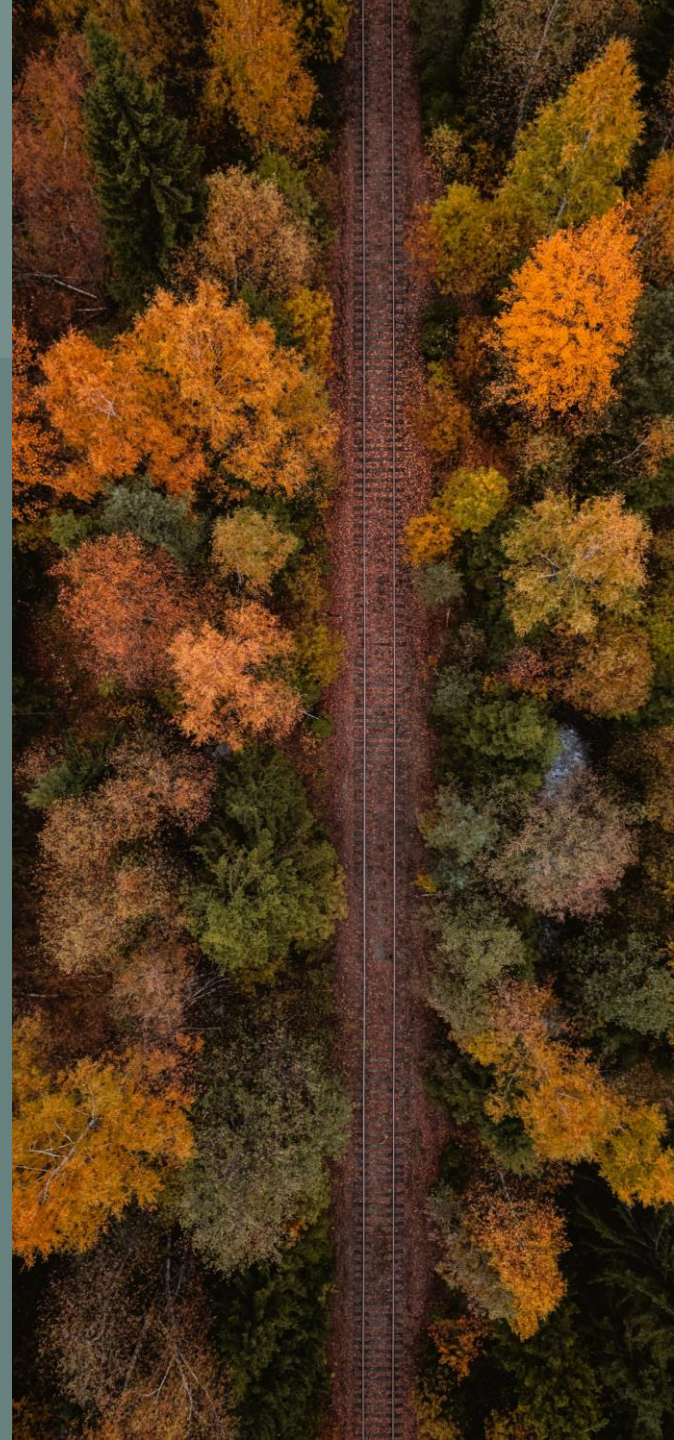
Tapping into the full potential of EU Capital Markets

Increase efficiency in the Capital Market Infrastructure by clearing the Financial Railways for blockages

A minimum of EUR 52 billion boost to GDP in the EU from an efficient Capital Market Infrastructure



An Implement Economics study commissioned by Finance Denmark

June 2026

Preface

The EU is significantly behind the US in utilising capital markets for innovation and growth. EU capital markets are underperforming in size and efficiency, meaning funds are not optimally allocated to companies that can generate the highest returns with minimal costs.

It is demonstrated in this report that addressing the root causes, rather than symptoms, can not only enhance growth and innovation in the EU, but also contribute to the simplification agenda by reducing complexity in regulation and limiting the ability for Capital Market Infrastructure companies to use that complexity as revenue tool. While EU markets may not reach US efficiency, policymakers can significantly improve competitiveness through better capital access and lower costs for listed companies, benefitting investors, including pension savers. The first step is to identify and regulate areas in the EU capital markets lacking genuine competition.

Finance Denmark commissioned Implement Consulting Group to examine the status of the EU Capital Market Infrastructure and its impact on market efficiency and growth potential. The study aims to:

1. Document competitive challenges in the EU Capital Market Infrastructure.
2. Analyse the growth potential lost due to these challenges.
3. Provide recommendations for new regulations to address these issues and unlock growth potential.

This report is, to our knowledge, the first one to adopt a comprehensive approach, examining the entire value chain of the EU Capital Market Infrastructure to shed light on the structural challenges affecting key components of the sector. The analyses in this report are based on a combination of available data, academic literature, and industry reports. While the data is scarce and not without limitations, we have sought to ensure that our conclusions are well-founded within the constraints of existing sources. As such, the findings should be understood as subject to a degree of uncertainty, yet we believe they provide a genuine and robust reflection of the competitive challenges in the EU Capital Market Infrastructure.

The focal point in this report is “Capital Market Infrastructure”, encompassing trading venues, Central Counterparties (CCPs) and Central Securities Depositories (CSDs). This report focuses on the listing exchange in each country (“incumbent exchanges”), to CCPs clearing shares and to Issuer CSDs located in EU even as trading venues cover Regulated Markets (RM), Multilateral Trading Facilities (MTF) and Organised Trading Facilities (OTF) as defined in MiFIDII/MiFIR. Systematic Internalisers are not covered as they offer bilateral risk capital and not multilateral trading and are therefore not trading venues. Furthermore, the instruments covered are limited to shares. CCPs may differ in respect of types of instruments they are able to clear. In this report, the focus is on clearing of shares. For CSDs, there are Issuer CSDs and Investor CSDs, where the issuer CSD is the CSD where securities are issued (or immobilised). The issuer CSDs open accounts allowing investors (in a direct holding system) and/or intermediaries (including investor CSDs) to hold these securities. The issuer CSDs were primarily created to serve their domestic market. ICSDs or “international CSDs” was originally set up to settle Eurobond trades and is now active also in the settlement of internationally traded securities from various domestic markets, typically across currency areas. At present, there are two ICSDs located in EU countries: Clearstream Banking in Luxembourg and Euroclear Bank in Belgium. Finally, when referring to “other data providers”, we mean vendors, benchmark providers, credit rating agencies (CRAs), and ESG-providers.

A list of abbreviations used in this report is presented in the appendix.

The EU Capital Market Infrastructure has evolved into powerful monopolies

EU Capital Market Infrastructure: Monopolies hamper competitiveness

The EU Capital Market Infrastructure has evolved into powerful monopolies after three decades of **liberalisation, industry consolidation, and insufficient competition** and urgently needs a future fit regulation to strengthen competitiveness and to tap into the full economic potential of the EU Savings and Investment Union.

The Capital Market Infrastructure is the backbone of capital allocation among EU institutions, companies, and citizens. However, **Capital Market Infrastructure companies are exploiting their dominant market positions and power**, resulting in considerable socio-economic costs for the EU economy.

Leading economic authorities and experts, including Draghi (2024) and Letta (2024), stress that **well-functioning and efficient capital markets are essential for driving productivity, growth, and prosperity**. By allocating resources where they generate the highest value, capital markets can support innovation, investment, and long-term welfare across the EU.

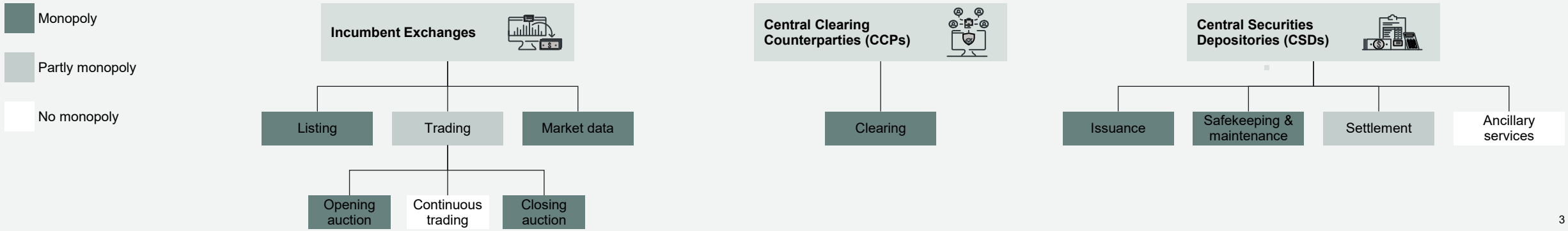
EU Capital Market Infrastructure in numbers

The Capital Market Infrastructure in the EU is notably fragmented, consisting **of 27 incumbent exchanges**, **14 Central Clearing Counterparties**, and **27 Central Securities Depositories**. Their primary role is to facilitate the connection between companies seeking capital and investors providing it.

In 2000, 14 EU countries, representing around 95% of today's market capitalisation in the EU, each had their own independently owned exchange. Today, 11 of these exchanges are owned by large exchange groups.

Currently, **94% of the EU market capitalisation on incumbent exchanges is concentrated in four exchange groups**. This yields a Herfindahl Hirschman Index of 3,038, indicating that the Capital Market Infrastructure is highly concentrated among a few companies providing them with significant market power.

Level of monopoly power across business areas in the Capital Market Infrastructure



Solving monopoly issues in the EU Capital Market Infrastructure can boost EU GDP by at least 0.3% over the next decade corresponding to EUR 52 billion

Key problems identified

Monopoly over closing auctions: Incumbent exchanges in each EU country hold monopoly power over closing auctions, as these are conducted exclusively on the listing exchange.

Monopoly over market data: Trading venues hold monopoly power over market data that is indispensable and non-substitutable for investors and intermediaries for trading, best execution, portfolio management, market surveillance, risk management, reporting, regulatory compliance and by companies for the pricing of securities and access to capital markets.

Monopoly over clearing: The primary Central Clearing Counterparty in each EU country holds monopoly over clearing if market participants cannot freely choose between Central Clearing Counterparties and the available Central Clearing Counterparties are not linked with each other. I.e., there is no interoperability, which eliminates competition.

Monopoly over issuance of shares: If only one issuer Central Securities Depository is linked to an incumbent exchange, the issuer Central Securities Depository holds monopoly power over issuance of shares in its home country. This **monopoly power extends to safekeeping and maintenance** as these are tied to the original issuance registration.

Regulatory recommendations

At least **52** bnEUR increase in GDP (0.3% of 2024 GDP)

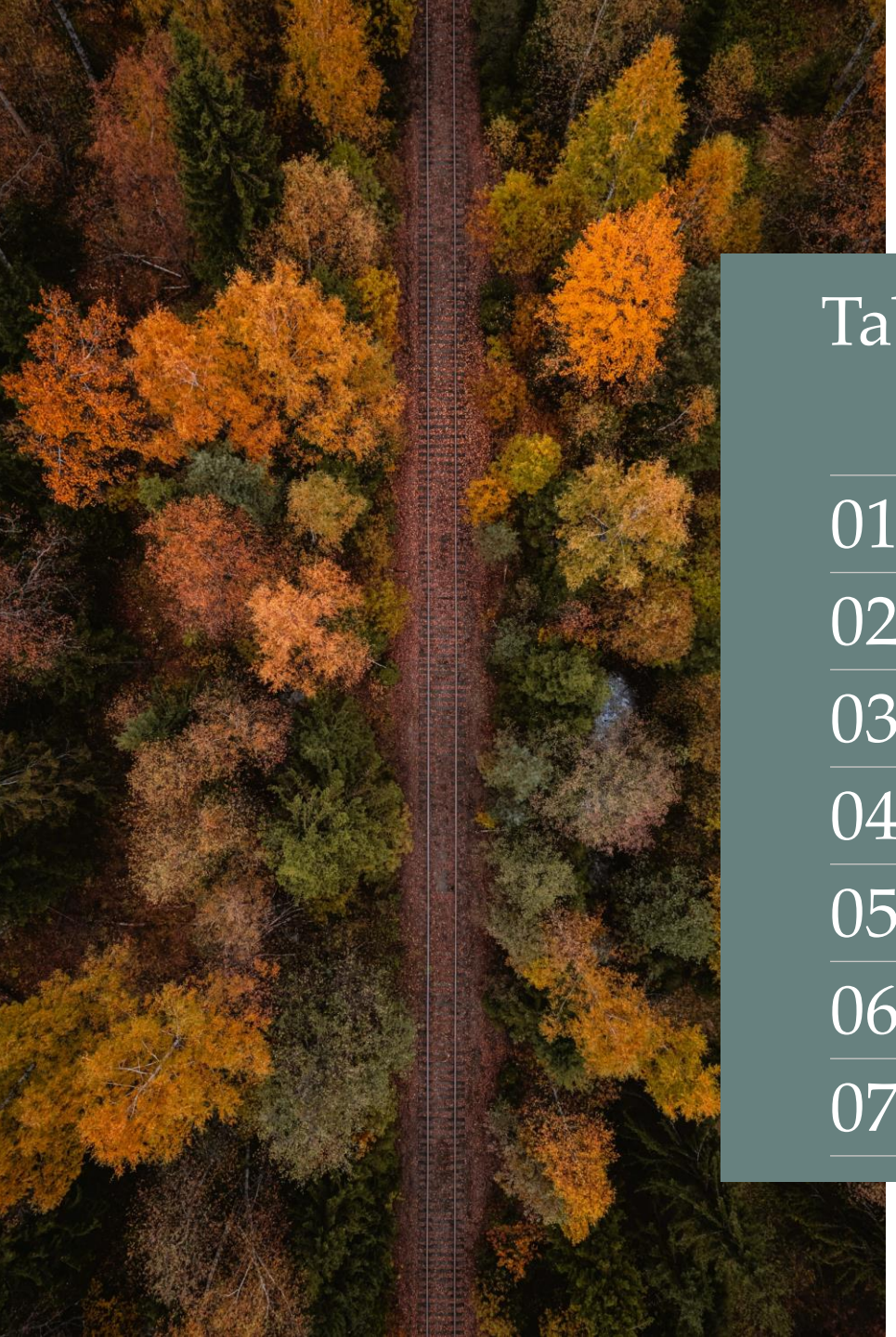
1. **EU regulations must tackle monopolies within the Capital Market Infrastructure:** To realise the economic potential, the EU Commission must introduce a future fit regulation, which will incentivise Capital Market Infrastructure companies to behave as if they were subject to well-functioning competition.

2. **Prevent abuse of monopoly power:** Given the market traits of a natural monopoly, this report advises the EU Commission to establish and enforce regulations that will:
   1) Promote cost efficiency, ensure standardised and harmonised terms and conditions including participation agreements, provide open access to fee schedules and policies for a 10-years period with multiyear comparison.
   2) Prevent monopoly rents and discriminatory practices.
   3) Ensure third-party access and transparency as regulations in other industries providing essential infrastructure services and public goods, e.g., water, energy, telecom, railways etc.

3. **Suggested regulatory solutions:**
   1) Create a robust regulatory authority with a defined mandate to develop and enforce a future fit regulation, which prevents abuse of market power and promote open, competitive markets.
   2) Build upon the insights of this report to formulate the new future fit regulation.
   3) Initiate implementation by gathering data from participants in the EU Capital Market Infrastructure to provide documentation and evidence of market misconduct.

Solving the monopoly issues can boost EU GDP by EUR 52 billion over the next 10 years

Solving the monopoly issues in the EU Capital Market Infrastructure… → …will reduce complexity and improve the efficiency of the EU Capital Market Infrastructure… → …which will reduce EU companies' cost of capital… → …leading to increased EU investments… → …that will increase EU GDP.



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Efficient capital markets are vital for EU productivity, economic growth, and wealth distribution as they allocate essential resources to companies, institutions, and citizens across the EU (I/IV)

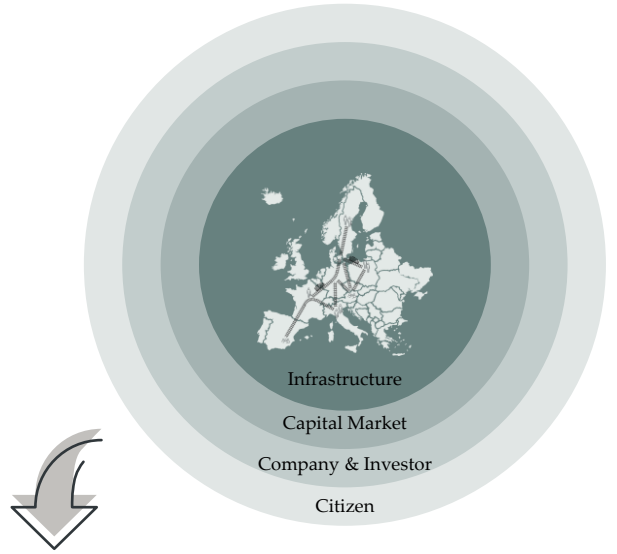
After three decades of liberalisation, industry consolidation, and insufficient competition, the EU Capital Market Infrastructure now requires regulation to enable the EU Capital Markets to reach their full growth potential.

Efficient capital markets are crucial for the productivity, economic growth, and wealth distribution of the EU, as they distribute necessary resources throughout the region.

- Academic literature and leading economic authorities, such as the European Commission (2023), underscore the importance of efficient capital markets in enhancing productivity and delivering returns to investors. Efficient markets are pivotal to improving the overall business climate, boosting competitiveness, and ensuring the optimal utilisation of a society's economic assets, as highlighted by Draghi (2024), ECB (2023), and Letta (2024).
- Capital markets serve as the lifeblood of modern economies by providing a platform for businesses to raise capital and thereby fuelling innovation and fostering growth through business investment and expansion. Additionally, capital markets offer citizens opportunities to invest their savings and partake in wealth creation, thereby promoting financial inclusion and widespread prosperity.
- It is widely recognised that the EU capital market is not reaching its full potential, leaving substantial economic value unexploited. The EU's combined market capitalisation of 11 trillion EUR amounts to 61% of GDP. This is markedly lower than the most capitalised peer, the US, which has a market capitalisation of 214% of GDP.
- A major factor contributing to the underperformance of the EU capital market is its for-profit infrastructure, which exacerbates barriers to creating a cohesive European Savings and Investments Union (SIU).

Capital markets rely on well-functioning trading venues, Central Clearing Counterparties (CCPs), and Central Securities Depositories (CSDs) as their underlying infrastructure to efficiently connect supply with demand.

- Currently, the Capital Market Infrastructure in the EU is notably fragmented, consisting of 27 incumbent exchanges, 14 CCPs, and 27 CSDs. Their primary role is to facilitate the connection between market participants seeking capital and those seeking investment opportunities.
- This infrastructure supports a flow of EUR 9 billion in the primary market, where companies raise capital by issuing new shares, and EUR 5 trillion in the secondary market, where investors trade existing shares. This underscores the critical importance of an efficient system for facilitating supply and demand.
- The Capital Market Infrastructure can be likened to financial railways, with capital seekers and investors akin to passengers and trains. If these railways are poorly maintained, mismanaged, or lack interoperability, capital cannot flow freely between different EU countries. For example, investors in Southern Europe seeking opportunities in specific sectors may be unable to efficiently allocate capital to Northern Europe. Hence, the repercussions for the European real economy include increased costs of capital, which will have ripple-effects throughout the EU.
- Despite its complexity, the Capital Market Infrastructure shares characteristics with other natural monopolies that provide public goods, such as water and wastewater services, electricity and district heating distribution, fibre optics, telecom, and railway services. These shared features include monopolistic power, entry barriers, and economies of scale.
- Notably, the Capital Market Infrastructure is not subject to infrastructure regulation, despite its role as critical infrastructure supporting financial stability and supporting economic growth.



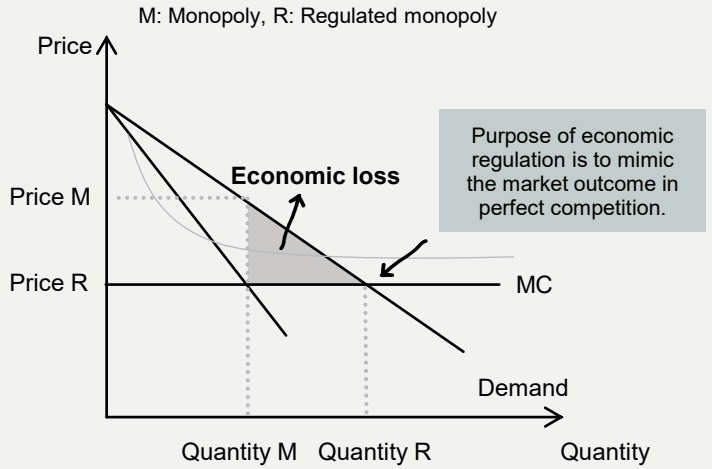
It is important to recognise that the Capital Market Infrastructure is the backbone and enabler of first order effects for capital seekers (companies) and capital providers (investors). Moreover, second order effects via EU companies' economic activities, productivity, growth etc.

The historical market development has evolved the EU Capital Market Infrastructure into powerful monopolies, increasing the risk of costly market inefficiencies (II/IV)

EU Capital Market Infrastructure has evolved into powerful monopolies, increasing the risk of market inefficiencies.

- To stimulate innovation and efficiency, liberalisation of the EU Capital Market Infrastructure was initiated more than 30 years ago, starting with the exchanges. This shift gradually extended to CCPs and CSDs. As a result, these entities transitioned from being public or member-owned to private entities. At the same time, the regulation was changed from non-profit to for-profit frameworks, significantly encouraging consolidation.
- Despite these changes, interoperability remains poor, and infrastructure integration has not occurred sufficiently. Instead, ownership is highly concentrated both horizontally (exchange groups owning incumbent exchanges in several EU countries) and vertically (incumbent exchanges expanding into clearing and settlement), creating large conglomerates with considerable monopoly power over critical services across the value chain.
- In 2000, 14 EU countries, representing around 95% of today's market capitalisation in the EU, each had their own independently owned exchange. Today, 11 of these exchanges are owned by large exchange groups. In general, the 27 incumbent exchanges across the EU were self-owned, but horizontal consolidation has since consolidated ownership into 15 exchange groups. This shows that the incumbent exchanges with large market capitalisation have been consolidated into groups whereas smaller exchanges with modest capitalisation, so far, mainly remain independently owned.
- Currently, 94% of the EU market capitalisation on incumbent exchanges is concentrated in four exchange groups. This yields a Herfindahl Hirschman Index of 3,038, indicating that market power in the Capital Market Infrastructure is highly concentrated among a few companies.
- Vertical integration among exchange groups is also prevalent, with 89% of EU Capital Market Infrastructure entities exhibiting some degree of vertical integration by owning at least two out of three steps of the infrastructure value chain. This increases these entities' market power.
- Despite this consolidation, barriers to efficient cross-border trading and post trade activities in the EU persist. The Giovannini Group identified 15 technical and legal barriers to efficient post-trade activities across borders in 2000. In 2017, the European Post Trade Forum and the European Central Securities Depositories Association in 2024 reaffirmed that 10 barriers persist, hindering efficient capital allocation and deep liquid markets.
- Academic research highlights that the consolidation has led to significant economies of scale within the Capital Market Infrastructure, which in theory should lead to lower prices. Instead of passing on these efficiency gains, the consolidation and entry barriers have been exploited to boost profitability of Capital Market Infrastructure, ultimately leading to higher capital costs for companies. Specifically, Shaofang and Matej (2017) found that vertically integrated companies achieve 10% higher profits compared to their non-integrated counterparts.
- Hence, over the past three decades, the Capital Market Infrastructure in the EU has transitioned to a for-profit model, leading to significant consolidation which has created economies of scale. However, the gains have generally not been passed on to companies and investors.
- It is important to note that natural monopolies do not necessarily pose a problem to the economy if they do not exploit their dominant positions.

Large deadweight loss for society when a monopoly is not regulated



Monopolies that maximise profits increase costs for companies and investors, resulting in higher prices and reduced quantities.

- **Price is too high:** Prices are set by the monopolist, unlike in competitive markets where prices align with marginal cost (MC).
- **Quantity is too low:** Due to the price-setting mechanism, a sub-optimal quantity is supplied.

This is an inefficient outcome for society. To prevent this, monopolies must be regulated to avoid exploiting their dominant market position.

Traditional measures of well-functioning markets indicate that the infrastructure of EU capital markets is dysfunctional, with several inefficiencies needing urgent attention (III/IV)

Traditional measures of well-functioning markets indicate that the EU Capital Market Infrastructure is lacking competition.

- These measures indicate that companies and citizens are disadvantaged by weak competition and inadequate regulation of the Capital Market Infrastructure, enabling market power abuse that leads to monopoly pricing.
- In a competitive and efficient market, consolidation, innovation, and economies of scale typically lead to decreasing prices. However, this has not been the trend in the EU Capital Market Infrastructure, where costs have decreased due to economies of scale, but prices have risen significantly. This market behaviour exemplifies textbook monopoly practices, with prices set too high and quantities too low.
- With one incumbent exchange in each EU country, the incumbent exchange holds monopoly power over closing auctions, as the closing auction is solely conducted on the incumbent exchange where the shares are listed.
- Trading venues incl. incumbent exchanges hold monopoly power over market data as an outcome of trading on their platforms. Market data (e.g. prices, bid-ask quotes, market volumes) is a by-product of trading activity and is used by investors and intermediaries for trading, best execution, portfolio management, market surveillance, risk management, reporting, regulatory compliance and by companies for the pricing of securities and access to capital markets.
- Hence, each trading venue generates unique market data that is indispensable and non-substitutable for the investors and intermediaries.
- The annual cost for exchanges to provide market data is estimated at EUR 4-12 million per venue. Yet, the revenue from this data ranges between EUR 60-170 million, reflecting a markup of 1,400% achievable through monopoly power. This report finds clear indications that exchanges exploit this monopoly power via high fees and overly complex fee schedules, reducing transparency for clients. Since 2017, the number of pages detailing fees has grown by approximately 150%, from about 20 to 50 pages.
- The cost of market data for market participants has surged. Between 2017 and 2024, the annual non-display market data fees charged by Deutsche Börse and Euronext have increased by 225% and 142%, respectively. These fees far exceed the costs of producing and distributing the data – costs that generally have declined due to economies of scale and advancement in the underlying technology used in distributing the market data. This cost increase is significant considering that the Consumer Price Index increased by 30% over the same period.
- Excessive pricing of market data imposes direct costs for firms and investors of EUR 180-200 million annually. Addressing these inefficiencies would lower the cost of capital through improved information access and higher liquidity.
- Currently, 14 CCPs are responsible for clearing trades, of which 10 are authorised to clear shares, across 27 EU incumbent exchanges. If it is not possible to freely choose a CCP in a market and the available CCPs are not linked with each other, i.e. no interoperability, the primary CCP holds monopoly power in their home market.
- Despite few CCPs offering interoperability, allowing multiple CCPs to clear trades from the same venue, widespread adoption of interoperability is lacking. Enhancing interoperability will reduce exposures, collateral needs, liquidity risk, and complexity.
- In general, CCPs exhibit less pronounced market inefficiencies compared with incumbent exchanges and CSDs.
- If only one issuer CSD is linked to an incumbent exchange, the issuer CSD holds monopoly power over issuance of shares in its home country. This monopoly power extends to maintenance and safekeeping as these are tied to where the shares are issued and originally registered.
- The monopoly power of CSDs can lead to excessive fees and cross-subsidisation. This has led to CSD revenue increases of +20% over two years, and safekeeping costs for shares that are 50% higher than for bonds.
- Eliminating these inefficiencies would reduce the cost of capital and enhance market liquidity depth.

Inefficiencies in the Capital Market Infrastructure increase the cost of capital and impede progress toward developing a European SIU.

- The lack of competition has led to costly inefficiencies across trading venues, CCPs, and CSDs. This dysfunctional infrastructure results in less liquid capital markets due to inefficient cost allocation throughout the European economy.
- Based on Saad and Samet (2017) and historical European precedents where the monopoly of an incumbent exchange was challenged by the entry of a new trading venue, we find evidence that an inefficient Capital Market Infrastructure leads to an excessively high cost of capital.
- Draghi (2024) underscores the importance of reducing cost of capital, noting that the EU needs a reduction in the cost of capital by 2-2.5 percentage points to stimulate private investments equivalent to 4% of GDP.
- While the inefficiencies in the EU Capital Market Infrastructure are not the sole obstacle to developing a SIU, they represent significant barriers that must be addressed to facilitate further progress towards integration.

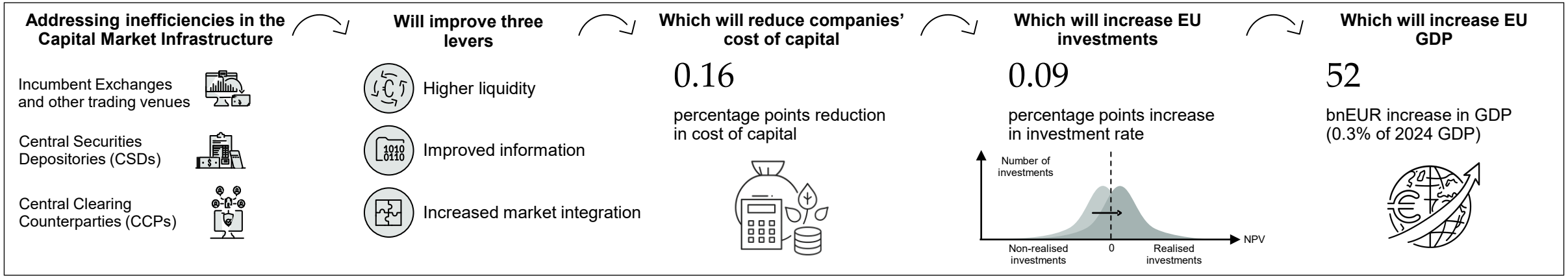
Addressing the inefficiencies in the EU Capital Market Infrastructure – trading venues, CCPs, and CSDs – can boost EU GDP by at least EUR 52 billion over the next ten years (IV/IV)

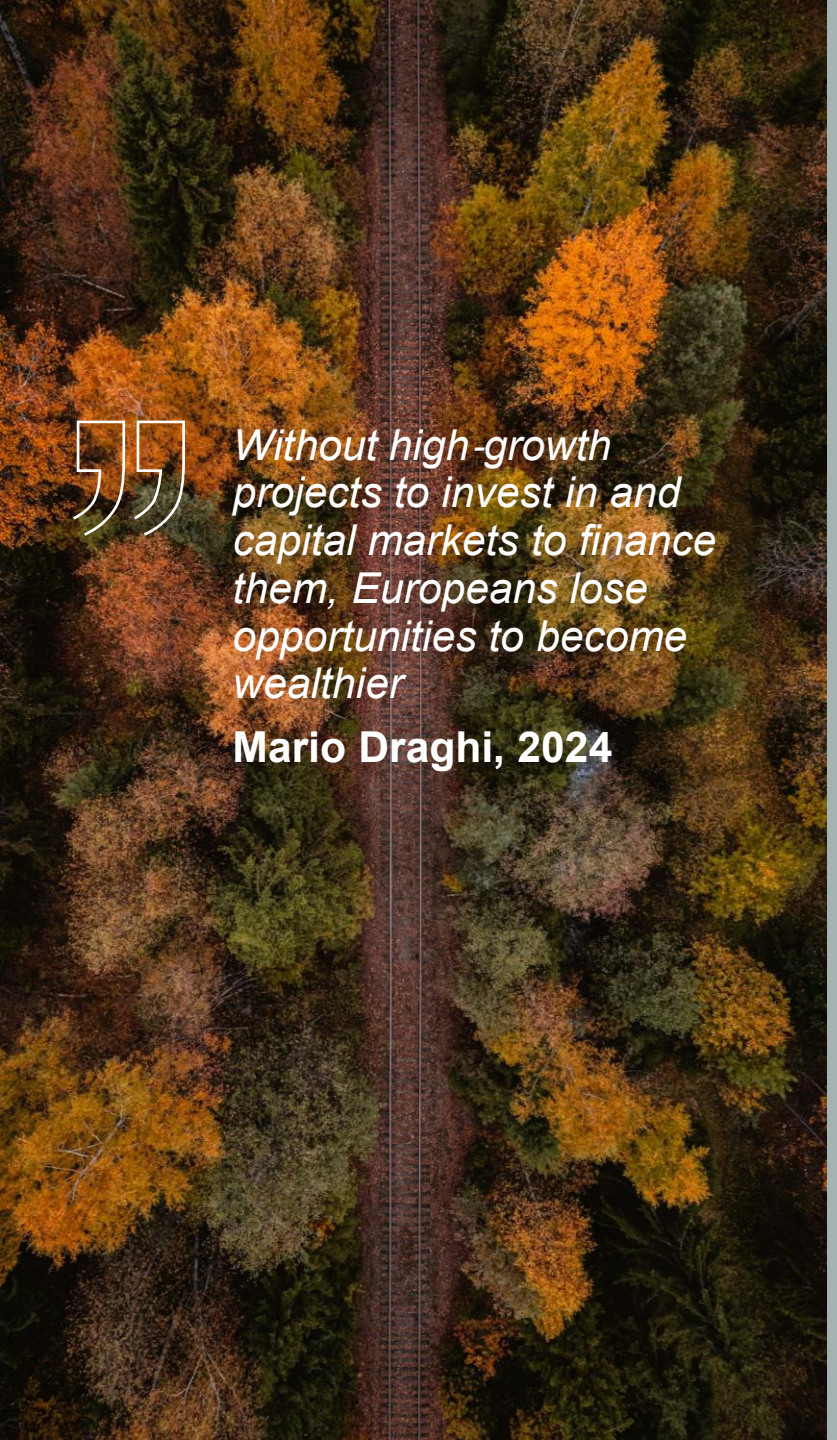
Addressing inefficiencies through better economic regulation can significantly enhance investments and growth in EU.

