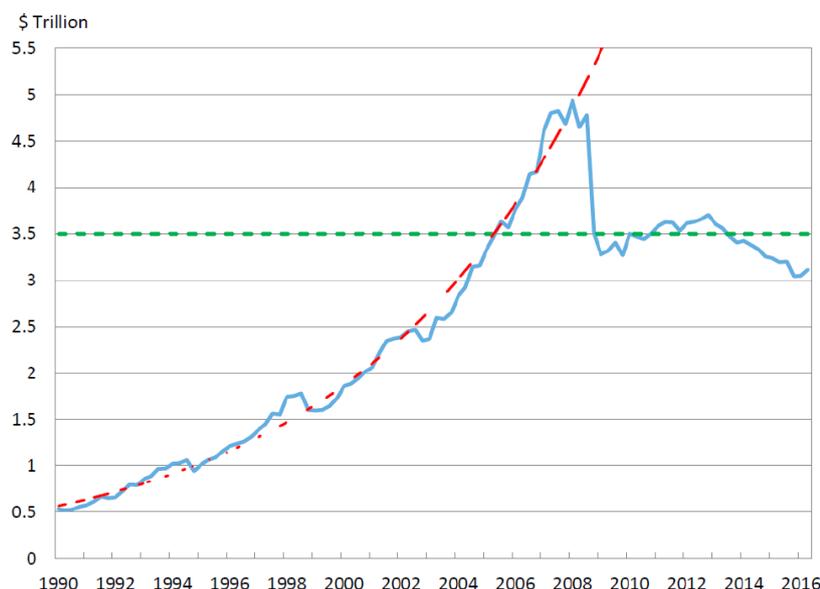
⁶⁵² Johann, T., Scharnowski, S., Theissen, E., Westheide, C. and Zimmermann, L. (2018), 'Liquidity in the German Stock Market', *Schmalenbach Business Review*, **71**:4, pp. 443–473.

⁶⁵³ European Securities and Markets Authority (2016), 'Order duplication and liquidity measurement in EU equity markets', Economic Report, No. 1, https://www.esma.europa.eu/sites/default/files/library/2016-907_economic_report_on_duplicated_orders.pdf.

⁶⁵⁴ Financial Conduct Authority (2016), 'UK equity trading costs continue to decline', Insight, November, <https://www.fca.org.uk/insight/uk-equity-trading-costs-continue-decline>.

Figure A10.1 shows, while the size of dealer balance sheets in the USA expanded exponentially from 1990 to 2008, with a peak close to \$5 trillion, it has been at around \$3.5 trillion since the financial crisis.

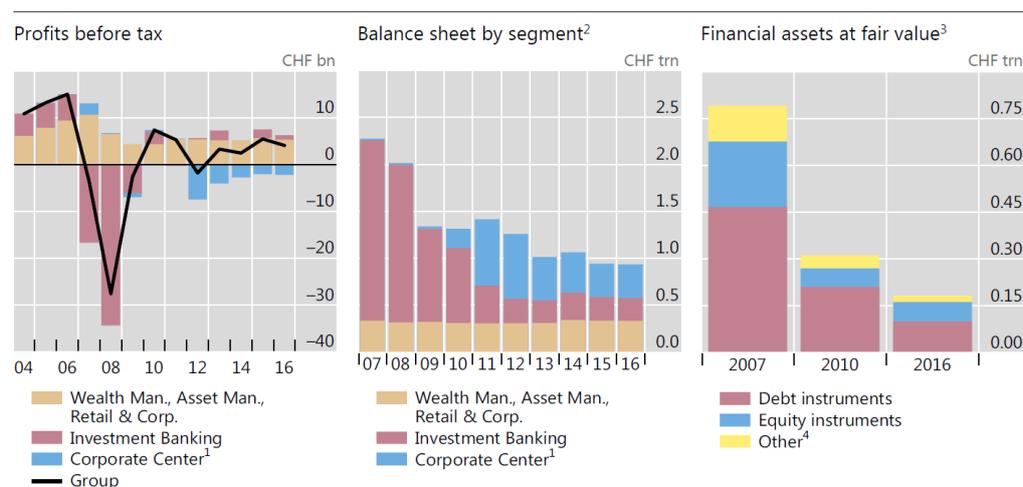
Figure A10.1 Dealer assets in the USA, 1990–2016 (\$ trillion)



