

An analysis of the EU governance framework for corporate reporting

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Executive summary

The fundamental purpose of economics is to allocate scarce resources in the most efficient way across different potential uses and across different groups of people. As a general rule, the more efficient the allocation is, the more optimal the resources are deployed in the economy. As noted by the 18th century economist Adam Smith, the benefits from optimal resource allocation ultimately filter down to consumers.¹

In western economies, capital markets play a significant role in resource allocation. Through a complex process that aggregates the trades of investors and savers, the market functions as a nexus that yields the expected risk-adjusted returns and prices for different uses of capital. Funds then flow to the best perceived investments, shifting the resources in the economy. One particular implication of these general economic principles is that having a better quality and reliability of information available to investors in the capital markets will improve the way in which these markets function, and therefore ultimately result in a better allocation of resources to consumers.

The European Commission's Directorate-General for Financial Stability, Financial Services and Capital Markets Union (DG FISMA) has recognised the importance of companies reporting accurate information for the efficient operation of financial markets in its recent consultation on the quality of corporate reporting. In particular, in its Call for Evidence on the quality of corporate reporting, DG FISMA states: 'Corporate reporting by listed companies is the bedrock of capital markets as it gives investors the essential information they need to make sound investment decisions such as information about the financial situation of companies', and that 'High-quality and reliable corporate reporting by listed companies is of key importance for the efficiency of EU financial markets'.²

DG FISMA's consultation concerns three pillars of corporate reporting: (i) corporate governance; (ii) statutory audit; and (iii) the supervision of statutory auditors and audit firms.

This study focuses on the first pillar. Corporate governance is critical whenever management and ownership functions diverge, which is the case for listed companies. Essentially, whenever a management team is entrusted with the funds of investors, the potential for mismanagement arises. In the absence of investor protections, rational investors will build this possibility into their expectations and pay a reduced price for such investments, leading to inefficiencies in resource allocation. Economists refer to this as the 'agency problem'.³

¹ Smith, A. (1776), *An Inquiry into the Nature and Causes of the Wealth of Nations*, Book IV, Ch. VIII.

² European Commission (2021), 'Corporate reporting—improving its quality and enforcement: Call for Evidence', https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13128-Corporate-reporting-improving-its-quality-and-enforcement_en (accessed 12 October 2022).

³ For a formalisation of this problem, see Jensen, M. and Meckling, W. (1976), 'Theory of the firm: Managerial behaviour, agency costs and ownership structure', *Journal of Financial Economics*, 3:4, pp. 305–360.

Corporate governance codes, regulations and laws contribute to reducing the agency problem. In this report, we identify major corporate governance reforms—in the USA (the Sarbanes–Oxley Act), Italy in the post-Parmalat era, South Africa and Japan⁴—and describe the resulting changes made in these countries.

Two common themes emerge.

- There is an emphasis on the individual responsibility of key management and board members. It is not uncommon for the CEO, CFO and/or specific board committee members to be personally accountable for the accuracy of the accounts.
- There is an emphasis on the importance of risk management and internal controls. For example, the mapping, testing and reporting around the company's internal controls are codified. As with corporate reporting, responsibility for the internal controls function is often explicitly assigned to management and/or the board. Although the reforms across the four countries analysed share many features, there are also important differences. We describe these different legal and regulatory environments in detail in section 2.

The Commission's Call for Evidence has several focus areas for the first pillar.⁵ The first is the concern that boards of listed companies may have insufficient responsibilities regarding the quality of corporate reporting. Also highlighted is the need for robust risk management and internal controls systems. Inconsistencies in how audit committees are created and monitored (where they exist at all) are noted. The Commission's focus on internal controls and management/board responsibility is therefore similar to the focus of the four historical reforms described in this report. We also note a similar effort under way in the UK, with the Financial Reporting Council focusing on corporate governance reform.⁶

The current status of corporate governance frameworks across EU countries: a patchwork of initiatives

We outline the current status of these areas for each EU member state in section 3. Our data collection considered areas such as the responsibility for corporate/financial reporting, the role of the audit committee, the risk management/internal controls framework, and the requirements for corporate governance reports.

It is important to highlight that there is no single data source on corporate governance frameworks at the member state level. The current systems are often a combination of securities regulations, legislation, non-binding corporate governance codes, and even

⁴ Although our study focuses on the corporate governance aspect, the Sarbanes–Oxley Act also included provisions about auditor independence, although the Italian reforms do not. As discussed later in the empirical section, we use both samples to inform our results and also to ensure that these results are driven (solely) by audit reforms.

⁵ European Commission (2021), 'Corporate reporting—improving its quality and enforcement: Call for Evidence', https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13128-Corporate-reporting-improving-its-quality-and-enforcement_en (accessed 12 October 2022).

⁶ Financial Reporting Council (2022), 'Restoring Trust in Audit and Corporate Governance'. https://www.frc.org.uk/getattachment/aafabbc3-81a3-4db3-9199-8aaebb070c7f/FRC-Position-Paper-July_2022_.pdf (accessed 12 October 2022).

guidance from central banks. To ensure that our coverage is as complete as possible, we collect information on board responsibilities and internal controls guidance from multiple data sources, such as Thompson-Reuters, law reviews, government websites, corporate annual reports, academic studies, and development banks

The findings from this extensive cross-country comparison show a striking pattern of many EU member states exhibiting a patchwork of guidance coming from legislation, securities regulators (including stock exchanges), corporate governance codes, and central banks. Some of these rules are required by law and others are considered 'best practice'. Many member states work on a comply-or-explain principle, with different interpretations of how detailed the explanations must be.

In short, the corporate governance framework underpinning corporate reporting varies considerably across the EU, providing support for the DG FISMA initiative to consult on the quality of corporate reporting in the EU.

What might the EU expect from a unified and improved corporate governance framework for corporate reporting? The answer is not obvious. On the one hand, based on the academic evidence, one might reasonably expect an improvement in reporting quality and corporate governance.⁷ On the other hand, compliance with new governance rules is costly. In addition to direct administrative costs, there are sometimes unintended economic and social costs. For example, the additional information that is required to be disclosed could be used by competitors, which increases the economic costs of disclosure. In addition, any change in oversight and governance risks leading to a structural break which would then lead to a loss of consistent time series, which is often as or more informative than absolute levels. Firms may reduce their risk-taking below optimal levels.⁸ Additionally, better-governed companies may choose to opt out completely from listed markets upon the creation of new corporate governance rules, choosing instead to take themselves private to avoid regulations that their investors consider unnecessary and/or too costly, which reduces the pool of investment opportunities.⁹

It is important to note that our study focuses only on the benefits, as the potential costs (such as firms delisting) are unobservable in our setting. However, the bulk of the academic evidence suggests that post-reform delistings are minimal. The direct costs in the first year of compliance were estimated at between 0.02% and 0.30% of sales revenues, depending on the study in question.¹⁰

⁷ Chang, H., Fernando, G.D. and Liao, W. (2009), 'Sarbanes - Oxley Act, perceived earnings quality and cost of capital', *Review of Accounting and Finance*, 8, pp. 216–231.

⁸ Barger, L., Lehn, K. and Zutter, C. (2009), 'Sarbanes-Oxley and corporate risk-taking', *Journal of Accounting and Economics*, 49, pp. 34–52.

⁹ Engel, E., Hayes, R. and Wang, X. (2007), 'The Sarbanes Oxley Act and firms' going private decisions', *Journal of Accounting and Economics*, 44, pp. 116–145.

Gao, F., Wu, J. and Zimmerman, J. (2009), 'Unintended consequences of granting small firms exemptions from securities regulation: evidence from the Sarbanes-Oxley Act', *Journal of Accounting Research*, 47, pp. 459–506. Maher, M.W. and Weiss, D. (2008), 'Costs of complying with the Sarbanes-Oxley Act', *UC Davis Graduate School of Management Research Paper*.

¹⁰ Ibid.

Oxera, in its 2020 study for DG FISMA on the performance of EU primary and secondary capital markets, found that:

feedback from market participants indicates that the costs of becoming a public company have risen considerably in recent decades. The initial and ongoing costs of listing appear to have widened the gap between public and private companies. While regulation may not be a primary driver for the decline in listings, the regulatory costs associated with listing are particularly relevant for smaller issuers, for which alternative private funding options may be more readily available.¹¹

Potential benefits of further reforms in the EU

Therefore, the question of the potential benefits of further reforms becomes even more relevant. The economic benefits resulting from the findings of this report indicate that they are likely to outweigh the costs of these reforms (which have been set out in previous studies), which we review in section 4.2. Specifically, the reduction in the cost of capital lowers the compliant companies' financing costs and increases their profitability. With higher profitability, companies have contributed to the overall economy in the form of higher gross domestic product (GDP), higher tax payments (which in turn support increased government spending) and increased investment.

We attempt to provide evidence on this question in a quantitative way, recognising that to analyse the question of benefits of the reforms in a comprehensive way would require a more in depth research agenda. In particular, we examine the impact of corporate governance reforms in the USA and Italy on the company-level cost of equity (CoE), accruals quality, and corporate governance rating. The improvements found in all three metrics post-reform suggest that such reforms lead to better corporate governance and better financial reporting quality and are therefore expected to lower the investor risk. Our econometric methodology is aimed mainly at identifying a causal relationship and eliminating alternative explanations.

In particular, we compare 42 Italian companies after the reform in Italy with comparable non-Italian companies in the EU, looking at changes in the company-level CoE and accruals quality. This is known in econometrics as a 'quasi-natural' experiment. Unlike in medical trials, true controlled double-blind experiments are extremely rare in the area of economic policy. However, the intuition of this quasi-natural experiment is similar to that of a medical experiment, as Italian companies have received the governance 'treatment' and non-Italian companies have not. The results of this natural experiment confirm significant benefits for Italian companies following the governance reform relative to matched non-Italian companies, in the form of lower investor risk and improved financial reporting quality.

To cross-check the empirical results of the EU quasi-natural experiment, we also examine the impact of corporate governance

¹¹ Oxera (2020), 'Primary and secondary equity markets in the EU', report prepared for European Commission DG FISMA, <https://www.oxera.com/wp-content/uploads/2020/11/Oxera-study-Primary-and-Secondary-Markets-in-the-EU-Final-Report-EN-1.pdf>.

reforms in the USA and Italy. We find post-reform improvements in the CoE, accruals quality and corporate governance (US only), which supports our conclusions regarding the benefits of governance reforms, as drawn from the EU quasi-natural experiment. It is important to highlight that the results from the US and Italian analysis are indicative only. While the findings from these analyses are broadly consistent with those set out in a broad body of literature, they need to be interpreted with caution due to the difficulties with the experiment design (US and Italian analysis) and limitations with data quality (Italian analysis).

Finally, we examine the potential benefits for EU companies and investors following a corporate governance reform similar to that implemented in Italy and/or the USA. Drawing on the results from the analyses described above, over a 10–20 year period, say, the evidence from these approaches is suggestive of a potential impact of an EU corporate governance reform leading to a reduction to the average CoE of approximately 0.5 percentage point (p.p.) to 1.5 percentage point (p.p.), with a point estimate of 1 p.p. There are limitations with such an analysis, as explained above and in appendix A3, but the evidence on the positive impact on capital market performance indicators is consistent with previous academic literature on the impact of similar reforms.

We also cautiously highlight that the results of this analysis are for the average company and its magnitude is only indicative of the economic and statistical significance of the potential impact of reforms that aim to improve corporate reporting in Europe. For example, some EU member states already require internal controls reporting and would be likely to experience more modest changes, whereas member states without a current framework could expect greater changes. Separately, the unification and enhanced cross-border comparability in governance is likely to be another benefit, although we have not quantified this benefit in our analysis.

What does a reduction in the CoE mean for consumers, investors and economies?

The list is long. Most directly, a reduction in the CoE for firms in the EU lowers risk for investors, making the EU a more attractive investment opportunity. Further, the decrease in the cost of capital makes riskier, innovative projects more profitable and firms are more likely to make these innovative investments. From a consumer perspective, many prices are linked to the cost of equity capital. For example, energy tariffs are calculated based on the underlying CoE. If the CoE falls, the 'fair' energy tariff also falls. A long-term reduction in the CoE should therefore lead to a (relative) long-term decline in energy prices.

More generally, we also expect any EU reforms, comparable to those in Italy and USA, to improve the quality of financial reporting and corporate governance. This would be consistent with our empirical analysis for comparable reforms in Italy and the US. To summarise, our results suggest that investors could expect improvements in corporate reporting quality and reductions in investor risk following a reform along the lines of the first pillar identified by DG FISMA's consultation

(which focuses on management and board responsibility for corporate governance financial reporting and internal controls).

We caution that the actual outcome may vary by member state and by company, and that we cannot quantify the potential for firms to delist.

Looking forward and further research

Our empirical tests focus on the effects around financial reporting due to the nature of the historical reforms. The Commission's framework is broader, focusing on corporate reporting, which also includes non-financial aspects such as information on environmental, social and corporate governance (ESG) matters. However, we fully expect that a framework that sets up a structure of internal controls and management responsibility around reporting will have similar effects for investors, whether the reporting is strictly financial reporting or corporate reporting more broadly.

The report does not claim to be comprehensive in its assessment of the potential impact of the reforms, as such an objective would require longer timeframes and a deeper research agenda. It provides evidence that supports the hypothesis that the reforms will lead to improvements in EU capital markets performance. However, future research into this important subject could test alternative measures of capital market indicators (eg alternative indicators of corporate governance standards, different quality of accounting reporting variables, different risk profiles of investors), and use alternative datasets and time periods, to provide further evidence on the strength of our results.

1 Introduction

The recent consultation by the European Commission's DG FISMA on the quality of corporate reporting covers three pillars: (i) corporate governance; (ii) statutory audit; and (iii) the supervision of statutory auditors and audit firms. The European Contact Group (ECG), an informal regulatory and policy working group of six large audit networks in the EU,¹² has asked Oxera to undertake an independent analysis of the potential impact of the first pillar: corporate governance.

Oxera was asked to provide more evidence on the benefits of corporate governance reforms in the US and Italy. In its original consultation, the Commission was also looking for evidence, but the ECG realised that limited evidence existed. Finally, the Commission, in its summary report to responses to its consultation, noted that corporate governance and reporting (Pillar I) was the area that most needed improving.¹³

In this research report we:

- 1 examine and describe the major corporate governance reforms of the last 20 years;
- 2 examine and describe the current corporate governance frameworks in each EU member state;
- 3 analyse potential changes in investor risk, financial statement quality, and corporate governance quality as a result of past corporate governance reforms. We then treat this as indicative of the estimate of potential benefits following a similar corporate governance reform in the EU.

Oxera's experience in the field of corporate governance and financial markets has developed over many decades through the research of its teams (including its network of leading academics), its research for many leading studies into international capital markets, and the provision of advice to many key organisations in capital markets. The Oxera team for the current study was led by Dr Luis Correia da Silva and Professor Ryan Williams (who has left Oxera, although he co-authored the report while still at the firm), whose CVs are provided in Appendices A6 and A7. Luis and Ryan were assisted by the broader Oxera team as well as our network of academic Associates. Our results were independently audited by experts in capital markets and econometrics under our strict quality control guidelines. Oxera also wants to thank Professor Belcredi of Università Cattolica del Sacro Cuore for his helpful comments on our report.¹⁴

The rest of this report is structured as follows:

¹² BDO, Deloitte, EY, Grant Thornton, KPMG and PwC.

¹³ European Commission (2022), 'Corporate reporting—improving its quality and enforcement: Summary Report', https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13128-Corporate-reporting-improving-its-quality-and-enforcement/public-consultation_en (accessed 12 October).

¹⁴ The usual disclaimer applies.

- section 2 discusses corporate governance reforms in the USA, Italy, Japan and South Africa;
- section 3 discusses the current corporate governance frameworks in each EU member state;
- section 4 presents our econometric analysis of the impact of the past corporate governance reforms. This analysis is then used to estimate potential benefits following a similar corporate governance reform in the EU, with additional details, methodology and data set out in Appendix A2;
- section 4 concludes.

2 History of corporate governance reforms

2.1 Introduction

In this section, we describe corporate governance reforms in the US, Italy, South Africa, and Japan, and comment on the pros and cons of each. Our research identified these as the closest historical reforms to the type of reform being considered by the Commission. The US and Italy also have appealing properties for our empirical tests, as we describe further in section 4.

2.2 US reforms

The Sarbanes-Oxley Act (SOX), enacted on 30 July 2002, was created as a political response to a series of corporate scandals in the aftermath of the dot.com boom that affected many investors and well-known companies, such as Worldcom and Enron.