- Addressing market failures and monopoly power within the EU Capital Market Infrastructure can significantly improve market functioning through three levers: 1) Higher market liquidity, which will result in smaller liquidity risk premiums and lower transaction costs; 2) better information by enhancing flow and reducing information asymmetry between capital seekers and providers; and 3) increased market integration by lowering barriers to cross-border transaction and interoperability.
- No previous market reforms match the type and scope of the changes considered here. Consequently, no direct quantitative estimates exist of their potential impact on market functioning. Based on the literature, we can only credibly quantify effects operating through liquidity.
- Based on Saad and Samet (2017), we find that improvements in liquidity alone could reduce the cost of capital by at least 0.16 percentage points. Additional benefits are expected from other channels including a broader access to and integration of capital markets as well as enhanced information flows – effects that are not included. Hence, the scope for growth in GDP is expected to be significantly larger.
- A reduction in the cost of capital broadens the range of economically viable investment opportunities by making a greater number of projects financially attractive and profitable.
- Evidence from Gilchrist and Zakrajse (2007) and Carluccio et al. (2021) suggest that a reduction of 0.16 percentage point in cost of capital will boost the investment rate among EU companies by 0.09 percentage points.
- Ultimately, the increase in investment activity from reduced cost of capital could increase EU GDP by an estimated EUR 52 billion over the next ten years, equivalent to a 0.3% rise relative to GDP in 2024. This underscores a significant economic potential that can be realised if we act today.

We recommend a comprehensive reform of the EU Capital Market Infrastructure to reduce critical barriers for developing a Savings- and Investment in EU (SIU).

- We recommend a regulatory setup of the EU Capital Market Infrastructure that incentivises infrastructure companies to behave as if they were subject to competitive market forces. Such regulation would ensure that efficiency gains are shared with market participants and support the overall infrastructure in serving as the backbone for a unified EU capital market.
- The existing regulation and its enforcement are currently insufficient to guarantee that the benefits of improved market efficiency are passed on to infrastructure users through lower prices, which in turn will increase the availability of funding for new businesses and other economic activities, ultimately supporting higher prosperity and growth in the EU. Equally important, the entire EU Capital Market Infrastructure must function effectively to facilitate the formation to a European Savings and Investments Union (SIU).
- Therefore, as demonstrated in this report, we advise the European Commission to establish a robust, organised regulatory body with the authority to evaluate this report's findings and implement effective monopoly regulation, considering the complexity and unique characteristics of the Capital Market Infrastructure.
- The overall objective is to reduce cost of capital to boost EU investments and economic activity throughout the region. Hence, increasing the EU competitiveness, growth, and prosperity.





01

Introduction to the EU Capital Market Infrastructure

This chapter introduces the EU Capital Market Infrastructure and the vital role it plays for EU companies, investors & pension savers, and the real economy. This chapter also serves as the foundation for the analysis of market failures and inefficiencies covered in the following chapters. This report focuses on cash equities, but most findings extend to other financial instruments in the capital markets.

Key messages

In this chapter we demonstrate that,

- Efficient capital markets are crucial for driving productivity, growth, and prosperity by allocating vital resources to companies, institutions, and citizens across the EU.
- Like a railway system, the Capital Market Infrastructure is the critical backbone for the capital markets, enabling companies and investors to efficiently allocate capital throughout the economy.
- The capital markets are supported by a fragmented infrastructure, which sets extraordinary requirements to the Capital Market Infrastructure's efficiency to facilitate cross-border transactions and interoperability. Fragmentation is a challenge where competition does not work.
- The average market capitalisation to GDP ratio is 61% in the EU compared to +214% in the US, indicating a significant potential for a more capitalised EU
- To untap the full potential, the European Commission must address market failures that increase cost of capital by prohibiting the ability for Capital Market Infrastructure to collect monopoly rent and cross-subsidise between business areas.

Efficient capital markets are crucial for driving productivity, growth, and prosperity by allocating vital resources to companies, institutions, and citizens across the EU

According to academic literature and empirical evidence on competitiveness and growth, efficient capital markets are an integral enabler for…

Better jobs and higher salaries

Financial markets contribute to a thriving economy that creates better jobs with higher salaries for today's workers and future generations and offers adequate retirement income in light of demographic developments

European Commission (2025)

Increased competitiveness among European companies

The success of these measures [to boost competitiveness] will in turn depend on integrating the Single Market and Europe's capital markets

Draghi (2024)

More competitive business climate

More attractive and efficient listing of securities in Europe would help develop the equity market. It would also contribute to enhancing the depth and liquidity of listed securities in Europe – further facilitating firms to start new businesses and develop into successful operations

ECB (2025)

Better use of economic assets and investment capabilities

Around €300 billion of European families' savings [flow] from EU markets abroad, primarily to the American economy, due to the fragmentation of our financial markets. This phenomenon underscores a significant inefficiency in the use of the EU's economic assets...

Letta (2024)

However, efficient capital markets are crucially dependent on a well-functioning and efficient Capital Market Infrastructure. The following chapters address costly *market failures and inefficiencies* within the EU Capital Market Infrastructure, which form the foundation for our *regulatory recommendations* on how to overcome them.

Source: European Commission (2025), Draghi (2024), ECB (2025), and Letta (2024).

Annually, the EU Capital Market Infrastructure supports the flow of EUR 5 trillion between companies and investors; but there is a significant untapped economic potential

The infrastructure's core function is to facilitate the flow of savings into productive investments. That is, ensuring seamless matching of supply and demand, which is critical for EU productivity and growth. The Capital Market Infrastructure consists of three main entities: incumbent exchanges, central counterparties, and central securities depositories.

Overview (simplified)

Primary market | Secondary market

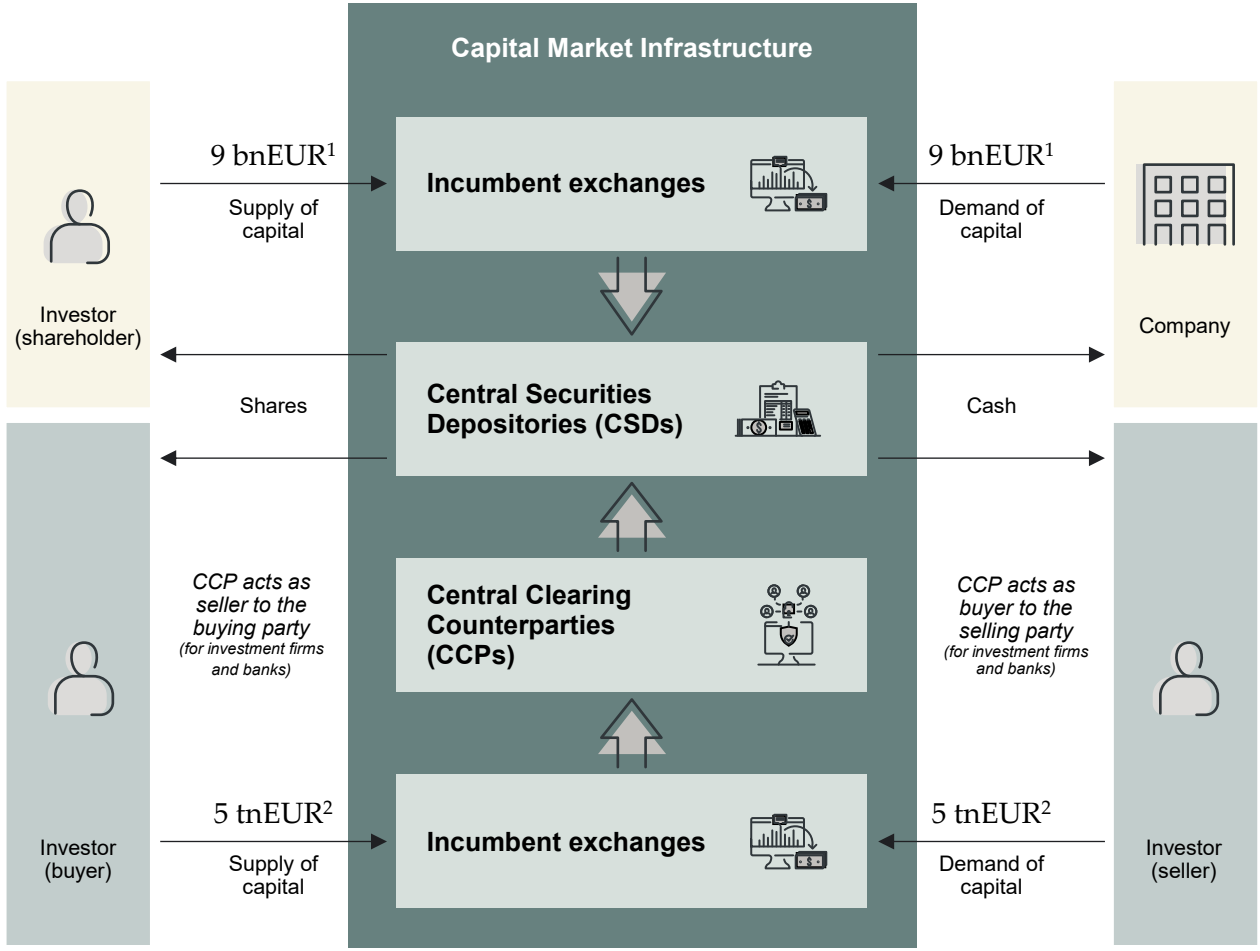
In the **primary market**, companies raise capital by issuing new shares (in scope of this report) or bonds (out of scope).

The shares are listed on an incumbent exchange and issued by a Central Securities Depositories (CSD), which keeps track of the ownership of the shares.

In the **secondary market**, investors trade existing shares. Trading venues including incumbent exchanges match buy- and sell orders from investors.

When two orders are matched, a Central Clearing Counterparty (CCP) acts as a middleman and guarantees the trade by e.g. taking over the so-called counterparty risk from investment firms and banks.

The CSD finalises the settlement between buyer and seller by moving cash and securities between the investors' accounts.



EU capital markets are challenged

In an efficient capital market, liquidity is high, the capital cost is low, and the capital allocation ensures that resources flow to where they are most productive used.

However, Capital Market Infrastructure companies in the EU are playing a role in hindering a fully efficient EU capital markets as they leverage their monopoly power by collecting monopoly rent and cross-subsidising other business legs, which can be exposed to competition. This leads to market failures and poorly functioning capital markets.

Poorly functioning markets are like handcuffing Adam Smith's 'invisible hand' through which markets produce allocative efficiency.

Overcoming these issues via better regulation has a significant impact on investment and GDP activity.

In the following chapters, we provide documentation and analysis that clearly support the above conclusions.

Notes: Note, this is for investment firms and banks. 1) Value of newly issued shares, 2024. 2) Turnover of equity trading.
Source: Implement Economics based on ECB (2021), The Giovannini Group (2001), FESE (2024), and Acharya and Li Bo ((2019).

Like a railway system, the Capital Market Infrastructure is the critical backbone for capital markets, enabling efficiently allocation of capital throughout the EU economy

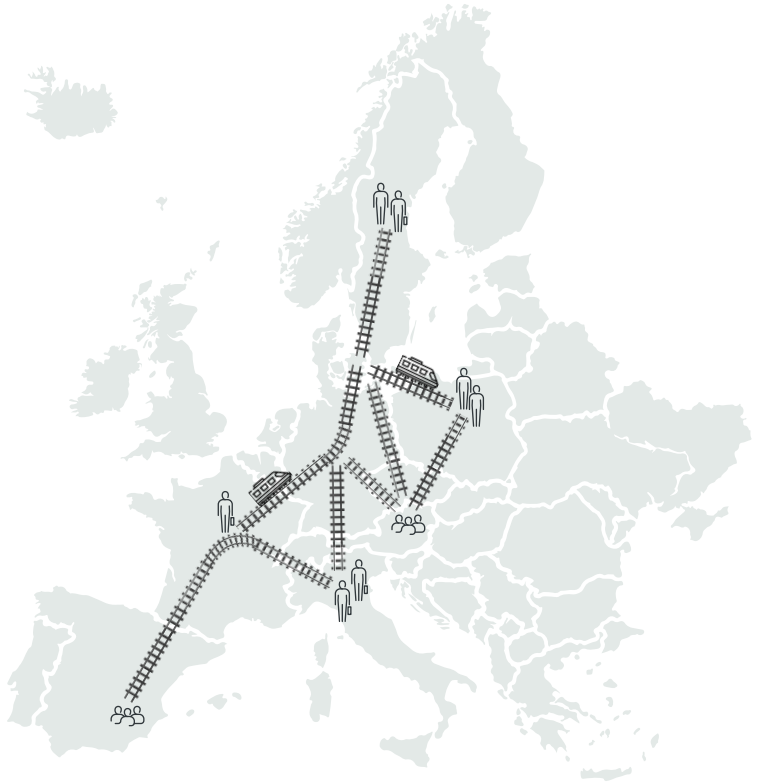
The railway system

The Capital Market Infrastructure is the *financial railway system* , while various financial firms are comparable to private train operators that establish routes to transport passengers (investors, companies) and goods (capital) across Europe. Like physical railway systems, the Capital Market Infrastructure is critical. If a railway company is for-profit and there are no alternative transport options, it holds a monopoly over essential infrastructure that enables goods (capital) to move seamlessly across borders. In the same way, incumbent exchanges, CSDs, and CCPs can exert monopoly power over the infrastructure needed to ensure capital and investments flow freely within the EU.

If financial railway systems do not function properly, capital cannot flow efficiently – for example between EU countries. Investors in Southern Europe seeking opportunities in specific sectors may be unable to efficiently allocate capital to Northern Europe; companies may face difficulties in obtaining the needed funding.

If these financial railway companies are allowed to exploit their monopoly power, the consequences for the real economy can be severe, increasing capital costs and reducing market liquidity.

This is not just a system for financial ‘trainspotters’; it is critical infrastructure that, when functioning efficiently, delivers tangible benefits to businesses, citizens, and the overall economic prosperity of the EU and its member states.



An unrestricted for-profit monopoly

Setting up this Capital Market Infrastructure requires significant upfront investments, but once established, the marginal cost of processing an additional transaction is low. Just like other infrastructures such as railways, electricity, water, fibre, etc.

The nature of these industries implies that an efficient system is better than multiple overlapping infrastructures. Just like, no EU households have two water pipelines.

In essence, the Capital Market Infrastructure exhibits many characteristics of a natural monopoly, yet it has not been exposed to the right economic regulation accordingly.

Activities facilitated by the financial railway systems in the real economy

Driving growth and innovations as efficient capital markets act like high-speed trains on high-speed financial railways systems delivering essential fuel and components (capital) to workshops and factories (EU businesses) fuelling economic growth.

Improving productivity like a sophisticated pan-European rail traffic control system, efficient capital markets ensure trains carrying valuable cargo (capital) are routed with precision and low costs to the most productive destinations (resource allocation).

Boosting employment and income as the railway network (capital markets) efficiently delivers raw materials and investment goods (capital), businesses and industrial parks (EU companies incl. SMEs) flourish along its routes and attract workers (employment).

Enhancing competitiveness and attracting investments as a modern and transparent system makes the entire EU an attractive global hub for commerce. This draws international freight operators (investors) to commit more cargo (capital) to its lines.

Supporting stability and resilience as well-regulated capital market, with multiple interconnected lines, robust bridges, and advanced safety systems, effectively manages potential disruptions (reduce risks on an investor and systemic level).

The fragmented EU capital market sets extraordinary requirements to the infrastructure's efficiency

Without the genuine, unified market in EU, it is crucial that the capital market operates as efficiently as possible to create smooth markets with deep liquidity and low cost of capital.

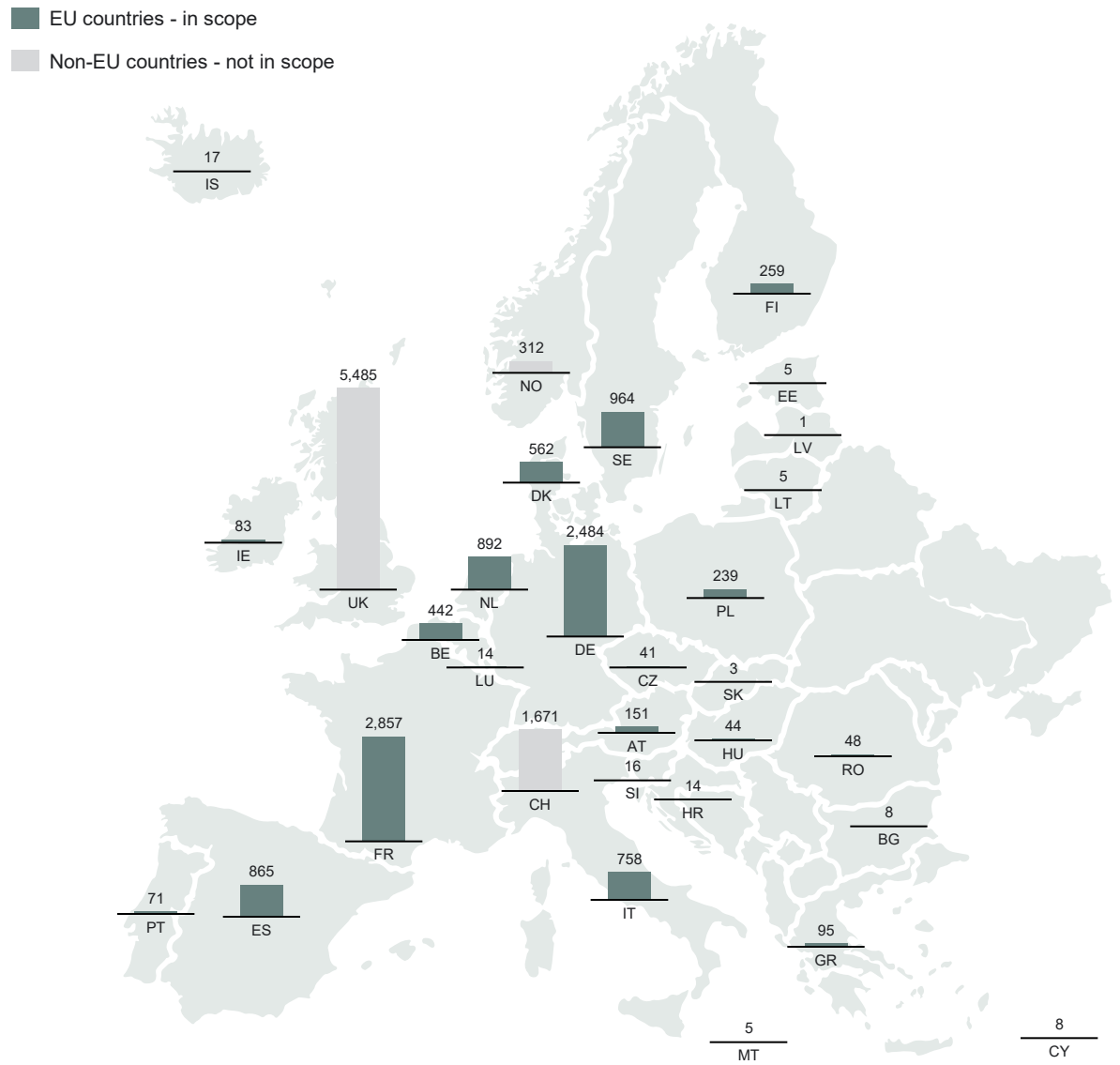
Liquidity refers to how easily and quickly a share can be bought or sold without significantly affecting its price. High liquidity typically implies many buyers and sellers, making trading fast and efficient. In essence, enhancing liquidity is about seamlessly connecting buyers and sellers, as if they were side by side and able to trade instantly, without friction or delay.

For a deeper understanding and overview of the development in the European liquidity market, relevant publications are for example Penalva and Tapia (2025); *Changes in the Turnover Ratio and Liquidity in International Equity Markets* and AFME (2025)*; Equity Primary Markets and Trading Report..*

From a helicopter perspective, the EU capital market is supported and operated by a fragmented Capital Market Infrastructure consisting of 27 incumbent exchanges[1], 14 CCPs of which 10 are authorised in shares[2], and 27 CSDs[3]. Note, the report does not include the additional complexity of more than 250 additional trading venues (e.g. MTFs) in EU.[1]

The core task is to facilitate the connection between market participants seeking capital and market participants seeking investment opportunities. In economic terms, they clear supply and demand.

Market capitalisation of listed companies by incumbent exchanges in the EU and other selected European countries, billion EUR[4]



11 tnEUR

Market capitalisation of companies listed on incumbent exchanges in the EU[5]

7,200

Listed companies on incumbent exchanges in the EU[6]

27

Incumbent exchanges in the EU[1]

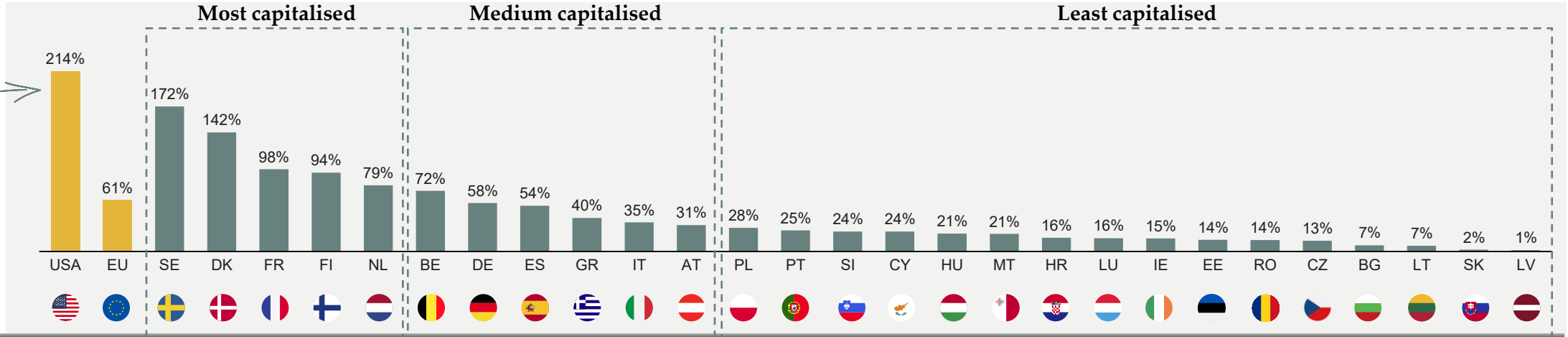
Notes: 1) Based on Bloomberg (2025) and FESE (2025). Note that more than 250 listing and trading venues exist when including e.g. Multilateral Trading Facilities (MTFs). E.g. in Germany, there are six additional exchanges operating alongside the incumbent (Deutsche Börse Group as representative for Germany). However, this report focuses on incumbent exchanges, where inefficiencies primarily exist. 2) Based on ESMA (2025), list of Central Counterparties authorised to offer services and activities in the Union. 3) Based on ESMA (2025), CSD register. 4) Selected non-EU countries include UK, Switzerland, Norway, and Iceland. 5) Based on Bloomberg (2025) and FESE (2025). 6) Number of listed companies is based on the listing in FESE-member countries, FESE (2025).
Source: Implement Economics based on Bloomberg (2025), FESE (2025), ECB (2025), ESMA (2025), AFME (2025), Penalva and Tapia (2025).

The average market capitalisation to GDP ratio is 61% in the EU compared to +214% in the US, indicating a significant potential for a more capitalised EU

Market capitalisation to GDP, household and pension fund assets

%

The US is recognised as a capital market with deep liquidity.



Metric	USA	EU	SE	DK	FR	FI	NL	BE	DE	ES	GR	IT	AT	PL	PT	SI	CY	HU	MT	HR	LU	IE	EE	RO	CZ	BG	LT	SK	LV
Household assets in equity and funds of all financial assets	45%	35%	46%	43%	30%	51%	24%	46%	32%	46%	35%	43%	40%	21%	37%	34%	23%	49%	27%	23%	37%	16%	71%	34%	45%	54%	35%	-	39%
Pension fund assets (% of GDP)	170%	25%	107%	198%	12%	61%	147%	-	6%	11%	1%	11%	7%	8%	14%	7%	-	4%	-	-	2%	26%	15%	-	8%	-	10%	14%	20%

A More Capitalised European Union

- The ratio of the top five EU countries ranges from 80% to 170% but half of the member states have market capitalisation to GDP ratios below 25%.
- Household equity and fund assets make up 35% of all financial assets in the EU versus 45% in the US, which also indicate potential for a more capitalised EU.
- According to OECD (2015), if EU countries were to boost their market capitalisation, GDP could increase by 0.2 percentage points for every 10% rise in the market capitalisation to GDP ratio.

Note: Greater participation by households and pension funds in equity markets is generally associated with larger and more developed capital markets.
Source: Implement Economics based on Bloomberg (2025), FESE (2025), Eurostat (2025), and OECD (2015).

To unlock the full potential of EU capital markets, the EU Commission must address market failures in the Capital Market Infrastructure

With one incumbent exchange in each EU country, the incumbent exchange holds monopoly power over closing auctions, as the closing auction is solely conducted on the incumbent exchange where the stocks are listed. There are several reasons for that, but the main one is that the closing price of the incumbent exchange is the official closing price, making it a key KPI for the market.

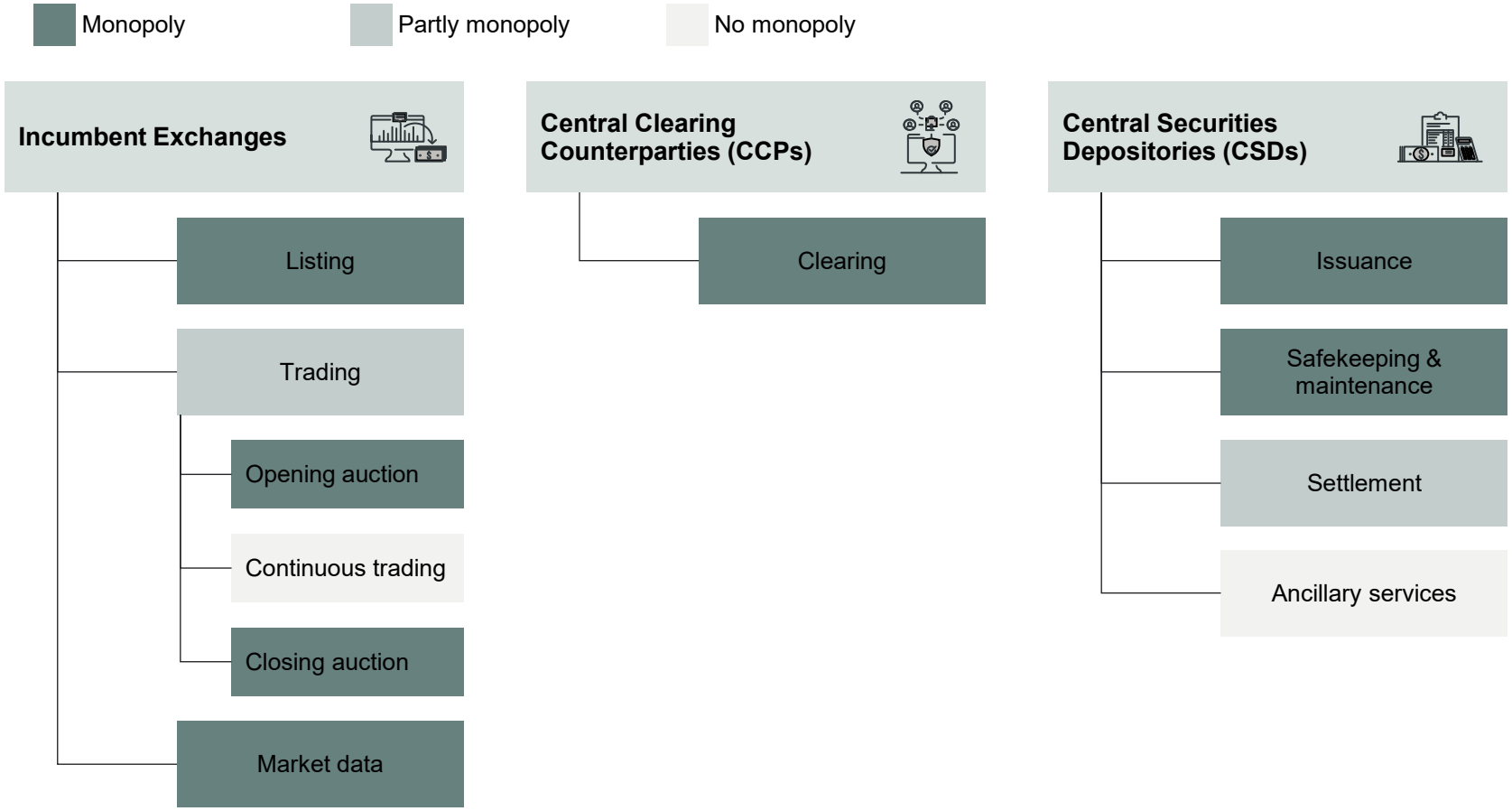
Trading venues incl. incumbent exchanges hold monopoly power over market data as an outcome of trading on their platforms. Market data (e.g. prices, bid-ask quotes, market volumes) is a by-product of trading activity and is used by investors and intermediaries for trading, best execution, portfolio management, market surveillance, risk management, reporting, regulatory compliance and by companies for the pricing of securities and access to capital markets.

Hence, each trading venue generates unique market data that is indispensable and non-substitutable for the investors and intermediaries.

If it is not possible to freely choose a CCP in a market and the available CCPs are not linked with each other, the primary CCP holds monopoly power in their home market.

If only one issuer CSD is linked to an incumbent exchange, the issuer CSD holds monopoly power over issuance of shares in its home country. This monopoly power extends to maintenance and safekeeping as these are tied to where the shares are issued and originally registered.

Level of monopoly power across business areas of the Capital Market Infrastructure



"When big companies abuse their power, they can very quickly push markets beyond the tipping point, where competition turns to monopoly."
Margrethe Vestager, 2020

02

Industry consolidation and monopoly power

This chapter reviews the historical evolution of Capital Market Infrastructure that has shaped the present market framework. It explores various structural components that enable the potential for monopoly power exploitation. The chapter provides an overview of the key features of Capital Market Infrastructure before addressing specific inefficiencies and market failures in the subsequent chapter.

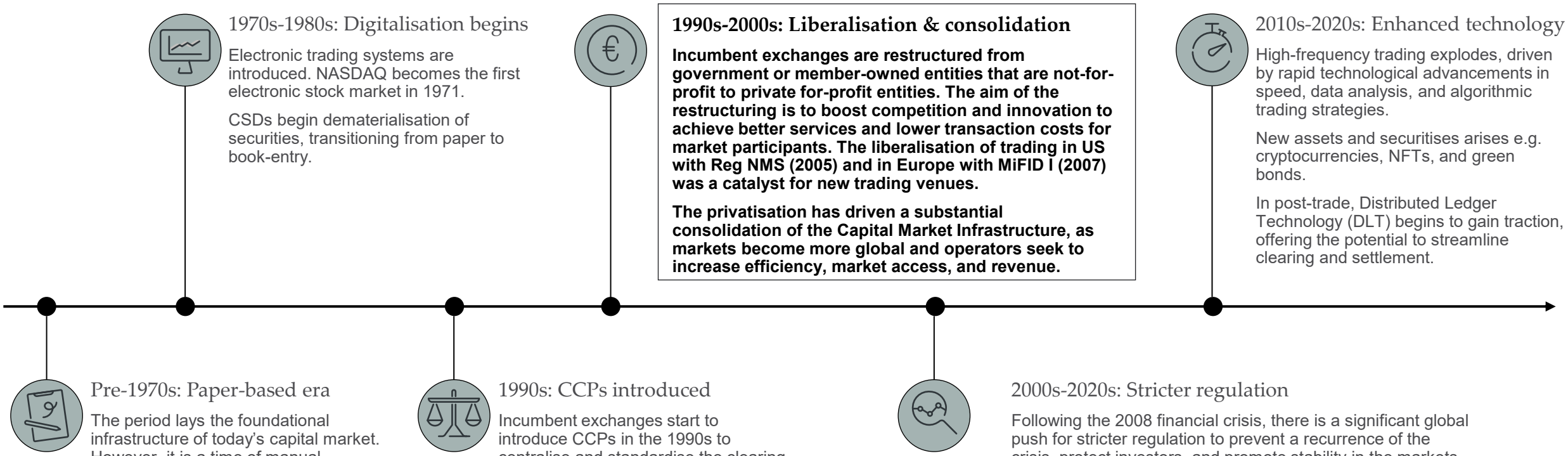
Key messages

In this chapter we demonstrate that,

- During the 1990s-2000s, the EU Capital Market Infrastructure was liberalised and consolidated, creating monopoly power to the infrastructure companies.
- Unlike other critical infrastructures (e.g., railways, utilities, electricity, airports etc.) the Capital Market Infrastructure remains unregulated in terms of pricing and income, which increase the likelihood of an economic loss.
- There are clear indications that today, the EU Capital Market Infrastructure is underperforming and suffers from several inefficiencies. This is due to the significant consolidation, restrictive entry barriers, and network effects, which stifle competition and innovation.

