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***General assessment of potential
economic consequences of
country-by-country reporting
under CRD IV***

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Non-confidential version



Following an open call for tenders (Ref MARKT/2013/205/F), the Internal Market and Services Directorate General (DG MARKT) has commissioned PwC to undertake a general assessment of potential economic consequences of country-by-country reporting under CRD IV, including an econometric study of the impact of disclosure quality on capital market outcomes and a number of other key outcomes. DG MARKT is the addressee of this report.

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Abstract

This report examines the potential positive and negative economic consequences of public country-by-country reporting by banks and other financial sector firms under Article 89 of the EU Capital Requirements Directive IV (Directive 2013/36/EU). We reviewed relevant academic literature and subsequently conducted an econometric analysis to investigate potential links between accounting disclosure quality and economic impacts for the reporting institutions. We asked a range of stakeholders what they thought the economic impact of Article 89 might be and we looked at the differences in the implementation and interpretation of Article 89 by Member States and by reporting institutions.

From the econometric analysis we concluded that Article 89 was unlikely to have a significant negative economic impact, and could have a small positive economic impact.

On balance, the stakeholders expected Article 89 to increase transparency of and public confidence in the financial sector, but they expected the economic impact to be minimal.

We identified a number of differences in the interpretation and implementation of Article 89 by Member States and reporting institutions and concluded that the consistency and comparability of the implementation of Article 89 needed to be improved in order not to undermine any benefits afforded by the disclosures.

Ce rapport examine les éventuelles répercussions économiques positives et négatives liées à la publication d'informations pays par pays par les établissements de crédit et les entreprises d'investissement en vertu de l'article 89 de la Directive 2013/36/EU du Parlement Européen et du Conseil du 26 juin 2013 concernant l'accès à l'activité des établissements de crédit et la surveillance prudentielle des établissements de crédit et des entreprises d'investissement (CRD).

Après la revue et l'examen de la littérature universitaire, disponible et pertinente à ce sujet, nous avons procédé à une analyse économétrique afin d'examiner les liens potentiels entre la qualité de l'information comptable rendue publique et un ensemble de résultats économiques concernant les établissements déclarants.

Nous avons sollicité l'avis et l'opinion d'un éventail de parties prenantes, sur le potentiel impact économique de l'article 89; Et nous avons également examiné les différences dans l'application et l'interprétation de l'article 89 par les États membres et par les institutions soumises à cette Directive.

L'analyse économétrique, suggère que l'article 89 est peu susceptible d'avoir un impact économique négatif important, et pourrait avoir un léger impact économique positif.

Dans l'ensemble, les différentes parties prenantes s'attendent à ce que l'article 89 augmente la transparence et la confiance du public dans le secteur financier; mais l'impact économique est selon eux minime.

Nous avons identifié un certain nombre de différences dans l'interprétation et l'application de l'article 89 par les États membres et les établissements déclarants; et nous avons conclu que la cohérence et comparabilité de l'application de l'article 89 devraient être améliorées afin de ne pas compromettre les avantages associés à la communication des informations pays par pays.



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List of abbreviations

• BEPS	Base erosion and profit shifting
• CAPM	Capital asset pricing model
• CBCR	country-by-country reporting
• COEC	Cost of equity capital
• CRD IV	Capital Requirements Directive IV
• CRR	Capital Requirements Regulation
• CSO	Civil society organisation
• EBA	European Banking Authority
• EC	European Commission
• EIOPA	European Insurance and Occupational Pensions Authority
• EITI	Extractive Industries Transparency Initiative
• EPS	Earnings per share
• ESMA	European Securities and Markets Authority
• EU	European Union
• FS	Financial services
• GMM	Generalised method of moments
• GRI	Global Reporting Initiative
• GSIB	Global systemically important bank
• IFRS	International financial reporting standards
• MEP	Member of the European Parliament
• MKTCAP	Market capitalisation
• MTBV	Market to book value
• OECD	Organisation for Economic Co-operation and Development
• PE ratio	Price-earnings ratio



Section one - Executive summary

Overview of the work performed

The scope of our work was agreed with DG MARKT as set out in our contract number MARKT/2013/205/F2/ST/OP. The contract includes the terms of reference from the related invitation to tender and from our response to that tender.

The principal objective of our work, as stated in 3.2.1 of the invitation to tender, was to carry out a general study on potential economic consequences, both positive and negative, of the public disclosure of information such as the information referred to in Article 89(1) CRD IV with a specific focus on the impact on competitiveness, investment and credit availability and the stability of the financial system. The study was designed with the intention of covering all institutions subject to the reporting requirement and also sought the views of other stakeholders that have an interest in the regime, although they are not subject to it.

The work to be performed as well as the detailed methodologies were discussed and agreed with DG MARKT at various stages in our work. The next page sets out where the methodology, results and conclusions from each element of our work can be found within this report.