The Act was sweeping in scope, comprising 11 sections. Among other changes, SOX established a new entity, the Public Company Accounting Oversight Board (PCAOB), as an independent regulator of the audit profession. SOX also created new rules on auditor independence, and disclosure of any potential conflict of interest for securities analysts. SOX requires listed companies to have independent audit committees with direct oversight of the audit, including compensation. The Act further outlines a series of criminal penalties for corporate and criminal fraud.

Most importantly to our study, SOX contains specific rules designed to assign accountability for the accuracy of financial reporting. These include requiring senior executives to certify a company's financial reporting. In addition, the management of public companies are required to assess the effectiveness of the company's internal control over financial reporting (ICFR), and, in the case of larger companies, for auditors to attest to the effectiveness of their ICFR. Sections 302 and 404 of the Act deal with management responsibility and internal controls, respectively, and we discuss these in detail below.

2.2.1 Section 302

Section 302 of SOX assigns direct responsibility to the CEO and CFO for the accuracy, documentation and submission of annual and quarterly reports to the US Securities and Exchange Commission (SEC). Further, the CEO and CFO are responsible for a company's internal controls structure, and both must sign each quarterly filing, to attest that:

- the signing officer has reviewed the report;
- the report contains no materially untrue facts or omissions;
- the financial statements and other financial information in the report fairly present the company's financial condition;
- they are responsible for the company's internal controls;
- the effectiveness of the internal controls has been evaluated as of the report date;

- they have presented conclusions about the company's internal controls.

They must also attest to have provided all material information to the company's auditors and audit committee, as well as any information on fraudulent behaviour by management and/or employees with access to the internal controls systems.

2.2.2 Section 404

Section 404 of SOX is a major overhaul of internal controls testing and reporting. Since its passage, annual financial reports must include an Internal Control Report stating that management is responsible for an adequate internal controls structure. According to SEC rules to implement this section, the Internal Control Report must also include management's assessment of the effectiveness of the internal control structure and must note any deficiencies in the structure. Finally, SOX requires the company's external auditors to attest to the accuracy of the management's assertion that internal accounting controls are in place, operational and effective. SEC rulemaking has limited this attestation requirement to larger public companies only.

2.3 Italian reforms

In contrast to SOX, corporate governance reform in Italy has been the result of efforts over decades to gradually improve the governance structure for listed companies.¹⁵ These efforts, which started in the 1990s, were intended to correct a perception that investors had insufficient protections in Italy. The three primary reforms have been the Draghi Law, the general corporate law reform of 2002–04, and the post-Parmalat Law on Savings.

2.3.1 Draghi Law

Broadly, the Draghi Law streamlined the legal framework for securities offerings, takeover bids, disclosure obligations and audit firms. Minority shareholders were granted governance rights and remedies that were previously unavailable.

The new law also reshaped the Collegio Sindacale (which is similar to an audit committee) and required the internal auditors to focus on internal controls. The law also clarified that the board is responsible, among other things, for the adequacy of the internal control system, the adequacy of the administrative and accounting systems and implementing the Borsa Italiana corporate governance rules. These powers were created via legislative decree in 1998.

2.3.2 General corporate law reform of 2002–04

It was recognised that a more general corporate law reform was needed to rectify issues such as lack of clarity about board responsibilities. As a result, the Italian government enacted the general

¹⁵ For example, the 2005 Italian legislative reform sets out the scope of the reforms that apply to all companies listed in Italy. See *Rivista di Diritto Societario* (translated as 'Journal of Corporate Law'), 'Il dirigente preposto alla redazione di documenti contabili', <https://www.rivistadirittosocietario.com/dirigente-preposto-alla-redazione-di-documenti-contabili#5>.

corporate law reform of 2002–04 (also named the *Vietti* Reform after the Undersecretary of Justice at the time).

The Vietti Reform changed the legal framework for the governance of Italian limited liability companies by giving them more choice, although the vast majority of Italian limited liability companies choose the traditional Italian model. Other changes concerned share issuances and minority rights.

Perhaps ironically, lawyers and academics criticised these pre-Parmalat corporate law reform as a step backwards for the effectiveness of corporate governance rules in Italy. For example, the government revised its white-collar crime law such that it became nearly impossible to punish companies reporting false annual accounts and other financial reports. This was the state of play when the Parmalat scandal occurred.

2.3.3 The post-Parmalat Law on Savings of 2005, Italian Law 262/2005

In a similar way to the US, following the Parmalat and Banca Popolare di Lodi scandals, the Italian government implemented reforms inspired by, but not identical to SOX. In general, the 2005 Law on Savings requires more director independence and stricter standards for auditors and audit committees, as well as the reporting of internal controls. It requires management to attest to the accuracy of financial reports. Specifically:

- if the board of directors of a listed company has more than seven members, at least one director must meet certain independence requirements;
- the Law on Savings requires the appointment of an officer responsible for the preparation of financial information (the 'Accounting Officer');
- the Accounting Officer and the *direttore generale* must certify the accuracy of financial information contained in the company's financial reporting;
- the Accounting Officer and CEO (*amministratore delegato*) must provide a report certifying the adequacy of internal controls around financial reporting.

The reform contains rules similar to SOX on external auditor independence. It restricts directors and executives from working for external auditors and closes other perceived loopholes in corporate governance.

2.4 Japanese reforms

Japan's Financial Instruments and Exchange Law, colloquially known as 'J-SOX', came into effect on 1 April 2008. Unlike in Italy and the USA, Japan's law initially focused on internal controls. Modifications to proposed board structures and corporate governance reforms

followed in 2015 and 2018, with more reforms currently under proposal in 2022.¹⁶

J-SOX is closely modelled on Sections 302 and 404 of the US SOX. For example, it requires the CEO and CFO to certify the accuracy of the financial reports and to evaluate the company's internal controls around financial reporting.¹⁷ There are, however, also differences between J-SOX and SOX regarding internal controls reporting. For example, J-SOX broadens the requirements beyond the financial statements and footnotes alone to non-financial items reported to investors.¹⁸

In other dimensions, the corporate governance system in Japan follows the current EU model. A non-mandatory Corporate Governance Code sets out best practice on certain aspects of corporate governance, such as the number of independent directors,¹⁹ and provides a 'comply-or-explain' framework.²⁰

Other aspects of Japanese corporate governance remain different from those of many western countries. For example, it was not until 2015 that a board structure was created that was intended to facilitate more widespread use of audit committees.²¹ As at 2021, only 34% of the companies listed on the first section of the Tokyo Stock Exchange had an audit committee.²² Given the opacity of Japan's ownership structures, there is still some scepticism in the western business press that Japanese corporate governance reporting is comparable to those of other regimes, despite the adoption of J-SOX.²³

2.5 South Africa's reforms

In contrast to the above three reforms, which were enacted via legislation, South Africa's reforms have been driven primarily by changes to the listing requirements of the Johannesburg Stock Exchange.²⁴ These requirements came into effect on 31 December 2020.

As with the reforms discussed above, a key focus of the South African reports is management's certification of the financial statements and internal controls. For example, as in SOX and J-SOX, the CEO and

¹⁶ Eisner Amper (2017), 'J-SOX Versus U.S. Sarbanes Oxley Act Specifics of J-SOX Requirements', <https://www.eisneramper.com/j-sox-sarbanes-oxley-act/> (accessed 12 October 2022).

¹⁷ Eisner Amper (2017), 'J-SOX Versus U.S. Sarbanes Oxley Act Specifics of J-SOX Requirements', <https://www.eisneramper.com/j-sox-sarbanes-oxley-act/> (accessed 12 October 2022).

¹⁸ Ibid.

¹⁹ Harada, M., Nakayama, T. and Omata, Y. (2022), 'The Corporate Governance Review: Japan', *The Law Reviews*, <https://thelawreviews.co.uk/title/the-corporate-governance-review/japan> (accessed 12 October 2022).

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

²³ Lewis, L. (2021), 'There's a bad smell to Japan's corporate governance reform', *Financial Times*, 14 February.

²⁴ Engelbrecht, L. (2021), 'Time for companies to get their heads around new JSE rules', EY, https://www.ey.com/en_za/assurance/time-for-companies-to-get-their-heads-around-new-jse-rules (accessed 12 October 2022).

Financial Director must sign a statement attesting to the accuracy of the financial reporting.

However, the JSE does not require the full internal controls reform prescribed by SOX. It is closer to the current system in many European countries, where management is responsible for the establishment and maintenance of internal controls, but it does not go as far as the SOX requirements. Although management must attest to the adequacy and effectiveness of internal controls, the JSE does not provide details as to the testing process.²⁵

2.6 Summary

The four corporate governance reforms described above have a similar broad focus on management responsibility for financial reporting, and creating, maintaining, and testing an effective internal controls system. They differ in key ways, with more recent reforms being somewhat more flexible than the earlier US and Italian reforms. In the US, SOX has an additional strong focus on the audit committee's requirements and responsibilities. The reforms in Japan and South African share aspects with the current systems in many EU member states. For example, Japan's Corporate Governance Code uses a comply-or-explain approach as do many EU states, whereas South Africa's internal controls requirement does not go as far as that of SOX.

Note that these historical reforms have traditionally focused on financial reporting. The Commission's goal appears broader, with a focus on corporate reporting, encompassing non-financial information such as environmental, social and corporate governance (ESG).

²⁵ Van Deventer, M. (2020), 'South Africa's CEO/CFO are to sign off on internal financial controls—JSE listing Requirement', Nexia, <https://nexia.com/insights/articles/south-africa-s-ceo-cfo-are-to-sign-off-on-internal-financial-controls-jse-johannesburg-stock-exchange-listing-requirement/> (accessed 12 October 2022).

3 Current corporate governance structure in the EU

3.1 Introduction

As noted in section 2, corporate governance reforms tend to share a focus on two broad areas: (i) assigning personal accountability for the accuracy of financial reporting by management and/or the board; and (ii) the creation, monitoring, testing and reporting of the company's internal controls around financial or corporate reporting. Guidance on audit committees also plays an important role.

In this section, we outline the current status of these areas for each EU member state. Our data collection considered areas such as the responsibility for corporate/financial reporting, the role of the audit committee, the risk management/internal controls framework, and the requirements for corporate governance reports.

It is important to highlight that there is no single data source on corporate governance frameworks at the member state level. The current systems are often a combination of securities regulations, legislation, non-binding corporate governance codes, and even guidance from central banks. Documents are not always available in English, and corporate governance codes vary by country. To ensure that our coverage is as complete as possible, we collect information on board responsibilities and internal controls guidance from multiple data sources, such as Thompson-Reuters, law reviews, government websites, corporate annual reports, academic studies, and development banks. Some of this data is illustrated below, particularly those with respect to public interest entities and their requirements. However, all illustrations have been simplified to enhance readability. The reality is often more nuanced than can be presented in two categories because no two member states have the same underlying corporate governance system. To that effect, in Appendix A1 we present tables with summaries of the information collected.

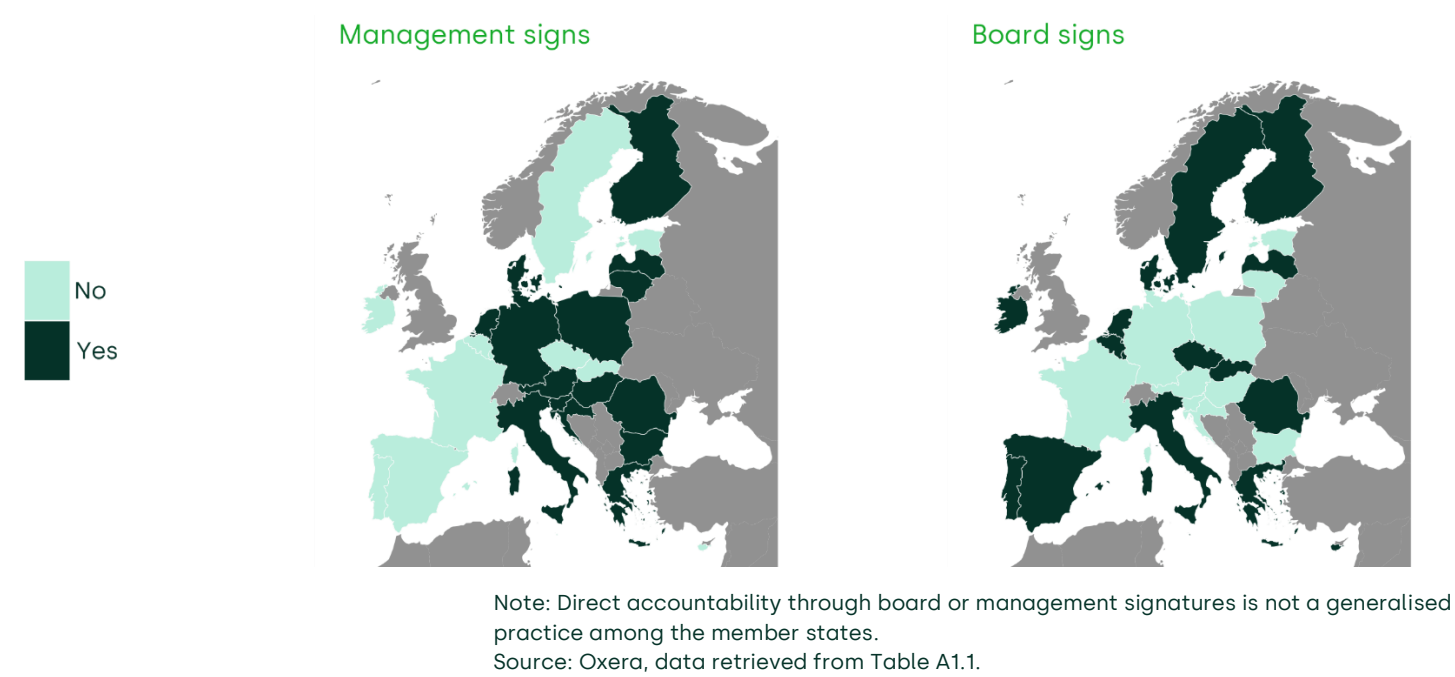
In our reporting of the findings, missing values for a field generally mean that the member state in question has no explicit requirement in that area.

3.2 Findings across EU member states

Corporate governance guidance takes a variety of forms across countries. For instance, some member states explicitly require the board and/or management of public interest entities to personally sign the accounts to attest to their accuracy. However, as shown in Figure 3.1, this is not a widespread practice. Other countries explicitly make directors personally liable for incorrect accounts without such an attestation, whereas some make directors liable only in the event of fraud.

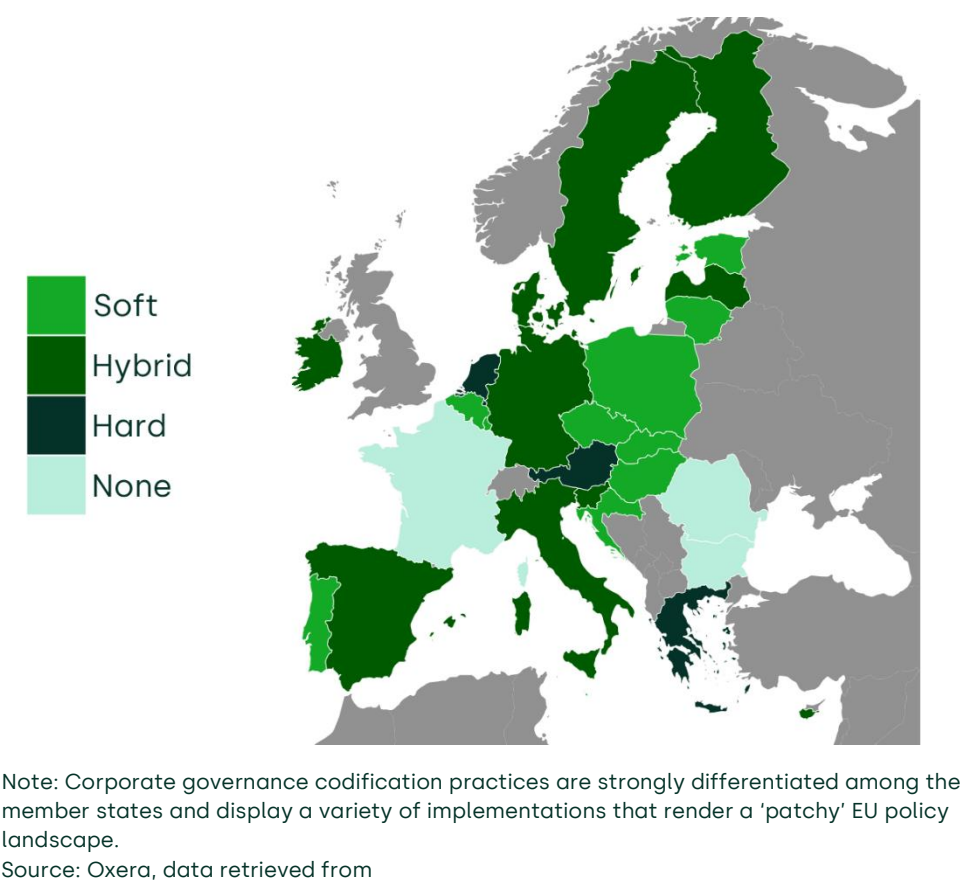
Note that in the case of countries with a two-tier board system, the term "board" in this section refers to the supervisory board.