The capital markets and underlying Capital Market Infrastructure in the EU have been liberalised and consolidated over the last three decades

To support innovative capital markets, incumbent exchanges and CSDs went from **public not-for-profit** entities to **private for-profit entities**. Moreover, new infrastructure elements were introduced and adapted, e.g. CCPs. Finally, the European infrastructure has undergone both horizontal and vertical consolidation.

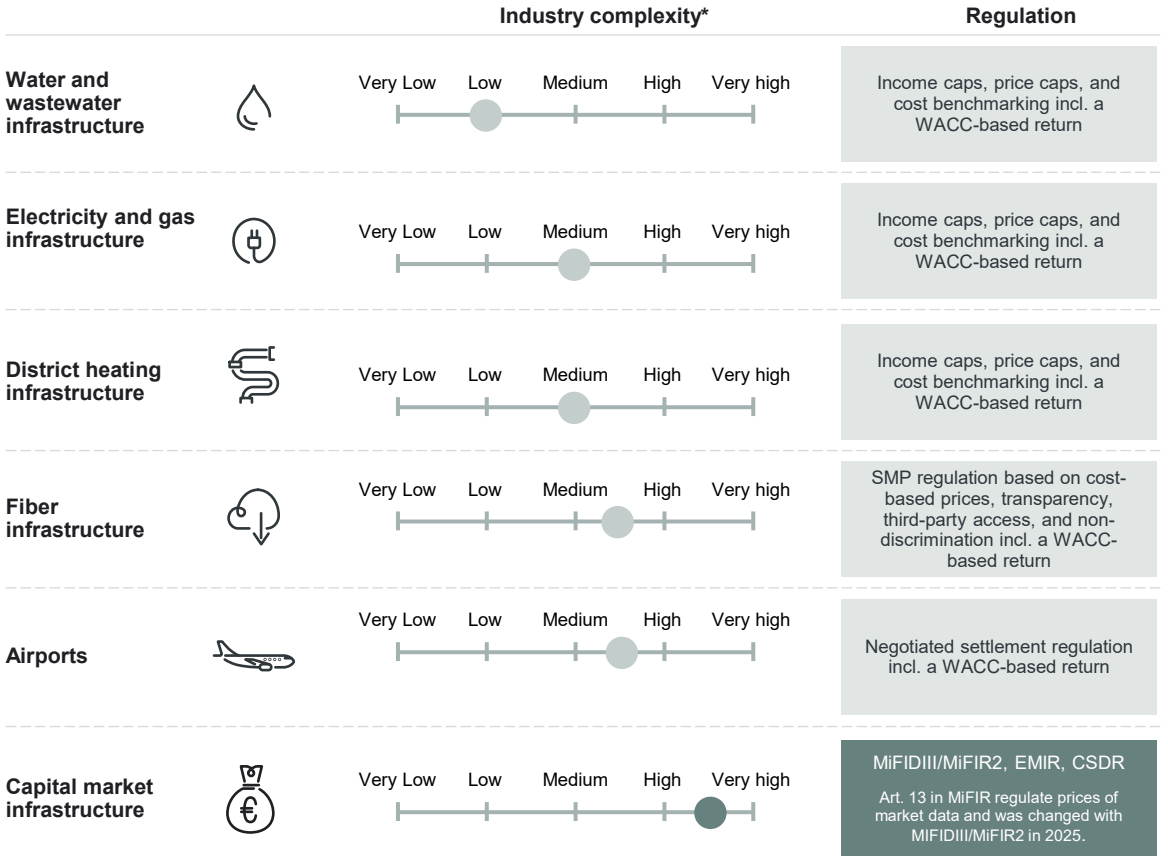


Source: Implement Economics based on ECB (2021), The Giovannini Group (2001), IOSCO (2005), Petry (2021), REG NMS (2005), MiFID I (2007), MiFIDII/MiFIR (2018), MiFIDIII/MiFIR2 (2025), EMIR (2012) and CSDR (2014)

Unlike other critical infrastructures, the Capital Market Infrastructure remains unregulated in terms of pricing and income

- Infrastructure industries across Europe vary in both technical and operational-complexity as well as the complexity of the product/service provided by the industry.
- The Capital Market Infrastructure is characterised by a high degree of complexity making it difficult to assess how changes to the infrastructure impact companies and investors.
- EU has a long history of regulating critical infrastructure industries often with price and income caps. This, however, is not the case for Capital Market Infrastructure, which is missing a proper economic regulation for the commercial framework conditions.

Overview of complexity and regulation in selected infrastructure industries in Europe[1]



Critical infrastructure

We underline that it is not possible to increase competition between network infrastructures due to the natural monopoly characteristics of the market. Moreover, the nature of the capital markets is centred around liquidity, which attracts more liquidity.

It is possible to expose some areas of the Capital Market Infrastructure to competition (e.g. trading) whereas others are more difficult (e.g. market data). But there are no good arguments for not regulating the Capital Market Infrastructure with the aim of mirroring a well-functioning market.

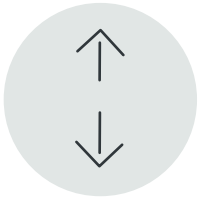
Of course, one should not just copy the water regulation but consider the idiosyncratic characteristics of the industry. E.g. working with interoperability which is not possible for water infrastructures.

Note: 1) We underline that this regulatory overview is a high-level perspective and there are multiple nuances to the specific regulatory setups across EU member states.
Source: Implement Economics analysis.

This report finds clear indications that the Capital Market Infrastructure is inefficient due to consolidation, entry barriers, and scale effects which provide basis for exploiting monopoly power

Capital Market Infrastructure companies have over the last +25 years obtained dominant market positions in their respective geographic markets. The below levers indicate that infrastructure players have increased their market power, which can be exploited if not regulated efficiently. Due to these characteristics, this report finds it crucial to implement proper economic regulation that incentivises trading venues, CCPs and CSDs to act ***as if*** they were subject to well-functioning competition where dominant market positions are not exploited.

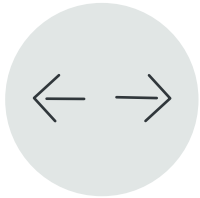
Consolidation



Vertical integration | Over the last three decades many incumbent exchanges have expanded their operations to include clearing and settlement services, creating *vertical silos* where trading, clearing, and settlement occur within the same group. This model is seen in entities like Deutsche Börse and Euronext which own both trading platforms and post-trade services.

\+ Increased efficiency by reduced costs and improved across value chain. coordination

— Too much integration reduces competition in each part of the value chain

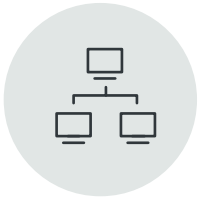


Horizontal integration | Over the last three decades entities such as Euronext and Nasdaq have geographically expanded operations across different countries of EU leading to the ownership of incumbent exchanges being concentrated on fewer companies.

\+ Increased efficiency by more scale, consistent standards across markets and improved service.

— Too much integration increases market concentration and market power

Entry barriers



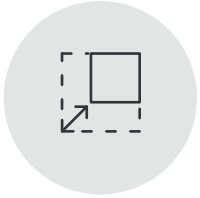
Technical barriers | The Giovannini report in the early 2000s, the European Post Trade Forum in 2017 and the ECB forum AMI-SeCo Securities Group in 2025 have identified technical barriers in clearing and settlement systems, making them non-interoperable between borders and creating proprietary system setups, driving high switching costs.

— High fragmentation in post trade and lock-in effects that hinder market entry, reduce competition, and increase costs, ultimately slowing innovation and market efficiency.

Legal barriers incl. tax | The Giovannini report in the early 2000s, the European Post Trade Forum in 2017 and the ECB forum AMI-SeCo Securities Group in 2025 have identified legal barriers preventing cross-border settlement. Since then, the EU has actively worked to harmonise and standardise legislation, but fragmentation persist due to divergent national frameworks.

— High entry costs and protected incumbents, reducing competition and limiting consumer choice in the market.

Scale effects



Economies of scale | The presence of economics of scale in financial markets is well documented in academic literature e.g. Shaofang and Matej (2017), who confirm the existence of economies of scale in trading and post-trading financial market infrastructures.

\+ Increased efficiency by lower costs, resulting in lower consumer prices and better-quality services.

— Can create entry barriers, reduced competition, harming innovation.

Network effects | The more participants using an incumbent exchange, CCP or CSD, the higher the functional value, which benefits entities owning the incumbent platforms relative to competitors. Furthermore, without proper regulation the surplus from these effects will benefit companies (infrastructure owners) and not the consumers (investors and savers).

\+ Higher liquidity, reducing cost and enhancing efficiency and price discovery.

— Too strong network concentrated market power, limiting innovation and competition.

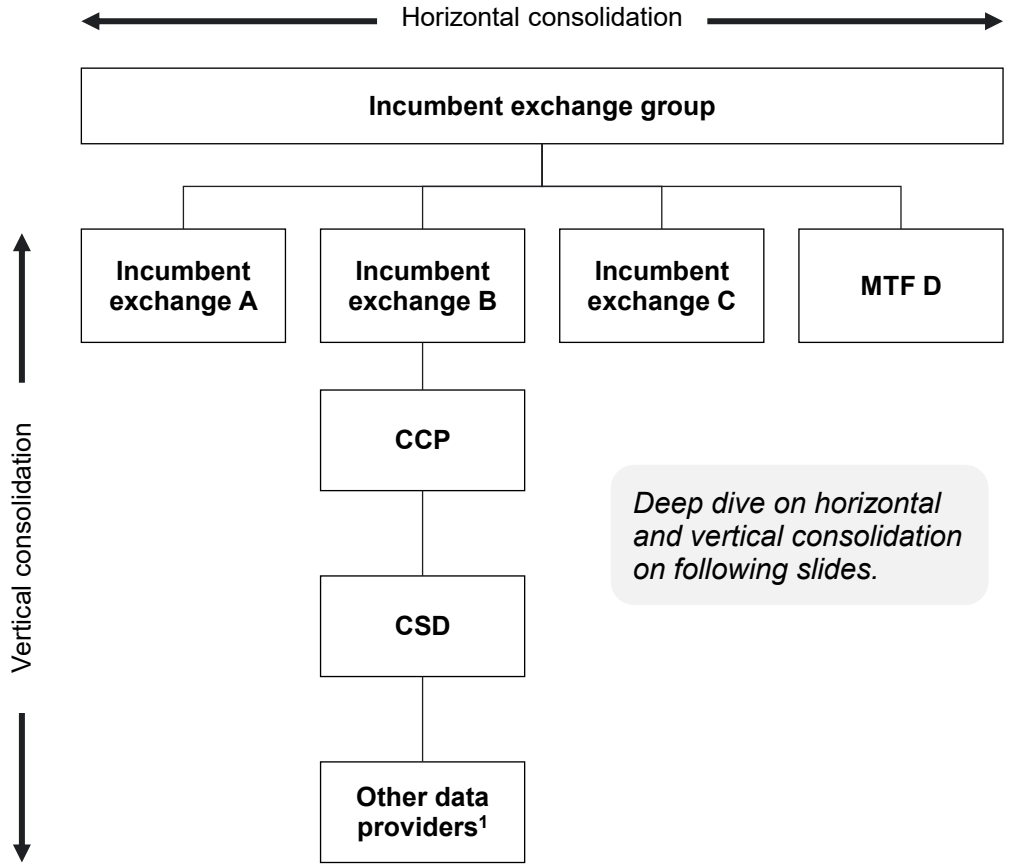
Source: Implement Economics based on European Post Trade Forum (2017), ECB (2021), The Giovannini Group (2001), IOSCO (2005), Shaofang and Matej (2017), Johannes Petry (2021), and AMI-SeCo Securities Group (2025).

Consolidation has driven efficiency but has raised concerns about anti-competitive behaviour

Over the last three decades, the EU Capital Market Infrastructure has experienced a significant integration across the value chain, increasing the anti-competitive behaviour due to insufficient regulation of the market power:

- **Market Concentration:** As incumbent exchanges, CCPs, and CSDs consolidate, fewer players dominate the market, reducing competition and potentially leading to monopolistic or oligopolistic structures.
- **Market Power:** Integrated entities can exert greater control over pricing, access, and services, potentially disadvantaging smaller market participants.
- **Barriers to Entry:** New entrants may struggle to compete with vertically integrated giants that control multiple layers of the financial ecosystem.
- **Reduced Innovation:** With fewer competitors, there are less incentivesed to innovate, leading to stagnation in market infrastructure development.
- **Potential Conflicts of Interest:** When a single entity controls either trading, clearing, or settlement or a combination, it may prioritise its own interests over market fairness and efficiency.

Consolidation
Vertical and horizontal



Historical development

The analysis on the next pages documents that over the last three decades, the European Capital Market Infrastructure has experienced:

- Horizontal consolidation where a group acquires incumbent exchanges.
- Vertical consolidation where a group acquire CCP, CSD, and data and benchmark providers.

Consolidation has improved efficiency due to economics of scale. In a normal market the efficiency gains are (partly) passed to clients via lower prices. However, this has raised concerns about anti-competitive behaviour in the Capital Market Infrastructure.

In this context, the European Commission has 15 April 2025 launched a targeted consultation to gather information on obstacles to capital market integration, including concerns about vertical integration and competition.

Note: 1) Providers of value-add data, indices, benchmarks, ESG-data, credit rating, etc. Examples include Bloomberg, Refinitiv, MSCI, and FTSE.
Source: Implement Economics based on New Financials (2021), Bloomberg (2025), and FESE (2025).

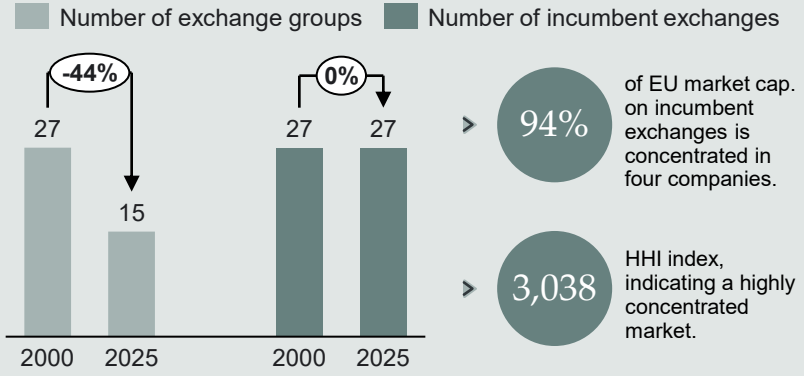
Horizontal consolidation has resulted in 94% of the EU market capitalisation on incumbent exchanges being concentrated in four exchange groups

Consolidation of EU exchanges | Fewer groups, greater power

More than twenty years ago, most incumbent exchanges within the EU were independently owned and operated. Today, consolidation has significantly reshaped the landscape, with 15 exchange groups owning 27 incumbent exchanges. Despite this ownership concentration, the number of incumbent exchanges and order books are still the same as before the consolidation wave. The incumbent exchanges do as a rule not trade each others' shares. I.e., a company listed on Deutsche Börse is not traded on Nasdaq, Euronext, etc.

The consolidation has resulted in a **few dominant players** on the market. This concentrated power allows entities to manipulate pricing and access, potentially disadvantaging smaller participants and stifling competition.

If this tendency continues without any intervening, the EU might enter a future where e.g. Nasdaq and Euronext own all incumbent exchanges.



94% of EU market cap. on incumbent exchanges is concentrated in four companies.

3,038 HHI index, indicating a highly concentrated market.

Conclusion: The market for incumbent exchanges is characterised by a high concentration of market power.

27 countries	27 exchange groups, 2000	15 exchange groups, 2025	27 stock exchanges, 2025	Market Cap. bnEUR *(% of total market cap)*
France	Paris Bourse	Euronext[2]	Euronext Paris	5,104 *(47%)*
Netherlands	Amsterdam Exchanges		Euronext Amsterdam	
Belgium	Bourse de Bruxelles		Euronext Brussels	
Portugal	Bolsa de Lisboa e Porto		Euronext Lisbon	
Ireland	Irish Stock Exchange		Euronext Dublin	
Italy	Borsa Italiana		Euronext Milan	
Germany[1]	Deutsche Börse	Deutsche Börse	Deutsche Börse	2,484 *(23%)*
Sweden	OM Group	Nasdaq[3]	Nasdaq Stockholm	1,796 *(16%)*
Finland	Helsinki Exchanges Group		Nasdaq Helsinki	
Denmark	Copenhagen Stock Exchange		Nasdaq Copenhagen	
Estonia	Talinn Stock Exchange		Nasdaq Talinn	
Latvia	Riga Stock Exchange		Nasdaq Riga	
Lithuania	Vilnius Stock Exchange		Nasdaq Vilnius	
Spain	BME	SIX Group[4]	BME	865 *(8%)*
Austria	Wiener Boerse	Wiener Börse	Wiener Boerse	192 *(2%)*
Czech Rep.	Prague Stock Exchange		Prague Stock Exchange	
Croatia	Zagreb Stock Exchange	Zagreb Stock Exchange	Zagreb Stock Exchange	30 *(<1%)*
Slovenia	Ljubljana Stock Exchange		Ljubljana Stock Exchange	
Poland	Warsaw Stock Exchange	GPW	Warsaw Stock Exchange	*(<1%)*
Luxembourg	Luxembourg Stock Exchange	Luxembourg Stock Exchange	Luxembourg Stock Exchange	*(<1%)*
Romania	Bucharest Stock Exchange	Bucharest Stock Exchange	Bucharest Stock Exchange	*(<1%)*
Hungary	Budapest Stock Exchange	Budapest Stock Exchange	Budapest Stock Exchange	*(<1%)*
Greece	Athens Stock Exchange	Athens Stock Exchange	Athens Stock Exchange	*(<1%)*
Bulgaria	Bulgarian Stock Exchange	Bulgarian Stock Exchange	Bulgarian Stock Exchange	*(<1%)*
Cyprus	Cyprus Stock Exchange	Cyprus Stock Exchange	Cyprus Stock Exchange	*(<1%)*
Malta	Malta Stock Exchange	Malta Stock Exchange	Malta Stock Exchange	*(<1%)*
Slovakia	Bratislava Stock Exchange	Bratislava Stock Exchange	Bratislava Stock Exchange	*(<1%)*

Note: 1) Deutsche Börse Xetra makes up more than 90% of trading on German stocks. There are six others: Berlin, Stuttgart, Munich, Hamburg, Hanover, and Düsseldorf. Most of these are specialist venues for private investors. 2) Oslo Børs is also a part of Euronext. 3) Iceland Stock Exchange is also part of Nasdaq. 4) SIX Group includes also Swiss Exchange.
Source: Implement Economics based on New Financials (2021), Bloomberg (2025), and Fese (2025).

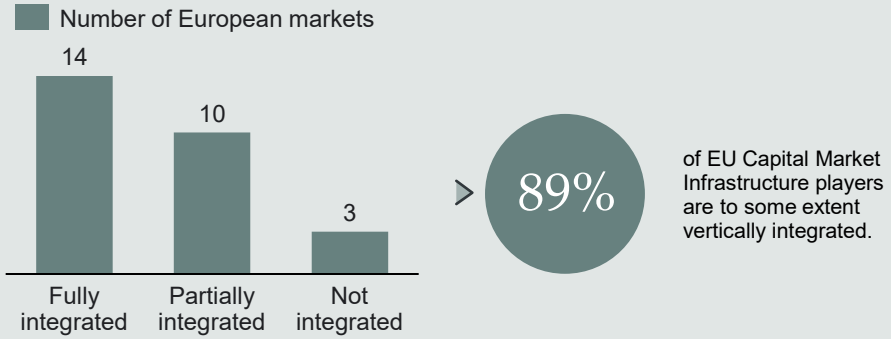
Vertical consolidation has resulted in 89% of EU Capital Market Infrastructure companies being vertically integrated to some extent

Consolidation of value chain | Same group owning incumbent exchange, CCP and CSD

Over the past decade, the EU Capital Market Infrastructure landscape has seen increased vertical integration, where the same group owns the incumbent exchange, CCP, and CSD in a market. Notable examples include:

- **Euronext** operates the entire Capital Market Infrastructure in Portugal and Italy. I.e., they operate both the incumbent exchange, the CCP (Euronext Clearing), and the CSD (Euronext Securities), effectively controlling the complete vertical silo.
- **Nasdaq** operates the entire Capital Market Infrastructure in the Baltics; incumbent exchange, Nasdaq Clearing, and Nasdaq CSD.
- **Deutsche Börse** operates the entire Capital Market Infrastructure in Germany; incumbent exchange, Eurex Clearing, and Clearstream.

Vertical consolidation can enhance operational efficiency and support integrated service offerings. However, it also raises competition concerns by strengthening barriers to entry, such as for post-trade providers. The potential for bundling or tying services may reduce market transparency and hinder competition.



Conclusion: The Capital Market Infrastructure market is increasingly controlled by vertically integrated companies with high market power.

27 countries	Exchange group	CCP group (for equities)	CSD group (for equities)
France, Netherlands, Belgium, Ireland, Portugal, Italy	Euronext	Euronext Clearing	Euroclear (Settlements possible in Euronext Securities from 2026 in FR, NL and BE.[1]); Euronext Securities
Spain	SIX Group	BME	Iberclear
Germany	Deutsche Boerse	Eurex Clearing	Clearstream, ICSD
Sweden, Finland, Denmark, Estonia, Latvia, Lithuania	Nasdaq	CBOE Clearing, Six X., LCH; Nasdaq Clearing	Euroclear; Euronext Securities; Nasdaq CSD
Austria	Wiener Boerse	CCP Austria	OeKB CSD
Czech Rep.	Wiener Boerse	CSD Prague	CSD Prague
Croatia	Zagreb Stock Exchange	SKDD	SKDD
Slovenia	Zagreb Stock Exchange	KDD	KDD
Poland	GPW	KDPW	KDPW
Luxembourg	Luxembourg Stock Exchange	Euronext Clearing	Clearstream
Romania	Bucharest Stock Exchange	CCP. RO	Depozitarul Central
Hungary	Budapest Stock Exchange	KELER	KELER
Greece	Athens Stock Exchange	ATHEX Ckear	ATHEX CSD
Bulgaria	Bulgarian Stock Exchange	CDAD	CDAD
Cyprus	Cyprus Stock Exchange	CSD CSE	CSD CSE
Malta	Malta Stock Exchange	Malta Stock Exchange CCP	Malta Stock Exchange CSD
Slovakia	Bratislava Stock Exchange	CDCP SR	CDCP SR

Note: Fully integrated: One Group owning all parts of the infrastructure in a market. Partially integrated: One Group owning two parts of the infrastructure in a market. 1) See PostTrade360.
Source: Implement Economics based on New Financials (2021), and FESE (2025).

Consolidation in the Capital Market Infrastructure is accelerating, raising the urgent need for regulation

Over the past three decades, the capital market infrastructure sector has seen steady consolidation through mergers and acquisitions, alongside exchanges expanding into new business areas. While this is not a new trend, the pace has accelerated significantly in recent years.

This pattern is best described as exponential. The more consolidation that takes place, the greater the pressure and incentives for further mergers, creating a compounding effect.

This acceleration reflects that larger firms benefit from economies of scale and scope, strong network effects, and the ability to leverage both horizontal and vertical integration.

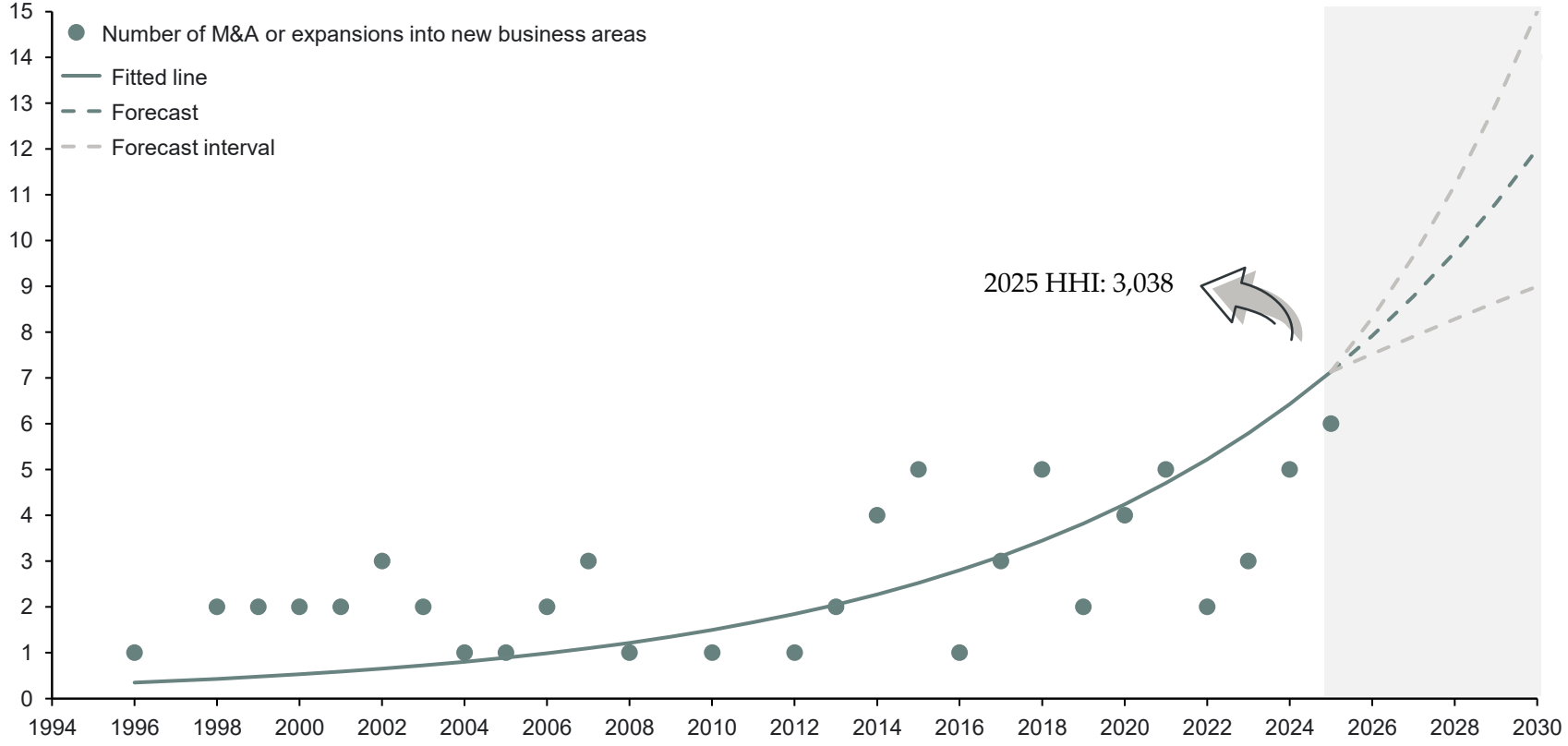
If the consolidation continues at this speed, we risk ending up with only a handful of powerful groups dominating the market. Such concentration could give them extensive opportunities to exploit their dominant position.

This development clearly illustrates why regulatory action is needed to ensure that consolidation does not undermine competition, and that Capital Market Infrastructure continues to serve the capital markets and the broader economy rather than the interests of a few dominant players.

Horizontal integration

Vertical integration

Number of mergers and acquisitions or expansions into new business areas



Source: Implement Economics based on Nasdaq (2025), Deutsche Börse,(2025), Euronext (2025), Euroclear (2025).

10 out of 15 barriers for competitive and efficient post-trading in the EU have survived since their identification in 2001

The Giovannini Group (2001) identified 15 technical and legal barriers to an efficient cross-border clearing and settlement in the EU. These barriers limited the integration of the Capital Market Infrastructure within the EU and were seen as major obstacles to competition and efficiency in post-trade infrastructure.

In 2017, the European Post Trade Forum reaffirmed the relevance of many of these barriers, noting that several remained unresolved or had reemerged in new forms despite regulatory progress (CSDR and T2S).

In 2024, European Central Securities Depositories Association reports that 10 out of 15 barriers have still not been resolved.

The report concludes that technical barriers hinder competition by:

- Raising entry and operating costs for new players.
- Deterring cross-border participation and protecting local incumbents from challengers.

The legal barriers hinder competition by:

- Creating uncertainty for new entrants.
- Raising the compliance burden.

Most recently, the ECB forum AMI-SeCo Securities Group has further addressed the barriers.

Technical barriers

Legal barriers

The Giovannini barriers

Barriers to efficient cross-border clearing and settlement, **bold** indicating persisting barrier

Technical barriers

1. **National differences in information technology and interfaces.**
2. National clearing and settlement restrictions that require the use of multiple systems.
3. **Differences in national rules relating to corporate actions, beneficial ownership and custody.**
4. Absence of intra-day settlement finality.
5. Practical impediments to remote access to national clearing and settlement systems.
6. National differences in settlement periods.
7. National differences in operating hours/settlement deadlines.
8. **National differences in securities issuance practice.**
9. **National restrictions on the location of securities.**
10. **National restrictions on the activity of primary dealers and market makers.**

5 of 10

Technical barriers persisting

Legal barriers

11. **Domestic withholding tax regulations serving to disadvantage foreign intermediaries.**
12. **Transaction taxes collected through a functionality integrated into a local settlement system.**
13. **The absence of an EU-wide framework for the treatment of interests in securities.**
14. **National differences in the legal treatment of bilateral netting for financial transactions.**
15. **Uneven application of national conflict of law rules.**

5 of 5

Legal barriers persisting

Source: Implement Economics based on The Giovannini Group (2001), The Giovannini Group (2003), European Post Trade Forum (2017), ECSDA (2024), and AMI-SeCo Securities Group (2025).

Economies of scale and scope in the Capital Market Infrastructure have increased companies' profitability

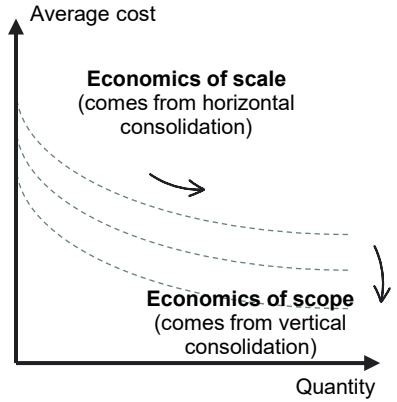
The scale and network effects in financial markets incentivise companies to integrate horizontally and vertically. The scale effects can lead to competitive challenges:

- **Natural Monopoly Formation**: High fixed costs and scale advantages can lead to one dominant provider, crowding out competition.
- **Market Concentration**: A few large players can control most of the market, limiting the choice for investors when it comes to choosing incumbent exchange, CCP, and CSD.
- **Market Power:** Dominant companies can harvest the scale benefits, influence prices and engage in rent seeking, reducing fairness and transparency.
- **Barriers to Entry:** New entrants struggle to compete due to the high capital and volume requirements needed to establish e.g. a CSD or CCP and reach efficiency.
- **Reduced Innovation**: Lack of competition can lower incentives to innovate or improve infrastructure services.

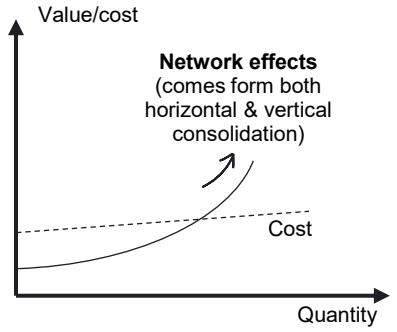
Scale and network effects in the Capital Market Infrastructure

Microeconomic illustration

Economies of scale and scope



Network effects



Economies of scale

Shaofang and Matej (2017) confirm the existence of substantial economies of scale in trading and post-trading Capital Market Infrastructures. They show that economies of scale are **positively related** to size, vertical and horizontal integration of Capital Market Infrastructure providers. Economies of scale are significantly higher in North America than in other regions.

Economies of scope

When analysing economies of scope, they show that the **efficiency of Capital Market Infrastructure providers increases with vertical (but not horizontal) integration**.