Note: Total financial assets of security brokers and dealers at the subsidiary level. The red-dotted curve shows the exponential growth trend computed over 1990–2008. The green-dotted line is set at \$3.5 trillion. The data is from the financial accounts of the USA published by the Board of Governors of the Federal Reserve System.

Source: Federal Reserve Bank of New York (2016), 'Market Liquidity after the Financial Crisis', Staff Reports, p. 5, figure 1, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr796.pdf.

Two prominent examples of substantial strategic and business model shifts at the Global Systemically Important Financial Institutions (G-SIBs) in Europe are RBS and UBS. In both cases, these banks have downsized their investment banking units and repositioned to focus largely on other intermediation activities (see Figure A10.2 below). However, as discussed in section 10.1, trading volume and turnover value have been stable (or slightly increased) since at least 2013, indicating that other market participants, including HFTs, ETFs and hedge funds, may have compensated for the reduced trading activities done by banks.

Figure A10.2 UBS balance sheet and profit

¹ Including legacy unit. ² Third-party view. ³ Excluding positive replacement value. ⁴ Including precious metals and commodities.

Note: Part of the balance sheet shrinkage was due to an active reduction or compression of positions by UBS, and part was market-driven.

Source: Bank for International Settlements, Committee on the Global Financial System, CGFS Papers, UBS (2018), 'Structural changes in banking after the crisis', p. 17, Graph B.2, January, <https://www.bis.org/publ/cgfs60.pdf>.

A10.3 Implications of distributed ledger technology

New technologies, in particular those based on DLT, are expected to radically change the issuing and trading process in capital markets.

Implications of initial coin offerings

Perhaps one of the most well-known use case of DLT is the tokenisation of assets and ICO, along with Security Token Offerings. An ICO is an innovative method of financing corporations by which funds are raised for a new venture based on the blockchain technology. Through an ICO, an issuer offers for sale a stock of specialised crypto tokens, with the promise that these tokens will operate as the medium of exchange when accessing services on a digital platform as developed by the venture. Following the model of IPOs, coin offerings provide a source of capital for start-ups in the blockchain space for the initial development of digital platforms, although no commitment is made as to the price of future services in tokens, or otherwise.⁶⁵⁵ The initial step is for the issuer to publish a white paper that presents details on the project (that will be implemented upon the completion of the offering), such as the amount of capital to be raised, the percentage of the virtual tokens the founders of the project will keep for themselves, the type of currency that is accepted in the offering, and the duration of the ICO campaign.

ICOs have several advantages as a new source of capital-raising. They tend to be less equity-dilutive for the issuers, since they do not automatically entail ownership rights. Under ideal conditions, ICOs can also create a competitive dynamic for the offering of the token, while providing the issuer with useful market information and an estimate of what consumers are willing to pay for the proposed services.⁶⁵⁶

⁶⁵⁵ Catalini C. and Gans, J.S. (2018), 'Initial Coin Offerings and the Value of Crypto Tokens,' MIT Sloan School Working Paper 5347-18, March 9.

⁶⁵⁶ Catalini and Gans (2018), op. cit.

On the other hand, from the investor's perspective, ICOs give access to innovative opportunities in technology that are not usually available through traditional equity investments. Another potential advantage of ICOs is liquidity. Under certain conditions, investors can sometimes trade tokens in secondary markets rather than having their value locked in the coin/security for several months and sometimes years, as is the case with private placements.⁶⁵⁷ A secondary market also means that investors can monitor real-time prices based on the company's progress, bringing more transparency into markets that can otherwise be quite opaque.