Figure 3.1 Countries explicitly requiring a signature attesting to the accuracy of accounts



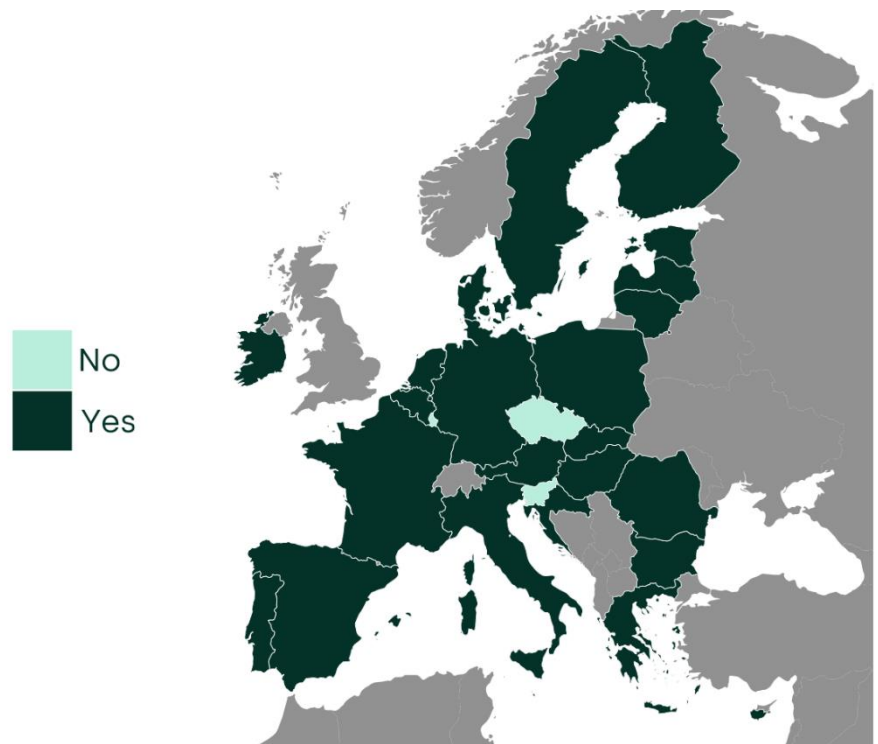
In some member states, the corporate governance framework is a mix of mandatory 'hard' law (which is often codified in corporate legislation) and 'soft' corporate governance codes (which tend to be non-mandatory). In contrast, the corporate governance framework in some other member states is either entirely 'hard' or entirely 'soft'. Most member states are somewhere in between (and this is not always a clean distinction). We show the results of this data in Figure 3.2.

Figure 3.2 Legal status of corporate governance framework



In relation to corporate governance reports, some member states require the publication of reports outlining, among other items, any non-compliance with the member state's code, while others do not. Even the 'soft' states shown in Figure 3.2 have a comply-or-explain system that is often captured in the corporate governance report. We show the distribution of these reports in Figure 3.3.

Figure 3.3 Explicitly requires discrete corporate governance report

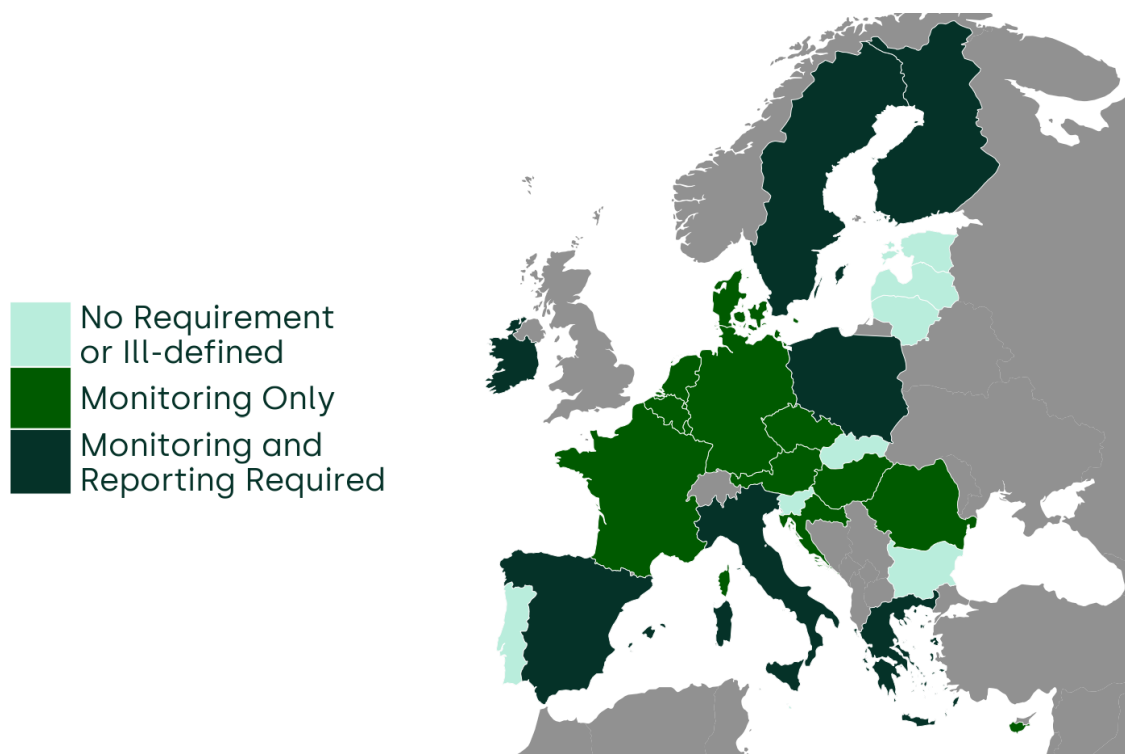


Note: Although the majority of member states require a corporate governance report by law, those that do not often implement a comply-or-explain system which puts them closer to strict reporting requirements.

Source: Oxera, data retrieved from Table A1.3.

In terms of the requirement regarding internal controls, many member states have internal controls frameworks that are clearly defined, and which outline individual responsibilities for creating, monitoring and testing internal controls. Some member states go a step further, also requiring a report from the board about internal controls. Other member states have internal control frameworks for banks only, poorly defined internal control frameworks, or no framework at all. Figure 3.4 shows the arrangements for internal controls frameworks across member states, including both hard and soft coded practices.

Figure 3.4 Internal controls frameworks



Note: Internal controls frameworks are notably diverse and do not exhibit a clear standardisation among the member states.

Source: Oxera, data retrieved from Table A1.2

The underlying data used in the report, presented in Appendix A1, shows a broad divergence in the corporate governance rules around financial reporting, as well as the degree of enforcement of these rules.

3.3 Summary

To summarise, the findings from this extensive cross-country comparison show a striking pattern of many EU member states exhibiting a patchwork of guidance coming from legislation, securities regulators (including stock exchanges), corporate governance codes, and central banks. Some of these rules are required by law and others are considered 'best practice'. Many member states work on a comply-or-explain principle, with different interpretations of how detailed the explanations must be.

In short, the corporate governance framework underpinning corporate reporting varies considerably across the EU, providing support for the DG FISMA initiative to consult on the quality of corporate reporting in the EU.

4 Analysis of potential benefits of corporate reporting reforms in the EU

4.1 Introduction

In this section, we provide some evidence to illustrate the potential impact of the corporate governance reforms in the US and Italy on three elements: a measure of investor risk; reporting quality; and corporate governance rankings. We then use our findings as an approach to highlight the potential future outcomes if the EU were to adopt similar corporate governance reforms.

Although there are similarities between the reforms of the US and Italy and the potential reforms being considered by the European Commission, they also differ in certain respects. For example, SOX places stronger emphasis on the audit committee than the Italian reforms do. The US and Italy, in their reforms, focused mostly on financial reporting, whereas the Commission has a broader focus on corporate reporting.

Finally, we can test the effects of the reform as a whole only. For example, we can test whether SOX as a whole had an effect on investor risk in the US but cannot test the marginal effects of individual components of SOX, such as the independent effects coming from management responsibility versus internal controls testing. We note that SOX also contained aspects outside the scope of Pillar I, such as dealing with auditor independence, whereas the Italian reforms generally did not. That said, the Italian regulatory framework for audit was already detailed.

Before describing the analytical approach followed, it is important to highlight a fundamental plank of our analysis. DG FISMA's consultation on corporate reporting is broader than the reforms highlighted in section 2 of this report. The Commission's consultation focuses on broad corporate reporting, which includes non-financial information such as information on ESG. We note, however, that underpinning the Commission's consultation are changes that aim to create a framework for setting up a structure of internal controls and management responsibility around reporting, which are principally similar to those used in the previous reforms. The possible EU reforms are therefore likely to have similar effects on investors, whether the reporting is strictly financial reporting or corporate reporting more broadly.

As a result, our analysis attempts to establish whether there is evidence consistent with an economically and statistically meaningful potential impact of reforms in the EU that share similar characteristics with previous reforms that placed more emphasis on internal controls and management responsibility.²⁶

Finally, another implication of the approach followed is that our estimated potential effects in the EU are based on averaging evidence

²⁶ It is important that we distinguish this analysis from the analysis undertaken in other academic literature on the impact of broader reporting indicators, such as ESG, on returns to investors, for example. That type of analysis is beyond the scope of this study.

across European member states and companies, arising from our analysis of the impact of previous reforms in the US and Italy.

4.2 Review of the academic literature

Before we set out the design of our econometric analysis, we first look at the body of academic literature that addresses the impacts of corporate governance on corporate and capital market outcomes.

Academics have considered the effect of corporate governance on a variety of outcomes. The majority of these studies use US data due to its good historical availability, although some have also used evidence from other countries. Such studies tend to regress a corporate outcome, such as financial reporting quality, on a set of variables of interest. This was the standard empirical set-up in the accounting literature for a long period. For example, one strand of literature examines the relationship between CEO/CFO quality and financial reporting quality.²⁷ Cohen and Krishnamoorthy (2008) collated a large body of accounting literature, which generally found that improvements in the quality and independence of the board and accounting committee generally improves financial reporting quality.²⁸ Biddle, Hilary and Verdi (2009) reviewed previous literature and found consistent results that higher-quality financial reporting improves capital investment efficiency.²⁹

Historically, it was difficult to identify causal relationships in the data, and only correlations could be found. More recently, academics have focused on treating corporate governance reforms as shocks to a company's baseline corporate governance incentives.³⁰ These shocks represent rapid changes and enable researchers to make causal inferences based on the response of investors and companies to those shocks.

One example is the implementation of SOX, which represented a large shock to firms in the US. A large amount of academic research has been devoted to examining its impact, showing positive effects in

²⁷ See, for example, Aier, J.K., Comprix, J., Gunlock, M.T. and Lee, D. (2005), 'The financial expertise of CFOs and accounting restatements', *Accounting horizons*, 19:3, pp. 123–135. Bamber, L., Jiang, J. and Wang, I. (2010), 'What's My Style? The Influence of Top Managers on Voluntary Corporate Financial Disclosure', *The Accounting Review*, 85:4, pp. 1131–1162. Dyreng, S., Mayew, W. and Williams, C. (2012), 'Religious social norms and corporate financial reporting', *Journal of Business, Finance, & Accounting*, 39:7–8, pp. 845–875. Ge, W., Matsumoto, D. and Zhang, J.L. (2011), 'Do CFOs Have Style? An Empirical Investigation of the Effect of Individual CFOs on Accounting Practices', *Contemporary Accounting Research*, 28:4, pp. 1141–1179. Demerjian, P., Lev, B., Lewis, M. and McVay, S. (2013), 'Managerial Ability and Earnings Quality', *The Accounting Review*, 88:2, pp. 463–498.

²⁸ Cohen, J. R., Krishnamoorthy, G. and Wright, A. (2004), 'The Corporate Governance Mosaic and Financial Reporting Quality', *Journal of Accounting Literature*, pp. 87–152.

²⁹ Biddle, G.C., Hilary, G. and Verdi, R.S. (2009), 'How does financial reporting quality relate to investment efficiency?', *Journal of Accounting and Economics*, 48:2–3, pp. 112–131.

³⁰ Atanasov, V. and Black, B. (2016), 'Shock-Based Causal Inference in Corporate Finance and Accounting Research', *Critical Finance Review*, 5, pp. 207–304.

terms of cost of capital/corporate valuations,³¹ as well as negative effects, such as the propensity for better firms to delist or 'go dark'.³²

We follow a similar approach to identify the causal relationships between corporate governance reforms and various dependent variables, as outlined below.

4.3 Design of our quantitative analysis

As noted in section 2, our research identified major corporate governance reforms in the USA (SOX), Italy in the post-Parmalat era, South Africa and Japan. After screening for sufficient data availability, we decided to centre our econometric analysis on the impact of the US and Italian reforms. This is because our sample ends in 2019, after which the performance of the financial markets has been distorted by the COVID-19 pandemic.

While there is sufficient data from both before and after the corporate governance reforms in the US and Italy for an examination of initial evidence on the potential impact of the reforms, this is not the case for the Japanese and South African reports. As discussed earlier, Japan changed its Corporate Governance Code in 2015 and again in 2018, leaving little data to examine in the post-reform period. Similarly, the South African reforms came into force in 2020, which is after the end of our data's sample period.

We consider the effect of the corporate governance reforms on the three dependent variables outlined in Table 4.1, which proxy for investor risk, quality of financial reporting, and corporate governance. The CoE measures the required return for equity investors, which is higher when risk is higher. A measure of abnormal accruals proxies for the quality of financial reporting, which is higher when there are fewer abnormal accruals. The modified G-Index measures a firm's level of anti-takeover defence, with a higher level pointing to fewer shareholder rights and therefore a lower quality of corporate governance.

³¹ See, for example, Jain, P. and Rezaee, Z. (2006), 'The Sarbanes-Oxley Act of 2002 and Capital-Market Behavior: Early Evidence', *Contemporary Accounting Research*, 23, pp. 629–654; and Funchal, B. and Gottlieb, D. (2011), 'Corporate governance and credit access: the Sarbanes-Oxley Act as a natural experiment', in *Anais do XXXVIII Encontro Nacional de Economia [Proceedings of the 38th Brazilian Economics Meeting]* (No. 053). ANPEC-Associação Nacional dos Centros de Pós-Graduação em Economia [Brazilian Association of Graduate Programs in Economics].

³² Leuz, C., Triantis, A.J. and Wang, T.Y. (2008), 'Why do firms go dark? Causes and economic consequences of voluntary SEC deregistrations', *Journal of Accounting and Economics*, 45, pp. 181–208.

Table 4.1 Dependent variables used in the analysis

	Dependent variable	Proxy for	Data source
1	Cost of equity (CoE)	Investor risk	Datastream, Bloomberg, Damodaran and Duff & Phelps
2	Abnormal accruals	Financial reporting quality	Datastream
3 (USA only)	Modified G-Index	Corporate governance	Gompers, Ishii and Metrick (2003)

Source: Oxera analysis based on Datastream, Bloomberg, Damodaran and Duff & Phelps, and Gompers, P., Ishii, J. and Metrick A. (2003), 'Corporate Governance and Equity Prices', *The Quarterly Journal of Economics*, 118, pp. 107–156.

The design of our empirical analysis aims to capture evidence on the impact of reforms through different approaches. The report does not claim to be comprehensive in its assessment of the potential impact of the reforms, as such an objective study would require longer timeframes for the research, additional datasets and the testing of alternative hypotheses. However, from publicly available data and hypotheses highlighted in the academic literature, it is possible to design the following three analyses.