Network effects

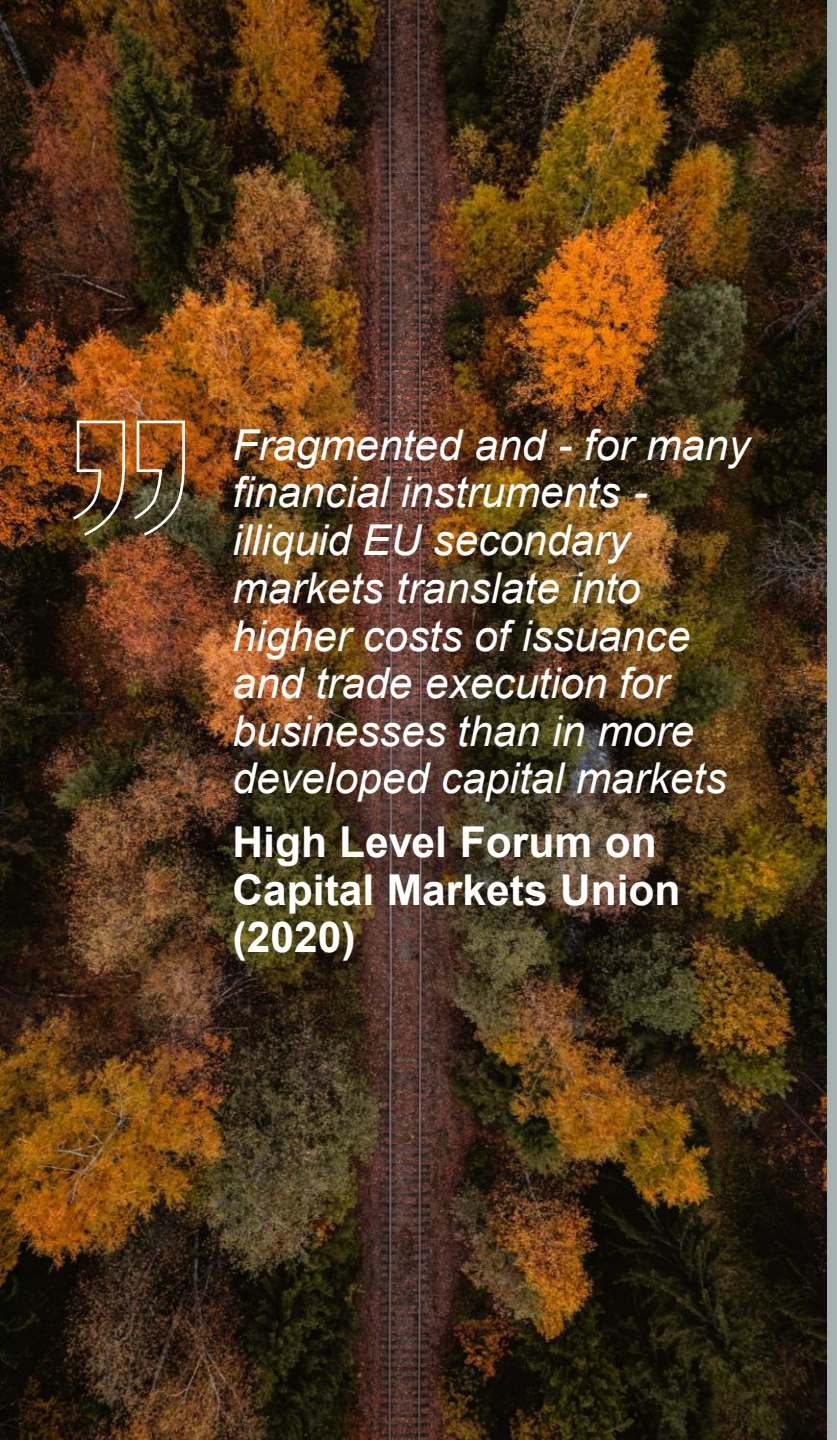
McNamara (2018) explores network effects with an emphasis on liquidity, highlighting the structural challenges faced by emerging, smaller venues in securing sufficient liquidity to compete effectively. They find that these challenges stem from the self-reinforcing nature of liquidity network effects and the competitive advantages held by established exchanges.

Higher profit for vertically-integrated companies compared with non-integrated companies.[1]

Impact

When scale and network effects increase, entry barriers also increase. The implication is that the incumbent's market power increases significantly. When the market is unregulated in terms pricing and income, the scale effects increase producer surplus without a corresponding increase in consumer surplus.

Note: 1) Shaofang and Matej (2017) estimate that the profit efficiency will be higher 10% higher for vertically integrated companies than non-integrated companies. They define profit efficiency as the profit that could be obtained if the firm were fully efficient.
Source: Implement Economics based on Shaofang and Matej (2017) and McNamara (2018).



Fragmented and - for many financial instruments - illiquid EU secondary markets translate into higher costs of issuance and trade execution for businesses than in more developed capital markets

High Level Forum on Capital Markets Union (2020)

03

Analysis of market inefficiencies

This chapter provides an overview of significant market failures within the EU Capital Market Infrastructure. These inefficiencies reduce market liquidity, limit information flow, and prevent market integration. Additionally, the chapter outlines the implications and costs associated with anti-competitive market behaviour and inadequate regulation.

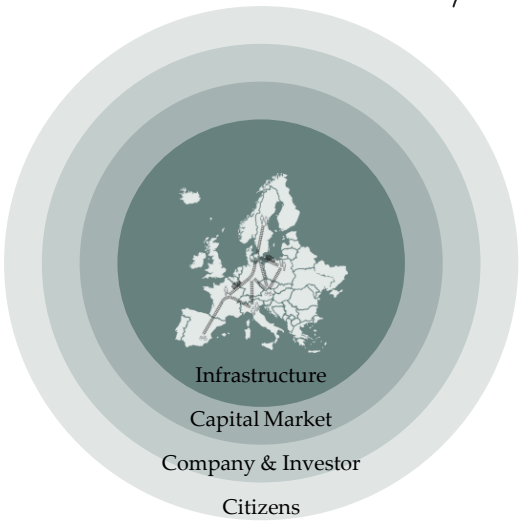
Key messages

In this chapter we demonstrate that,

- Incumbent exchanges hold monopoly power over the closing auction, leading to high fees (up to 45% higher than for continuous trading) and exercising of market power over closing auction trading data.
- Incumbent exchanges leverage their monopoly power over market data, generating revenues over five times higher than costs, with fees rising by over 140% in the past seven years.
- Excessive pricing of market data provides an extra cost of EUR 180-195 million annually for market participants. Addressing the inefficiencies will increase liquidity and improve information.
- Without interoperability between CCPs, the CCP in each EU member state holds monopoly power over clearing. Enhancing interoperability will reduce counterparty risk, collateral needs, and liquidity risk.
- If only one issuer CSD is linked to an incumbent exchange, the issuer CSD holds monopoly power over issuance, maintenance, and safekeeping of shares. This results in a +20% revenue increase over two years, and safekeeping costs for shares that are 50% higher than for bonds.
- Addressing these Capital Market Infrastructure inefficiencies will increase liquidity, improve information, and increase market integration, which will reduce cost of capital for listed companies.

Incumbent exchanges, CSDs, and CCPs are central for the EU capital markets and play a decisive role for driving efficiency for companies and investors by lowering costs, ultimately benefitting all citizens

Much like an actual railway system, the *financial railways* (Capital Market Infrastructure) and the *financial passengers and trains (*capital seekers and investors) fuel activity in the real economy.
If the railway system is broken or poorly managed, i.e. market inefficiencies and failures prevail in the Capital Market Infrastructure, it has real economic implications for companies and citizens.



Stock

The more efficient capital markets, the lower cost of capital for issuers, enhancing capital allocation

Inflow

Investors	Companies
• **The more liquid** and transparent[1] a capital market is, the better rebalancing, allocation, and diversification of long-term holdings can be enabled.	• Companies with better fundamentals retain and **deploy capital more productively**, reinforcing productivity and long-term value creation.
• Less information asymmetry and lower transaction costs allow investors **to easier broaden and diversify investment across EU and allocate more capital to more productive opportunities**, improving returns and market participation while managing risk in the EU.[2]	• The more integrated and liquid markets the stronger matching between firms seeking funding and investors looking for investment opportunities. This **better match on factors such as industry expertise and risk appetite boosts investment activity**.

Examples: Real world implications of inefficient capital markets

Access to finance and job creation

Inefficiencies can prevent funding from reaching high-potential SMEs, limiting their ability to grow and create jobs.

- *Example*
  One in four European SMEs report difficulties with access-to-finance (debt and equity). European SMEs are key contributors to job creation employing 89 million workers and generating 53% of total value added.

Source: European Investment Fund

Non-value adding support functions

European companies listing on US incumbent exchanges or selling themselves to American firms inflict a loss of economic value.

- *Example*
  Over the past decade more than half of European ‘unicorns’ (startups valued at over $1 bUSD) have conducted their IPOs on Nasdaq US and NYSE.

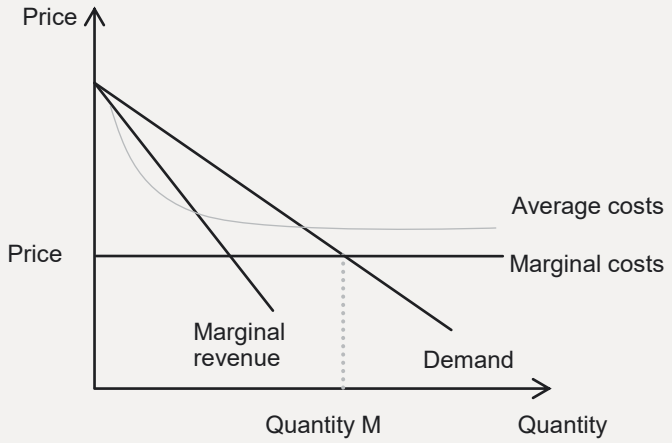
Source: Bergstrom and Holste (2025)

Note 1) Up to a certain order size. 2) This allows the invest to easier diversify across sectors in the EU. In this way, it might be easier to be a specialised or focused investor within a specific sector, e.g. cleantech, in the EU.
Source: Implement Economics based on OECD (2024), Hughes et al. (2006), The Giovannini Group (2001), High Level Forum on Capital Markets Union (2020), European Investment Fund (2024), and Bergstrom and Holste (2025).

Multiple indicators of monopoly abuse is identified, leading to price increases despite falling costs – an outcome that would not have occurred under perfect competition or sufficient regulation

Perfect competition

No deadweight loss for the society with perfect competition

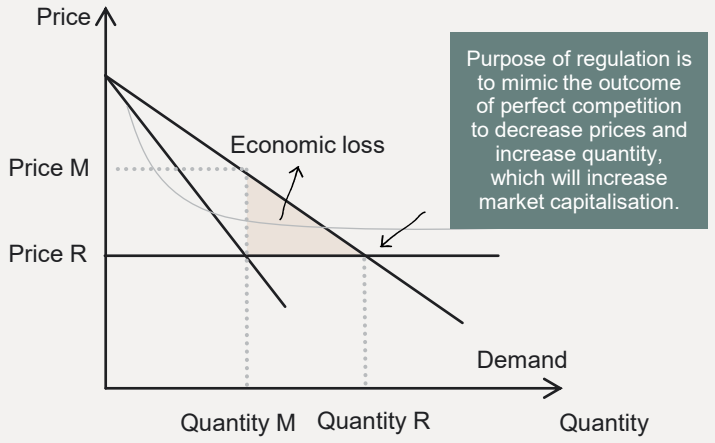


Well-functioning markets typically have the following characteristics:

- Price equal to marginal costs
- High operating efficiency.
- High quality and performance
- No entry barriers
- High user experience
- Wide product range and level of innovation

Monopoly rent with no regulation

Large deadweight loss for the society when a monopoly is maximising profit



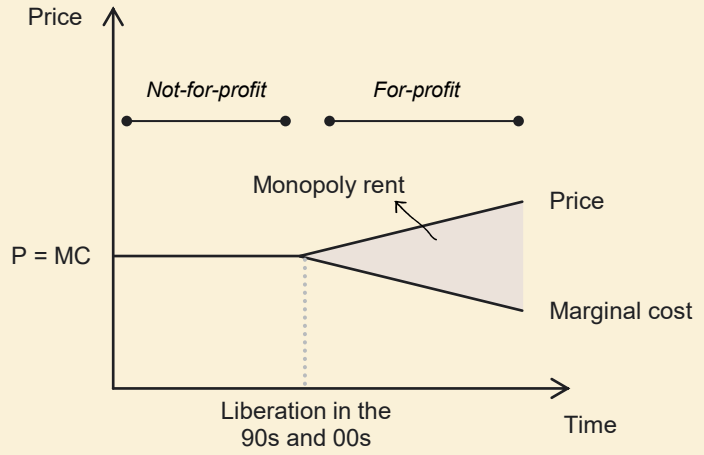
It is expensive for companies and investors when monopolies are given free rein to maximise profits. **Price is too high:** Prices are set by the monopolist as opposed to a competitive market where prices are set by the market and equals the costs. **Quantity is too low:** Due to the price setting, a suboptimal low quantity is supplied.

This is an inefficient outcome for society. To prevent it, monopolies must be regulated to prevent them from exploiting their dominant market position. Despite exchanges being mere facilitators of supply and demand, this industry holds significant market power.

When infrastructure is critical and users lack alternatives, demand becomes quite inelastic. Even small changes in quantity can significantly impact prices and market stability.

The Capital Market Infrastructure exhibits monopoly power

Market consolidation has led to scale and network effects; however, higher prices occur for companies and investors



When the Capital Market Infrastructure went from public not-for-profit entities to private for-profit companies, a horizontal and vertical consolidation of incumbent exchanges, CCP and CSD unfolded.

The consolidation has led to large exchange groups with scale and network effects driving down costs. However, the benefits of these efficiencies have not been passed on to listed companies, consumers, and investors. This highlights the need for effective regulation to ensure that monopolies operate as close to natural competitive conditions as possible.

Addressing market inefficiencies in incumbent exchanges, CCPs, and CSDs is likely to reduce total transaction fees, enhance information flow, increase market integration, and boost liquidity

In the previous section, we demonstrated several competitive concerns of the Capital Market Infrastructure stemming from historical developments, including vertical and horizontal integration, technical and legal barriers, network effects and economies of scale. Without proper regulation that incentivises companies to act as if they were subject to efficient competition, these factors are likely to lead companies to exploit their monopoly power, resulting in excessive prices and insufficient quantities. The table below provides **an overview of the market inefficiencies** associated with incumbent exchanges, CCPs, and CSDs. These inefficiencies will be examined and analysed in the following pages.

	Market inefficiencies	Implication	Efficiency gains from solving failures
Incumbent Exchanges 	Incumbent exchanges hold monopoly power over closing auctions, as these are only conducted on the exchange where the stocks are listed. The closing auction data (e.g. closing price) is indispensability and used for various critical purposes (e.g. tax reporting, passive investment) which reinforces incumbent exchanges' monopoly power. Market data is a by-product of trading activity. As market data is indispensability and critical for investment decisions, incumbent exchanges hold monopoly power over its generated data.	• Excessive fees on closing auctions. • No willingness among incumbent exchanges to open closing auctions for other trading venues to access. • Excessive fees on market data. • Complex and non-transparent pricing of market data.	**Improved information** improving price discovery and reducing information asymmetry between buyers and sellers **Higher liquidity** leading to lower liquidity risk premiums and transaction costs **Increased market integration** resulting from genuine competition in trading and cheaper access to data from incumbent exchanges.
Central Clearing Counterparties (CCPs) 	If it is not possible to freely choose a CCP in a market and the available CCPs are not linked with each other, no interoperability, the primary CCP will not be exposed to genuine competition and holds monopoly power in their home market. Without interoperability, the incumbent exchanges can appoint the preferred CCP allowing the incumbent exchanges to expand their market power downstream.	• Excessive clearing fees. • Reduced netting efficiency. • Margin requirement too high.	**Higher liquidity** leading to lower liquidity risk premiums and transaction costs **Increased market integration** reducing cost of capital
Central Securities Depositories (CSDs) 	If only one issuer CSD is linked to an incumbent exchange, the issuer CSD holds monopoly power over issuance of shares in its home country. This monopoly power extends to maintenance and safekeeping as these are tied to where shares are issued and originally registered. Cross-border settlement remains limited. Differences in national laws and market practices persist, and both the incentives and willingness among CSDs and market participants to engage in cross-border settlement are low.	• Excessive issuance fees. • Excessive fees for maintenance and safekeeping. • Excessive settlement fees. • Reduced cross-border settlement.	**Higher liquidity** leading to lower liquidity risk premiums and transaction costs **Increased market integration** reducing cost of capital

Incumbent exchanges

In this section we demonstrate that,

- Incumbent exchanges hold monopoly power over closing auctions (20-25% of daily trading volume), leading to high fees and market power over critical trading data.

- Incumbent exchanges have monopoly power over market data as it is indispensable and non-substitutable, resulting in revenues more than 5x costs and excessive, complex pricing.

> *It is like buying eggs at the store but only being told the price after you explain whether you will use them for breakfast, baking, or running a restaurant.*
>
> Trader, Systemic Bank

This section finds that incumbent exchanges hold monopoly power over closing auctions and market data, leading to too high fees, which MiFID II has failed to adequately address

Situation and complication

In the current market…

Incumbent exchanges play a central role in the listing and trading phases of the capital market value chain.

Incumbent exchanges facilitate the listing of companies, provide the infrastructure for daily trading, including opening auctions, continuous trading, and closing auctions, and generate and distribute market data.

In the EU, around 95% of enterprises are listed on their national incumbent exchange. The heavy reliance on local investors and the legal fragmentation across countries drive the home bias in listings.

MiFID I introduced competition in trading, which had an impact on continuous trading but not in the opening and closing auctions as these remain exclusive to the listing exchange. The growing volume in the closing auction adds market power to the incumbent exchange which can be exploited in terms of excess fees.

Incumbent exchanges also claim proprietary rights over the market data generated on their platform, including the closing auction, making them the sole source for indispensable, non-substitutable market data.

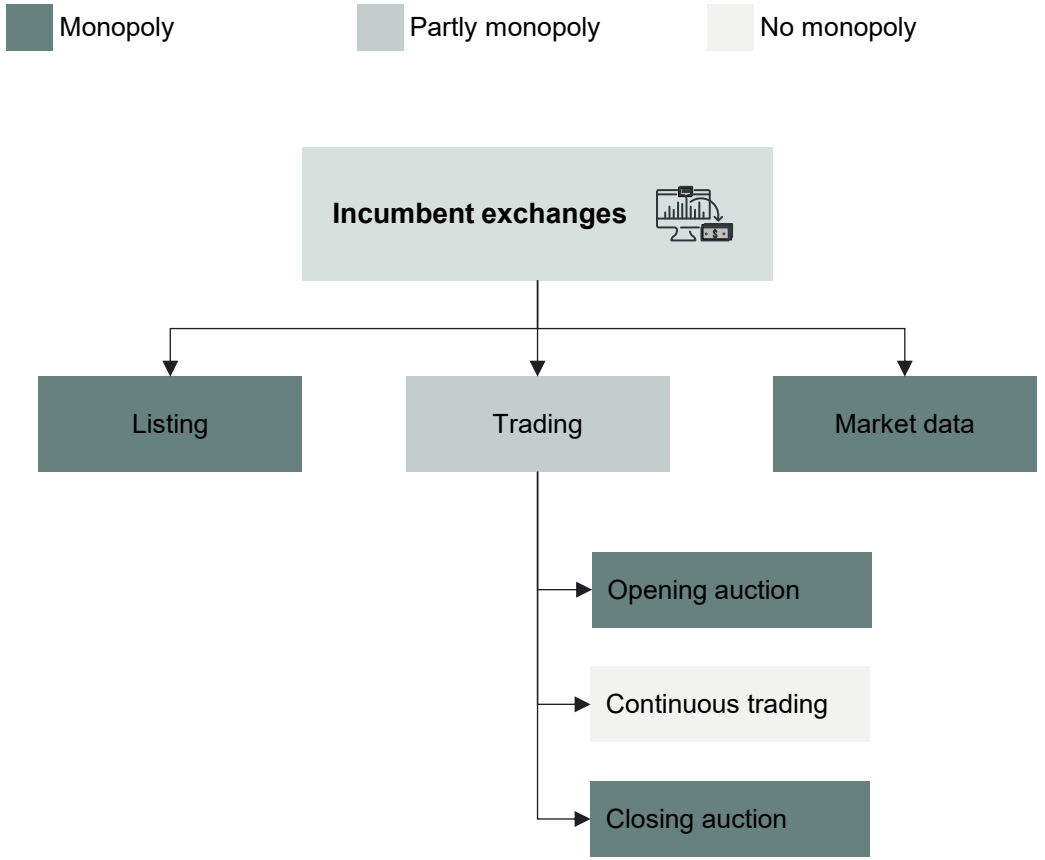
…leading to…

Incumbent exchanges operating under conditions with monopoly over listings, closing auctions, and market data.

This monopoly can be leveraged into high trading fees in the closing auction and excessive charges for market data access.

MIFID II has failed to keep market data prices at a fair level and as a result, overall execution costs have increased, making life more expensive for everyone.

Business areas of incumbent exchanges

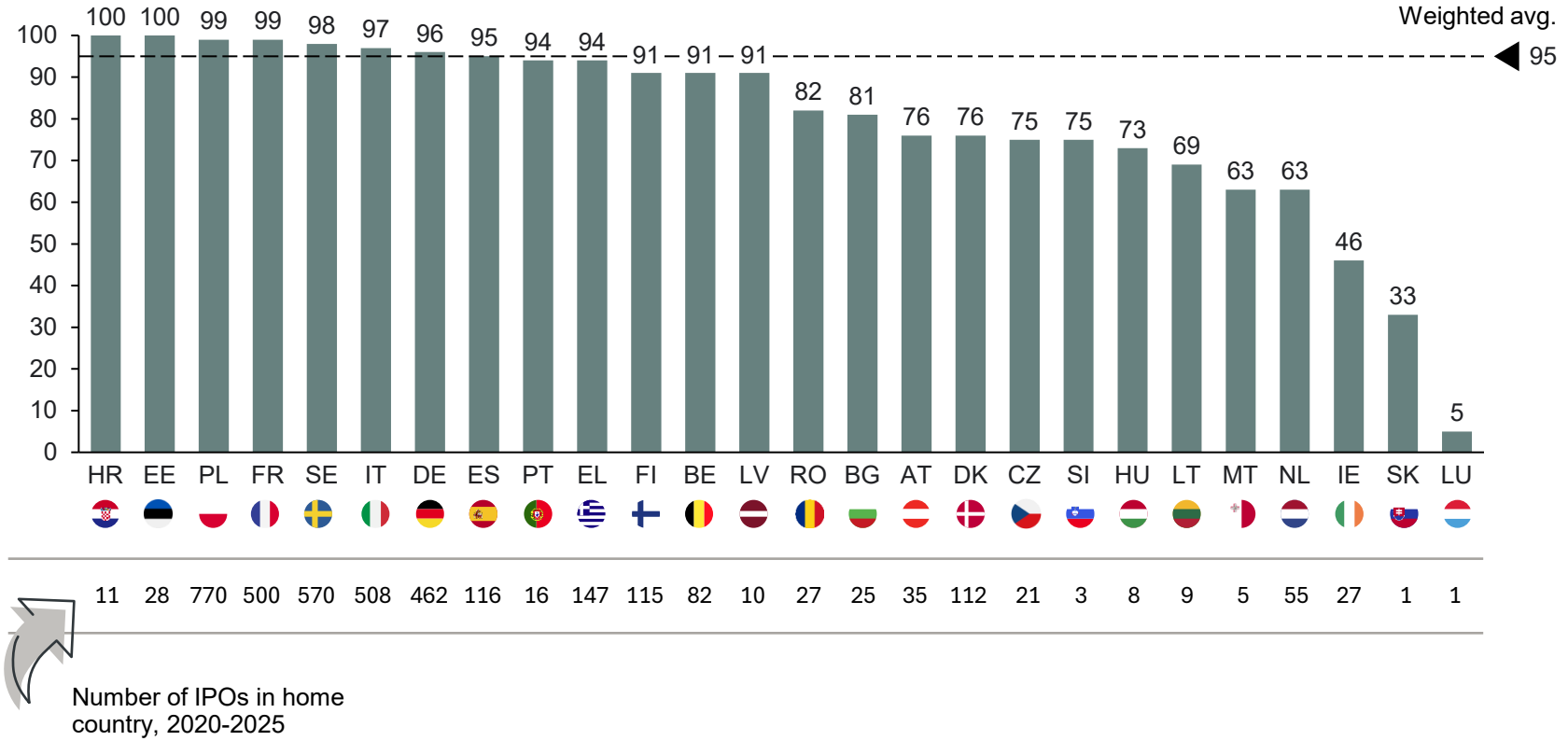


Source: Implement Economics based on Market Structure Partners (2025), New Financial (2021), AFME (2019) and Copenhagen Economics (2018).

95% of IPOs occur in home countries, highlighting reliance on local exchanges and structural barriers to cross-border listings

- In the EU, around 95% of enterprises are listed on their domestic incumbent exchange. These listings are typically tailored to local investor bases and maximise attention from potential investors.
- Dual or cross-border IPOs remain an exception rather than the norm. When companies choose to list on foreign incumbent exchanges, it is often because they expect a higher probability of attracting specific investor awareness e.g., due to industry clusters.
- Many enterprises rely heavily on local financial institutions, investors, and advisors who have close ties to the domestic incumbent exchange. These relationships influence listing decisions and often reinforce a nationally oriented approach to capital raising.
- Additionally, differences between countries in terms of corporate laws, tax laws, insolvency laws etc. create structural barriers. These legal and regulatory differences can limit a firm's ability to list on the incumbent exchange that might otherwise best suit its business model or growth strategy.

Share of IPOs in home country, 2020-2025
Percent

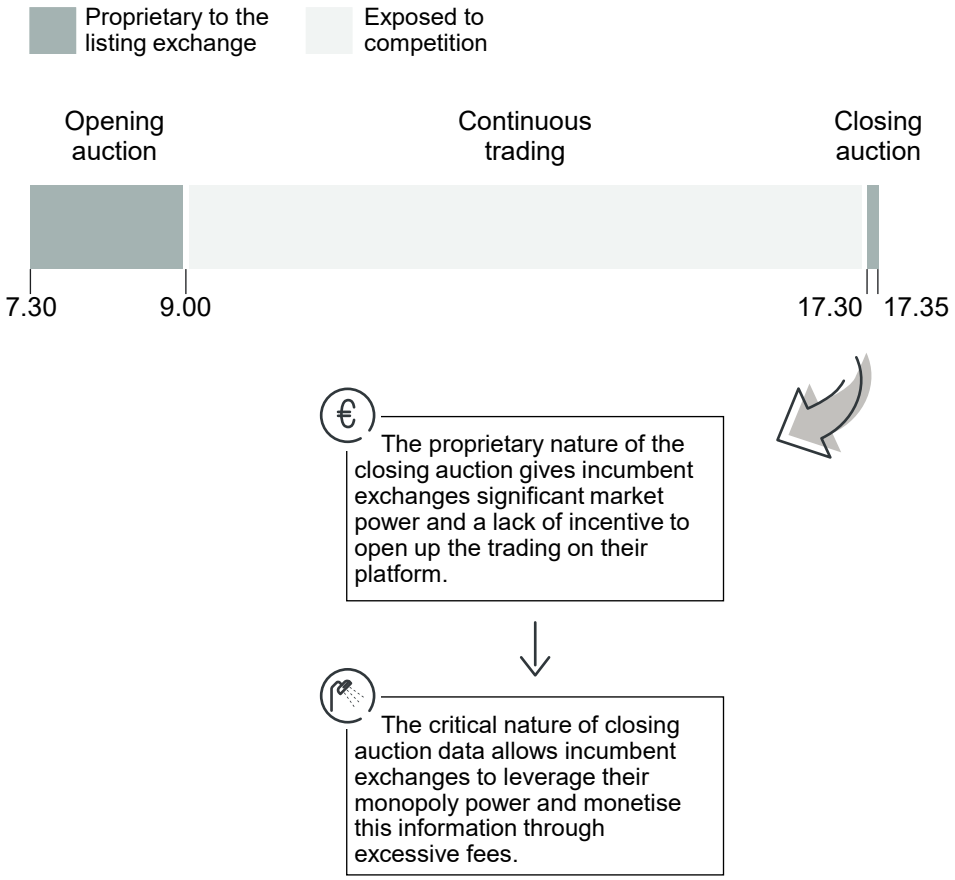


Source: Implement Economics based on data from a European Bank (2025).

Incumbent exchanges hold monopoly power over closing auctions

- A trading day consists of an opening auction, a continuous trading session, and a closing auction.
- MiFID I opened trading to competition but had no impact on the opening and closing auctions, as these are considered proprietary to the incumbent exchange on which the company is listed.
- Often, incumbent exchanges hold a national listing monopoly, consequently, granting them monopoly power over the critical closing auction for their listed securities.
- The closing price from the closing auction plays a critical role in various purposes, *see box 'Critical nature of closing auction data'*, which reinforces the incumbent exchanges' market power.
- The monopoly power over closing auctions can be leveraged into excessive fees, which increase the costs for the final investor.
- At some incumbent exchanges, fees for trading in the closing auction are observed to be up to 45% higher than those in continuous trade.
- The proprietary nature of the closing auction and the indispensability of its data, grant the incumbent exchanges with monopoly power over this data which is leveraged to charge high fees.

Overview of a trading day



Critical nature of closing auction market data

During the closing auction, incumbent exchanges generate unique and indispensable data, such as closing prices, volumes, and bid-ask spreads. Especially the closing price is critical for trading strategies and compliance reporting:

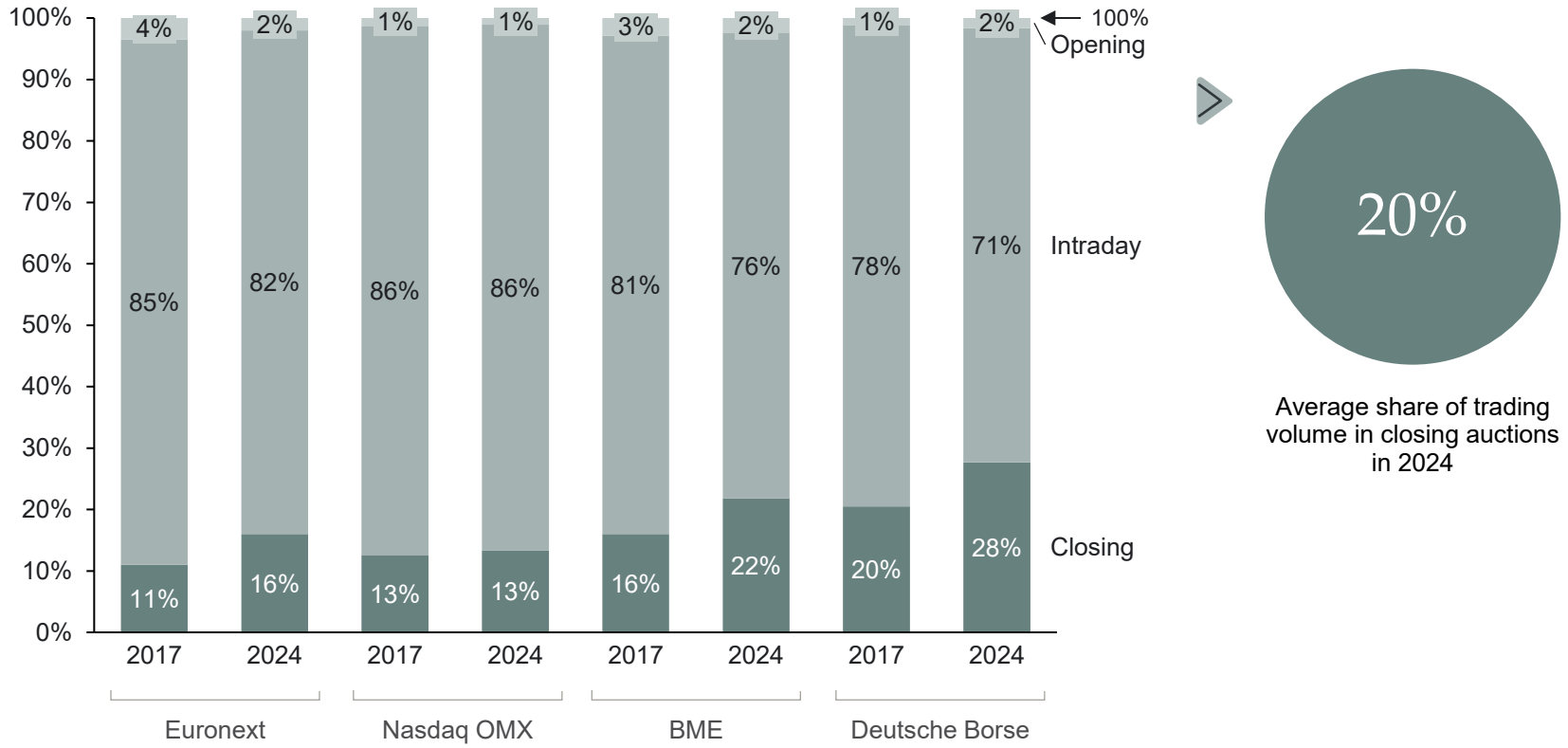
- Tax and accounting purposes: The official closing price is used for valuing portfolios and for calculating taxes.
- Index investing and passive management: With the rise of passive investment strategies, more trades are executed at the closing price, which directly affects how well funds track their benchmarks.
- Quantitative and algorithmic strategies: Many modern investment strategies rely on data and benchmarks based on closing prices, increasing the importance of accurate and fair closing prices.
- Best execution requirements (MiFID II): Regulations now emphasise that investors must get the best possible price, often tied to the closing price.
- Reduced exposure to High-Frequency Trading: Some market participants prefer trading during the closing auction to avoid the volatility caused by HFT activity during regular trading hours.