Overall, capital markets have welcomed the innovation brought by ICOs. In 2018, blockchain start-ups raised more than \$7.5 billion through ICOs.⁶⁵⁸ In the first three-quarters of the same year, approximately \$3.9bn was invested by venture capitalists in the blockchain space.

Despite the popularity of these new types of securities, ICOs remain relatively illiquid and their regulatory framework somewhat ambiguous. This casts doubts on the viability and successful future development of these markets. ICOs also seem to experience higher failure rates post-placement and face a greater risk of fraud than other offerings.

The FCA has identified the following risks related to ICOs:⁶⁵⁹

- **unregulated space:** most ICOs are not regulated and many are based overseas;
- **no investor protection;**
- **price volatility:** as with cryptocurrencies in general, the value of a token can be extremely volatile, and vulnerable to sharp changes;
- **potential for fraud:** some issuers might not have the intention to use the funds raised in the way set out when the project was marketed;
- **inadequate documentation:** instead of a regulated prospectus, ICOs usually only provide a 'white paper'. An ICO white paper might be unbalanced, incomplete or misleading. A sophisticated technical understanding is needed to fully understand the characteristics and risks of the tokens;
- **early-stage projects:** typically, ICO projects are at a very early stage of development and their business models are experimental.

Despite these challenges, ICOs, along with other forms of equity finance such as equity-based crowdfunding, have to a certain extent competed with public equity markets. Companies using these options, at present, are mostly of smaller size and the funds raised by these sources remain very small scale compared to IPOs.

Wider applications of distributed ledger technology in capital markets

While Bitcoin is an implementation of a blockchain, a blockchain is an implementation of a DLT. Different from Bitcoin (which is one of 'permission-less' cryptocurrencies or crypto-assets), in the 'permissioned' version of the technology, securities would be issued in the form of self-executing, or 'smart', contracts.

⁶⁵⁷ Burke, J. (2017), 'ICO Pros & Cons: Cutting Through The Hype', Outlier Ventures, April 16.

⁶⁵⁸ 'Funds raised in 2018,' ICodata.io, <https://www.icodata.io/stats/2018>, accessed January 5 2019.

⁶⁵⁹ Financial Conduct Authority website, Initial Coin Offerings, <https://www.fca.org.uk/news/statements/initial-coin-offerings>.

Benefits of DLT

The main benefits of DLT are lower administrative costs and settlement risk through two channels:

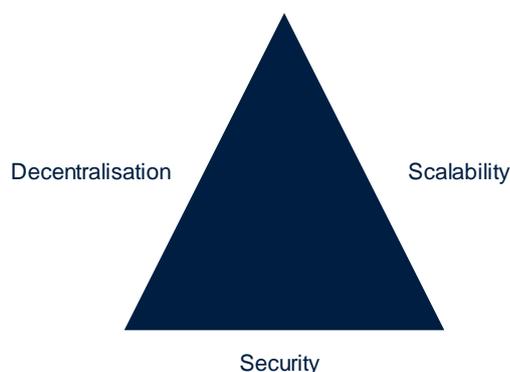
- a more streamlined, efficient and cost-effective issuing and servicing process, as programmable securities live on the chain and can pay their own dividends, self-register their owners and carry out their own reporting;
- a DLT-based clearing system would operate via smart contracts to connect cash with a securities blockchain.

The primary advantage of a DLT-based system over the current technology goes beyond automation, in that it would function autonomously after the point of release. In addition, regulators and supervisors would gain access only to the relevant data from the system. However, embedded supervision would still hold the Boards and senior management of financial intermediaries accountable for compliance with regulation. In addition, while DLT can evidence the transfer of ownership of asset-backed tokens from one entity to another, the connection between the underlying asset and the digital token must still be underpinned by the legal system.