- **EU quasi-natural experiment**, where we compare over 40 Italian listed companies with non-Italian EU listed companies to assess the impact of the Italian corporate governance reforms. The intuition is similar to that of a medical experiment, where affected Italian companies are the 'treatment group' and unaffected non-Italian companies are the 'untreated group'.
- **US analysis**, where we study the impact of the US corporate governance reform on the CoE, accruals quality and corporate governance scores of past and current S&P 500 constituents. Due to the difficulties in experiment design (which we explain in section 4.5 below), the results from this analysis are indicative only.
- **Italian analysis**, where we study the impact of the Italian corporate governance reform on the CoE and accruals quality of past and current listed companies in Italy. Due to the difficulties in experiment design and data quality (which we explain in section 4.5 below), the results from this analysis are indicative only.

For some of the analyses, we include firm and year fixed effects in our models. Firm fixed effects control for time invariant, firm-specific factors that may affect our dependent variables. This means that we can interpret our models as within-firm changes in the outcomes as a result of the shock. Year fixed effects control for time trends in the data—notably, other macroeconomic factors that may affect our dependent variables during the sample period. Although this model is more robust than a model without fixed effects, we note two possible limitations.

First, a second shock that happened at the same time as the adoption of the US and Italian governance changes may interfere with the results, resulting in a spurious correlation and incorrect inference. We view this as being unlikely, for two reasons.

- The US and Italian laws are passed in different years, and specifically target the outcome variables used in the paper (equity risk, governance, and accounting quality).
- We are not aware of other shocks at the same time that would have had similar or more pronounced effects.³³

A second potential limitation is that firm fixed effects do not capture firm characteristics that vary through time, such as gearing. To perfectly control for such effects is impractical, as it would capture all of the variation in the model, effectively muting the regression results. Additionally, to affect the regression results, a firm-level change would need to be the result of a characteristic trending in a general direction for the sample as a whole. Such a trend would be at least partially captured by our use of year fixed effects.

To summarise, we view our firm and year fixed effects models with no additional control variables as the simplest, cleanest and least arbitrary set-up to examine the effect of a governance shock.

More detailed explanations of fixed effect models are set out in Box 4.1.



Box 4.1 Fixed effect regression modelling

A fixed effect regression model is used to estimate correlations between variables, controlling for company-specific effects in a panel dataset comprising cross-sectional data and data over time on the different variables.

In the current context, the company-specific (or firm) effect refers to factors that might have an impact on the accrual quality and/or CoE of some companies more than others—for example, management competency and capital structure. Assuming that these factors differ across companies, but are invariant over time, their impact on the variable of interest (e.g., the CoE) is absorbed by the coefficient on firm-specific dummies. These are referred to as 'firm fixed effects'. Where information on the same companies is available over time (i.e. when the dataset comprises panels of information on the same companies over time), the time-variant effects that apply to all companies in the sample—such as changes in macroeconomic environments—can also be captured by adding time dummy variables to the regression. These are referred to as 'time fixed effects'. These time fixed effects are assumed to be the same for all companies.

Source: Oxera.

³³ The adoption of IFRS was mandated by 2005 for European firms. However, the net effect of IFRS was to make standards more 'judgement-based' and it is difficult to state the predicted effect on accruals. Many firms also adopted earlier. Finally, our evidence includes the U.S. shock, which happened at a different time period and is unaffected by the IFRS conversion.

As we discuss in more detail in section 4.5, due to the limitation on the data availability in Italy, for the EU quasi-natural experiment we perform an additional simplified difference-in-difference (DiD) analysis to test whether Italian companies experienced an additional reduction to their CoE following the reforms relative to non-Italian companies.

While this simplified DiD analysis is conceptually similar to our fixed-effect regression models (see section 4.5.1 for more details), it provides a more intuitive way of presenting and visualising our empirical results. It also acts as an additional robustness check, which is particularly valuable given the limited availability of pre-reform data for Italian companies. We discuss this in more detail in section 4.4.1.

4.4 Data

As described in Table 4.1, the three analyses use different datasets. Below, we describe at a high level our data sources for each analysis. More detailed descriptions of the data sources and dependent variables can be found in Appendix A2. All data used is at an annual level, and accounting data is based on each company's fiscal year end.

4.4.1 EU quasi-natural experiment

The EU quasi-natural experiment uses the financial statement data and the estimates of the **CoE** for the past and current constituents of the STOXX Europe 600 index between 1990 and 2019. The CoEs are estimated using the standard capital asset pricing model (CAPM).

Under the CAPM, three parameters are needed to estimate a company's CoE: a company-specific equity beta; and the equity risk premium (ERP) and risk-free rate (RFR), which apply to all the companies. In our analysis, equity betas, obtained from Datastream,³⁴ are based on two-year daily stock price data of the companies and general market, proxied by STOXX Europe 600 index, which is one of the most reputable pan-European equity indices. It has been widely used by European economic regulators of public utilities, in their equity beta estimations for regulatory determinations.³⁵

The RFR is proxied by the annual average yield of the ten-year local and German government bonds, whereas the ERP is based on long-horizon historical ERPs estimated by the International Cost of Capital Module published by Duff & Phelps.³⁶ Where the ERP is not available for a specific country, we use the contemporaneous average figure from across all EU member states.

³⁴ Refinitiv Datastream is an industry-leading analytical data source used for commercial and academic purposes by many reputable institutions around the world, including the European Commission. For example, see European Systemic Risk Board (2015), 'Annex I to the ESRB risk dashboard', March, p. 9.

³⁵ For example, see CAA (2022), 'Economic regulation of Heathrow Airport Limited: H7 Final Proposals', section 3, June, para. 9.76; and Bundesnetzagentur (2021), 'Festlegung von Eigenkapitalzinssätzen nach § 7 Abs. 6 StromNEV für die vierte Regulierungsperiode', 12 October, p. 30.

³⁶ The Duff & Phelps cost of capital services are widely used by finance practitioners, regulators and Courts around the world. For example, see European Commission (2018), 'Commission Decision concerning Case SK/2018/2051: Wholesale voice call termination on individual public telephone networks provided at a fixed location in Slovakia – remedies', 20 February, p. 4.

It is worth noting that the equity beta data for the Italian constituents of the STOXX Europe 600 index is not available prior to 2003. As a result, we have only two years (excluding 2005) of pre-reform data for the CoE analysis. This data availability issue does not apply to the analysis of accruals quality, which we set out below.

Accruals quality is computed using the absolute values of regression residuals from the Dechow–Dichev (2002) model, where changes in working capital in year t are regressed on cash from operations in year $t-1$, t and $t+1$.³⁷ The intuition of this measure is that, over the long run, changes in working capital should average out to operating cash flows. Therefore, significant deviations (i.e. a high absolute value of the level of residuals in the regressions) indicate poor accruals quality, and vice versa.³⁸

4.4.2 US analysis

The US analysis uses financial statement data for the past and current constituents of the S&P 500 index between 1990 and 2019, as well as their CoEs. Equity betas, obtained from Datastream, are based on two-year daily stock price data of the companies and general market (proxied by S&P 500 index, one of the most liquid and commonly used indices of US equities), and the annual ERP and RFR are taken from Professor Damodaran's datasets.

Specifically for the US, as a **measure of corporate governance**, we use the index of anti-takeover defences in a company's corporate charter, as developed by Gompers, Ishii and Metrick (2003)³⁹ and commonly referred to as the 'G-Index'. We obtain the G-Index of US public companies from 1991 to 2006 estimated by Professor Andrew Metrick. We then apply the Karpoff, Schonlau and Wehrly (2017)⁴⁰ correction and the geography-based instrument to correct for statistical biases and use the modified G-Index in our analysis. A lower score of the resulting measure indicates better shareholder rights. Note that this data is available for the US only.

Accruals quality is computed using the same methodology as for the EU quasi-natural experiment using the Dechow–Dichev (2002) model.

4.4.3 Italian analysis

The Italian analysis uses the financial statement data and estimates of the CoEs for all Italian companies listed between 1990 and 2019.

Similarly to the US analysis, two-year daily equity betas for these companies are retrieved from Datastream. The RFR is proxied by the annual average yield of the ten-year Italian and German government

³⁷ Dechow, P.M. and Dichev, I.D. (2002), 'The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors', *The Accounting Review*, 77, pp. 35–59.

³⁸ There is a large academic literature with different measures of accruals. The Dechow and Dichev (2002) measure has been the most widely used as well as the most intuitive for the purposes of this study. We acknowledge that there are many other measures of financial reporting quality that are not considered in this study.

³⁹ Gompers, P., Ishii, J. and Metrick A. (2003), 'Corporate Governance and Equity Prices', *The Quarterly Journal of Economics*, 118, pp. 107–156.

⁴⁰ Karpoff, J., Schonlau, R. and Wehrly, E. (2017), 'Do Takeover Defense Indices Measure Takeover Deterrence?', *The Review of Financial Studies*, 30, pp. 2359–2412.

bonds, whereas the ERP is based on long-horizon historical ERPs estimated by the International Cost of Capital Module and published by Duff & Phelps.

We calculate accruals quality using the same methodology as for the EU and US analyses.

4.5 Results

For each dataset listed above, we estimate two empirical specifications:

- Model 1: firm and time fixed effects;
- Model 2: firm and time fixed effects, omitting the years around the corporate governance reforms (for example, omitting 2003–04 data for the USA, and 2004–05 data for Italy).

Although we use Model 1 as our benchmark model for our broad estimates, Model 2 is used to assuage concerns that the impact on our dependent variables could have been a short-term reaction by markets and firms around the reform dates.

As set out in section 4.3 above, it is important to highlight that the results from the US and Italian analyses are indicative only. While the findings from these analyses are directionally consistent with those set out in a broad body of literature (see section 4.2), they need to be interpreted with caution due to the difficulties in experiment design (US and Italian analysis) and limited data availability and quality (Italian analysis).

First and with respect to the difficulties in experiment design, the statistical interactions between the time fixed effects and the variable on governance reform mean that the results of the US and Italian analysis are sensitive to how the time fixed effects are applied. More details on this statistical issue are set out in Appendix A4.1.

Second and with respect to data quality, since the Italian dataset consists of all listed Italian companies from 1990 to date, the estimated equity betas are likely to be distorted by the inclusion of smaller companies with illiquid shares. In Appendix A3, we show the distortions in Italian betas by comparing the distribution of equity betas in the US and Italy. This distortion could lead to biased CoE estimates and consequently biased regression results in our fixed effects model for Italy.

Based on the considerations set out above, we place more weight on the empirical results from the EU quasi-natural experiment and present these results in the rest of this section. We present the results from the US and Italian analysis in Appendix A3 for completeness to indicate of possible effects. We note however that these results are directionally consistent with our quasi-natural experiment and the findings set out in a large body of literature, and can still be considered indicatively useful by policymakers.

4.5.1 EU quasi-natural experiment

As described above, Italy overhauled its corporate governance laws in the mid-2000s, whereas the rest of the EU did not do so, at least not to the same extent.⁴¹ We use this divergence in policy as a quasi-natural experiment, similar to those used in medical research, where the 'drug' is the governance change. Put simply, the Italian companies are the treatment group, analogous to the group that receives the actual drug in a medical experiment. The non-Italian EU companies are the untreated group, which are matched to the Italian companies in terms of size and geography, without receiving the actual drug. This quasi-natural experimental design is outlined in Table 4.2.

When using panel data, a quasi-natural experiment is considered the standard in empirical research in economics in terms of pinning down a causal relation. If Italian companies show an independent reaction relative to other EU companies, this is strong evidence that governance reforms causally affect the CoE and accruals quality.

Table 4.2 Quasi-natural experimental design

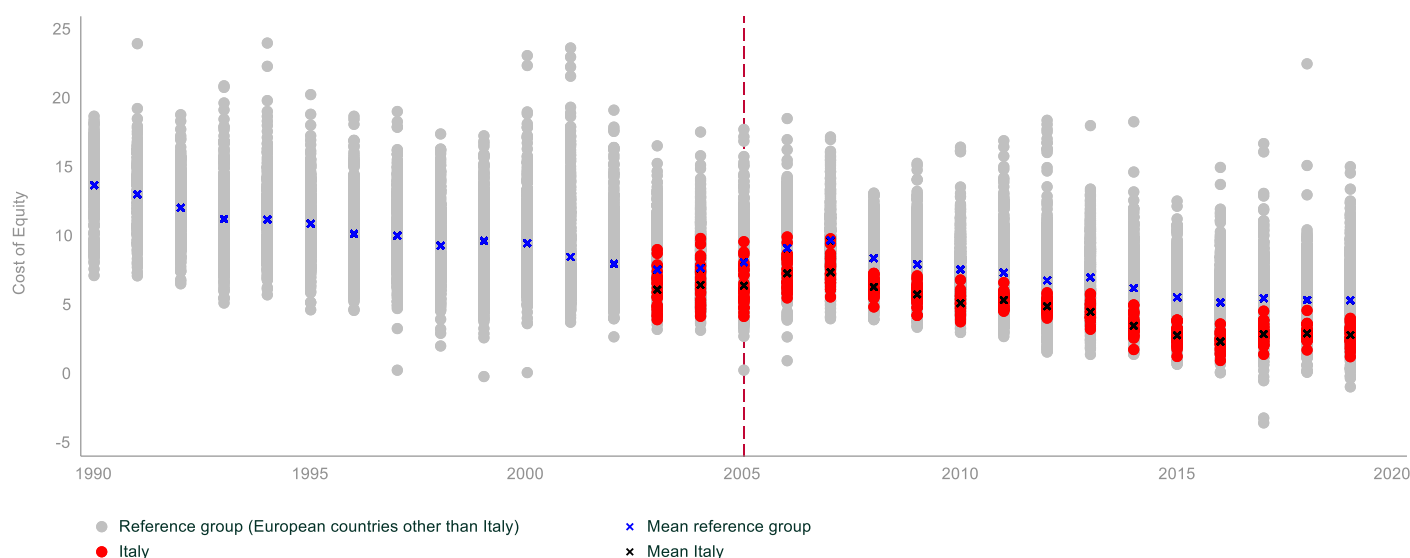
	Pre-regime change in Italy	Post-regime change in Italy
Italian companies (treatment group)	No effect	Baseline change + reforms effect
Non-Italian companies (untreated group)	No effect	Baseline change

Source: Oxera.

As discussed in sections 4.3 and 4.4.1, the Italian companies in our EU quasi-natural experiment do not have data on equity beta (and therefore CoE) available prior to 2003. As such, we have only two years of data on CoE for the Italian companies prior to the 2005 reform. This is visualised in Figure 4.1, which shows the CoE for Italian and non-Italian firms over time. Averages across all firms in each group are denoted as small blue crosses. It can be observed that the mean CoE declined steadily for both Italian and non-Italian companies following the Italian corporate governance reform in 2005.

⁴¹ Many EU countries passed guidance on internal controls in the mid-2000s that was considerably weaker than Italy's reforms. For example, the 2003 Financial Security Law (Loi de sécurité financière) in France requires the board to prepare a separate report on internal controls.

Figure 4.1 Visualisation of cost of equity (CoE) for Italian and non-Italian companies between 1990 and 2019



Source: Oxera.

The question of interest is whether the development of CoE of Italian firms was different from that of other firms. In terms of Figure 4.1 above, this means whether the distance between the blue and the black means grow post reform. In other words: did the average CoE for Italian firms decline more than the average CoE of reference firms post 2005?

Figure 4.2 below visualises this analysis. It shows the difference-in-difference (DiD) analysis of changes in CoE following the Italian governance reforms in 2005. The black dots denote the normalised difference in CoE between Italian and non-Italian companies in each year. For each year prior to the reform, the normalised difference is calculated by subtracting the mean difference for all pre-reform periods from the difference for that year. A similar normalisation process is also done for post-reform periods. This normalisation mechanistically sets the average before reform (green line) to zero. Moreover, it directly shows how much more the average Italian CoE declined than the reference group. The average effect is marked by the grey line.