Source: Implement Economics based on Market Structure Partners (2025), AFME (2019), and Nasdaq (2025).

Rising closing auction volumes (20%-25%) of daily trading volume) boost incumbent exchanges' monopoly power

- The more trading in closing auctions, the more market power incumbent exchanges gain as they hold a monopoly over this part of the trading.
- Since 2017, the share of trading volume executed in closing auctions has been increasing for three out of four large incumbent exchanges, reaching an average of 20% in 2024.
- At the same time, The Trade (2024) and AFME (2025) report that the closing auctions account for, on average, 25% of liquidity.
- The trend is particularly driven by the rise in index investing and low-cost Exchange Traded Funds (ETFs), which use the price from the closing auction for rebalancing and benchmarking purposes.
- The growing volume adds market power to the exchange which can be exploited in terms of excess fees and a reduced willingness to provide services such as cross border trading at a competitive price.

Share of trading volume
Percent

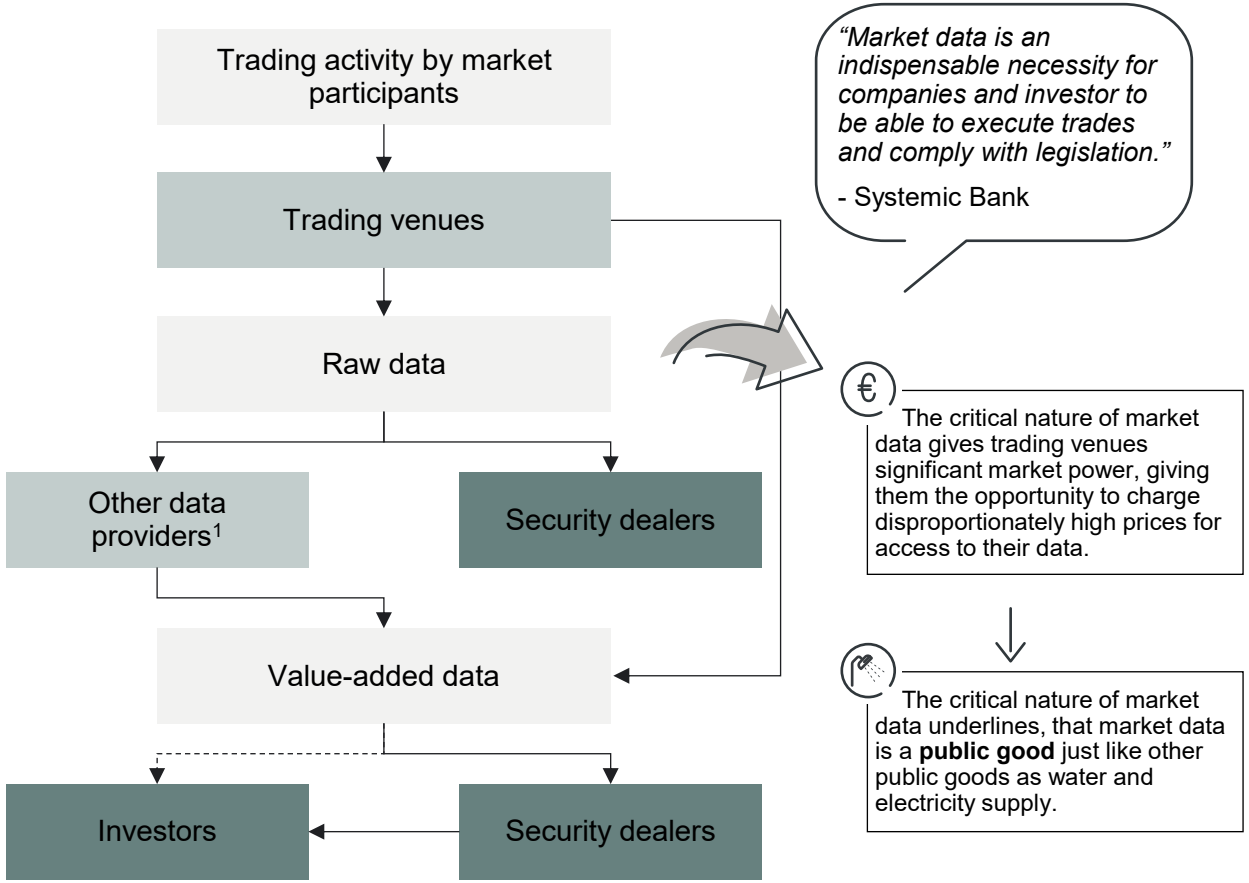


Source: Implement Economics based on Market Structure Partners (2025), CBOE (2025), The Trade (2024) and MiFID II (2018).

Trading venues hold monopoly power over market data, driving high costs despite MiFID II intended to ensure fair pricing

- Market data is a by-product of trading, provided by exchanges. It includes real-time or delayed information on the prices, bid-ask quotes, market volumes, and executed trades. Reliable access to this data is crucial for participating effectively in financial markets.
- Trading venues own the data generated on their platforms, giving them monopoly power over this non-substitutable information. Market data is indispensable for companies and investors to execute trades and comply with legislation, making the demand inelastic.
- MiFIDII aimed to reduce the costs of market data by requiring that it be priced on a 'reasonable commercial basis' by clearly linking the price to the costs of the production and dissemination. However, market data users have not seen a benefit from this provision as costs are often cross-subsidised with other services. This means that price increases can be justified by the cost of other services, which are not directly related.
- MIFID II has failed to keep market data prices at a fair level and as a result, overall execution costs have increased, making life more expensive for everyone. Rising costs ultimately impact the whole financial ecosystem from trading venues to intermediaries and vendors down to their clients and ultimately end-investors.
- MiFID III has launched new regulation intended to be clearer in how the costs and conditions for market data usage is to be set. However, the new measures which will apply from around mid 2026 are still not developed as genuine regulatory tools for infrastructure as in other sectors.

Flow of market data

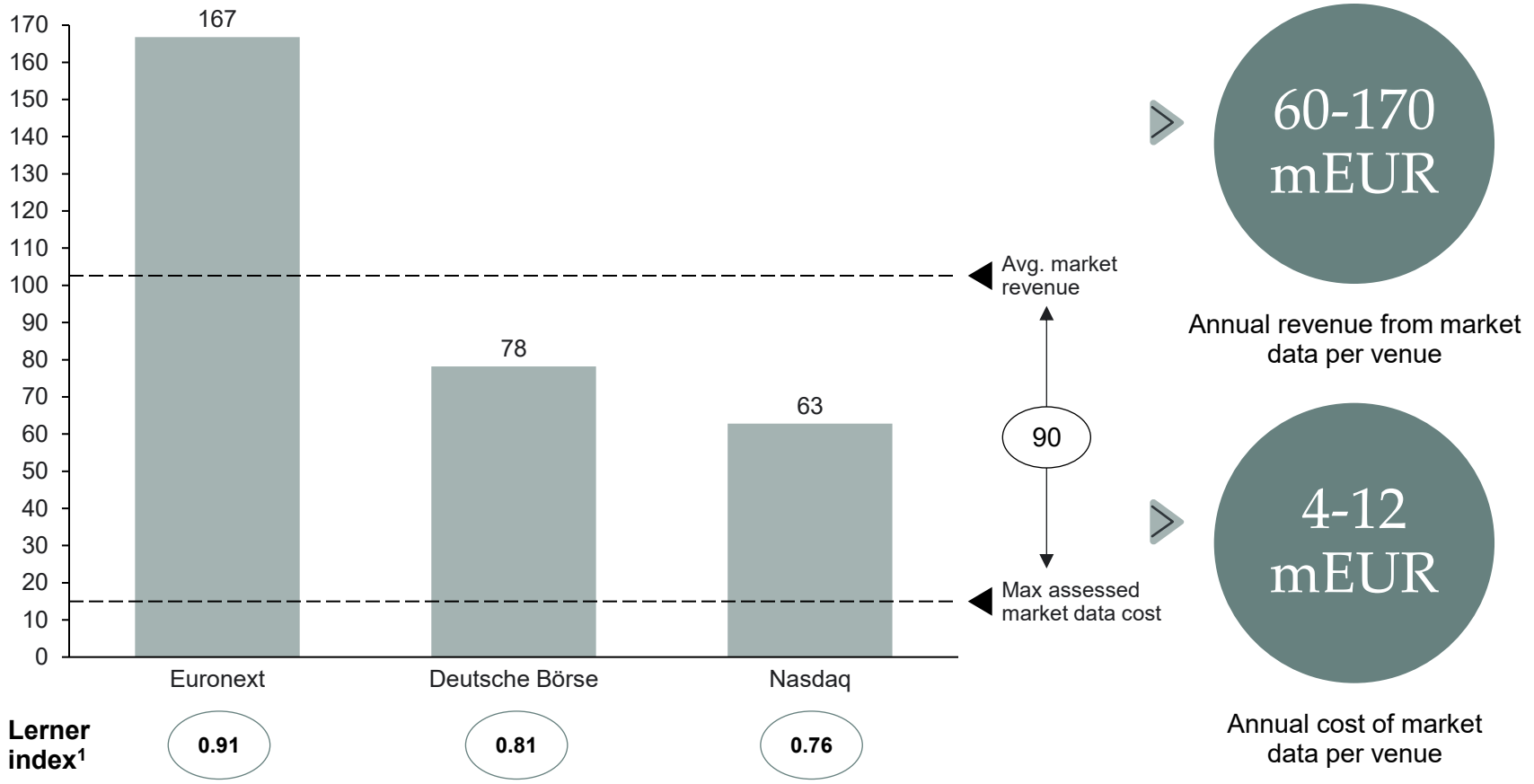


Note: 1): Providers of value-add data, indices, benchmarks, ESG-data, credit rating etc. Examples include Bloomberg, Refinitiv, MSCI, and FTSE.
Source: Implement Economics based on Market Structure Partners (2025), Copenhagen Economics (2018), and AFME (2019).

Revenues from market data are +5X costs, indicating monopoly rent, which is possible as regulation is not enforced

- The trading venues do not publish the costs involved with producing and distributing the data. However, earlier studies have estimated that the annual distribution costs of market data are around EUR 4-12 million per trading venue.
- Although the cost estimate is subject to uncertainty, it is very low compared to the revenue from market data.
- The average annual revenue from market data of the three largest incumbent exchanges within the EU is around EUR 100 million.
- The Lerner index is 0.91 for Euronext, 0.81 for Deutsche Börse, and 0.76 for Nasdaq, which indicates excessive pricing compared to corresponding costs. A Lerner index of 1 implies monopoly behaviour.
- This suggests that market data sales generate substantial profit margins, raising questions about MiFID II and a need for new, more stringent regulation.

Annual revenue and cost of market data
EUR million, 2023

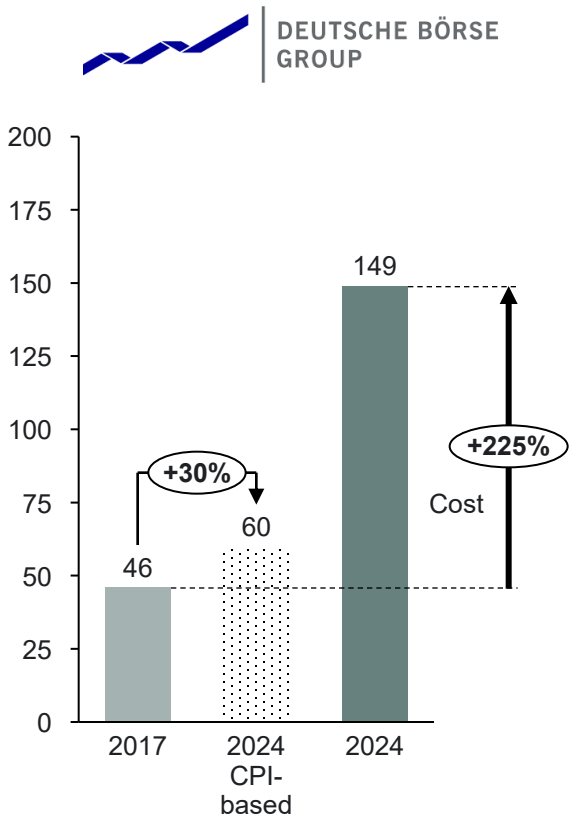


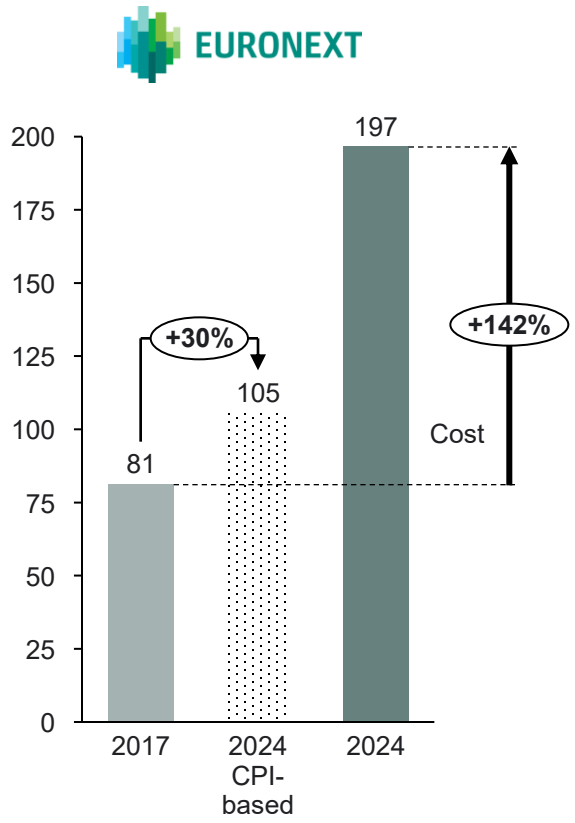
Note: 1) Lerner index = (p – mc) / p. L = 0 indicates competitive conduct, and L = 1 implies monopoly behaviour. Approximation of Lerner index = (Revenue – Costs) / Revenue. L = 0 indicates competitive conduct and L = 1 implies monopoly behaviour.
Source: Implement Economics based on Market Structure Partners (2025), Copenhagen Economics (2018), Oxera (2014), and MiFID II (2018).

Prices on market data have increased more than 140% in seven years, driven by market power rather than costs or competition

- Non-display fees, charged for machine-consumed data, were introduced by most trading platforms post-MiFID I in the mid 2000s.[1]
- The price development is detached from the development in production costs (technology and distribution), which have fallen over the same period.
- Despite falling production costs (technology and distribution), these fees have risen steeply, exceeding display data price growth and far outpacing the consumer price index, which has been around 30% over the same period.
- Market Structure Partners notes that trading venues have used non-transparent licensing and complex contracts to expand the scope and price of non-display use, highlighting how market power, not cost or competition, drives pricing.

Annual cost of non-display market data fees[2]
Thousand EUR per calendar month (pcm)





+103 tEUR/pcm

Increased cost of non-display market data fees at **Deutsche Börse**

+116 tEUR/pcm

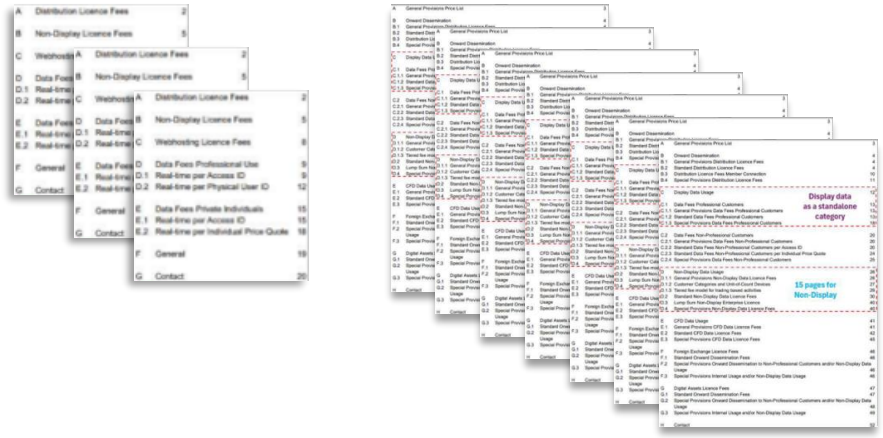
Increased cost of non-display market data fees at **Euronext**

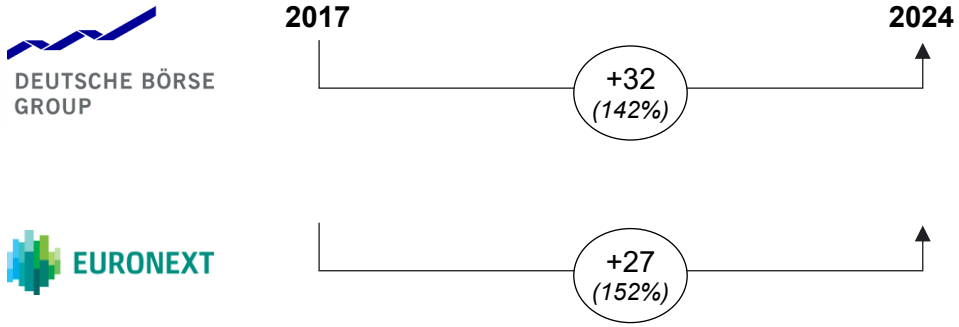
Note: 1) Non-display fees are charged for using market data without displaying it to a human, i.e., when the data is consumed by automated systems, algorithms, or internal processes. Display data fee is a fee that an exchange charges when market data is displayed on a screen or user interface to a human user (e.g., a trader, analyst, or retail investor). 2) For a single product category within level 2 data.
Source: Implement Economics based on Market Structure Partners (2025), and MiFID II (2018).

The fee schedule of market data is very complex, reducing transparency and increasing costs for consumers

- The price list and terms and conditions have increased exponentially from 2017 to 2024.
  - Deutsche Börse: From 21 to 53 pages.
  - Euronext: From 19 to 46 pages.
- Prices have evolved from simple tariffs to complex systems with multiple categories applied for consuming data in different ways.
- Introducing this kind of differential pricing increases producer surplus (the trading venue) at the expense of consumer surplus (the investor).
- To enforce the complex pricing, interviews have revealed rigorous auditing procedures. The true price of consuming data is often unknown before auditing, and the audit procedure adds additional overhead to consumers of market data. This underscores the incumbent exchanges' significant control over pricing.

Fee schedule changes
Number of pages





Examples from the real economy

Non-value adding support functions

As a consequence of the price disparities and complexity in fee schedules, a market has arisen for advisory companies helping clients understand, manage, and optimise their market data usage and expenditures.

This additional layer of consultancy costs could be mitigated through enhancing transparency and standardisation in market data pricing.

Source: Implement Economics based on Market Structure Partners (2025), and MiFID II (2018).

Excessive pricing of market data has a direct cost of EUR 180-195 million annually, and addressing the inefficiencies can reduce cost of capital through lower fees, better information, and higher liquidity

Solving the current situation and complication

- A cost-plus model with a price cap is considered the best option given the current regulation. The current MiFIDIII/MiFIR2 regulation has taken some steps in the right directions but has unfortunately taken a joint cost rather than the correct by-product approach and not included a price cap either.
- The cost-plus model sets the price by adding a markup to the total costs. Only costs directly associated with market data production and dissemination should be included. As previously seen, the operating costs are limited due to the decline in data distribution costs.
- To determine a reasonable cost level, one needs to include a risk-adjusted mark up. In this context, this report applies a WACC between 5% and 7% based on current levels for telecommunications, utility, and electricity distributing companies.
- It is important to implement an upper price cap to avoid abuse of market power however without cutting costs so hard that trading venues can't innovate. Setting the right measures and ensuring enforcement is essential and require a strong mandate

Perspective

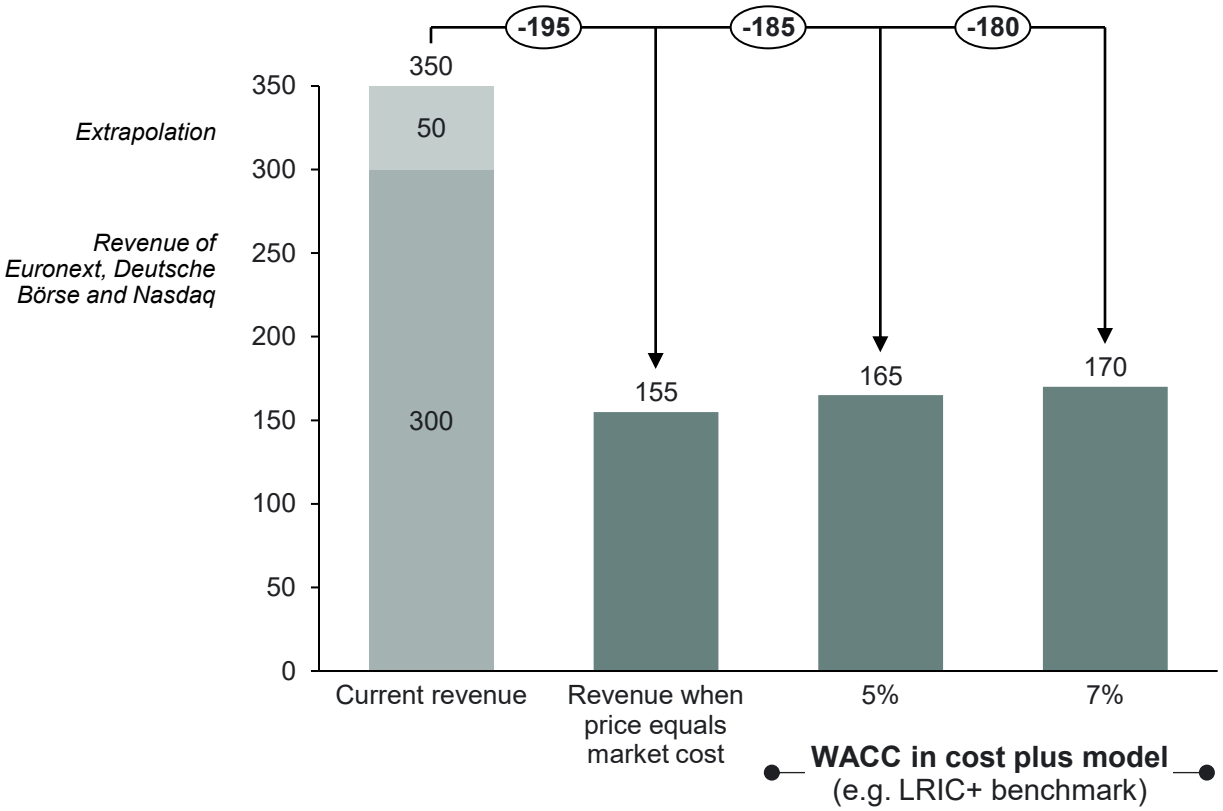
If market data became a public good, it would enable easier access, foster competition, increase market liquidity, and promote transparency in price setting. This would challenge the dominance of trading venues and shift the market away from "big is beautiful".[1]

Cost of capital reduction levers

Better information improving price discovery and reducing information asymmetry between buyers and sellers

Higher liquidity leading to lower liquidity risk premiums and lower transaction costs

Total market data revenue at different mark-up levels in the EU[2]
EUR million



Note: 1) A public good is defined as a commodity or service that is both non-excludable and non-rivalrous. Use by one person neither prevents access by other people, nor does it reduce availability to others. 2) Total market data revenue is calculated by extrapolating the market data revenue of Euronext, Deutsche Börse, and Nasdaq. Total market data cost is based on Copenhagen Economics (2018) estimate of 3-10 EURm per trading venue adjusted for inflation in the period 2018-2023.
Source: Implement Economics based on Copenhagen Economics (2018) and Market Structure Partners (2025).

Central Clearing Counterparties

In this section we demonstrate that,

- With a single primary CCP in each EU member state, the primary CCP holds monopoly power over clearing in its home market if there is no interoperability with foreign CCPs.

- Interoperability can reduce counterparty risk, collateral needs, liquidity risk and complexity.

Limited CCP interoperability and restricted ability to freely choose CCP hinder efficiency and competition, allowing primary CCPs to retain monopoly power in their home market

Situation and complication

In the current market…

The primary function of a CCP is to mitigate risk by interposing itself between the buying investment firm and the selling investment firm. By being the buyer to every seller and seller to every buyer, it protects each party against counterparty risk.

CCPs enhance clearing efficiency through netting, consolidating multiple buy and sell trades in the same security into a single net position. This reduces the number of settlements, lowers exposure, and minimises operational risk.

Few EU incumbent exchanges offer interoperability, allowing multiple CCPs to clear trades on the same trading venue. However, the general adoption of interoperability is limited. In markets where full interoperability is not supported, preferred clearing has emerged.

Preferred clearing enables an alternative CCP to clear a trade, but only if both counterparties have selected the same preferred CCP. Otherwise, the trade defaults to the primary CCP.

…leading to…

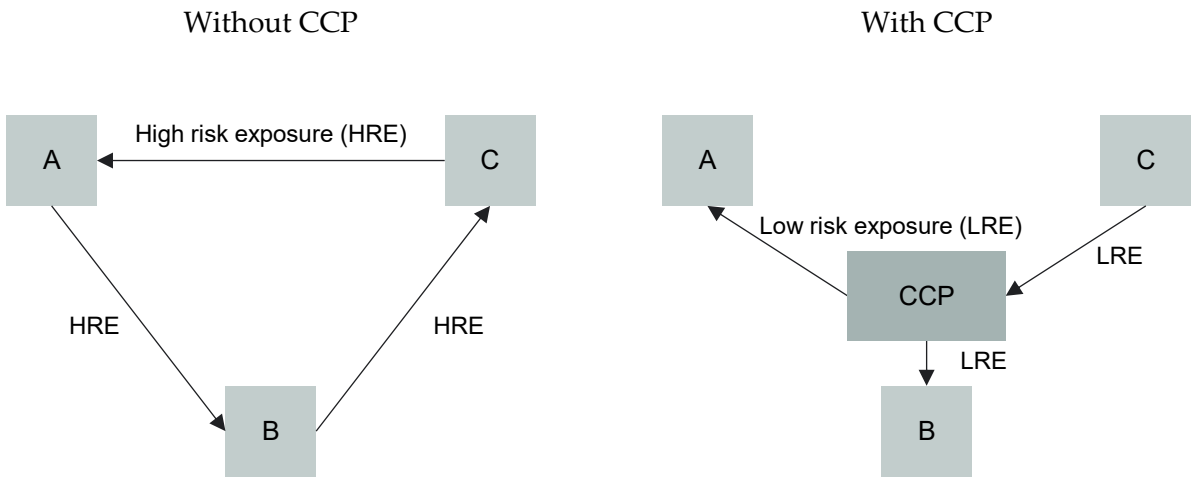
While full interoperability remains the ideal for maximising efficiency and competition in CCP clearing, the adoption is limited as exchange groups are reluctant to open up to interoperability. The positive effects of interoperability will first materialise if there are multiple trading venues that trades the same security.

However, if there is no interoperability, the primary CCP will not be exposed to genuine competition and will hold monopoly power in their home market.

Interoperability is a key enabler of a more efficient Capital Market Infrastructure. It enables deeper netting efficiencies, lowering margin and collateral requirements.

However, In general, CCPs exhibit less pronounced market inefficiencies compared with incumbent exchanges and CSDs.

Netting with and without a CCP



Without a CCP, the parties (A, B and C) cannot net trades with different counterparties.

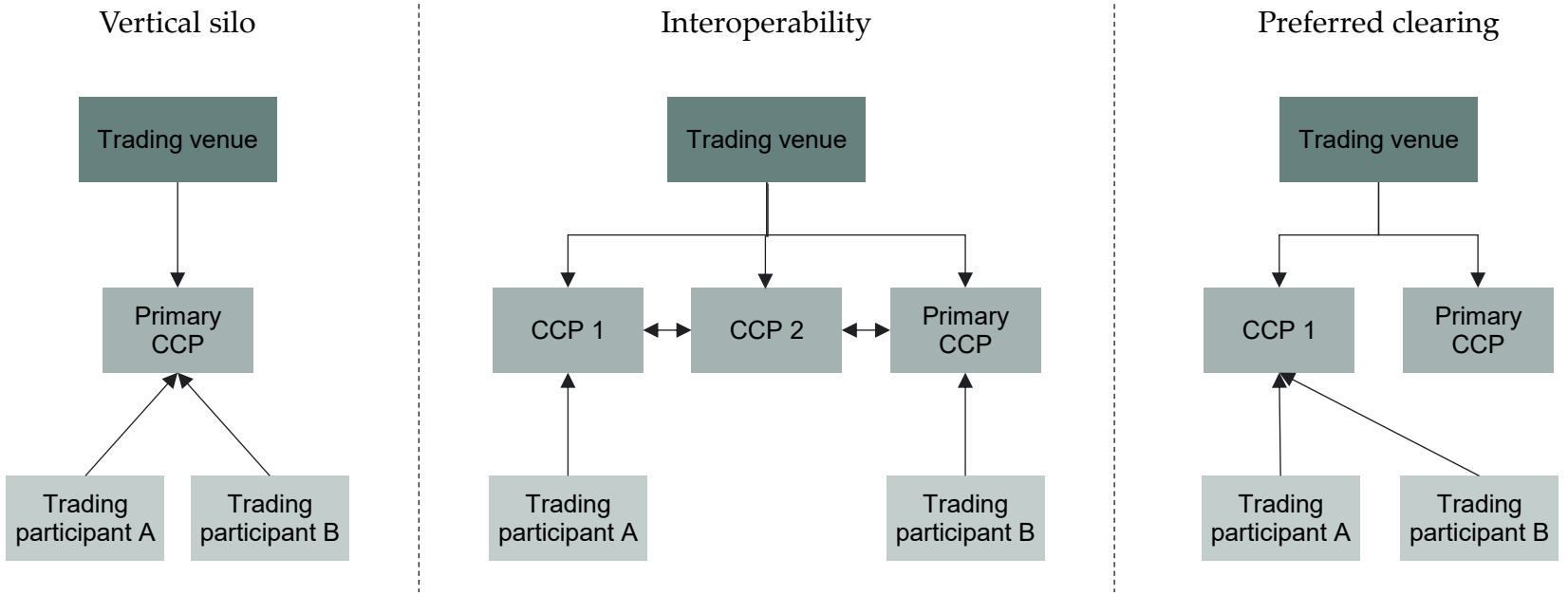
By interposing itself as the counterparty for all transactions, a CCP allows the netting of positions, resulting in increased netting efficiency.

Source: Implement Economics based on ECB (2025), Six (2023), and European Systemic Risk Board (2016).

CCPs are operating under different models with interoperability being critical for infrastructure efficiency and competition

- CCPs are currently operating under different business models. The model that has traditionally existed and is mostly used in the clearing landscape is the vertical silo.
- **Vertical silo:** The trading venue routes all trades to a single, primary CCP. All trading participants must clear through this CCP.
- **Interoperability:** Competing CCPs establish links, allowing trades to be cleared by different CCPs on equal terms, giving trading participants real choice.
- **Preferred clearing:** A compromise where a venue allows access to additional CCPs without full interoperability. Trades go to the preferred CCP only if both parties choose it. Otherwise, the primary CCP is used.
- While the adoption of full interoperability remains limited due to exchange groups being reluctant to open up to interoperability, preferred clearing has emerged.
- To enhance efficiency and competition in CCP clearing, interoperability is the ideal.

CCP models



Source: Implement Economics based on ECB (2025), Six (2023), and European Systemic Risk Board (2016).

Promoting interoperability between CCPs can reduce exposures, collateral needs, liquidity risk and complexity, which will increase market integration and enhance liquidity

Solving the current situation and complications[1]

- Enhancing and promoting interoperability implies,
  - **Reduced aggregate exposures** by lowering the total gross exposures across clearing venues due to boarder and more effective netting.
  - **Reduced aggregate collateral needs** by allowing the consolidation of positions across CCPs, enabling more efficient use of collateral.
  - **Reduced liquidity risk** by implementing more coordinated and netted margining.
  - **Reduced complexity** by using a single CCP to access multiple markets, reducing the need for multiple memberships, systems, and risk models.
  - **More competition between CCPs**

Perspective

In 2011, Nasdaq announced plans of interoperability and launched a free choice of CCPs in the Nordics, allowing participants to select between multiple CPPs. Today LCH Clearnet, SIX x-clear, and Cboe Clear offer interoperable clearing services in the Nordics.