Challenges of DLT

Despite the potential high-impact applications of DLT in capital markets, there are major challenges to realising them. The trilemma in developing distributed ledgers are decentralisation (permission-less as in the case of Bitcoin), security (correctness), and scalability (cost efficiency) (see Figure A10.3). To maintain security, there is a trade-off between **decentralisation** and **scalability**. While public blockchains offer their core features of providing maximum security and creating the best network effects due to decentralisation, they do not scale very well owing to the high computation costs required to achieve decentralisation and maintain security.

Figure A10.3 The DLT Trilemma



Source: Oxera.

The other side of development revolves around more centralised blockchains and permissioned/private blockchains. The premise is that, without cost-effective scalability, DLT will never take off. Therefore, sacrificing some decentralisation for scalability is seen as the most practical solution. Currently, many large corporations have experimented with permissioned DLT as it provides a much more private and controlled environment for companies to test the water. Some notable examples in capital markets include:

- the Australian Securities Exchange replacing the Australian Clearing House Electronic Subregister System (CHES) with DLT developed by Digital Asset;⁶⁶⁰
- the SIX Digital Exchange (SIX Group) pilot CSD for digital assets and ongoing industry-wide DLT development;⁶⁶¹
- testing undertaken by the Depository Trust & Clearing Corporation (DTCC).⁶⁶²

While offering great scalability and privacy, private blockchains do not offer the same level of network effects and deterministic guarantees that come with full decentralisation.

As a result of the wide disparity of approaches to tackle this trilemma and other issues, such as how to incorporate oracles that feed real-world data into smart contracts, DLT solutions are numerous and can differ significantly from one another. Therefore, besides scalability, the lack of *interoperability* is another challenge to further development of DLT. DLT not only needs to connect to other DLTs, but also to legacy systems. Without interoperability or standardisation—where one technology is adopted and service providers can add value through, for example, the improvement of user experience—there is a risk of further market fragmentation. This issue already exists in the current capital market infrastructure and is one that the DLT development has the potential to help resolve.

Moreover, uncertainty about how governance for these solutions would look is another reason why corporations may hesitate to adopt besides some small-scale experiments. Indeed, a report of the European Post Trade Forum points out that CSD regulation does not allow for securities traded on trading venues to be issued anywhere other than in a CSD.⁶⁶³

A10.4 Overview of liquidity in the US equity market

Liquidity in the US equity market has improved substantially by most measures since 2005, when the Reg NMS was adopted and implemented. A 2015 SEC study⁶⁶⁴ shows the following indicators of liquidity improvement in the US equity market: i) quoted bid–ask spreads for the largest stocks are significantly low, and overall spreads, including those for smaller stocks, are near historical lows; ii) displayed market depth for the median stock has grown nearly 300% in the past eight years, average daily trading volumes have returned to pre-financial crisis levels, and intraday volatility is near its lowest level in decades; iii) institutional investors also appear to be performing well—the average costs for block trade transactions have fallen by approximately 66% since 2001; and iv) while small cap stocks continue to lag behind, there has been some improvement, such as a near doubling in market depth for these securities in the last ten years. These findings are consistent with our analysis of the liquidity performance of the US equity market.

The US equity market has experienced a material transformation over the past few decades due to advances in technology and the adoption of new regulation.⁶⁶⁵ Several drivers may have contributed to this liquidity performance, including:

⁶⁶⁰ Australian Securities Exchange website, CHES replacement, <https://www.asx.com.au/services/chess-replacement.htm>.

⁶⁶¹ SIX Group Website, SIX Digital Exchange, <https://www.six-group.com/en/newsroom/media-releases/2019/20190923-six-sdx-update.html>.

⁶⁶² 'Governing DLT Networks', <https://perspectives.dtcc.com/articles/governing-dlt-networks>

⁶⁶³ UBS Group Technology (2016), 'Building the trust engine: how the blockchain could transform finance (and the world)', pp. 27–29; Bank for International Settlements (2019), 'Embedded supervision: how to build regulation into blockchain finance', working paper, No. 811, September, <https://www.bis.org/publ/work811.htm>.