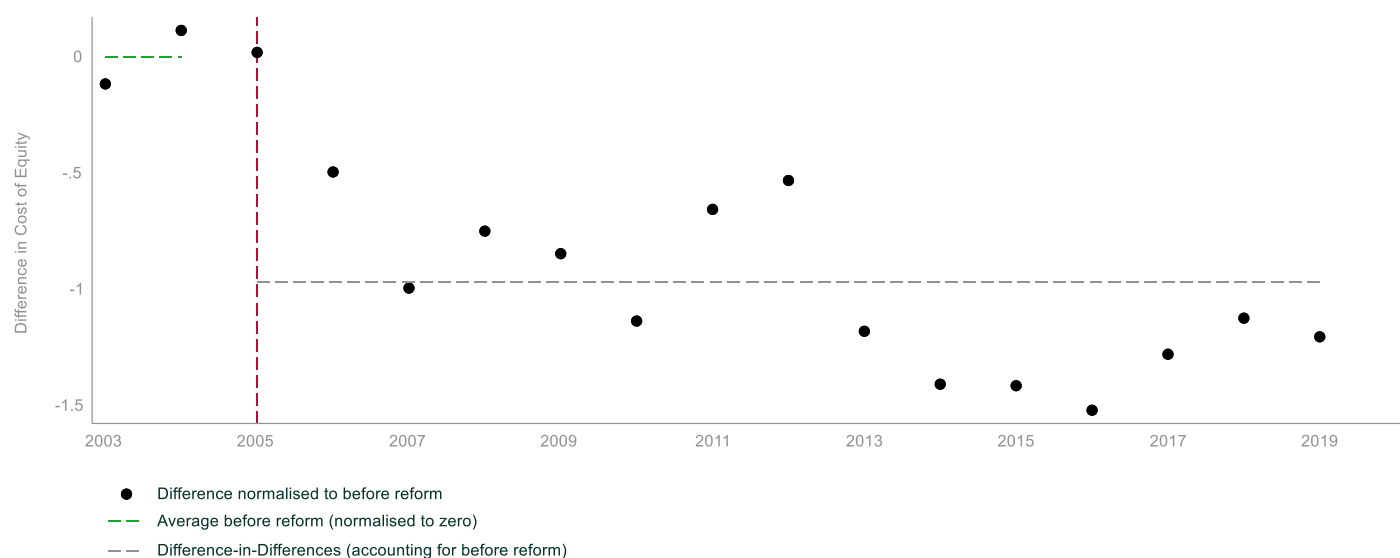
It can be seen that, on average, following the Italian reforms, Italian companies experienced around a 1 p.p. extra reduction in CoE than to non-Italian EU companies, with the DiD estimates ranging from 0.5 p.p. to 1.5 p.p. between 2006 and 2019.⁴² Given that these companies were matched to the Italian companies in terms of size and geography (i.e. they are all past and/or present constituents of the STOXX Europe 600 index), this finding suggests that the Italian reforms had a positive effect on investor risk.

It is worth noting that this analysis is based on an important assumption, which is that for the pre-reform period, the distribution of CoEs across time would have been the same for Italian and non-Italian

⁴² This c.1% difference in CoE reduction is statistically significant at 1% significance level.

companies. In reality, the pre-reform trend is unobservable due to the lack of long-term data for Italian companies prior to the reforms (data is available only from 2003, 2 years prior to the reforms).⁴³

Figure 4.2 Difference-in-difference (DiD) analysis of changes in CoE following the Italian governance reforms in 2005



Note: the black dots denote the normalised difference in CoE between Italian and non-Italian companies in each year. This analysis has two underlying assumptions: (i) for the pre-reform period, CoE trends for Italian and non-Italian companies would have been the same; and (ii) for the post-reform periods and absent the reform, CoE trends would also have been the same.

Source: Oxera.

Table 4.3 below reports the results for the fixed effect regression of the CoE, which further supports the results of our simplified DiD analysis. The coefficient on the interaction term of the post-reform dummy and the Italy country dummy (i.e. Reform X Italy) is comparable to the simplified DiD estimate of 1% visualised in Figure 4.2, underlain by a different estimation method. This coefficient is significantly negative, at c.-0.9%, which indicates that, following the Italian reforms, Italian companies experienced a 0.9% extra reduction in CoE relative to non-Italian EU companies.⁴⁴ The coefficient on the interaction term is also

⁴³ Note that there are numerous ways to calculate the key CAPM inputs for CoE: RfR and beta. Our quasi-experiment coupled with year fixed effects partially solves concerns that alternative methods would result in different results as long as we are using the same methodology across countries and times. With RfR, we blend the local and German bond rates, creating a partial commonality in RfR as well while also allowing for local variation. Further, in the case of RfR, there is a high correlation between changes in Italian and German bonds other than the periods we have already identified (i.e., financial crisis and COVID).

⁴⁴ Additionally, as a baseline change, our regressions suggest that investors across the EU have experienced a general decline in equity risk since the period of the Italian reforms. We do not have a uniform explanation for this empirical fact, although we note two possibilities. First, there is a potential 'bleeding over' effect as investors price in a future with enhanced corporate governance. Second, other EU member states such as France were enacting their own modest corporate governance reforms around the same time. Note that, to conclude that the Italian reform had a causal effect on the CoE and accruals quality, we need to document only a significant post-reform difference between Italian companies and non-Italian companies.

largely stable when year fixed effects are removed from the model, at around c.-0.8%.

Table 4.3 Results of EU quasi-natural experiment, using cost of equity (CoE) as the dependent variable

Dependent variable: CoE	Model 1	Model 2	Model 1 – No year fixed effect
Reform X Italy	-0.884***	-0.829***	-0.781***
Shock	-2.127***	-1.996***	-0.501*
Constant	7.605***	7.468***	7.429***
Firm fixed effect ¹	Yes	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes	No
R-squared, within	0.473	0.529	0.008
Observations	11,344	11,344	11,344
Firms	809	809	809

Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹'Yes' means that dummy variables are included. For some dummy variables, we observe significant coefficients as well. These coefficients are not reported, since the focus of this research is on the long-term impact of governance shock. Observations prior to 2003 are dropped due to the lack of data on Italian betas prior to 2003. ²Year fixed-effect was applied to 2003–14.

Source: Oxera.

Table 4.4 sets out the results for the fixed effect regression on the quality of accruals. The negative coefficient of the interaction term of the post-reform dummy and Italy country dummy implies that the accrual quality of all European companies improved following the period of the Italian corporate governance reforms, due to the decline in the number of abnormal accruals. The coefficient is significantly negative in all models, suggesting that Italian companies experienced more improvement in accruals quality than their non-Italian EU comparator companies following the country's reforms.

Table 4.4 Results of EU quasi-natural experiment, using accrual quality as dependent variable

Dependent variable:	Model 1	Model 2	Model 1 –
<i>Accrual quality</i>			No year fixed effect
Reform X Italy	-0.011**	-0.014***	-0.012**
Shock	-0.007***	-0.012***	-0.011***
Constant	0.057***	0.061***	0.064***
Firm fixed effect ¹	Yes	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes	No
R-squared, within	0.019	0.020	0.010
Observations	17,453	16,135	17,453
Firms	850	850	850

Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹‘Yes’ means that dummy variables are included. For some dummy variables, we observe significant coefficients as well. These coefficients are not reported, since the focus of this research is on the long-term impact of governance shock. ² Year fixed-effect was applied to 1991–2014.

Source: Oxera.

4.6 What results should we expect in the EU?

Based on the results of the quasi-natural experiment and the US analysis, over the long term we expect the corporate governance reform comparable to that introduced in Italy and USA to reduce the average CoE of EU companies. The point estimates of the analysis provided here suggest a range of approximately 0.5 p.p. to 1.5 p.p. with a point estimate of 1 p.p., reflecting a reduction in investor risk.⁴⁵ We also expect the quality of financial reporting and corporate governance to generally improve following the reforms.

These are indicative estimates and further research into this topic should aim to provide evidence on the size of such effect. These results are based on the empirical results of the difference between Italian and non-Italian companies in the quasi-experiment (both the simplified DiD model and fixed effect regression model), which is cross-checked by the impact of the US reform on equity beta of US companies (see Appendix A4.4).⁴⁶ There are limitations with such an analysis, as explained above and in appendix A3, although the evidence on the positive impact on capital market performance indicators is consistent with previous academic literature on the impact of similar reforms.

⁴⁵ These estimates are based on data up to FY2019, in order to avoid the volatility caused by COVID-19 in markets.

⁴⁶ This cross-check is more robust than the US analysis on CoE, as it ensures that our CoE projections for the EU are unaffected by the differences in RFR and ERP between the US and EU, given that these estimates occur 15 years apart.

High-quality information for investors is important for the efficiency of financial markets. Such efficiency in turn is important for market economies, as financial markets determine the allocation of resources in the economy. Our study analyses the implications of improving corporate governance, which is the first pillar of DG FIMSA's recent consultation on the quality of corporate reporting.

Of the four major corporate governance reforms that have taken place so far, the USA's SOX is the widest-reaching. The Italian, Japanese and South African reforms are modelled closely on SOX, but differ along some dimensions, such as having weaker internal controls requirements or a non-mandatory corporate governance code. SOX also has stricter requirements around independent audit committees.

The current EU corporate governance frameworks vary significantly across member states. Compliance with corporate governance codes is frequently non-mandatory, and few member states require management of companies to attest to the accuracy of the financial reports and/or internal controls. The current patchwork of legislation, corporate governance codes, central banking regulation and securities regulation creates a complex nexus of requirements at the member state level.

Our quasi-natural experiment comparing Italian companies with matched non-Italian EU companies shows that the reforms in Italy led to significant declines in investor risk and improvements in financial statement quality. Our analysis of the US and Italian companies yields similar results, despite the differences in the two reforms noted above.

It is important to emphasise that the report does not claim to be comprehensive in its assessment of the potential impact of the reforms, as such an objective would require longer timeframes, additional datasets and the testing of alternative hypotheses. However, from publicly available data and hypotheses highlighted in the academic literature, it is possible within the timeframe allowed for the production of this report, to design a number of analyses, examine the evidence that comes from such approaches and check whether they are consistent with the expected effects of the reforms contemplated by the Commission.

Drawing on our results from the analyses of previous reforms of a similar nature to the possible reforms for the EU, over the long term we expect those reforms to reduce the average CoE to within a range of 0.5 p.p. to 1.5 p.p., with a central estimate of approximately 1 p.p. A reduction in the CoE for firms in the EU lowers risk for investors, making the EU a more attractive investment opportunity. Further, the decrease in the cost of capital makes riskier, innovative projects more profitable and firms are more likely to make these innovative investments. From a consumer perspective, many prices are linked to the cost of capital. For example, energy tariffs are calculated based on the underlying CoE. If the CoE falls, the 'fair' energy tariff also falls. A long-term reduction in

the CoE should therefore lead to a (relative) long-term decline in energy prices

We cautiously highlight that the results of this analysis are for the average company, and its magnitude is only indicative of the economic and statistical significance of the potential impact of reforms that aim to improve corporate reporting in Europe. More generally, we also expect EU reforms, comparable to those introduced in Italy and USA, to improve the quality of financial reporting and corporate governance, which is consistent with our empirical analysis for those reforms in Italy and USA.

The report provides evidence that supports the hypothesis that the reforms will lead to improvements in EU capital markets performance. However, future research into this important subject could test alternative measures of capital market indicators (eg alternative indicators of corporate governance standards, different quality of accounting reporting variables, risk profile of investors), and use alternative datasets and time periods, to provide further evidence on the strength of our results.

Table A1.1 Responsibility for corporate reporting

Member state	Management signs	Board signs	Responsibility for financial statements?	Responsibility for corporate reporting more broadly?
Austria	Yes	No, just an approval is necessary	Yes	Yes, a management report.
Belgium	No	Yes	No	Yes, an annual report containing governance and remuneration statements, and a management report, including an overview of the yearly performance and APM's
Bulgaria	Yes	No	Yes	Yes, a directors' report and a corporate governance statement for listed PIEs, banks, and insurers, and a non-financial declaration for large enterprises
Croatia	Yes	No, just an approval is necessary	Yes	Yes, an annual report and a separate remuneration report
Cyprus	No	Yes	Yes	Yes, a management report. For listed entities, a management-led separate declaration confirming the financial statement's appropriateness has to be signed.
Czech Republic	No	Yes	Yes	Yes, an annual report
Denmark	Yes	Yes	Yes	Yes, an annual report
Estonia	Yes, management board	No, but approves	Yes	Yes, an annual report which includes a management report
Finland	Yes, CEO must sign	Yes	Yes	Yes, annual and management report
France	No, even though the Management is responsible for drafting the reports	No, just an approval is necessary	No	Yes, a management report. Additionally, a management-led separate declaration confirming the financial statement's appropriateness has to be signed.

Member state	Management signs	Board signs	Responsibility for financial statements?	Responsibility for corporate reporting more broadly?
Germany	Yes	No but the supervisory board approves	Yes. The management board members are required to sign the financial statements and explicitly assure their appropriateness and that of the management report	Yes, for listed entities a management-led separate declaration confirming the appropriateness of the financial statements and the management report has to be signed.
Greece	Yes, but CFO only	Yes	Yes	Yes
Hungary	Yes, by legal representatives	No	Yes	Yes, a management report
Ireland	No	Yes	Yes	Yes, a management report
Italy	Yes	Yes	No ⁴⁷	Yes, a corporate governance report and a management report
Latvia	Yes	Yes, by the management Board	Yes	Yes
Lithuania	Yes	No, only if required by the association statutes.	Yes	Yes, a management report. It can include other reports, such as a sustainability report, a corporate governance report, and a compensation report, among others, depending on the type of PIE.
Luxembourg	No	No	No	Yes, a management report
Malta	No	Yes	Yes	Yes
Netherlands	Yes	Yes	Yes	Yes, a management report
Poland	Yes	No	Yes	Yes, a management report
Portugal	No	Yes	Yes	No
Romania	Yes	Yes	Yes	Yes, annual report (listed companies)/ administrators' Report (unlisted companies)
Slovakia	No	Yes	Yes	Yes, an annual report
Slovenia	Yes	No	Yes	Yes, an annual report
Spain	No	Yes	Yes	Yes, Board of Directors has to sign financial statements, non-financial statements and management report
Sweden	No	Yes	Yes	Yes, a management report

⁴⁷ The board of directors is responsible for the approval of the "final draft" ("Progetto di bilancio") of the financial statement. Technically, it is the shareholders who must formally approve the financial statements during the general shareholders meeting.

Table A1.2 Audit committee

Member state	Is it required?	Responsibilities
Austria	Yes	Monitoring of financial reporting, internal controls, risk management, external auditors
Belgium	Yes	Monitoring of financial reporting, internal controls, risk management, external auditors
Bulgaria	Yes	Monitoring of financial reporting, internal controls, risk management, external auditors
Croatia	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Cyprus	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Czech Republic	Yes	Monitoring of financial reporting process, internal controls, risk management, external auditors
Denmark	Yes, but if the board does not have executive members, the Audit Committee can be replaced by the board of directors	Monitoring of financial reporting, internal controls, risk management, external auditors
Estonia	Yes	Monitoring of financial reporting, internal controls, risk management, external auditors
Finland	No, all responsibilities can be done by the board	Monitoring of financial reporting, internal controls, risk management, external auditors
France	Yes, mandatory for public interest entities, including those added by the French code of commerce, and financing companies and recommended by the French governance codes for listed entities that are not PIEs (i.e. not listed on a regulated market).	Monitoring of financial reporting, internal controls, risk management, external auditors
Germany	Yes, public interest entities	Monitoring of financial reporting, internal control systems—incl. compliance a management system, a risk management system, an internal audit system— and external auditors
Greece	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Hungary	Yes, for PIEs	Monitoring of financial reporting, internal controls, risk management, external auditors
Ireland	Yes, for all 'Large' and Public Limited Companies. The Audit Committee consists of independent non-executive directors.	Monitoring of financial reporting, internal controls, risk management, external auditors
Italy	Yes, public interest entities	Monitoring of financial reporting, internal controls systems, risk management, external auditors (including independence)
Latvia	Yes, for large companies. For SMEs, the board can fulfil the Audit Committee functions	Monitoring of financial reporting, internal controls, risk management, external auditors

Member state	Is it required?	Responsibilities
Lithuania	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Luxembourg	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Malta	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Netherlands	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Poland	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Portugal	Yes, for listed entities and 'large' companies. The Audit Committee can be replaced by a supervisory board	Monitoring of financial reporting, internal controls, risk management, external auditors
Romania	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors
Slovakia	Yes, for public interest entities and "large" companies	Monitoring of financial reporting, internal controls, risk management, external auditors
Slovenia	Yes	Monitoring of financial reporting, internal controls, risk management, external auditors
Spain	Yes, public interest entities	Monitoring of financial reporting, non-financial reporting, internal controls, risk management, related party transactions, external auditors (including independence)
Sweden	Yes, public interest entities	Monitoring of financial reporting, internal controls, risk management, external auditors

Table A1.3 Corporate governance

Member state	Report required?	Risk management framework reporting
Austria	Yes	The management is responsible, and the supervisory board has oversight responsibility, but no formal documentation or reporting is defined by law. Indeed, there is no obligation for an auditor to provide assurance, only to report on material weaknesses.
Belgium	Yes	Unlike financial institutions, which are subject to specific rules on compliance and risk management, there are currently only a limited number of rules on compliance and risk management applicable to listed companies. Auditors need to ensure compliance of the Board of Directors (BOD) report and confirm that the BOD report and certain specifically mentioned sections of the annual report do not contradict anything that has come to their attention in executing their statutory audit mandate.
Bulgaria	Yes, for listed PIEs, banks and insurers	There are two corporate governance structures available to Bulgarian companies. One-tier system: The Board of Directors should establish the corporate risk management policy as well as control and ensure the proper functioning of the company's internal audit and risk management systems. Two-tier system: The Management Board should develop and adopt the company's risk management and internal audit policy. It must implement the company's internal audit and risk management systems and report on implementation to the Supervisory Board.
Croatia	Yes, for listed entities	The management board has a responsibility to implement an effective risk management system and report regularly to the supervisory board on the status of major risks.
Cyprus	Yes, for listed companies and banks	A review of the risk management systems by the Audit Committee or by a separate Risk Management committee is mandatory.
Czech Republic	No	The company should ensure that there is a risk management system in place. No designation of responsibilities to other parties.
Denmark	Yes	The board of directors must ensure that an adequate risk management framework has been established and identify key risks that must be discussed in the management commentary.
Estonia	Yes	The management board should analyse risks, prepare internal control provisions, and organise a control and reporting system.
Finland	No	—
France	Yes, required for all 'Sociétés anonymes'. However, the content requirements are broader if a SA is a listed PIE.	Listed companies must set up a special risk committee (known as the internal audit and risks committee), which in turn is responsible for internal control and risk management issues. In some cases, the audit committee may carry out the tasks of the risk committee.
Germany	Yes	Management must ensure that there is a risk management system, including monitoring mechanisms. Expected company developments including risks and opportunities have to be reported in the management report.
Greece	Yes, for listed entities	The Corporate governance report shall include a description of internal controls and risk management regarding financial reporting.
Hungary	Yes	The board is responsible for the supervision of risk management, and the audit committee has oversight responsibility.