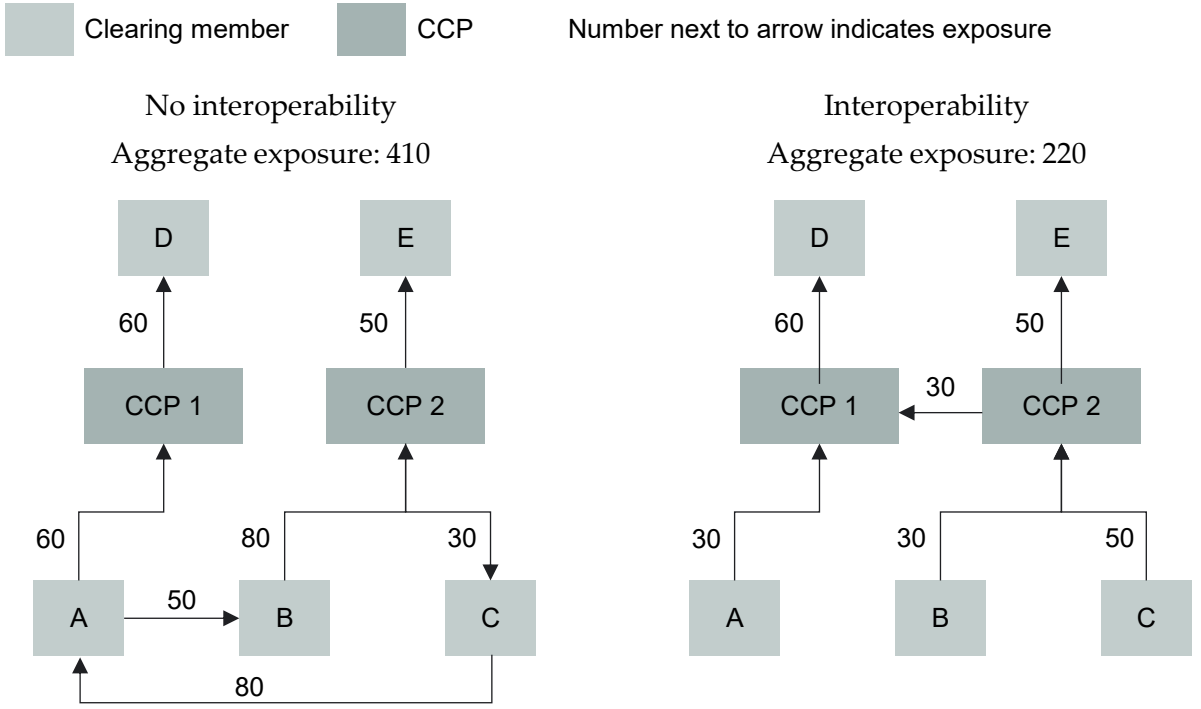
Cost of capital reduction levers

Higher liquidity
from lower liquidity risk and reduced collateral.

Increased market integration
from interoperability, enhancing netting efficiency.

Illustrative example showing the netting benefits of interoperability

This stylised example shows the netting benefits of interoperability relative to a situation where the CCPs act in isolation. Aggregate exposure is the sum of all participants' exposures. With no interoperability, each clearing member (A, B, C, D, E) is a member of just one of the two CCPs. With interoperability, CCP1 and CCP2 have an interoperability arrangement. Now, clearing member A can offset its positions with clearing members B and C as well as net its trades in CCP1 with its trades in CCP2, resulting in increased netting efficiency and reduced aggregate exposure.[2]



Note 1) Similar results can be found in the report by AFME (2025) around building a more competitive and integrated clearing market. 2) A, who is member of CCP 1, net owes B, who is member of CCP 2, an amount equal to an exposure of 50. C, who is member of CCP 2, net owes A, an amount equal to an exposure of 80, so the inter-CCP exposure between CCP 1 and 2 is 30. With interoperability, CCP1 receives 30 from CCP2 via the link, which nets against what A owes to CCP1, so A now only owes 30.
Source: Implement Economics based on ECB (2025), Six (2023), and European Systemic Risk Board (2016).

Central Securities Depositories

In this section we demonstrate that,

- If only one issuer CSD is linked to an incumbent exchange, the issuer CSD has monopoly over issuance, safekeeping, and maintenance of shares leading to excessive fees and increased costs for firms and investors.
- Addressing the inefficiencies would reduce cost of capital through increased market integration and higher liquidity

> *Issuing and maintaining bank notes are done by the National Bank non-profit but issuing and maintaining shares are done by the CSDs for big-profit.*
>
> Trader, Systemic Bank

The CSD has a monopoly over issuance, safekeeping and maintenance of shares, leading to cost increases for firms and investors

Situation and complication

In the current market…

Central Securities Depositories (CSDs) hold a fundamental role in the issuing and post-trading phase of the value chain. The CSD is responsible for

- Issuance of new shares e.g. in an IPO or capital increase.
- Settlement of a trade, moving cash and shares between investor's accounts.
- Safekeeping and maintenance, including corporate actions such as dividend payments and stock splits.

When a CSD issues a share, it proprietarily holds the responsibility for subsequent maintenance and safekeeping. Having one incumbent exchange who is linked exclusively to one CSD, it effectively grants monopoly power to the CSD.

TARGET2-Securities (T2S) has introduced cross-border competition within settlements by harmonising processes across Europe, allowing market participants to access multiple CSDs through a single platform and reducing barriers to choosing settlement providers.[1] However, due to the persistent Giovannini barriers, cross-border competition is still limited.

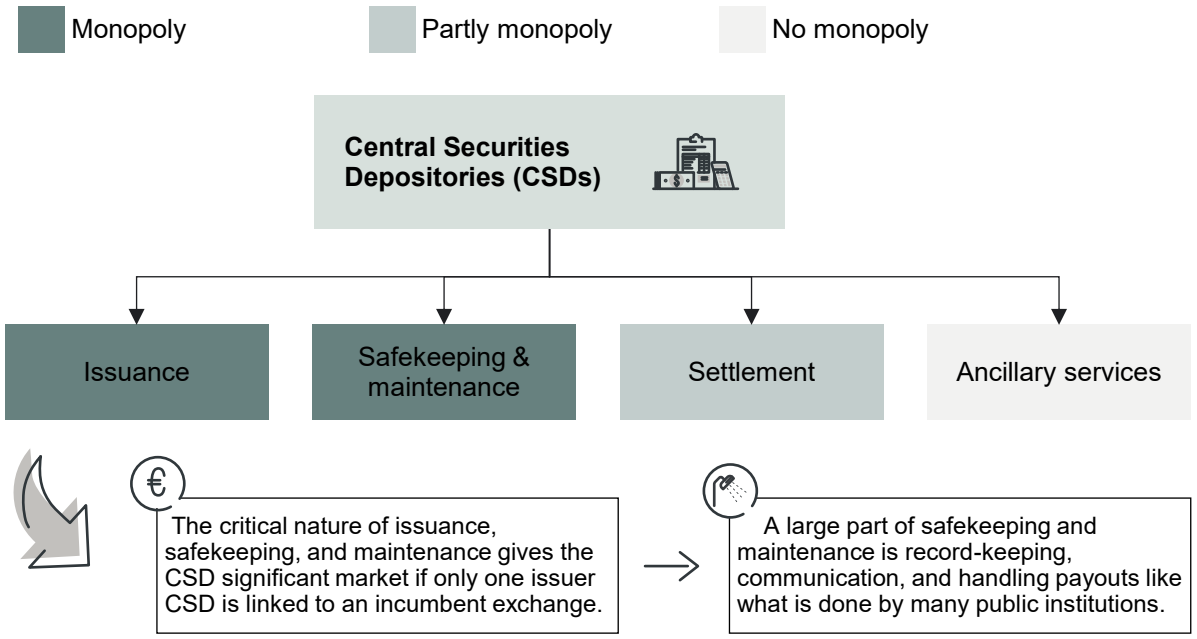
Many CSDs are vertically integrated with the same group owning both incumbent exchanges, CCPs and the CSDs. This allows the group to dictate which CSD must be used, most recently seen when Euronext required that trades executed on the Paris Bourse be settled through Euronext Securities in Italy.

… leading to

CSDs are currently operating under conditions of limited competition or even monopoly for issuance of shares, leading to monopoly over maintenance and safekeeping as well.

The market power within issuance, safekeeping and maintenance can be leveraged into excessive fees, cross-subsidisation, and growing auxiliary services, which increases the costs for the final investor.

Business areas of Central Securities Depositories



Issuer CSD and investor CSD

The **Issuer CSD** is the CSD in the country where shares are issued and originally registered. The **Investor CSD** is where investors hold their shares, which may differ from the issuer CSD. To facilitate cross-border settlement and safekeeping, CSDs establish links between them. When an investor holds shares through their investor CSD, that CSD must maintain a relationship with the issuer CSD to reflect the investor's holdings. As a result, the shares are registered in both the investor and issuer CSD books. This leads to investor CSDs compensating issuer CSDs for safekeeping services, effectively causing investors to pay dual safekeeping fees: one to the investor CSD and another indirectly to the issuer CSD.[2]

Note: 1) TS2 only allow one single issuer CSD per security for cross-border settlement. As a result, investor CSDs must link to the issuer CSD, reinforcing a dual safekeeping structure and limiting competition at the level of issuance. 2) The choice of investor CSD is also limited by the availability of CSD links.
Source: Implement Economics based on The Giovannini Group (2001).

Complex fee schedules amplify the monopoly power of CSDs by suppressing transparency and comparability

- Creating an overview of the price and cost development for CSDs is challenging due to their complex and frequently changing fee structures.
- Consequently, it is not possible, based on publicly available data, to provide a comprehensive view of price and cost trends across CSDs.
- The complexity of CSD fee structures has several important consequences:
  - It **suppresses transparency**, making it difficult for users to benchmark costs over time or across CSDs. This lack of comparability strengthens the monopoly position of CSDs as users have little basis for evaluating alternatives.[1]
  - It raises the **risk of excessive pricing**, as CSDs may extract monopoly rents and apply price discrimination without being meaningfully challenged.
  - It **hampers cross-border integration.** When entering a market, there is a degree of transparency, as the entrant receives the fee structure of the domestic CSD. However, the absence of comparability across CSDs effectively blocks cross-border competition and undermines integration.
- The complexity is illustrated in the report from AFME (2025) showing CSD invoices containing 38-242-line items.

27 CSDs leaves 27 ways to compute, structure and present CSD fees

A **Complexity of fee structures**
Understanding and verifying invoices from CSDs requires significant resources, as CSD fee structures are layered and difficult to interpret.

B **Continuous changes in fee structures**
Adjustments to volume bands, new fee types, or revised charging principles make it difficult for users to predict or plan costs.

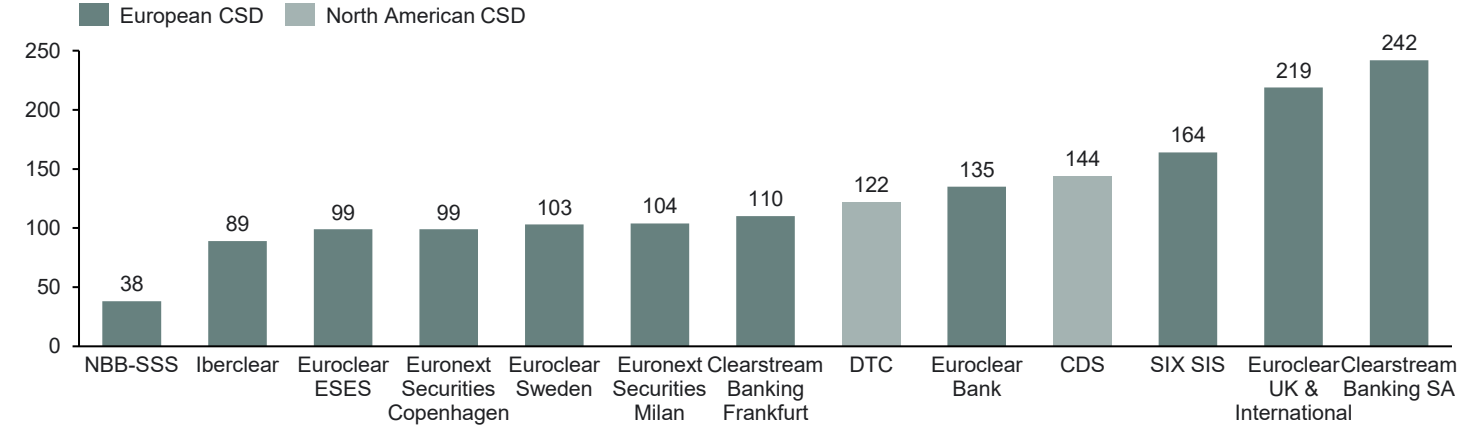
C **Frequent revisions of fees and structures**
Some CSDs revise fees monthly, undermining stability and predictability.

D **Lack of transparency in communication**
Updates are rarely explained or visualised, leaving market participants without clarity on the rationale for changes.

E **Heterogeneity across asset types and account models**
Costs differ depending on the type of security and whether end-investor or omnibus accounts are applied, making cross-CSD comparison even more difficult.

F **Limited access to historical fee schedules**
Making time-series or cross-CSD comparisons nearly impossible

Total line items on CSD's fee schedules

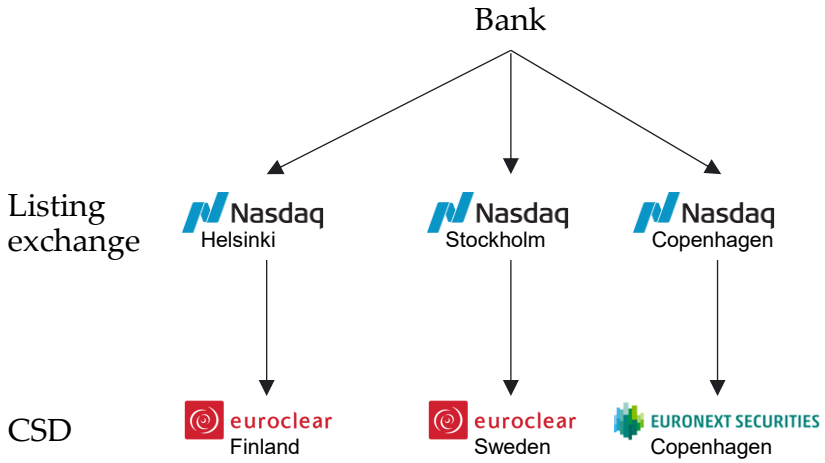


Note 1) In some cases, switching is in practice not even possible, for example, in equities, where the choice of CSD is determined by the listing venue.
Source: Implement Economics based on The Giovannini Group (2001), Euronext (2025), Clearstream (2025), Euroclear (2025), AFME (2025).

Companies are effectively forced to use their national CSD due to persistent barriers and incumbent exchange-linked issuance

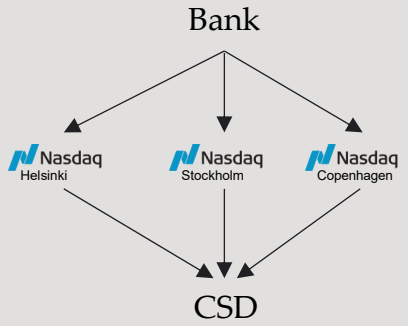
- Since the marginal cost of safekeeping decreases with volume, clients have incentive to consolidate their holdings with a single CSD to benefit from scale effects.
- However, this is not what happens in practice. Evidence shows that companies use the CSD in the country in which they are listed.
- Due to the persistent Giovannini barriers and the nature of issuance being linked to the incumbent exchanges, companies are effectively required to use their national CSD.
- This grants the CSD monopoly power over the issuance service and the associated safekeeping and maintenance.
- There are no new CSDs that have successfully challenged the existing infrastructure. When CSDR was introduced, there was an expectation that some of the major custodian banks would establish their own CSDs to increase competition, but this has not materialised. There are no successful examples of new CSDs in any of the EU countries.
- Nevertheless, Euronext Securities has announced that they plan to designate the Italian CSD for France, the Netherlands and Belgium, utilising the power of the stock exchange to try to create competition in the CSD space. We are yet to see if this will be effective.

Listing exchange and CSDs applied by a European Systemic Bank[1]



A socio-economic optimum

If CSDs were truly interoperable across borders, the bank would use the same CSD. However, the fact that a separate CSD is used for each country illustrates that the Giovannini barriers persist and the CSDs hold a monopoly within their respective markets.[2]



Note 1) This bank also use Euronext Securities Oslo. 2) In addition to the Giovannini barriers, the use of different national currencies in each country further contributes to the complexity of using a single CSD as settlement systems are closely tied to local currencies.
Source: Implement Economics based on European Systemic Bank (2025).

National differences and location restrictions give CSDs monopoly power over issuance of shares

- Two of the barriers identified by the Giovannini Group in relation to CSD issuance persists:
  - National differences in securities issuance practice.
  - National restrictions on the location of securities.
- These barriers effectively grant monopoly power to issuer CSDs over the issuance of shares. This monopoly power extends to maintenance and safekeeping as these are tied to where securities are issued and originally registered.
- However, CSDs are not immediately exploiting their monopoly power by charging high fees directly on issuance.
- Instead, they use their exclusive role in issuance to lock in clients and subsequently exploit their monopoly power over safekeeping and maintenance, charging excessive prices.

Persistent Giovannini barriers

Technical barrier 9

National differences in securities issuance practice

Technical barrier 10

National restrictions on the location of securities

These barriers effectively grant a monopoly to issuer CSDs over issuance, which extends to maintenance and safekeeping, resulting in excessive fees on these services.

Source: Implement Economics based on The Giovannini Group (2001), European Post Trade Forum (2017), and ECSD (2024).

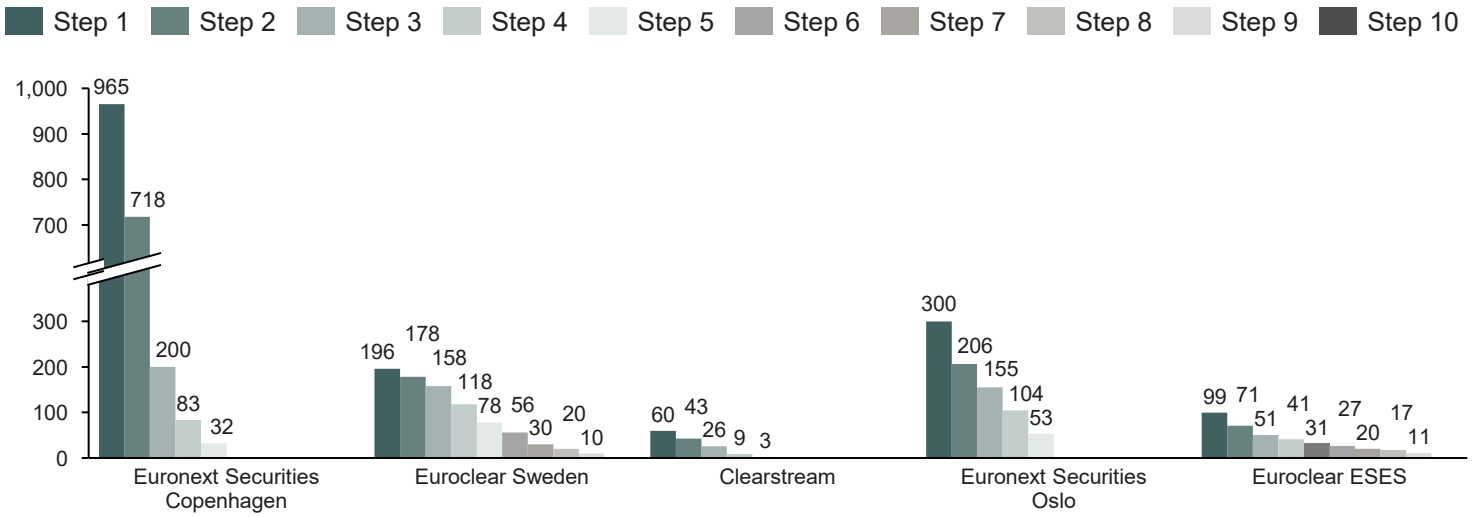
The pricing behaviour of CSDs impact the competitive landscape between participants

- CSDs apply volume-based pricing, offering different tiers depending on the safekeeping volume.
- There is clear evidence that the more volume a client safekeeps, the lower the price.
- Step 1 represents the highest price tier, applied to clients with the lowest volumes. As volume increases, clients move up the tiers and benefit from lower fees.
- This pricing structure clearly favours larger clients and makes it more difficult for the smaller clients.
- In the Nordics, the relative difference between lowest and highest fee level is particularly significant, with Step 1 costing 965% more than the cheapest step in Denmark.
- The average safekeeping fee of ICSDs and European Domestic CSDs are substantially higher than in North America.
- The average safekeeping charge applied by EU domestic CSDs is 159% greater than the US.

Safekeeping costs

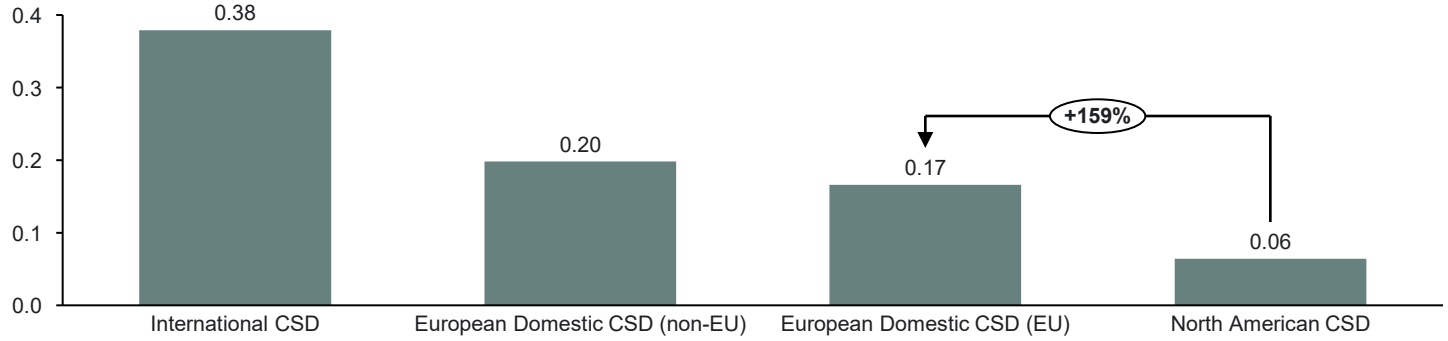
Safekeeping costs for selected CSDs[1]

(Percentage price difference between the lowest steps and other higher steps)



Average safekeeping fee per region

(basis points)

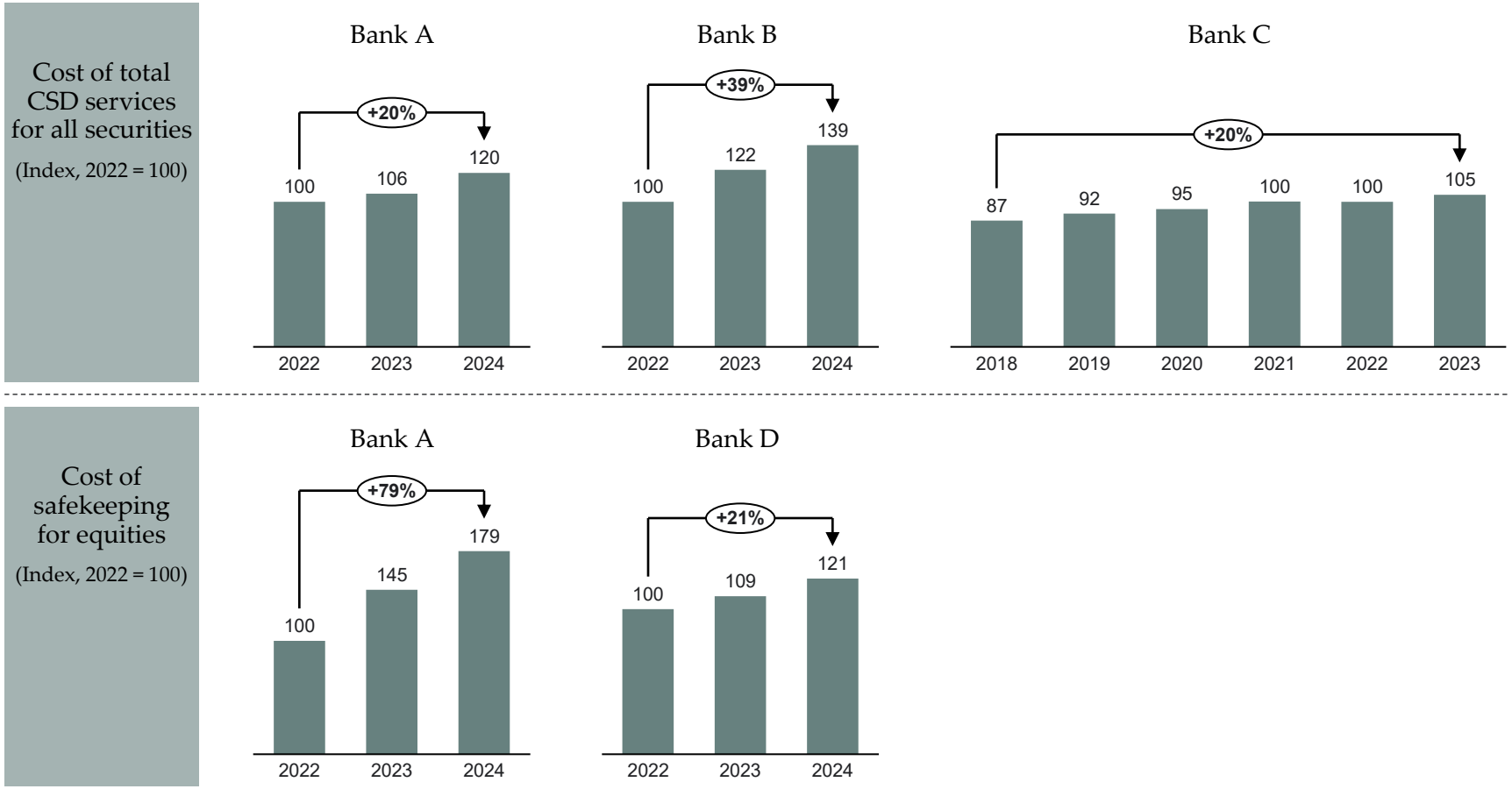


Note 1) Based on public price lists.
Source: Implement Economics based on Euronext Securities Copenhagen (2025), Euroclear Sweden (2025), Clearstream (2025), Euronext Securities Oslo (2025), Euroclear ESES (2025) and AFME (2025).

Cost for safekeeping by CSDs are up 20%-80% in two years

- Case studies from medium-sized European banks (Bank A, B, C) have revealed a price increase in total CSD services of 20%-40% in two years without a significant increase in settlement activity over the same period.
- Bank A has also experienced an increase in cost of safekeeping for equities of 79% in two years, while Bank D has experienced an increase of 21% in two years.
- In the same period, the Consumer Price Index has increased ~9%.
- The sharp price increases in total CSD services and safekeeping, far exceeding inflation and rather unrelated to activity levels, indicate weak competition among CSDs and the exercise of market power.

European banks' costs for total CSD services and safekeeping
Index



Source: Implement Economics based on European banks (2025).

Cross-border settlements remain below 5% of total settlements, despite T2S efforts to harmonise and integrate markets

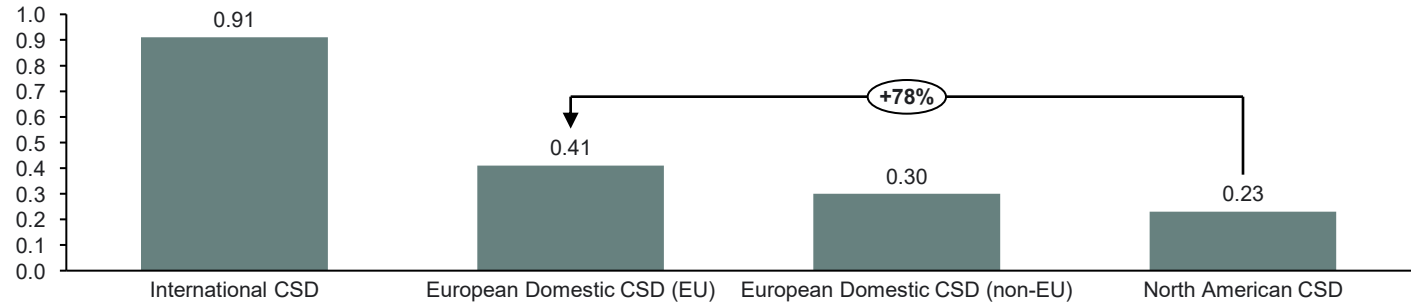
- Settlement fees of ICSDs and European CSD are much higher than North American CSDs.
- TARGET2-Securities has introduced cross-border competition within settlements by harmonising processes across Europe, allowing market participants to access multiple CSDs through a single platform and reducing barriers to choosing settlement providers.
- However, due to the persistent Giovannini barriers, cross-border competition is still limited.
- The CSDs are passing on the direct T2S costs related to settlement and information services, and a case study of fees has revealed that CSDs also are charging additional T2S fees:
  - T2S transfer fees
  - T2S communication fees
  - T2S account fees
  - Handling of missing Cash Securities Account when processing a CA payment
- Contrary to the original purpose of T2S, these fees have increased settlement costs for the investors.
- There are still legal, fiscal, and structural barriers in settlement practice that lacks harmonisation and standardisation.
- Higher level of cross-border settlement will increase competition and enhance market integration, resulting in lower costs and higher liquidity.

Cross-CSD settlements as a share of total settlements

Percent

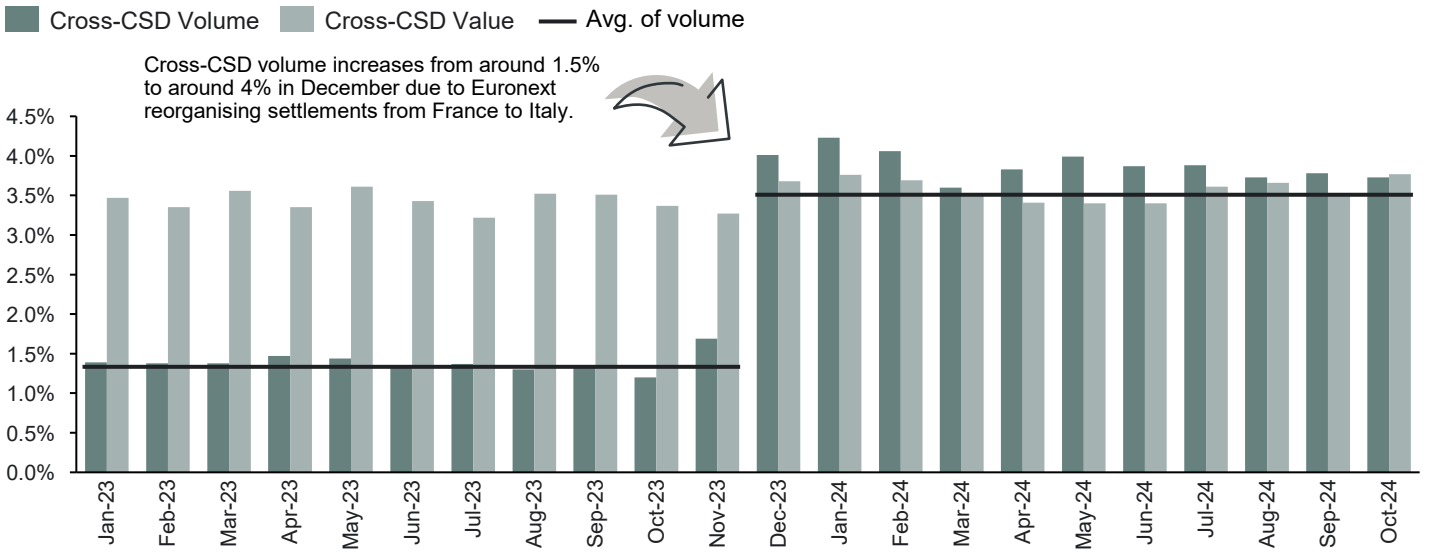
Weighted average effective fee per settlement per region

(EUR per settlement)



Cross-CSD settlements as a share of total settlements

(Percent)



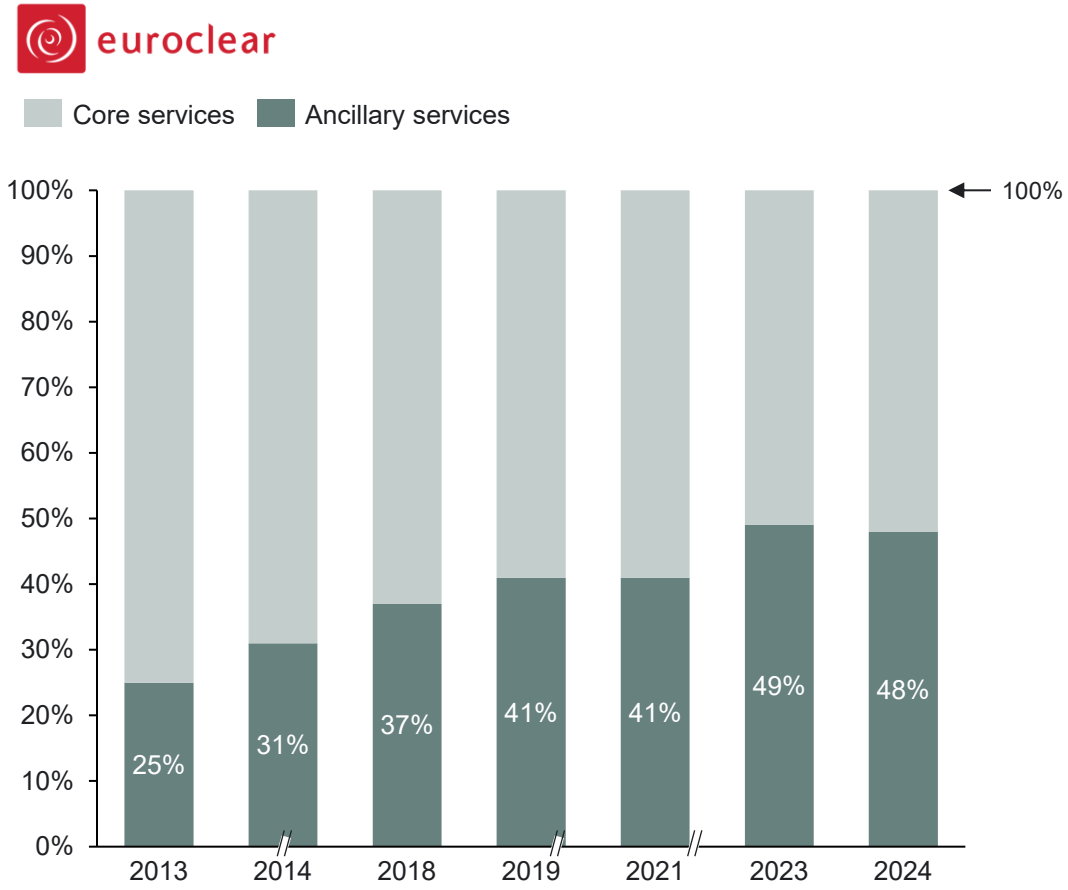
Note: This analysis represents a current picture based on participants of a somewhat different nature's current set-up at CSD level, it does not contain possible impact from fee trends e.g., UTI, future market developments, omnibus account structure.
Source: Implement Economics based on AMI-SeCo Securities Group (2024), AFME (2025).