⁶⁶⁴ U.S. Securities and Exchange Commission (2015), 'U.S. Equity Market Structure: Making Our Markets Work Better for Investors'.

⁶⁶⁵ Blackrock (2019), 'Mark-to-market structure: An end-investor perspective on the evolution of developed equity markets'.

- **the adoption of the Reg NMS**, which was primarily intended to: i) promote efficient execution of securities transactions; ii) encourage fair competition; iii) facilitate the availability of information to investors; iv) ensure that brokers could execute investor orders in the best market; and v) provide an opportunity for orders to be executed without the participation of a broker;⁶⁶⁶
- **electronification**—the resulting increase in connectivity and speed has made markets more accessible;
- **new market participants**—the entrance of new market participants (e.g. electronic liquidity providers, which are proprietary trading firms) has contributed to the development of better tools to manage and automate traditional market-making;
- **competition, fragmentation and complexity**—competition has benefitted retail investors in a number of ways, including by making prices generally more efficient and driving commission rates to historically low levels. However, it has also created fragmentation. For example, market participants in the USA must connect to 13 exchanges and 47 active alternative trading systems. Nonetheless, evidence suggests that increased fragmentation has not impaired market liquidity;
- **growth of ETFs**—the growth of ETFs has made the equity markets more accessible for individuals and institutional investors, and is now a central component of investors' portfolios.

On the other hand, the growth of dark pools, maker-taker and taker-maker exchange trading models, greater competition in providing market liquidity, and the technological advances in high-frequency trading have all contributed to concerns being raised about the future and integrity of US equity markets.⁶⁶⁷

The debate on unintended consequences of the Reg NMS is ongoing and attracts a high level of attention, focusing on the following main areas.

- There are concerns that the regulation might have facilitated HFTs' ability to arbitrage, as a result of the increased market fragmentation.⁶⁶⁸
- The Reg NMS may have created a complex and fragmented market with too great a focus on speed.⁶⁶⁹ In this respect, SIFMA has proposed the evaluation of the protection rule and a volume threshold for protected status and exemptions for large orders.⁶⁷⁰ It has also called for changes around market data—a contentious issue in the market, with brokers and banks arguing that prices are exorbitant, and exchanges arguing that rates are set by competition.
- While making the electronically accessible NBBO the primary determinant for order execution, the trade-through rule has created complications in the market, not only for trading venues that have to send business to their competitors,⁶⁷¹ but also for institutional investors, which face the complication and cost of accessing and executing against orders at the top of the order books of trading venues displaying the NBBO before executing a large block order with a broker.⁶⁷²

⁶⁶⁶ See CFA Institute (2017), 'Regulation NMS – Review and Recommendations'.

⁶⁶⁷ Ibid.

⁶⁶⁸ See *International Financial Law Review* (2014), 'Reg NMS in the spotlight amid HFT criticism', <https://www.iflr.com/Article/3341781/Reg-NMS-in-the-spotlight-amid-HFT-criticism.html>.

⁶⁶⁹ See *Financial Times* (2017), 'SEC urged to review rules for equity market trading', <https://www.ft.com/content/ac12e7b0-14c9-11e7-80f4-13e067d5072c>.

⁶⁷⁰ Ibid.

⁶⁷¹ The Order Protection Rule essentially requires all trading centres to ensure that trades are executed at the best publicly quoted prices, even if it means routing an order to a competitor that is publicly displaying a superior price.

⁶⁷² See CFA Institute (2017), 'Regulation NMS – Review and Recommendations'.

- The Order Protection Rule has also raised costs, as market participants are compelled to build connectivity to 13 protected venues, irrespective of available liquidity. This level of interconnectivity may also increase the risk of market disruptions. Moreover, the Rule reduces the incentives for exchanges to innovate, by declaring price to be the most important component of execution, as opposed to liquidity, anonymity or other considerations that competitive forces deem valuable.
- Unlike other major global markets, the US market maintains an inflexible 'one-size-fits-all' tick regime that does not account for differences in price levels and liquidity across thousands of listed securities.

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