Member state	Report required?	Risk management framework reporting
Ireland	Yes, for listed entities	It is included in the mandatory corporate governance statement. The audit committee has responsibility for monitoring the effectiveness of the risk management systems.
Italy	Yes	The board of directors has to report about the risk management system and the ICS adopted by the company in the corporate governance report. In addition, the Accounting Officer and the CEO must report on the adequacy of the Financial Reporting Internal Control System.
Latvia	Yes	The company is required to report the key elements of the risk management system and system of internal control used in the preparation of the financial statements
Lithuania	Yes, for listed entities	All main risk types are described in the management report.
Luxembourg	Yes, for listed entities	Listed companies must describe the risk management framework and internal controls system.
Malta	Yes, for listed entities	All boards must have an adequate understanding of risk.
Netherlands	Yes	It is the responsibility of management to implement a framework for risk management and internal controls. External auditors should also consider the effectiveness of the framework.
Poland	Yes, for listed entities	Listed companies are not obliged to adopt any risk management regulations, appoint a risk officer, or establish a risk committee.
Portugal	Yes, for listed Entities	Companies are required to undertake 'adequate' risk management.
Romania	Yes, for listed entities required to adhere and state compliance with CGC	Apart from financial institutions, which are subject to specific rules on compliance and risk management, there are currently only a limited number of rules on compliance and risk management applicable to listed companies. Specifically, the CGC requires that companies undertake 'adequate' risk management.
Slovakia	Yes	Companies dealing with securities shall include information in their annual report on risks to which they are exposed, risk management goals, methods and policies
Slovenia	No	The corporate governance statement in the Annual report must contain information on the risk management systems and internal control over financial reporting. Moreover, the management report also requires a commentary on risks and how the company manages those risks.
Spain	Yes	Listed companies are required to issue an annual Corporate Governance Report as part of the financial reporting. This report includes risk management system and internal control system information. The Board of Directors is responsible for this Corp Gov Report.
Sweden	Yes for public interest entities	The corporate governance report shall include a description of internal controls and risk management regarding the financial reporting.

Table A1.4 Internal controls frameworks and their legal basis

Member state	Internal controls monitoring?	Report required?	IC Effectiveness Certification?	Legal basis of Internal Control	If soft, comply-or-explain?	References
Austria	Yes	No	No	Hard		Corporate Law (UGB). Corporate Governance Code.
Belgium	Yes	No	No	Soft	Yes	Corporate Governance Code 2020.
Bulgaria	No	No	No	None		Accountancy Act. Public Offering of Securities Act. Corporate Governance Code 2007, amended in 2021.
Croatia	Yes	No	No	Soft	Yes, but explanations appear unmonitored	Corporate Governance Code 2019. Companies Act 2022 and Audit Act 2018.
Cyprus	Yes, by the board of directors	No	No	Hybrid	Yes	Corporate Governance Code 2019.
Czech Republic	Yes, by the board of directors	No	No	Soft	Yes	Corporate Governance Code 2018.
Denmark	Yes, by the board of directors	No	No	Hybrid	Yes	<i>Hard</i> : Companies Act of 2019. <i>Soft</i> : Recommendations on Corporate Governance 2020.
Estonia	No	No	No	Soft	Yes	Corporate Governance Recommendations 2005.
Finland	Yes, by the board of directors	Yes	No	Hybrid		<i>Hard</i> : Companies Act, Corporate Governance Code. <i>Soft</i> : Securities Market Association.
France	Yes, by the Audit Committee	No. The only information required on internal control is a high-level description of internal control and risk management procedures regarding the financial reporting	No	None		Commercial Code. AFEP-MEDEF Code (for large companies). MiddleNext Code (for smaller companies).

Member state	Internal controls monitoring?	Report required?	IC Effectiveness Certification?	Legal basis of Internal Control	If soft, comply-or-explain?	References
Germany	Yes	No	Yes, by the management	Hybrid	Yes	<i>Hard:</i> Stock Corporation Act and Commercial Code. <i>Soft:</i> Corporate Governance Code.
Greece	Yes, by the board of directors	Yes, only for listed entities	Yes, by statutory auditor or other providers	Hard		Law 4706/2020.
Hungary	Yes, by the Audit Committee	No	No	Soft	Yes	Corporate Governance Recommendations 2012. Capital Markets Act. Recommendations for Responsible Corporate Governance issued by the Budapest Stock Exchange.
Ireland	Yes, by management and overseen by the board and the audit committee.	Yes, management should report to the board or Audit Committee. Statutory auditors are also required to report to the audit committee on internal control systems material weaknesses in internal control in relation to the financial reporting process.	Reporting by the board of directors on the effectiveness of the internal control systems is included in the Annual Report.	Hybrid	Yes	UK Corporate Governance Code. Corporate Governance Annex.
Italy	Yes, by the board of directors	Yes	Yes, but limited to the financial internal control system. It is done by the Accounting Officer and CEO (<i>amministratore delegato</i>)	Hybrid	Yes	2005 Reform. Corporate Governance Code 2022.
Latvia	No, only for financial institutions	No	No	Hybrid	Yes	Principles of Corporate Governance and Recommendation on their Implementation. Law on Governance of Capital Shares of a Public Person and Capital Companies. Law On Financial Instruments Market. Corporate Governance Code 2021.

Member state	Internal controls monitoring?	Report required?	IC Effectiveness Certification?	Legal basis of Internal Control	If soft, comply-or-explain?	References
Lithuania	No, only for financial institutions	No	No	Soft, except for financial institutions (Hard)	Yes	Corporate Governance Code 2006. Law of corporate reporting. Law on Financial statements audit.
Luxembourg	Yes, by the board of directors	No	No	Soft	Yes	Companies Act 2016. LuxSE Principles.
Malta	No, but it is recommended by the latest directive	No	No	Soft	No, use 'best effort' standard	Corporate Governance Code 2022. Corporate Governance Guidelines for Public Interest Companies. Code of Principles of Good Corporate Governance for Listed Entities.
Netherlands	Yes, by the board of directors	No	No	Hard		Corporate Governance Code.
Poland	Yes, for listed PIES	Yes, by the management board	No	Soft	Yes	Commercial Companies Code 2000.
Portugal	No, only for financial institutions	No	No	Soft	Yes	Corporate Governance Code 2020. Companies Code.
Romania	Yes, by the Audit Committee	No	No	None		Corporate Governance Code 2016
Slovakia	No, only for financial institutions	Yes, for listed companies	No	Soft	Yes	Corporate Governance Code 2016, effective in 2018. Corporate Governance Code 2008.
Slovenia	No, but it is recommended	No	No	Hybrid	Yes	Corporate Governance Code 2016. Companies Act.

Member state	Internal controls monitoring?	Report required?	IC Effectiveness Certification?	Legal basis of Internal Control	If soft, comply-or-explain?	References
Spain	Yes	Yes, part of corporate governance report	No	Hybrid	Yes	Corporate Governance Code, Revised June 2020 and Technical Guide 3/2017 on Audit Committees at Public Interest Entities. Companies Act.
Sweden	Yes	Yes	No	Hybrid	Yes	Corporate Governance Code. Companies Act.

A2 Dependent variables used for the econometric analysis

A2.1 Cost of equity (CoE)

In our analysis, we estimate companies' CoE using the CAPM.

Under the CAPM, three parameters need to be estimated in order to calculate the CoE of a company: a RFR, an ERP and an equity beta. The first two are generic and apply to all companies, while the equity beta is specific to the company for which the CoE is being estimated. Below, we detail how each of these CAPM parameters was estimated for each of our experiments.

A2.2 Risk-free rate

For the US analysis, we rely on the annual Treasury bond rates published in Professor Damodaran's analysis.⁴⁸

Since Professor Damodaran does not publish similar RFRs for Italy and the other EU member states, for our Italian analysis and EU quasi-natural experiment we rely on the yields of ten-year government bonds from Bloomberg. For each country, we use the average yield of ten-year local bonds and the 10-year German Bund as a proxy for the local RFR. (For example, for Italy we use the average yields of ten-year Italian government bonds and the 10-year German Bund as a proxy for the RFR.)

A2.3 Equity risk premium

Similar to the RFR, for the US analysis we use the implied ERPs estimated by Professor Damodaran, which are based on an augmented dividend discount model.

ERPs are estimated based on a simple two-stage augmented dividend discount model and reflect the risk premium that would justify the current level of the index, given the dividend yield, expected growth in earnings and the level of the long-term bond rate.⁴⁹

For Italy and the rest of the EU, we use the long-horizon historical ERPs estimated by the International Cost of Capital Module published by Duff & Phelps.⁵⁰ These ERPs are computed by Duff & Phelps based on underlying equity return data from Morningstar, the International Monetary Fund and the European Central Bank.⁵¹

⁴⁸ Aswath Damodaran, Professor of Finance at the Stern School of Business at New York University, is an renowned academic in corporate finance. See Damodaran, A. (2022), 'Implied Equity Risk Premiums: United States', <https://pages.stern.nyu.edu/~adamodar/> (accessed 12 October).

⁴⁹ Ibid.

⁵⁰ <https://www.kroll.com/en/cost-of-capital>.

⁵¹ Duff & Phelps publishes ERPs for Austria, Belgium, France, Germany, Ireland, Italy, the Netherlands, Spain, Switzerland and the UK only. We use the average ERP across these countries as a proxy for the ERPs for the remaining EU member states.

A2.4 Equity beta

For all three experiments we use two-year daily equity betas computed by Datastream. As an example, we use the following expression to export equity betas for our EU quasi-natural experiment:

$$REGB\#(LN\#(DJSTOXX/LAG\#(DJSTOXX,1D)),LN\#(I:ENEL/LAG\#(I:ENEL,1D)),520D)$$

This expression is used to plot two-year (520D) daily beta (1D) for the company 'I:ENEL'. 'DJSTOXX' sets the STOXX Europe 600 as the equity index to calculate these betas. We use the same index for the computation of betas in the Italian analysis. For the US analysis, we use the S&P 500 index as the benchmark market index.

A2.5 Accrual quality

Accrual quality is computed using the absolute values of regression residuals from the Dechow–Dichev (2002) model.^{52, 53} Dechow and Dichev developed a model that examines the origination and reversal of working capital accruals in companies. As explained by the authors, recording a receivable (payable) accelerates (delays) the recognition of a future cash flow in earnings, and matches the timing of the accounting recognition with the timing of the economic benefits from the sale.

However, accruals are frequently based on assumptions and estimates which, if wrong, must be corrected in future accruals and earnings. The authors argue that estimation errors and their subsequent corrections are noise that reduces the beneficial role of accruals. Therefore, the quality of accruals and earnings decreases with the magnitude of accrual estimation errors.

Building on this intuition, the authors measure accrual estimation errors as the residuals from firm-specific regressions of changes in working capital cash flows from operations in the previous year, the current year and one year ahead. These residuals are unrelated to cash-flow realisations, and include the estimation errors and their reversals. Therefore, larger absolute values of these residuals (higher standard deviations from 0) represent lower accrual quality.

A2.6 Governance index (US only)

For a proxy variable for corporate governance, we use the G-Index, an index of anti-takeover defences in a firm's corporate charter, as developed by Gompers, Ishii and Metrick (2003).⁵⁴ We collect the G-Index of US public firms from 1991 from the website of Professor Andrew Metrick. The higher the index, the worse is the level of corporate governance.

⁵² Dechow, P.M. and Dichev, I.D. (2002), 'The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors', *The Accounting Review*, 77, pp. 35–59.

⁵³ We note that there is a large academic literature with literally hundreds of different measures of accruals. The Dechow and Dichev (2002) measure has been the most widely used as well as the most intuitive for the purposes of this study.

⁵⁴ Gompers, P., Ishii, J. and Metrick A. (2003), 'Corporate Governance and Equity Prices', *The Quarterly Journal of Economics*, 118, pp. 107–156.

The raw G-Index potentially contains an endogenous component, since firms might incorporate more takeover defences in their charters when the likelihood of receiving takeover bids is higher ex ante. Following Karpoff, Schonlau and Wehrly (2017),⁵⁵ we therefore use a geography-based instrumental variable to remove the endogenous component from the G-Index. This instrument is designed to capture the influence of peers through shared legal services or through social interactions. Additionally, the geography-based instrument is unlikely to be correlated with stock returns other than through takeover probabilities, thereby satisfying the exclusion restriction.

⁵⁵ Karpoff, J., Schonlau, R. and Wehrly, E. (2017), 'Do Takeover Defense Indices Measure Takeover Deterrence?', *The Review of Financial Studies*, 30, pp. 2359–2412.

A3 Summary statistics of samples used for EU, US and IT analyses

Appendix A3 sets out the summary statistics of our dependent variables for the EU, US and IT analyses. For the EU quasi-natural experiment, we also set out the geographical distribution of the companies included in our sample.

A3.1 EU quasi-natural experiment

Table A3.1 Breakdown of company-year observations by country

Breakdown by country	Observations (full sample)	Observations (2003 onwards)
United Kingdom	6,300	3,570
Germany	3,360	1,904
France	2,730	1,547
Sweden	2,100	1,190
Switzerland	2,070	1,173
Italy	1,260	714
Netherlands	1,260	714
Spain	1,230	697
Denmark	840	476
Norway	810	459
Finland	750	425
Belgium	720	408
Ireland	600	340
Greece	390	221
Austria	330	187
Luxembourg	330	187
Portugal	210	119
Poland	180	102
Cyprus	30	17
Czech Republic	30	17
Malta	30	17
Total	25,560	14,484

Source: Oxera analysis based on data from Thomas Reuters Datastream.

Table A3.2 Summary statistics of dependent variables

Statistics	CoE	Accrual Quality
Number of observations	17,461	17,453
Mean	7.874	-0.001
Standard deviation	3.793	0.102
25th percentile	5.628	-0.038
50th percentile	7.446	-0.001
75th percentile	9.664	0.035

Source: Oxera analysis based on data from Thomas Reuters Datastream.

A3.2 US analysis

Table A3.3 Summary statistics of dependent variables

Statistics	CoE	Accrual Quality	G-Index
Number of observations	20,282	18,975	159,850
Mean	8.940	-0.0003	9.096
Standard deviation	4.386	0.094	0.936
25th percentile	6.582	-0.033	8.598
50th percentile	8.488	-0.0003	9.031
75th percentile	10.731	0.0315	9.694

Source: Oxera analysis based on data from Thomas Reuters Datastream.