Without proper regulation, CSDs can cross-subsidise ancillary services using monopoly rents from core services

- Since 2013, the ancillary services share of revenue has almost doubled. Today, ancillary services account for almost half of the CSDs' revenue.
- However, in general, there is a lack of transparency in fees and cost allocation of core and ancillary services.
- If the core services of CSDs are not properly regulated, there is a risk that market power will be exploited through cross-subsidisation from revenues derived from core services, where monopoly rents are extracted, to make ancillary services that are subject to competition artificially cheaper than those of competitors.
- This can distort the pricing of ancillary services and create an unlevel playing field, ultimately harming market efficiency and leading to higher costs for investors.
- The quality of CSDs' financial reports is generally low because of vertically integrated groups and different financial approaches across different countries. Being able to distinguish between core CSD services and ancillary services is in general difficult.

Share of annual income from core and ancillary services in selected years

%



Source: Implement Economics based on Euroclear (2013-2024).

Data quality

Vertical integrated groups decrease transparency and data quality

It is not possible to find disaggregated income data for Iberclear and Clearstream. For Euronext, data is available but different financial practices across countries make it difficult to compare.

A proper regulation of CSDs can also ensure fair competition in the market for ancillary services

- Since 2022, the CSDs have acquired multiple IT service providers supporting ancillary services.
- The CSDs have a competitive advantage when providing certain ancillary services.
- Within the current regulation, it is unclear how risks that are normally under a banking license are handled. If e.g. the CSD is not obliged to post collateral when handling tax, it can do so more profitably than a competitor.[1]
- This is not immediately harmful if it results in better and more affordable products for the end consumer.
- However, it can create an uneven playing field for certain ancillary services by giving CSDs a regulatory and competitive advantage over other providers offering the same services.

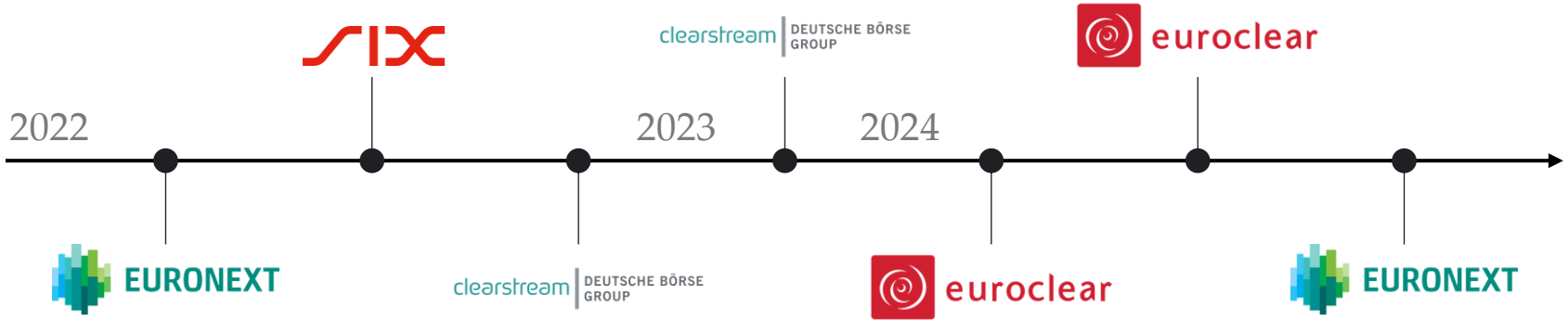
Acquisition timeline (selected M&As)

REGIS-TR: Consolidation of trade reporting services; enhanced control over significant regulatory data repository

SimCorp: Creation of Investment Management Solutions segment; improved data flow for tax lot accounting and investor reporting

Quantessence: Support complex tax calculations/reporting

Inversis: Depository services, "single tax report" for clients, facilitation of custody fee tax deductibility



Technology businesses from Nexi S.p.A: Internalise core technology, increase agility, strengthen operations underpinning auxiliary services

Kneip: Enhance Clearstream Fund Services, efficient data management, ensure compliance; foundational data for tax compliance and reporting

Goji: Expansion into private markets, "one-stop-shop" for diverse fund types; streamlined data for tax reporting in private assets

Acupay & BondCom: Global tax relief at source, tax reclaim services, tax compliance on cross-border bonds

Note: 1) See Central Securities Depositories Regulation (CSDR).
Source: Implement Economics based on Euronext (2022), Euronext (2024), SIX (2022), Clearstream (2022), Clearstream (2023), and Euroclear (2024).

The monopoly within safekeeping and maintenance imposes excessive costs on investors, addressing the inefficiencies would reduce cost of capital and enable deeper liquidity

Solving the current situation and complication

- By implementing proper regulation and/or removal of barriers to cross border settlement, investors would experience significantly reduced fees, reflecting the efficiency gains from introducing free and open competition across borders within CSD services.
- A regulatory approach could include benchmarking to the cost of CSD services within bonds.
- Key barriers to remove include
  - Differences in national rules relating to corporate actions
  - National differences in securities issuance practices
  - National restrictions on the location of securities
  - Domestic withholding tax regulations
  - Uneven application of national conflict of law rules

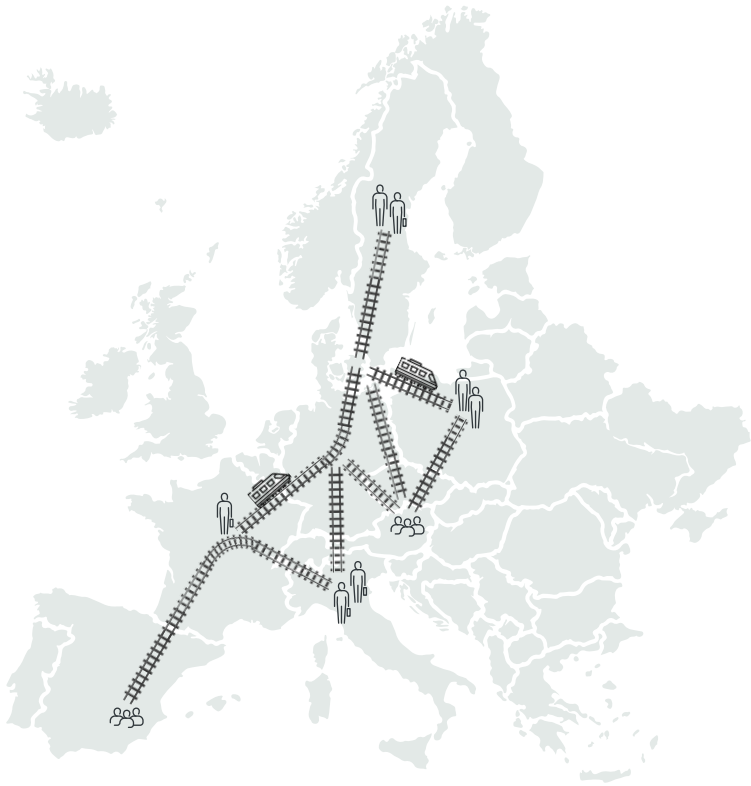
Perspective

Efficient cross border settlements increase post-trade integration which also leads to higher securities transactions, liquidity and market depth.

Cost of capital reduction levers

Higher liquidity from market integration and lower fees.

Increased market integration improving accessibility and financial integration



Following the railway analogy:

T2S and CSDR has built a common single railway system across Europe.

However, the passengers (investors/companies) still need to use their home station (the national CSD) for ticketing and local services (issuance, safekeeping and maintenance).

Around each station are shops (ancillary services) where the owner of the station (the national CSD) can offer products or services where it is hard for passengers to choose an alternative shop.

Removing the need for passengers to use their home station would create a more integrated railway (increased market integration) system with higher usage (higher liquidity).

Note: The extrapolation is significant due to limited availability of detailed revenue segmentation, such as the breakdown of CSD business areas and bonds versus shares, in the financial reports of CSDs (e.g., Nasdaq, Euronext, and Clearstream).
Source: Implement Economics based on Euroclear (2024), and The Giovannini Group (2001).

A more integrated and developed EU financial system would help channel these savings towards productive investments, offering companies, including SMEs and innovative start-ups, better financing opportunities and potentially higher returns for savers

European Commission (2024)

04

Tapping into the economic potential of efficient Capital Market Infrastructure

In this chapter, we analyse how addressing inefficiencies in the Capital Market Infrastructure will lower the cost of capital for companies and increase matching between firms seeking funding and investors looking for investment opportunities across the EU, which in turn fuels economic growth and generates tangible value for both citizens and businesses across the EU.

Key messages

In this chapter we demonstrate that,

- Addressing market failures and monopoly power within Capital Market Infrastructure can significantly improve market functioning. Improvements in liquidity alone could reduce the cost of capital by at least 0.16 percentage points.
- Additional benefits are expected from other channels including a broader access to and integration of capital markets as well as enhanced information flows — effects that are not included. Other studies, although not as comparable, estimate an even higher ratio, which suggest this rate may be the minimum.
- Lowering the cost of capital by this magnitude is expected to boost the investment rate among EU companies by approximately 0.09 percentage points, which could ultimately increase EU GDP by an estimated EUR 52 billion over the next ten years, equivalent to a 0.3% rise relative to 2024 GDP.

Addressing the inefficiencies of the EU Capital Market Infrastructure by handling the abuse of monopoly power could potentially boost EU GDP by at least EUR 52 billon over the next ten years

Rational

According to Draghi (2024), a reduction in the cost of capital by 2.0–2.5 percentage points is a critical prerequisite for unlocking private investments equivalent to 4% of GDP through market-based financing, crucial for reigniting growth, reversing the EU's lagging productivity, and ensuring long-term economic resilience and sovereignty.

While addressing market failures within Capital Market Infrastructure alone may not deliver the full extent of this reduction, such improvements serve as a vital enabler in achieving this objective and will on top facilitate the simplification agenda.

Step 1: Improved Capital Market Infrastructure efficiency leads to lower cost of capital

- No previous market reforms match the type and scope of those discussed here. Consequently, no direct quantitative estimates exist of their potential impact on market functioning.[1]
- Nonetheless, evidence from earlier changes in market infrastructure can serve as partial indicators. For example, historical European precedents where the monopoly of an incumbent exchange was challenged by the entry of a new trading venue.
- We combine this evidence with findings from Saad and Samet (2017), who demonstrate that higher liquidity is associated with a lower cost of capital.[2] Based on this, we estimate that addressing inefficiencies in the EU Capital Market Infrastructure could reduce the cost of capital by at least 0.16 percentage points, through the liquidity channel alone.

Step 2: Lower cost of capital increase EU investments

- A reduction of 0.16 percentage points in the cost of capital is projected to raise the investment rate by 0.09 percentage points. This estimate is based on Gilchrist and Zakrajsek (2007), who find that a one percentage point decrease in the cost of capital increases investment by 0.5–0.75 percentage points. Similar results are found in other studies, e.g., Carluccio et al. (2021).

Step 3: Larger investments increase EU GDP

- Eventually we find that the improved investments could contribute by approximately EUR 52 billion to GDP over a ten-year period, representing a 0.3% increase relative to the 2024 GDP. This is based on Bond et al. (2010) who find that a one percentage point increase in the investment rate results in a 0.33 percentage point rise in GDP growth per worker. Other studies, although not as comparable, estimate an even higher ratio which suggest this rate may be the minimum.

Improving Capital Market Infrastructure **efficiency** reduces EU companies' **cost of capital**…

0.16 percentage points reduction in cost of capital

…leading to increased EU **investments**…

0.09 percentage points increase in investment rate

…and increased **EU GDP**.

At least 52 bnEUR increase after 10 years

Note 1) The appendix presents an overview of the literature, qualitatively arguing how addressing inefficiencies in Capital Market Infrastructure can increase liquidity, increase market integration, and improve information flows. 2) The cost of capital is the minimum return investors expect for providing money to a company. It is what a company must pay to raise funds, either through borrowing or selling shares.
Source: Implement Economics based on Draghi (2024), Saad and Samet (2017), Gilchrist and Zakrajse (2007), Carluccio et al. (2021), Bond et al. (2010).

Step 1: Improved infrastructure efficiency leads to lower cost of capital due to increased liquidity and stronger matching between firms seeking funding and investors looking for investment opportunities (I/II)

- Academic literature indicates that a more efficient Capital Market Infrastructure contributes to enhanced market performance. It facilitates greater liquidity, improves the dissemination of information, and increases market integration, ultimately enabling broader access to and integration of capital markets. Each of these factors is a key driver of market performance.[1]
- No previous market reforms match the type and scope of those discussed here, and therefore no direct quantitative estimates of their potential impact on market functioning are available.
- However, empirical evidence from previous changes in the market infrastructure may offer indicative insights into the potential effects. For example, empirical studies have demonstrated that liquidity improves significantly when a new trading venue enters the market and introduces competition by challenging the incumbent exchange for the first time. This type of improvement reflects a correction of market failures stemming from monopoly power in one of the three core business areas of exchanges, namely securities trading. Hence, the observed effects parallel the anticipated impact of resolving monopoly inefficiencies in the areas targeted by the current study, including closing auctions, CCP, CSD, market data etc.
- These studies include:
  - When CBOE entered the Netherlands in 2007, competition with the incumbent exchange led to a 50% reduction in bid-ask spreads, a commonly used measure of liquidity (Menkveld, 2013).[2]
  - Similarly, CBOE's entry into the French blue-chip equities market later in 2007 resulted in a 14% decrease in bid-ask spreads (Chlistalla and Lutat, 2011).
  - On the contrary, when Switzerland in 2019 lost its EU equivalence and was forced to centralise trading on its domestic exchange, bid-ask spreads increased by up to 23% and market depth fell by up to 33% for the most affected stocks, illustrating how the removal of competition in financial market trading can significantly worsen liquidity (Dzieliński et al., 2025).

0.16 percentage points reduction in cost of capital

Current failures and monopoly power within Capital Market Infrastructure

We use empirical effects on liquidity and cost of capital when trading is exposed to competition for the first time as a proxy for the effects of removing monopoly power and other barriers for genuine competition and market integration.

Some studies argue that the effect on liquidity, when exposing trading to competition, is temporary. However, it is reasonable to assume that the effects are persistent as our proposal will remove structural barriers preventing genuine competition.

Historical instances of monopoly disruption in European exchanges provide a relevant parallel framework for predicting the magnitude of liquidity gains following the resolution of Capital Market Infrastructure monopoly issues.

While the preceding analyses on liquidity effects primarily address trading venues and continuous trading, it is important to note that closing auctions, representing approximately 20%-25% of trading activity today, remain subject to the monopoly power of incumbent exchanges. Hence, opening closing auctions for other trading venues will contribute to market integration and increased liquidity.

Beyond trading, addressing inefficiencies in CCPs and CSDs can further influence the cost of capital. For instance, IOSCO (2006) and The Giovannini Group (2001) find that improving post-trade efficiency enhances liquidity and increases market integration.

In sum, additional benefits including improved information flows, broader access to capital markets, and more efficient matching between investor and firm will further strengthen the overall impact on the cost of capital. The positive relationship is also verified in various empirical articles for example Schündeln & Funke (2001), Hillier and Loncan (2017), Foong (2016) and Hoang and Mateus (2023).

Note 1) The appendix presents an overview of the literature, qualitatively arguing how addressing inefficiencies in Capital Market Infrastructure can increase liquidity, market integration information flows. 2) This study is aware that bid-ask spread is a simplified scale.
Source: Implement Economics based on Menkveld (2013), Chlistalla and Lutat (2011), Dzieliński et al. (2025), IOSCO (2006), The Giovannini Group (2001), Schündeln & Funke (2001), Hillier and Loncan (2017), Foong (2016) and Hoang and Mateus (2023).

Step 1: Improved efficiency of the Capital Market Infrastructure could reduce cost of capital by 0.16 percentage points through the liquidity channel alone (II/II)

- Using the observed liquidity improvements as a conservative proxy for the potential impact of a comprehensive market reform, we draw on quantitative findings by Saad and Samet (2017).
- Saad and Samet (2017) demonstrate that higher liquidity is associated with a lower cost of capital. Based on this, our assessment suggests that addressing inefficiencies in the EU Capital Market Infrastructure could reduce the cost of capital by 0.16 percentage points through the liquidity channel alone.
- Although this represents our baseline and relatively cautious estimate, focusing solely on liquidity effects, other studies have explored the broader implications of capital market liberalisation, identifying substantially greater reductions in the cost of capital.
- While such liberalisations are not fully comparable to the market reforms discussed here either, they may still serve as other partial indicators. These studies find reductions in the cost of capital ranging from 0.4 to 1.2 percentage points, suggesting that the total impact of a reform, including improved information flows and broader market access, could be up to almost eight times larger than our estimate (Hoang & Mateus, 2024). Hence, the estimate may be considered as a conservative minimum.

0.16 percentage points reduction in cost of capital

The details of the estimations by Saad and Samet (2017)

We base our estimates primarily on the methodology of Saad and Samet (2017), who examine how liquidity affects cost of capital. In their main analysis, they extend the illiquidity measure originally developed by Amihud (2002). This measure is defined as the average daily ratio of the absolute stock return (daily price change) divided by the trading volume, effectively capturing the price impact of trades. A high ratio indicates low liquidity (large price changes on low trading volume), while a low ratio indicates high liquidity (small price changes despite high trading volume). Saad and Samet (2017) further refine this measure by adjusting for predictable patterns (such as day-of-week effects), isolating only the unexpected components of illiquidity.

As a robustness test, Saad and Samet (2017) replace the Amihud measure with the bid-ask spread. As the historical precedents we draw on (Menkveld, 2013; Chlistalla and Lutat, 2011) investigate liquidity changes in terms of bid-ask spreads, we anchor our approach to Saad and Samet's bid-ask spread specification from their robustness check rather than to the Amihud measure.

While Saad and Samet (2017) report distributional statistics for their Amihud measure, they do not provide similar percentiles for the bid-ask spread. Therefore, we apply data from BMLL on bid-ask spread for EU indices in the period 2020-2025, which have a median of 4.88 basis points.[1]

Assuming that inefficiencies in EU trading venues are addressed and that the effect of this is comparable to the historical precedents, we estimate a 35% reduction in bid-ask spreads, based on the average effects reported by Menkveld (2013) and Chlistalla and Lutat (2011).[2]

Applying the estimation results from Saad and Samet (2017), we find that a 35% decrease in the bid-ask spread decreases the cost of capital by 16 basis points.

In summary, we assess that addressing inefficiencies in the Capital Market Infrastructure could reduce the cost of capital by at least 0.16 percentage points.

Note 1) The simple average uses ceiling to the nearest 5. 2) Saad and Samet (2017) use the closing percent quoted spread, measured at the market close. The BML data is of the relative bid-ask spread, time-weighted average across the trading day. Both capture the same underlying bid-ask relationship and are assumed to be able to be treated as equivalent.
Source: Implement Economics based on Saad and Samet (2017), Hoang & Mateus (2024), Amihud (2002), Menkveld (2013), Chlistalla and Lutat (2011), BMLL (2025).

Step 2: Lower cost of capital increases EU investments by 0.09 percentage points

0.09 percentage points increase in investment rate

- A reduction in the cost of capital broadens the range of economically viable investment opportunities by making a greater number of projects financially attractive and profitable.
- Lower capital costs increase the present value of future cash flows[1], thereby improving the net present value of potential investments. As a result, firms are more likely to proceed with projects that previously did not meet viability thresholds. Consequently, as more projects become economically feasible, the volume of investments that can secure funding is expected to rise.
- Empirical evidence supports this relationship. Gilchrist and Zakrajsek (2007) find that a one percentage point decrease in the cost of capital leads to an increase in the investment rate of 0.5 to 0.75 percentage points, while Carluccio et al. (2021) reports an effect of 0.35 percentage points following a similar reduction in capital costs.

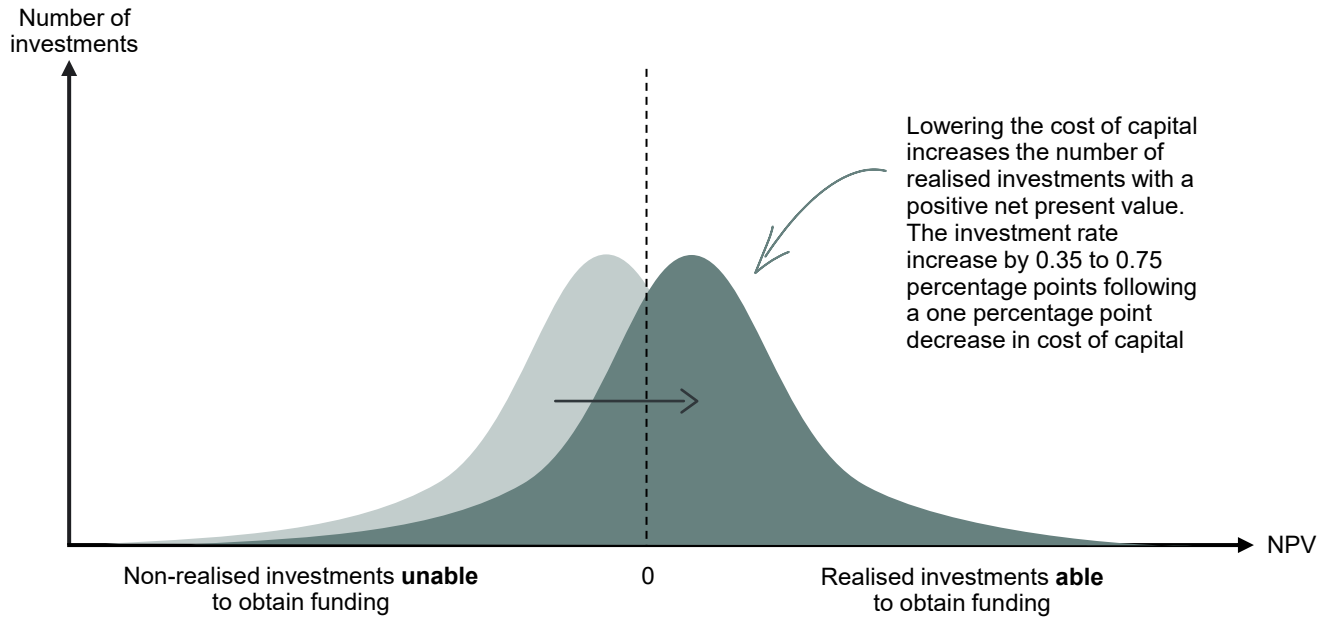
Realised investments from a decrease in cost of capital

Net present value (NPV)

Investments with high cost of capital

Investments with low cost of capital

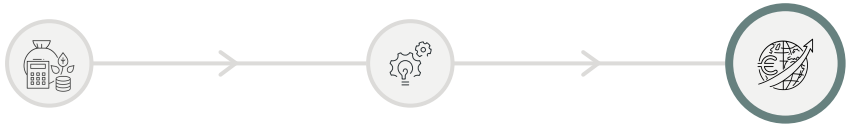
ILLUSTRATIVE



Note: 1) Net present value (NPV) is a financial metric that calculates the difference between the present value of cash inflows and outflows over an investment's lifespan, helping determine if the project is expected to generate a profit or a loss when discounted at a specific rate to adjust for the time value of money.
Source: Implement Economics based on Gilchrist and Zakrajse (2007), and Carluccio et al. (2021).

Step 3: Larger investments increase EU GDP by at least EUR 52 billion over the next ten years

- Enhancing Capital Market Infrastructure in the EU is expected to reduce the cost of capital, thereby making a broader range of investment projects financially viable for businesses. This, in turn, is anticipated to stimulate investment activity and ultimately contribute to higher GDP.
- Empirical evidence indicates that a one percentage point reduction in the cost of capital leads to an increase in the investment rate of between 0.35 and 0.75 percentage points, as investments become more attractive due to improved net present values.
- Subsequently, Bond et al. (2010) find that a one percentage point increase in the investment rate translates into a 0.33 percentage point rise in GDP growth per worker, reflecting both higher investment levels and productivity gains through endogenous growth effects.
- Overall, the resulting increase in investment activity could potentially raise EU GDP by at least an estimated EUR 52 billion over the next ten years, corresponding to an increase of 0.3% relative to 2024 GDP.
- As GDP could increase by EUR 52 billion through liquidity effects from addressing inefficiencies in the Capital Market Infrastructure, it is relevant to examine these effects further and include potential gains from greater integration of trading markets as well as improvements in the markets for CCPs and CSDs. Hence, additional improvements can be expected.



At least
52
bnEUR increase
after 10 years

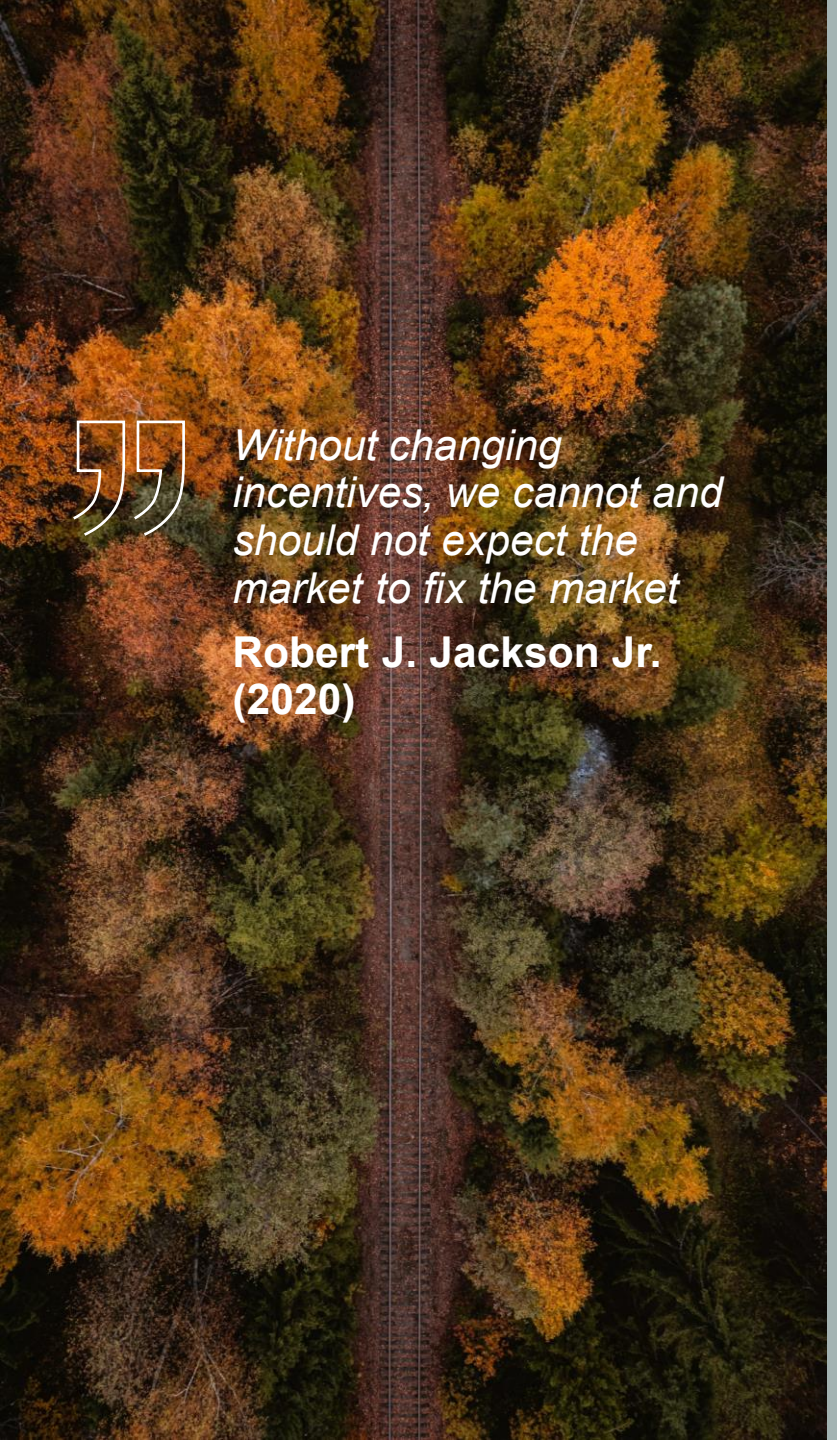
Increase in GDP in the EU over the next ten years
bnEUR

At least

EUR 52 bn

increase in GDP
(0.3% of 2024 GDP)

Note: The estimated effect is based on aggregate investment, including both public and private components. Afonso et al. (2024) find that private investments have a significantly higher output elasticity than public investments, and that private investments also constitutes a substantially larger share of GDP. As such, the reported effect based on Bond et al. (2010) should be seen as conservative, since it reflects a weighted average of both public investments and private, firm investments. The results does not account for increased market capitalisation stemming from lower discounting of firms' future dividends and potential higher cash flows from the additional investments. OECD (2015) find that an increase in market capitalisation of 10% increases GDP growth by 0.2 percentage points. As there is limited empirical evidence with estimates connecting cost of capital to firm valuations, we exclude the potential positive effects from increased market capitalisation on GDP growth.
Source: Implement Economics based on Bond et al. (2010), Afonso et al. (2024), Gilchrist and Zakrajse (2007), and Carluccio et al. (2021).



05

Regulatory recommendations

This chapter provides our regulatory recommendations to the European Commission, which will increase the efficiency of the Capital Market Infrastructure and facilitate the simplification agenda by handling the core issues. The recommendations focus on remedies, which solve the core issues, hence increase market liquidity and lower cost of capital to improve EU competitiveness and long-term economic growth.

Key messages

In this chapter we demonstrate that,

- The regulation should aim to align the behaviour of EU trading venues, CCPs, and CSDs with the dynamics of a competitive market, preventing the ability to charge monopoly rent and cross-subsidise.
- A strong pan-EU regulator with clear mandates for remedies and swift execution must be established to enhance capital market liquidity and reduce cost of capital.
- Proposed regulatory remedies aim to cap fees, ensure standardisation, harmonise legislation, and reduce technical barriers with the overall objective of reducing cost of capital.

The regulation should incentivise trading venues, CCPs, and CSDs to act as if they were subject to efficient market competition

The overarching principle for our recommendations

Industries subject to well-functioning competition should not be regulated. A competitive market is more efficient at allocating scarce resources than a centralised regulator. However, some industries like infrastructure and asset-heavy network industries can be difficult to expose to efficient competition. This is due to their natural monopoly characteristics, market power, entry barriers, etc. Such industries are important to regulate as unregulated natural monopolies will result in a costly deadweight loss and an inefficient market outcome.

The overarching objective of a future fit regulation of the EU Capital Market Infrastructure

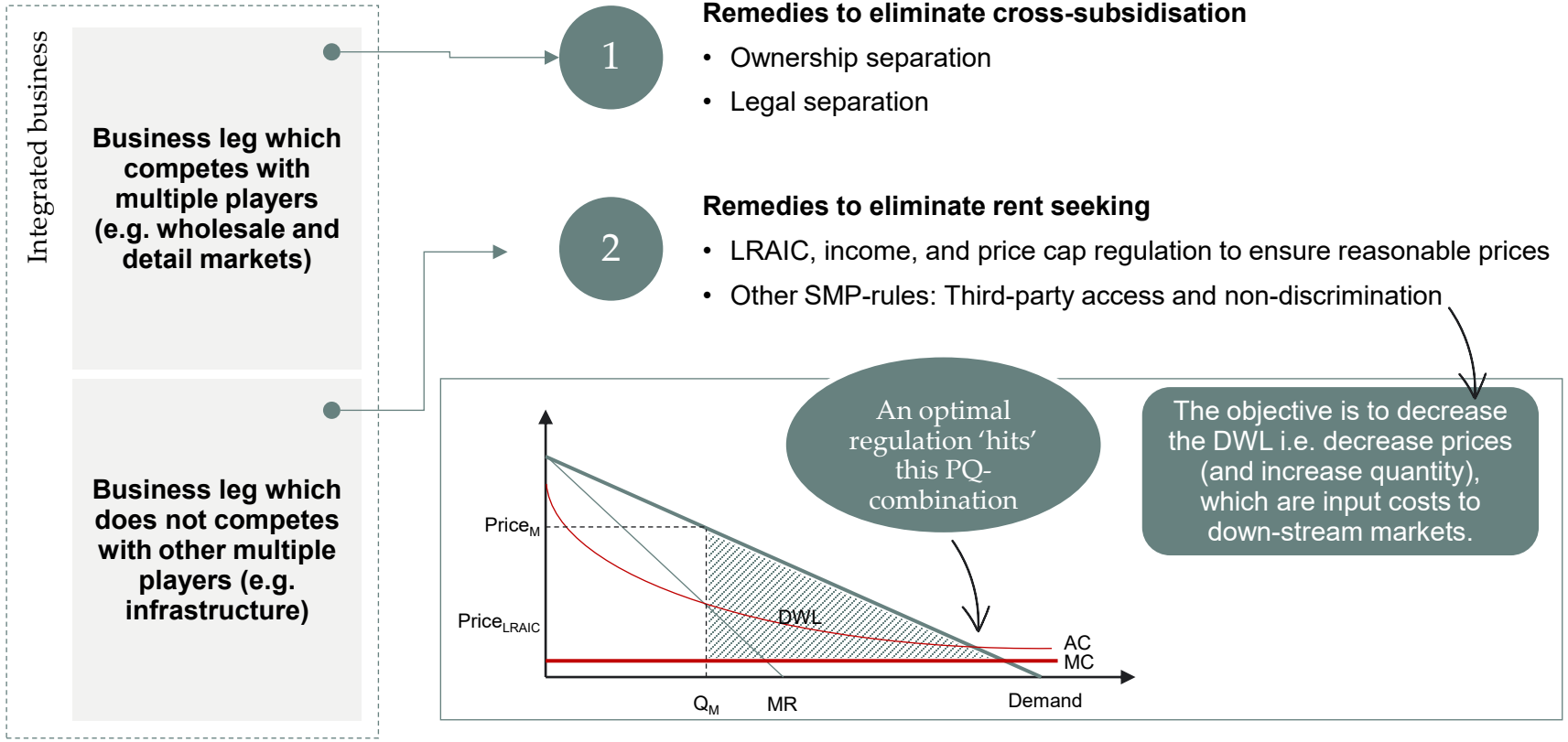
- The regulation **should incentivise** trading venues, CCPs, and CSDs to behave **as if** they were subject to efficient and well-functioning market competition. This report advises the EU Commission to establish and enforce regulations that will:
  - Promote cost efficiency, ensure standardised and harmonised terms & conditions including participation agreements, provide open access to fee schedules and policies for a 10-years period with multiyear comparison.
  - Prevent monopoly rents and discriminatory practices.
  - Ensure access and transparency as regulations in other industries providing essential infrastructure services and public goods, e.g., water, energy, telecom, railways etc.
  - Facilitate the simplification agenda by breaking the vicious cycle of symptom management through patchwork solutions that compound complexity, by addressing root causes and implementing coherent, long-term strategies

The following pages provide an overview of the regulatory remedies, which other infrastructure industries are subject to for a relevant comparison. Moreover, the chapter finishes off with a set of specific recommendations for the EU Commission to consider when proposing a future fit regulation of the European Capital Market Infrastructure.

The overarching aim with EU regulation is to secure a cost-efficient and non-discriminatory market behaviour by preventing monopoly rent and cross-subsidisation

- Overall, the regulation of European utilities (like water and wastewater), electricity and telecommunication (including fibre) is constructed as an ex-ante regulation.
- In this context, one centralised regulator per country (NRA) is responsible for estimating each company's income cap, price cap, or maximum prices (LRAIC), and monitoring that the companies react to the build-in incentives.
- The above regulatory remedy focuses on the cost-effectiveness of the infrastructure. However, some industries consist of vertically integrated companies like energy and telecom. In those industries, NRAs also monitor cross-subsidisation and margin squeeze.
- The overall approach is to incentivise the regulated entities to act as if they were subject to competition. So, the regulator is trying to regulate prices down to the point where prices equal marginal cost as in the perfect competition model - albeit a bit higher to avoid bankruptcy.

EU regulation regulates via various remedies at different levels



Infrastructure industries producing public goods are regulated to create the foundation for well-functioning markets

- Europe has a long history of regulating critical infrastructure industries, which forms as important inspiration for a future fit regulation of the Capital Market Infrastructure.
- These regulatory remedies differ across industries and countries. However, they align on the fact that infrastructure industries must be regulated to ensure productivity and efficient pricing.
- Despite the complexity of the Capital Market Infrastructure, there is no difference in the market power to the ones on the right-hand side. Therefore, there is no rational argument to not regulate this industry, taking specific characteristics and dynamics into account of cause.
- In general, these other EU infrastructures have achieved productivity gains driven by regulatory requirements for efficiency and quality. Overall, regulation in these industries has resulted in a more favourable balance between price and output, ultimately improving outcomes for consumers. Examples include:
  - The Norwegian electricity distribution sector experienced that productivity growth increased by an annual average of 3% after the introduction of regulation.[1]
  - Airport Charges Directive (ACD) was adopted to regulate how airport charges are set. The directive reduced airport charges by up to 10% in the EU.[2]

Overview of typical regulatory remedies in Europe

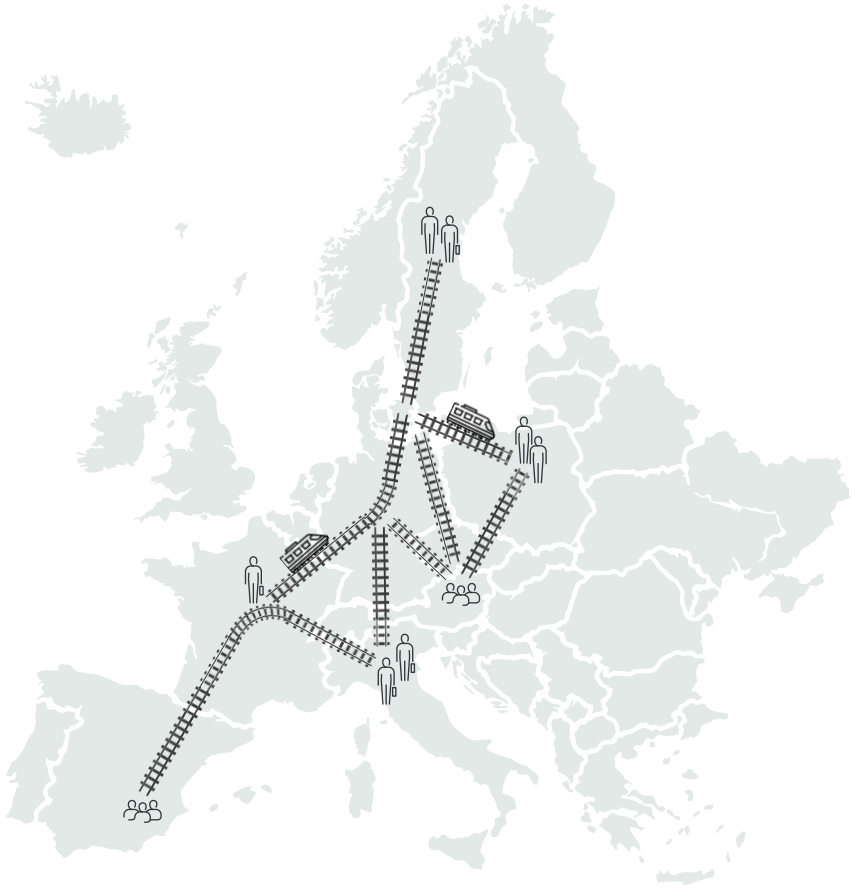
	Market structure	Ownership	Regulation	Incentives	Central regulatory
Water and wastewater infrastructure	Natural monopoly	State, municipality, and private	Income caps, price caps, and cost benchmarking incl. a WACC-based return	Positive incentives to become more efficient than the regulatory requirements	National regulator and legislation
Electricity infrastructure (DSO level)	Natural monopoly	Municipality and private	Income caps, price caps, and cost benchmarking incl. a WACC-based return	Positive incentives to become more efficient than the regulatory requirements	National regulator and legislation as well as European directives
Electricity and gas infrastructure (TSO level)	Natural monopoly	State	Income caps, price caps, and cost benchmarking incl. a WACC-based return	Positive incentives to become more efficient than the regulatory requirements	National regulator and legislation as well as European directives
District heating infrastructure	Natural monopoly	State, municipality, and private	Income caps, price caps, and cost benchmarking incl. a WACC-based return	Positive incentives to become more efficient than the regulatory requirements	National regulator and legislation
Fiber infrastructure	Natural monopoly, but increasing overlapping infrastructures	Municipality and private	SMP regulation based on cost-based prices, transparency, third-party access, and non-discrimination incl. a WACC-based return	Positive incentives to become more efficient than the regulatory requirements	National regulator and legislation as well as European directives
Airports	Contestable market	State and private	Negotiated settlement regulation incl. a WACC-based return	Positive incentives to become more efficient than the regulatory requirements	National regulator and legislation

Note 1) Senyonga (2014), 2) Maurizio et al. (2019)
Source: Implement Economics based on Senyonga (2014), Maurizio et al. (2019)

Preventing the financial railways to charge monopoly rent and cross-subsidise will ensure transparent pricing, access, and interoperable connections across borders

- If the financial railway system is effectively regulated, it is comparable to introducing measures for railways that ensure fair access, safety, and efficiency.
- For example, regulators could prevent a single railway operator from charging excessive fees for access to the tracks, or from blocking competitors from running services on the same routes. This would foster competition, lower costs, and expand the range of services available to passengers and freight.
- Applied to Capital Market Infrastructure, regulation would ensure that exchanges, CSDs, and CCPs cannot abuse their control over essential financial tracks, stations and other parts of the system. Instead, they would be obliged to provide transparent pricing, fair access, and interoperable connections across borders.
- The outcome would be a seamless flows of capital across the EU, deeper market liquidity, and lower cost of capital, enabling the EU's growth potential to be realised for the benefit of companies, investors, and EU citizens.

Effectively regulated financial railways



The EU Commission should establish a pan-EU regulator with clear mandates for remedies and swift execution to enhance capital market liquidity, reduce cost of capital and ensure a continuous, competitive environment

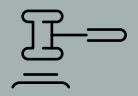
The regulation of Capital Market Infrastructure should acknowledge that EU and national interests are not mutually exclusive. They can and must coexist. While the ideal scenario would be to foster genuine competition, this is often not feasible in practice. The nature of financial markets is that liquidity attracts liquidity, leading to concentration and, ultimately, significant increase in market power. This makes it essential to establish a regulatory framework that imitates natural competitive situations and ensures transparency and fair conditions.

REGULATOR

We recommend that the EU should establish a strong pan-EU regulator with a clear mandate

It is crucial to establish a pan-EU regulatory authority with a clear and robust mandate to:

1. Collect necessary data across the entire Capital Market Infrastructure value chain.
2. Conduct independent analyses to identify and assess market failures and inefficiencies.
3. Design targeted regulatory remedies that address specific inefficiencies within each component of the value chain.
4. Implement and enforce these remedies consistently across all EU Member States.



REMEDIES

We recommend that the EU should establish a firm regulatory setup

It is crucial to develop specific regulatory remedies, which target the specific inefficiencies within each of the different parts of the value chain.

It is important that the new regulatory body has the mandate to develop and implement the new regulatory remedies across Europe.

See below slides for a discussion on regulatory remedies targeting the different parts of the Capital Market Infrastructure.

EXECUTION

We recommend that the EU should establish a momentum and get started

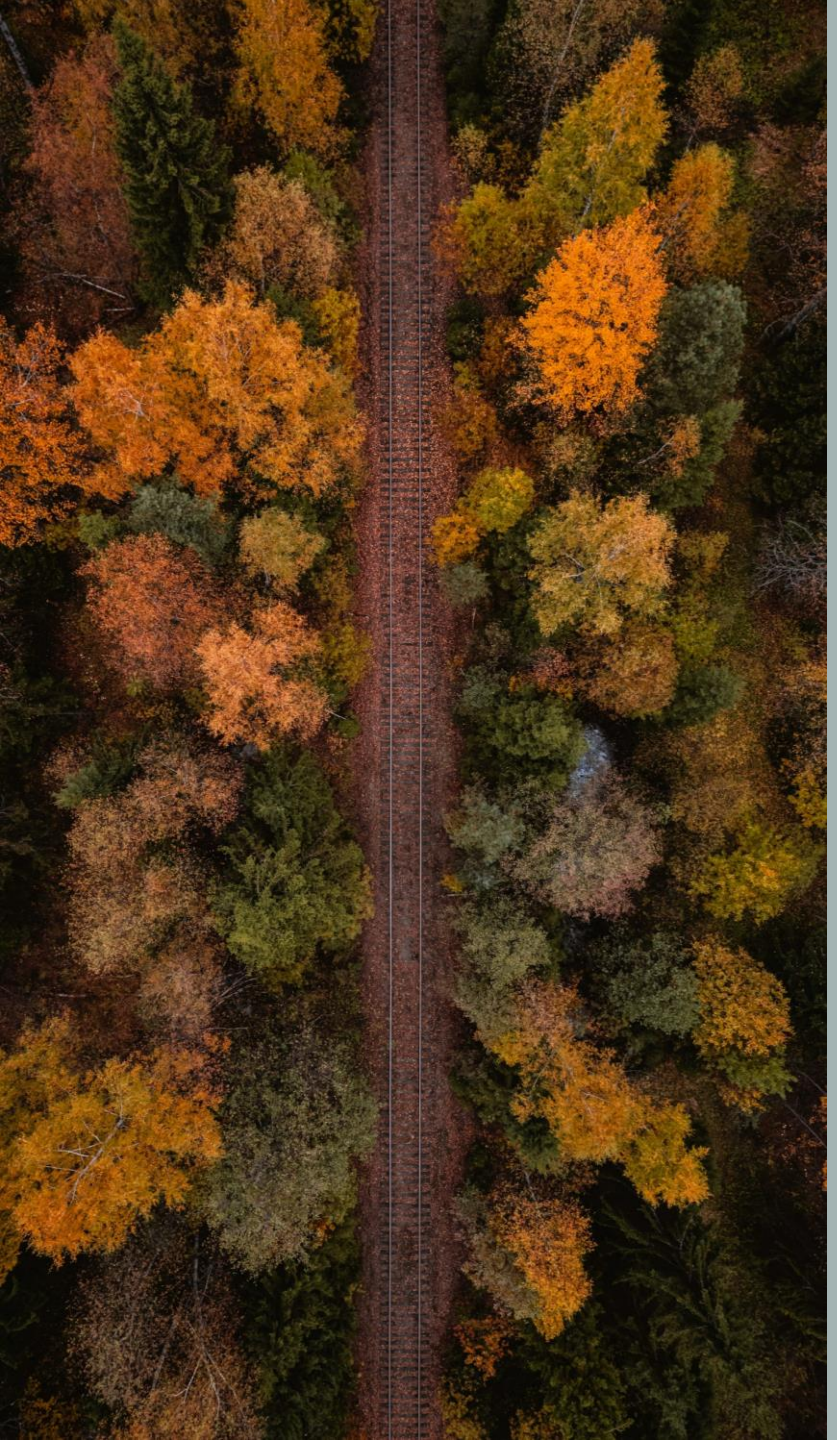
It is crucial that the regulatory body starts executing the new regulatory remedies as fast as possible.

Hence, the regulatory body must be empowered to implement them without delay. Speed is critical as every year without proper regulation imposes avoidable costs on firms and investors, reduces market efficiency, and hinders progress toward a true Savings- and Investment Union.

Proposed regulatory remedies aim to prevent the abuse of the monopoly power by capping fees, harmonising legislation, and reducing technical barriers with the objective of reducing cost of capital

The specific regulatory setup must be thoroughly analysed taking account of the specific characteristics of the EU Capital Market Infrastructure. The below regulatory remedies should be further analysed before implemented.

	Trading venues	Central Clearing Counterparties (CCPs)	Central Securities Depositories (CSDs)
Remedies and execution	• Cost-plus model with price cap for market data fees • Define market data as a public good (no IP rights) • Interoperability requirement in closing auction • Standardised and non-discriminatory fee structures and terms and conditions including participation rules • Transparency requirements, including publication of price lists with multiyear comparison for the past 10 years	• Price cap on clearing fees • Interoperability requirement • Standardised and non-discriminatory fee structures and terms & conditions including participation rules • Transparency requirements, including publication of price lists with multiyear comparison for the past 10 years	• Price cap on issuance, safekeeping and maintenance • Harmonisation of outstanding legislative acts • Interoperability requirement • Standardised and non-discriminatory fee structures and terms & conditions including participation rules • Transparency requirements, including publication of price lists with multiyear comparison for the past 10 years
Enabling	• Lower transaction costs • Greater transparency • Reduced information asymmetry • Increased market participation • More efficient capital allocation	• Lower transaction costs • Greater transparency • Lower collateral requirements • Increased netting efficiency • Better and more harmonised risk management	• Lower transaction costs • Greater transparency • Faster and more reliable cross-border settlement • Reduced settlement failures • More efficient use of collateral
Expected effects	**Reduced cost of capital through** **Improved information** improving price discovery and reducing information asymmetry between buyers and sellers **Higher liquidity** leading to lower liquidity risk premiums and lower transaction costs	**Reduced cost of capital through** **Higher liquidity** from interoperability, enhancing netting efficiency **Increased market integration** from lower liquidity risk and reduced collateral	**Reduced cost of capital through** **Increased market integration** enabling markets to merge and follow best practice while reaping the benefits of scale effects



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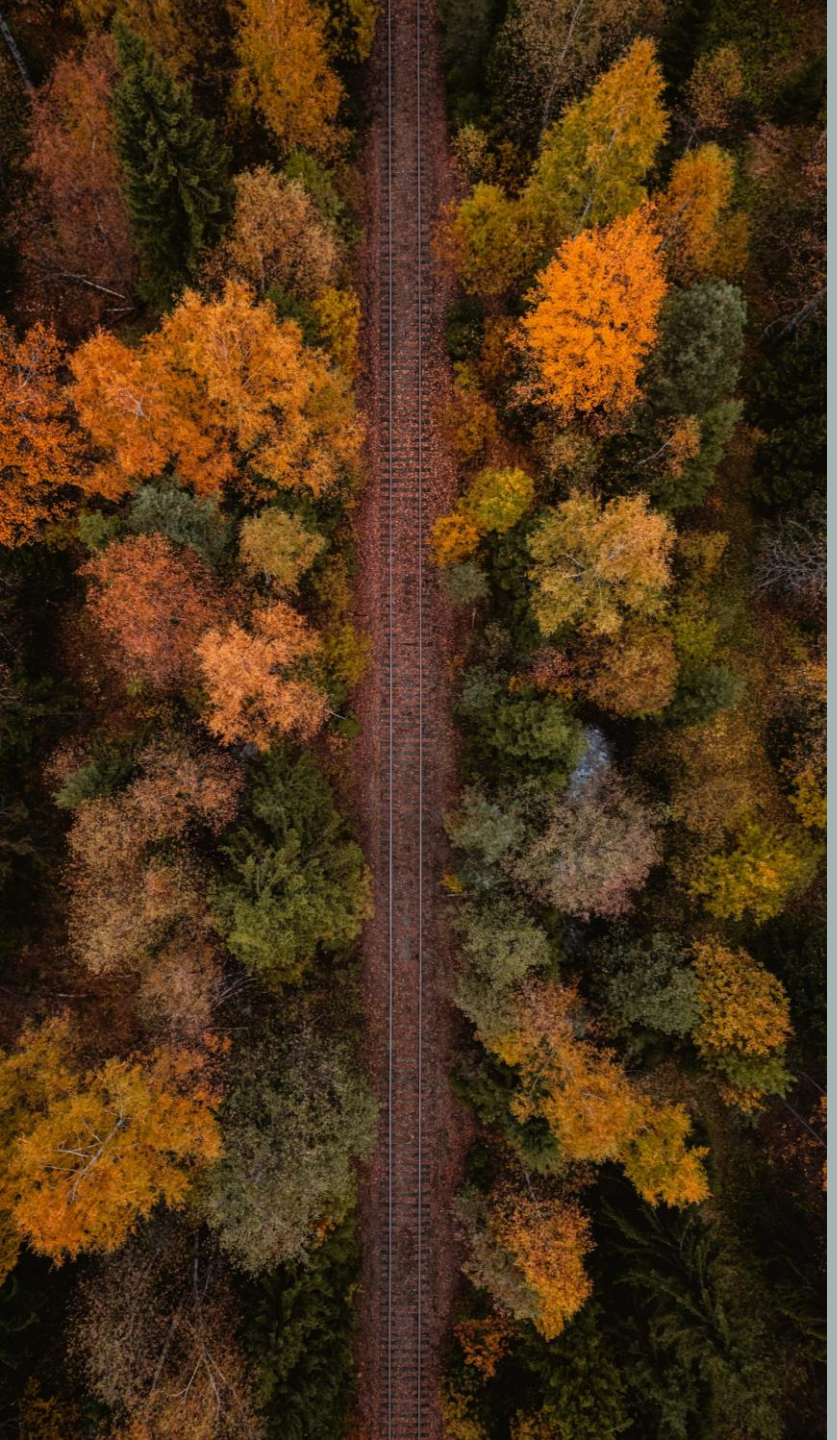

07

Appendix

This appendix provides supporting material for the analyses in the report.

Academic literature and reports support that addressing inefficiencies in Capital Market Infrastructure will improve three important levers for improved market efficiency (I/II)

Infrastructure player	Problem	Impact from problem	Market efficiency lever	Literature support	Source
Incumbent exchanges	Excessive and complex market data fees	Decrease in the efficiency of price discovery	Improved information	*This study examines the impact of a modification to data feed pricing schedule on the price discovery of competing venues. To this end, we use three exogenous events arising from the staggered increase of price quotation fee on Chicago Mercantile Exchange to test the theoretical predictions of Cespa & Foucault (2014) who note that price discovery is "…determined by the fee charged by exchanges for price information". After controlling for known determinants,* ***we observe a decrease in the efficiency of price discovery following increases in the acquisition costs of exchange's data feeds****, in line with the theory.*	Frino et al. (2019) *The Sensitivity of Trading to the Cost of Information.*
Incumbent exchanges	Excessive and complex market data fees	Reduce transparency and liquidity	Higher liquidity	*The study goes on to show that the limitation of the access to market data has several negative consequences for the financial markets:* *Less liquidity:* ***Less informed traders and less informative prices*** *will lead to less trade, as their risk on each individual transaction is greater – this will* ***impair the liquidity on the market****, especially for risky assets.*	Copenhagen Economics (2018) *Pricing Of Market Data.*
Incumbent exchanges	Excessive and complex market data fees	Reduce liquidity	Higher liquidity	*However,* ***lack of a full set of data makes the European market appear less liquid****, leading to cautious investment and trading strategies, delivering worse outcomes for investors and lower valuations for issuers.*	Market Structure Partners (2025) *There's No Market in Market Data.*
Incumbent exchanges	Excessive and complex market data fees	Worsen price formation	Improved information	*At the same time, the exchanges' use of complex contracts and high data fees that restrict dissemination of their data suggest that* ***improving price formation across the whole market is not a priority.***	Market Structure Partners (2025) *There's No Market in Market Data.*
Incumbent exchanges	European consolidated order books	Lower liquidity and higher liquidity risk	Higher liquidity	***When investors throughout Europe can trade assets from firms in any European country on equal terms****, this corresponds to a much larger demand side facing each firm's issuing of debt or stock. This* ***will result in a deepening of the market*** *and, to the extent that deeper markets give rise to higher trading volumes,* ***integration reduces liquidity risk****.*	London Economics (2002) *Quantification of the Macroeconomic Impact of Integration of EU Financial Markets.*
Incumbent exchanges	Excessive and complex market data fees	Increase cost of capital and worsen efficiency and liquidity	Higher liquidity	***… selling price data increases the cost of capital and volatility, worsens market efficiency and liquidity****, and discourages the production of fundamental information relative to a world in which all traders freely observe prices.*	Easley et al. (2016) *Differential Access to Price Information in Financial Markets.*

Academic literature and reports support that addressing inefficiencies in Capital Market Infrastructure will improve three important levers for improved market efficiency (II/II)

Infrastructure player	Problem	Impact from problem	Market efficiency lever	Literature support	Source
CCP	Missing interoperability	The lack of interoperability means that investors and traders face artificially high costs, which directly reduces market liquidity	Higher liquidity	*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.*	Oxera (2020) *Primary and secondary equity markets in the EU.*
CCP	Missing interoperability	Robust interoperability will limit concentration and thereby increase market integration	Increased market integration	*Overall, a single CCP solution appears less resilient than a few bilateral links between CCP when the magnitude of the crisis is large, and only more resilient when the magnitude of the crisis is small in relation to the clearing fund of the CCP(s).* ***In this respect, robust interoperability arrangements have been considered as a possible option to limit concentration.***	ECB (2021) *Payments and market infrastructure two decades after the start of the European Central Bank.*
CCP	Missing interoperability	Entry barriers make entry cost high, resulting in low competition.	Increased market integration	*Ideally, any organisation wishing to compete should be able to enter the clearing market easily. However,* ***a range of factors including, legal and regulatory requirements and technology makes entry costs rather high****. Accordingly, it would probably be difficult for a new CCP to compete successfully against an existing monopoly provider - unless that monopoly had lost the confidence of a very significant number of its users.*	Giovanni Group (2003) *Second Report on EU Clearing and Settlement Arrangements.*
CCP & CSD	Monopoly power	Monopoly power limits incentive to cross-border transactions, reducing liquidity	Higher liquidity	*In the US, there is a single central counterparty platform (CCP) and a single central securities depository (CSD) for all equity trades, while in Europe there are more than 20 CCPs and CSDs for equities alone, and different platforms use the services of different CCPs or CSDs.* ***As a result, cross-border transactions are more complex and costlier than domestic transactions, hindering multimarket trading.***	Draghi et al. (2024) *The future of European competitiveness.*
CSD	CSD monopoly power	Liquidity fragmentation	Higher liquidity	*"Therefore,* ***the integration efforts of trading platforms by some European players do not fully suffice to reduce liquidity fragmentation, as issuers remain registered with domestic CSDs that are not harmonised and have limited interoperability.***	Noyer et al. (2024) *Developing European capital markets to finance the future.*
CSD	CSD monopoly power	Fragmented market due to sovereignty reasons, non-harmonisation of securities law, and vertical integration.	Increased market integration	***The post-market infrastructure landscape is more fragmented in Europe than in the United States, primarily due to the multiplicity of central securities.*** *CSDs remain primarily national****, due to sovereignty reasons*** *(sovereign issuers' preference for nationally supervised CSDs),* ***non-harmonisation of securities law, and vertical integration of market infrastructures.***	Noyer et al. (2024) *Developing European capital markets to finance the future.*

Methodology for estimating GDP potential

Step 1: Investment response to a change in cost of capital

Empirical studies show that a lower cost of capital increase the number of realised investments. Gilchrist and Zakrajse (2007) find that a 1 percentage point decrease in cost of capital increases the investment rate by 0.5 to 0.75 percentage points. Similarly, Carluccio et al. (2021) find that a 1 percentage point decrease in cost of capital increases the investment rate by 0.35 percentage points.

Therefore, we apply the following changes using the estimates from Carluccio et al. (2021) and Gilchrist and Zakrajse (2007):

0.16 pp cost of capital reduction: $(0.16\ pp\ \times 0.35\ pp + 0.16pp \times 0.75pp)/2 = 0.09\ pp$ increase in the investment rate.

Step 2: Effect on GDP over ten years

Based on Bond et al. (2010), a 1 pp increase in the investment rate leads to a 0.33 pp increase in GDP growth per worker.
Applying this:

0.09 pp investment increase: $0.09\ pp\ \times 0.33\ pp = 0.029\ pp$ increase in GDP growth per worker per year.

Using compound growth, these annual increases in GDP growth per worker accumulate over 10 years. Assuming constant employment and a starting EU GDP of 17.9 tnEUR as of 2023, the estimated GDP gains are:

0.029 pp increase in annual GDP growth per worker assuming constant work force leads to an aggregated GDP effect of:
$[(1 + 0.00029)^{10} - 1] * 17.9 * 1000 = 52\ \text{bnEUR}$ which is the cumulative effect over ten years.

Note: We assume that firms' investment rates correspond to the aggregate investment rate in the economy measured as a share of GDP. This assumption is based on the idea that, when aggregating investment shares from the firm level to the macroeconomic level, the average will reflect the national investment share. While this is considered a reasonable simplification, we apply a scenario-based approach to account for uncertainty. We assume a constant work force. An increase in the work force could increase the aggregate potential, but diminishing returns could lower this effect, why we simplify to isolate the effect to not include a change in the work force. Results are conservative and do not account for second-round effects and does not account for an increase in market capitalisation which is found to increase GDP according to OECD (2015).
Sources: Implement Economics based on Eurostat (2025), Gilchrist and Zakrajse (2007), Carluccio et al. (2021), and Bond et al. (2010).

Abbreviations

Abbreviation	Full text	Description
BIS	Bank for International Settlements	International financial institution fostering global monetary and financial stability.
CCP	Central Clearing Counterparty	CCP interposes themselves between buyer and seller, thereby mitigating counterparty risk.
CMU	Capital Markets Union	EU initiative to deepen and integrate capital markets across member states.
CSD	Central Securities Depositories	CSD issues, safekeeps and maintains securities, while enabling secure settlement of transactions
CSDR	Central Securities Depositories Regulation	EU regulation that standardizes settlement discipline and enhances efficiency of CSDs.
DLT	Distributed Ledger Technology	Decentralised system for recording transactions, foundational for blockchain-based trading.
EMIR	European Market Infrastructure Regulation	Regulation mandating clearing, reporting, and risk mitigation of derivatives.
ETF	Exchange-Traded Fund	Investment fund traded on stock exchanges.
GDP	Gross Domestic Product	Total value of goods and services produced.
HHI	Herfindahl-Hirschman Index	A measure of market concentration based on the market shares of all firms within a market.
IOSCO	International Organization of Securities Commissions	Global body that develops standards for securities regulation.
IPO	Initial Public Offering	First sale of a company's shares to the public via a regulated market.
MC	Marginal Cost	The cost of producing one additional unit
MIFID/MIFIR	Markets in Financial Instruments Directive and Regulation	EU framework regulating trading venues and transparency in capital markets.
MR	Marginal Revenue	Additional revenue from selling one more unit
NBBO	National Best Bid and Offer	SEC rule ensuring investors receive the best available price when buying or selling securities.
NFT	Non-Fungible Token	Unique digital identifier recorded on a blockchain that certifies ownership of a specific digital or physical asset.
NRA	National Regulatory Authority	A public body responsible for implementing and enforcing sector-specific regulation within a country.
OECD	Organisation for Economic Co-operation and Development	Forum that promotes policies to improve economic and financial well-being globally.
SME	Small and Medium-sized Enterprises	Often targeted by capital market reforms to improve funding access.
SIU	Savings and Investments Union	EU initiative aimed at channeling Europeans' high levels of savings into productive investments, building on and broadening the goals of the Capital Markets Union.
TSO/DSO	Transmission and Distribution System Operator	Operators managing energy infrastructure distribution systems.
WACC	Weighted Average Cost of Capital	A firm's average cost of financing.

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