A3.3 Italian analysis

Table A3.4 Summary statistics of dependent variables

Statistics	CoE	Accrual Quality
Number of observations	7,902	7,771
Mean	5.670	-0.0003
Standard deviation	2.749	0.118
25th percentile	4.030	-0.041
50th percentile	5.700	0.000
75th percentile	7.374	0.035

Source: Oxera analysis based on data from Thomas Reuters Datastream.

A4 Empirical results from US and Italian analysis

A4.1 General issues surrounding model design

The statistical interactions between the time fixed effects and the variable on governance reform mean that the results of the US and Italian analysis are sensitive to how the time fixed effects are applied.

In general, time fixed effects (sometime referred to as 'dummy variables') are applied by assigning to each time interval (in our case, each year) a 0/1 binary indicator—the indicator's value equals 1 for the corresponding time interval, and 0 otherwise.

In our experiment, the key variable of interest is a governance reform indicator, which equals 0 for years before the reforms and 1 for years after them. By adding both an indicator for the governance and time fixed effects for all time periods, the issue of perfect collinearity arises. That is, there will be an exact 1:1 correspondence between the shock and the year indicators. Such 1:1 correspondence implies that the model cannot be identified.⁵⁶

To solve the issue of perfect collinearity, the model can be estimated by including several (but not all) indicators of years to account for time fixed effects. The approach ensures that variations over time that are not attributed to the governance reform can be captured by time fixed effects. However, the robustness of this approach can be affected by two main factors:

- On the one hand, the more year indicators that are included, the more likely there will be a collinearity issue with the governance indicator, resulting in less precise and reliable statistical inference. On the other hand, the fewer year indicators that are included, the fewer time fixed effects that are accounted for, which could also affect the precision and reliability of the results.
- The decision on how many year indicators to include is subjective, and statistical outputs are sensitive to the selection of year indicators.

As a result, the results from the US and Italian regressions (including analysis on CoE, accruals quality and corporate governance) need to be interpreted with caution.

A4.2 US analysis

We report regression coefficients for Models 1 and 2 in Table A4.1 to Table A4.3 below for the CoE, accruals quality and G-Index regressions, respectively.

Table A4.1 sets out the regression results of the analysis for the CoE. The results suggest that the SOX corporate governance reforms in the US significantly reduced the CoE in the post-reform period, by c. 2.5%.

⁵⁶ Where a model cannot be identified, it is not possible to estimate the marginal effect of the variable of interest (in our case the governance shock) while holding the time fixed effects constant. This is because the latter will always change in identical ways when the variable of interest changes.

This suggests that investors experienced a decline in equity risk following the US reform.

Table A4.1 Results of fixed effect regressions for US analysis, using cost of equity (CoE) as the dependent variable

Dependent variable: CoE	Model 1	Model 2
Governance reform	-2.489***	-2.485***
Constant	10.911***	10.888***
Firm fixed effect ¹	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes
R-squared, within	0.118	0.125
Observations	18,468	17,124
Firms	988	988

Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹'Yes' means that fixed effects are included. For some dummy variables, we observe significant coefficients as well. These coefficients are not reported, since the focus of this research is on the long-term impact of governance shock. ²Year fixed-effect was applied to 1993–2014.

Source: Oxera.

It is worth noting that the long-term CoE reduction of 2.5% post-reforms needs to be interpreted with caution, as at least part of this reduction can be attributed to the decline in the yields on long-term government bonds, which are the proxy for the RFR and one of the key inputs to CoE estimation under the CAPM framework. This decline in RFR is shown in Figure A4.1.

Figure A4.1 Yields on 10-year US Treasury bonds, 1990–2021



Source: Oxera analysis based on data from Damodaran.

In other words, the long-term reduction in CoE attributable to the SOX reform is likely to be smaller than 2.5%. In section A4.4, we improve our estimates of the long-term CoE reduction attributable to governance reforms by reconstructing the CoE using long-term equity beta reduction and a more recent RFR and ERP. This approach helps to exclude the impact on our estimates resulting from historical movements in the RFR and ERP.

In Table A4.2, we show the regression results on the effect of the US reforms on accruals quality. The statistically significant negative coefficient on the US governance reform shows that the reforms significantly reduce abnormal accruals, and therefore increase accruals quality.⁵⁷ This indicates that investors experienced an improvement in financial reporting quality following the US reforms.

Table A4.2 Results of fixed effect regressions for US analysis, using abnormal accruals as the dependent variable

Dependent variable: Accrual quality	Model 1	Model 2
Governance reform	-0.003*	-0.003*
Constant	0.051***	0.051***
Firm fixed effect ¹	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes
R-squared, within	0.010	0.011
Observations	18,975	17,587
Firms	1,006	1,006

Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹ 'Yes' means that fixed effects are included. ¹¹ For year dummy variables, we observe significant coefficients as well. These coefficients are not reported, since the focus of this research is on the long-term impact of governance shock. ² Year fixed-effect was applied to 1993–2014.

Source: Oxera.

In Table A4.3, we show the effect of the US reform on a modified G-Index. Broadly speaking, the G-Index quantifies anti-takeover provisions in the company's charter. A higher index value is correlated with worse governance. Following the academic literature, we use the latest innovation in this measure and modify the raw index to remove the potential endogeneity problem with the index. As shown in the table, the US reforms significantly lower a company's modified G-Index, and improves governance quality. This indicates that investors and companies experienced an improvement in governance following the US reforms.

Table A4.3 Results of fixed effect regressions for US analysis, using the G-Index as the dependent variable

Dependent variable: Modified G-Index	Model 1	Model 2
Governance Reform	-0.156***	-0.158***
Constant	9.286***	9.301***
Firm fixed effect ¹	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes

⁵⁷ The levels of coefficients do not have intuitive economic interpretations, as the independent variable (accrual quality) is measured as a regression residual.

Dependent variable: <i>Modified G-Index</i>	Model 1	Model 2
R-squared, within	0.183	0.105
Observations	159,850	129,597
Firms	2,006	1,986

Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹'Yes' means that fixed effects are included. ²Year fixed-effect was applied to 1993–2014.

Source: Oxera.

A4.3 Italian analysis

We report the results of the regression analysis on the impact of the Italian reforms on the CoE and accruals quality in Table A4.4 and Table A4.5.

Similar to the results of the US analysis, the governance reforms in Italy significantly reduced the CoE in the post-reform period, by c.7.3%, with over 99% statistical significance. This indicates that investors experienced a decline in equity risk following the Italian reform.

Table A4.4 Results of fixed effect regressions for Italian analysis, using cost of equity (CoE) as the dependent variable

Dependent variable: <i>CoE</i>	Model 1	Model 2
Reform	-6.697***	-6.677***
Constant	9.233***	9.215***
Firm fixed effect ¹	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes
R-squared, within	0.804	0.808
Observations	6,780	6,557
Firms	616	616

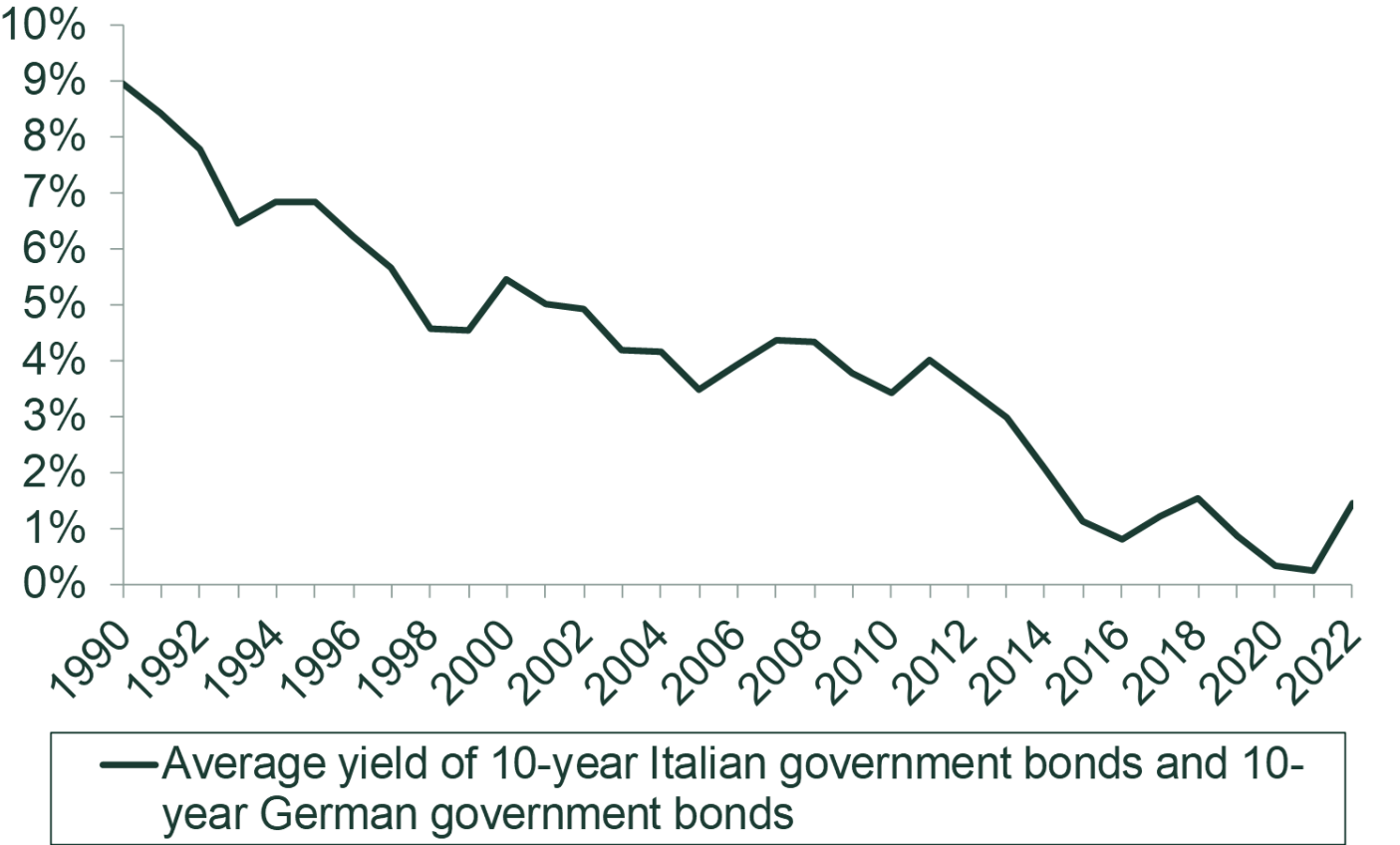
Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹'Yes' means that fixed effects are included. For year dummy variables, we observe significant coefficients as well. These coefficients are not reported, since the focus of this research is on the long-term impact of governance shock. ²Year fixed-effect was applied to 1993–2014.

Source: Oxera.

It is worth noting that the large drop in the CoE in Italy cannot be attributed solely to the governance reforms; at least two other factors contributed to this decline.

First, similar to the US, Italy and the rest of the EU have experienced a significant decline in the RFR since the 1990s. This decline has contributed to the reduction in the CoE. Figure A4.2 shows the Italian RFR, proxied by the average yield on 10-year Italian government bonds and 10-year German government bonds, from 1990 to 2022.

Figure A4.2 Average yields on 10-year Italian government bonds and 10-year German government bonds, 1990–2022



Source: Oxera analysis based on data from Bloomberg.

Second, since the Italian dataset consists of all listed Italian companies from 1990 to date, the equity betas are likely to be distorted by the inclusion of smaller companies with illiquid shares. In Appendix A5, we show the distortions in Italian betas by comparing the distribution of equity betas in US and Italy. This distortion could lead to biased CoE estimates and consequently biased regression results in our fixed-effect model for Italy.

In sum, while the statistical significance and the magnitude of post-reform CoE reduction is directionally consistent with our findings in the US, due to movements in RFR and data quality issues we are unable to quantify the CoE reduction resulting from the Italian reforms.

In Table A4.5 we estimate the effect of the Italian reform on accruals quality. Again, as in the US analysis, we find that the governance reforms significantly lower abnormal accruals, and therefore positively affect accruals quality in the post-reform period, with over 99% statistical significance. The negative coefficient implies that post-reform abnormal accruals declined relative to pre-reform levels.⁵⁸ This indicates that investors experienced an improvement in financial reporting quality following the Italian reforms.

⁵⁸ The levels of coefficients do not have intuitive economic interpretations, as the independent variable (accrual quality), is measured as a regression residual.

Table A4.5 Results of fixed effect regressions for Italian analysis, using abnormal accruals as the dependent variable

Dependent variable: <i>Accrual quality</i>	Model 1	Model 2
Reform	-0.020***	-0.016***
Constant	0.074***	0.069***
Firm fixed effect ¹	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes
R-squared, within	0.015	0.015
Observations	7,771	7,197
Firms	730	728

Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹'Yes' means that fixed effects are included. For year dummy variables, we observe significant coefficients as well. These coefficients are not reported, since the focus of this research is on the long-term impact of governance shock. ² Year fixed-effect was applied to 1991–2014.

Source: Oxera.

A4.4 US analysis on equity betas

In this sub-section, we estimate the impact of the SOX corporate governance reform on equity beta on companies included in our US analysis. This analysis is more robust than the US analysis on CoE, as it ensures that our CoE projections for the EU are unaffected by the differences in RFR and ERP between the US and EU, given that these estimates occur 15 years apart.

Table A4.6 Results of US analysis, using equity beta as the dependent variable

Dependent variable: <i>Equity beta</i>	Model 1	Model 2
Governance reform	-0.118***	-0.118***
Constant	1.197***	1.192***
Firm fixed effect ¹	Yes	Yes
Year fixed effect ^{1, 2}	Yes	Yes
R-squared, within	0.037	0.040
Observations	18,468	17,124
Firms	988	988

Note: *, **, *** are statistically significant at 10%, 5% and 1%, respectively. ¹'Yes' means that fixed effects are included. ² Year fixed-effect was applied to 1993–2014.

Source: Oxera.

Using the average ERP and RFR across the Europe as at 2019 and assuming an equity beta reduction of 0.118, we estimate the long-term CoE reduction after the EU post-reform to be 1.28%.

Table A4.7 Results of US analysis, using equity beta as the dependent variable

	Calculations	Value
RFR, 2019 average ¹	[A]	0.63%
ERP, 2019 ²	[B]	5.54%
Equity beta reduction	[C]	0.118
Cost of equity reduction	[D] = [B] × [C] + [A]	1.28%

Note: ¹ Simple average across Austria, Belgium, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the UK. ² Simple average across countries where data on the ERP is available from Duff & Phelps. These countries include Austria, Belgium, France, Germany, Italy, Netherlands, Spain, Switzerland and the UK.

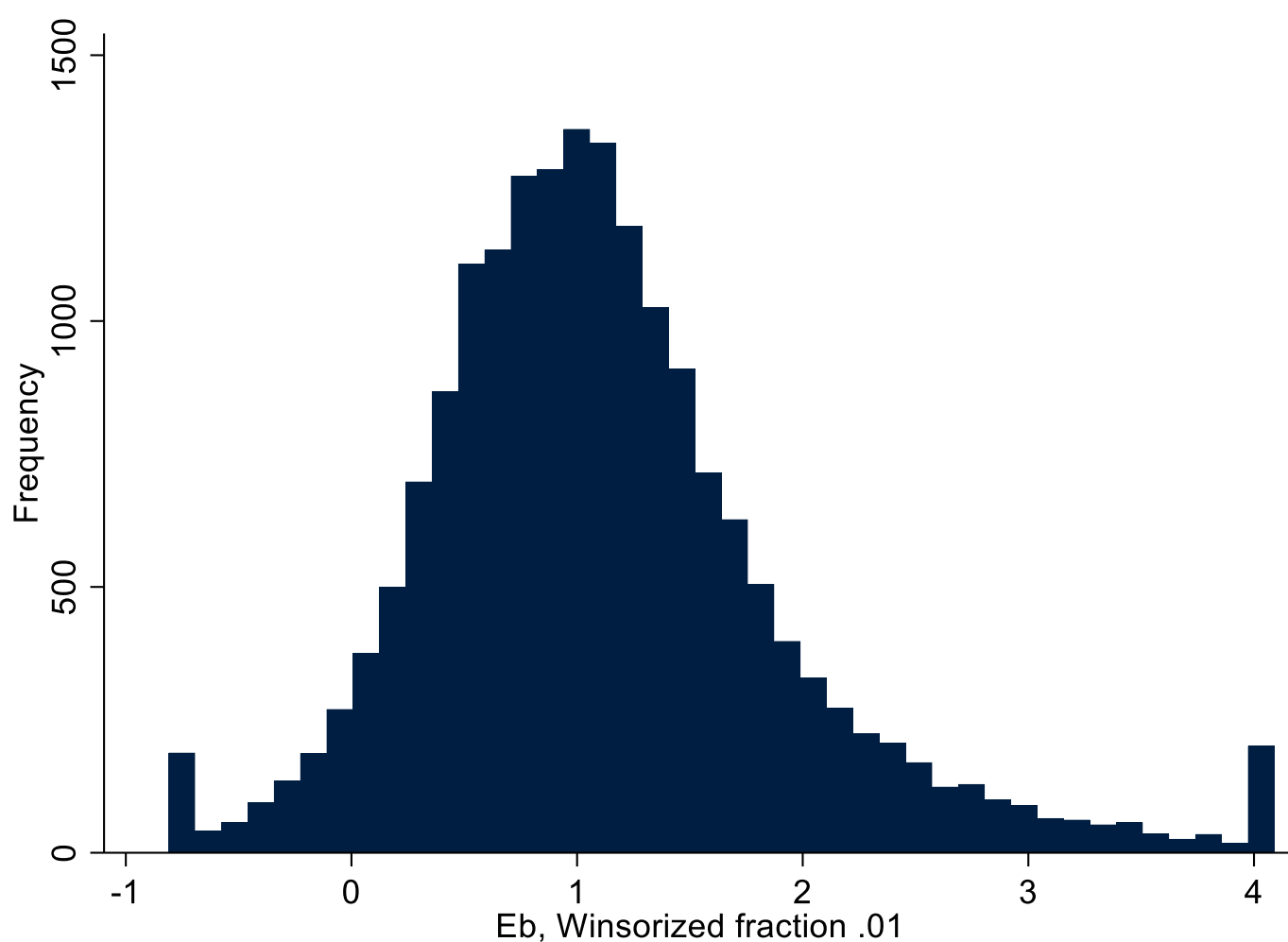
Source: Oxera.

A5 Distribution of US and Italian equity betas

Figure A5.1 and Figure A5.2 are histograms setting out the distribution of equity betas in the US and Italy, across all observations between 1990 and 2021. It can be seen that, while the US betas are normally distributed between -1 and 4 with a mean close to 1, the Italian betas are more clustered between -1 and 1.5 with a mean close to 0.5. The Italian distributions are unexpected, as the equity market is perfectly correlated with itself and should therefore have an average beta close to 1.

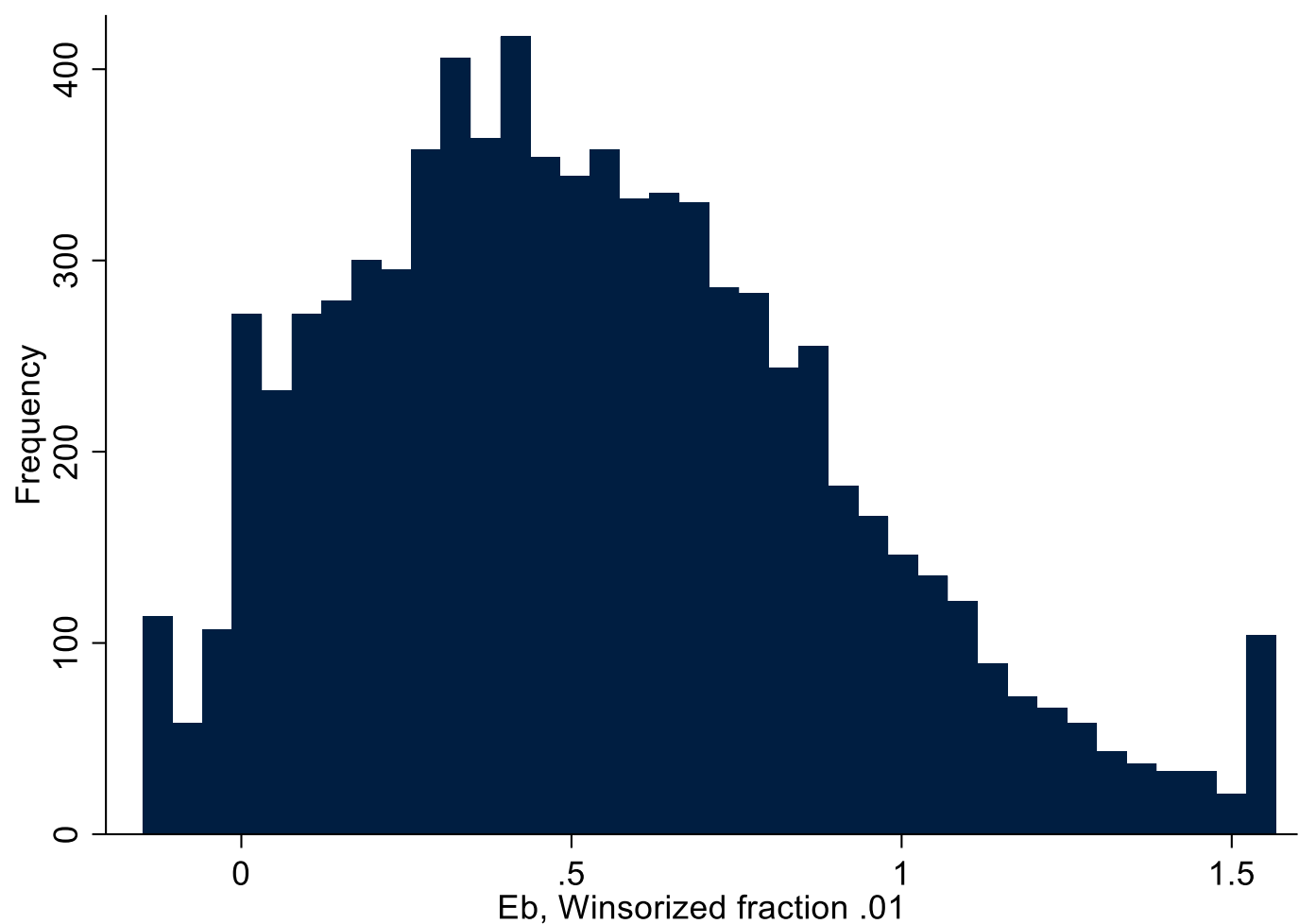
As discussed in section A4.3, this anomaly in the data is likely to be caused by the inclusion of smaller companies with illiquid shares, which consequently resulted in biased beta estimates.

Figure A5.1 Distribution of equity betas for US analysis, across all observations between 1990 and 2021



Note: All equity betas presented are winsorised at the 1% level.
Source: Oxera analysis based on data from Bloomberg.

Figure A5.2 Distribution of equity betas for Italian analysis, across all observations between 1990 and 2021



Note: All equity betas presented are winsorised at 1% level.
Source: Oxera analysis based on data from Bloomberg.

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Profile

Luis holds a doctorate in Economics and Finance from the University of Oxford and leads the Finance & Valuation and Regulation teams at Oxera. He has over 25 years of experience of applying his expertise in economics and finance to competition, regulation and policy issues across a wide range of industries. He provides advice at the board and executive level to companies, regulators and governmental departments in Europe across many sectors, including asset management, banking, communications, energy, securities markets, transport, water and others. He has extensive experience of acting as an expert, providing oral and written evidence, in regulatory, competition, state aid, litigation and arbitration proceedings. His academic research focuses on financial markets, cost of capital, corporate finance, corporate dividend and capital structure policy, financial regulation and corporate governance, and he has published extensively in these areas. Luis has directed more than 50 policy and research studies for many institutions, including for the European Commission, the London Stock Exchange, the European Asset Management Association, Ofcom (the UK communications regulator), and the UK Competition and Markets Authority (CMA). These studies have covered topics such as financial services, asset management,

state aid and corporate control, and advice to financial institutions on state aid matters arising from the global financial crisis.

Luis is a Maître d'Enseignement at Solvay Brussels School of Economics and Management, Université libre de Bruxelles. Before joining Oxera, he was a Researcher in the Economics and Finance departments of the University of Warwick (between 1992 and 1993) and the University of Oxford (between 1993 and 1994). Luis was a member of the Financial Innovation Standing Committee of the European Securities and Markets Authority (ESMA) for six years until 2018. He has been a member of the CMA's regulatory expert panel, and a trustee of Trust for London, an independent charitable foundation which aims to tackle poverty and its root causes among the people of London. He has also been a member of the Advisory Board of the Solvay Brussels School of Economics and Management.

Selected project experience

- **Executive advisory:** Luis has been a senior executive-level adviser to many European companies, regulators and governmental departments in financial services, transport, communications, water, energy and other sectors. His advice covers strategy, economic and financial issues, and corporate governance.
- **Regulatory and competition reviews:** Luis has led Oxera's work during regulatory price reviews and competition reviews in transport (rail, airports, bus), energy, and communications across many countries including the UK, Italy, Belgium, Portugal, France, Brazil, and Ireland. For example, he is currently leading Oxera's work for Anglian Water in the context of the CMA's appeal for a redetermination, and its work for energy regulators in Italy and France on financial issues.

- Market studies and investigations: Luis has supported many companies and regulators in the context of market studies and investigations by regulators and competition authorities. These include studies and investigations by the CMA and the Financial Conduct Authority (FCA) in the UK, the European Commission across several European countries, and the Securities and Exchange Commission (SEC) in Brazil, covering sectors including transport, banking, securities markets and asset management, energy and communications. For example, Luis has directed a study for the European Commission (DG FISMA) on primary and secondary equities markets in the EU, and led Oxera's support to The Royal Bank of Scotland plc on banking regulation and the Independent Commission on Banking, Capital Adequacy and Basel III (2011). He has led Oxera's support to the FCA in the UK on banking business models, and to Ofcom in relation to its investigation into the pay-TV market on the profitability of BSkyB. He led Oxera's support to Stagecoach during the UK Competition Commission's market investigation into local buses, and to BAA plc during the reviews of Heathrow, Gatwick and Stansted Airports' charges at the Competition Commission market and regulatory inquiries.
- Expert evidence and testimonials in commercial disputes and litigation: Luis has submitted expert reports to, and testified before, the tribunal in an ICC-administered arbitration on behalf of an international company in Italy regarding the alleged reputational harm to an asset management company; submitted expert reports to, and testified before, a Swiss arbitration tribunal in the context of a dispute in banking; submitted an expert report and testified in a commercial dispute in Brazil between equity market participants in a dispute over access terms to the clearing and settlement infrastructure; and submitted expert reports to the Competition Appeal Tribunal in *British*

Telecommunications plc (Wholesale Broadband Access Charge Control) v Office of Communications. He is currently involved in a dispute at the High Court of Ireland in a matter of investor compensation, and he has provided several written submissions in many other arbitration and dispute proceedings.

- Mergers and acquisitions: Luis has led Oxera's support in clearance by competition authorities of mergers in the water, transport and energy sectors. He also led Oxera's due diligence work supporting the acquisition of a large pension fund, and assets in the infrastructure space by infrastructure investors.

Selected publications

- Correia da Silva, L. and Hope, P. (2011), 'Profitability analysis in the context of the Pay TV market inquiry', *Competition Law Journal*, 10:4, pp. 328–33.
- Correia da Silva, L., Goergen, M., Andres, C. and Betzer, A. (2008), 'Trends in Dividends, Payers, Payouts and Yields', chapter 3, in K. Baker (ed.), *Blackwell Companion on Dividends*.
- Correia da Silva, L., Franks, J. and Mayer, C. (2008), 'Asset Management in Europe', chapter 13, in X. Freixas, P. Hartmann and C. Mayer, *Handbook of European Financial Markets and Institutions*, Oxford University Press.
- Correia da Silva, L. and Barnes, F. (2008), 'Occupational Retirement Provision: Are the Risks of Defined-contribution Schemes Overstated?', *Revue Bancaire et Financière*, 4.
- Correia da Silva, L. and Becht, M. (2007), 'External Financial Markets Policy: Europe as Global Regulator?', chapter 7, in A. Sapir (ed.), *Fragmented Power: Europe and the Global Economy*.

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- Jenkinson, T.J., Correia da Silva, L. and Mayer, C. (2003), 'The Capital Structure of Water Companies', in D. Helm (ed.), *Water, Sustainability and Regulation*, Oxera.
- Correia da Silva, L., Franks, J. and Mayer, C. (2001), 'Regulation and Asset Management', *Financial Times Mastering Investments*.

Qualifications

- DPhil Economics, University of Oxford, UK
- MBA European Studies, Solvay Business School, Belgium
- MSc Economics, Université libre de Bruxelles, Belgium
- BA Economics, Université libre de Bruxelles, Belgium

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Profile

Ryan advises clients on regulatory finance, energy/climate finance, data and financial valuation, and commercial disputes. He was the head of Oxera's Paris office between 2020 and 2022 and also served as a senior leader in Oxera's global finance and valuation team. Ryan has led on the UK energy industry's RIIO-2 price control appeal to the Competition and Markets Authority (CMA). In addition, he has worked on energy finance projects in France, Germany, Belgium and Finland.

Ryan serves on the Board of Directors for a \$3bn financial institution in the USA, and has chaired the Board's risk management committee for four years. He is also a professor at the Université Paris-Dauphine – PSL in Paris, France, where he lectures on econometric modelling, complex corporate finance problems, and financial valuation. His academic research has won multiple international awards, fellowships and grants. Prior to his current roles, Ryan was a tenured Associate Professor of Finance at the University of Arizona, where he designed an award-winning course in financial modelling. He also worked as a Professeur Affilié at the University of Lille. Ryan worked in accounting for PwC and the Reznick Group, and was a C++ programmer for Khafra Engineering. He has also performed valuation work for multiple start-up firms in Arizona.

Ryan's academic research has been profiled by Harvard Law School and Columbia Law School, *Forbes*, the *Wall Street Journal* and *Les Echos*, and has been published in multiple top-tier academic journals. He has also presented before the US Federal Trade Commission and US defence analysts, and led a research group devoted to infrastructure security, cybersecurity and risk management. From 2018 to 2020 he was the editor of the *Infragard Journal*, an interdisciplinary research journal co-created by the US Federal Bureau of Investigation (FBI) and the Department of Homeland Security (DHS).

Ryan has been awarded endowed fellowships at the Risk Institute at the Ohio State University, the National Center for Middle Markets at the Ohio State University, and the Global Association of Risk Partners in New York City. In addition to over 50 invited presentations in the USA, Ryan has given invited talks in Austria, Canada, Chile, Finland, France, Germany, Italy, Mexico, the Netherlands, Portugal, Sweden, and the UK.

Other experience

- Professor of Finance: Université Paris-Dauphine-PSL (2020–)
- Board of Directors: OneAZ Credit Union (\$3bn in assets), (2017–)
- Chair, Risk Management Committee: OneAZ Credit Union (\$2.5 billion in assets) (2018–)
- Associate Professor of Finance (with tenure): University of Arizona (2012–20)
- Editor in Chief, Infragard Journal (2018–20)
- Assurance, PwC (2004–07)
- Assurance, Reznick Group (2001–04)
- Computer Programmer (C++/VB coding), Khafra Engineering (2000–01)

Selected project experience

- Named expert witness for an energy dispute in the Finnish high court between an international energy company and the Finnish energy regulator (2020–22)
- Finance expert in a dispute for a major French auto manufacturer (2020–22)
- Economics expert for a dispute between the Colombian government and a global coal mining firm (2022)
- Finance expert for a state aid application for an international auto manufacturer (2022)
- Energy expert for the Finnish energy regulation framework (2022)
- Thought leader on an economic framework for climate change litigation (2022)
- Expert for a project on net neutrality and climate change for French utilities (2021)
- Lead for a data valuation initiative between energy firms, transport firms and financial institutions in France (2021)
- Financial expert in an international arbitration between a global bank and a European pension fund (2021)
- Energy expert for a dispute between UK energy companies and a regulator in front of the CMA for the RIIO-2 price controls (2020–21)
- Economics expert for an IP/patent dispute between two international medical device companies (2021)
- Finance expert for a litigation between an international air services company and a national air carrier (2021)
- Regulatory economics advice for BT's relative risk analysis (2020)
- Project lead on RIIO-2 CoE analysis for the Energy Networks Association (2020)
- Valuation of a financial start-up firm in the context of raising money from venture capital funds (2017)
- Valuation of a tech start-up firm in the context of raising money from venture capital funds (2016)

- Valuation and performance analysis of the City of Atlanta (US) pension fund (2011)

Selected academic publications

- Kini, O. and Williams, R. (2012), 'Tournament incentives, firm risk, and corporate policies', *Journal of Financial Economics*, 103, pp. 350–376.
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