In line with the contract we used a number of methods to investigate the potential economic impact of the country-by-country reporting (CBCR) requirements contained within Article 89 of the EU Capital Requirements Directive IV (CRD IV). We carried out the following:

- econometric study - an academic literature review and based on the literature we developed a consistent methodology to quantify banks' disclosure quality and conducted an econometric analysis to investigate potential links between disclosure quality and economic impacts for the reporting institutions
- stakeholder survey - a survey of a range of stakeholders including civil society organisations (CSOs), governments, regulators, banks and trade associations to obtain their views on likely economic impacts
- legal implementation analysis - a survey of PwC experts to determine how Article 89 has been implemented in the 28 EU Member States
- review of disclosures - a review of the first disclosures made under Article 89 by twelve of the fourteen EU-headquartered globally systemically important banks (GSIBs) that were required to report to the European Commission by 1 July 2014

Within our response to the invitation to tender we contemplated carrying out economic modelling to look at the economic effect should CBCR be thought likely to increase the effective corporate income tax rates of financial institutions. In the course of our work it became apparent that the assumptions required for such modelling would be very broad and so it was agreed with the Commission to exclude this from the scope of our work. A more detailed discussion of this issue can be found on pages 94-97.



Structure of this report

Section one of this report is a high level executive summary of our study explaining the work performed and the conclusions reached.

Sections two to four provide an overview of the methodologies and results from the different elements of our work highlighting our key findings:

- Section two - a brief introduction to the background of the study
- Section three - the methodology and the results from the econometric study
- Section four - an overview of the methodology and results from the stakeholder survey.

Section five contains a summary of the key issues with the implementation and interpretation of Article 89 that we identify from the stakeholder survey, the legal implementation analysis and the review of disclosures.

The appendices provide detailed information on the work performed and the results obtained:

- Appendix 1 – Detailed reference materials for the econometric study
- Appendix 2 – Detailed results of the stakeholder survey including the results by question and summaries of the comments made by respondents
- Appendix 3 – Detailed explanations of the issues with the implementation and interpretation of Article 89 drawn from our legal analysis, stakeholder survey and review of disclosures
- Appendix 4 – An explanation of the concept of deadweight loss from a tax perspective
- Appendix 5 – The text of Article 89



Conclusions

It is very early to form a view on the impact of the provisions of Article 89 of CRD IV. However, on the basis of the views that we have obtained from the organisations that responded to our survey, the balance of opinion suggests that these provisions are likely to have some impact, as intended, in improving the trust of citizens of the European Union in the financial services sector. Specifically, our stakeholder survey suggests that the respondents expect Article 89 to have some positive impact on the transparency and accountability of, and on the public confidence in, the financial services sector in the EU.

Furthermore, the balance of opinion and the work we performed suggest this improvement is likely to be obtained without the public disclosure of such information having noticeable negative economic consequences, including the impact on competitiveness, investment and credit availability and the stability of the financial system.

Looking at each of these impacts in turn:

Competitiveness – Although our econometric study has not captured the impacts on competitiveness directly, our results suggest that improved disclosure quality, which is a key objective of CBCR, could improve firms' competitive outcomes. The analysis suggests that an improvement in disclosure quality is associated with a reduction in earnings management¹, which could have positive impacts on firms' competitiveness.

Furthermore, the stakeholder survey indicated that 53% of respondents felt there would be no impact on competitiveness. The fact that three of the fourteen GSIBs have published their Article 89 disclosures in full in 2014 would suggest that they are not overly concerned that there will be a detrimental effect on their competitiveness. While many stakeholders recognised that there is a compliance cost for firms in complying with Article 89, it was generally felt not to be significant when compared to the overall cost of the wider regulatory compliance burdens faced by the reporting institutions. The compliance cost associated with Article 89 therefore seems unlikely to disadvantage reporting institutions significantly compared to non-reporting institutions.

Credit availability – Our econometric results suggest that CBCR is unlikely to have any negative impact on banks' ability to access capital markets. The improvement in disclosure quality as a result of CBCR could have an impact on reducing banks' cost of equity capital – an improvement in the disclosure score of 1 reduces the cost of equity capital by 0.2 percentage points, and these benefits could be passed onto non-financial sector firms and households in the form of lower lending rates.

This contrasts with the views from the stakeholder survey which indicated that only a very few respondents expect a positive impact on credit availability as a result of Article 89. The vast majority of respondents expected that there would be no impact on credit availability.

Investment – Related to the point on credit availability, our econometric results suggest that CBCR is unlikely to have a negative impact on investment. The improvement in disclosure quality, as perceived by capital markets as a result of CBCR, could lead to a lower cost of equity capital for banks, which may translate into

¹Earnings management is where a firm's management use accounting discretion in presenting financial results in order to present the entity to investors in an artificially positive light.

lower lending rates and enable firms to invest in their business and expand. However, these impacts are likely to be small.

In terms of investment into reporting institutions, 61% of stakeholders responding to the survey expected no impact on the investment in reporting institutions, 28% expected a positive or very positive impact, with regulators and CSOs generally having a more positive view than businesses.

Stability of the financial system – The evidence from our econometric analysis suggests that an increase in disclosure quality, which is a key objective of CBCR, could have a small but positive impact on accounting quality. This means that following the implementation of CBCR, the information provided by financial institutions could become more informative for external stakeholders, and better reflect the true economic condition of the institution. This could result in lower volatility and increased financial stability.

Three quarters of the stakeholders responding to the survey expected there to be no impact on the stability of the financial services sector, with 18% expecting a positive impact. It was noted that while there may be a negative effect on specific institutions it was felt unlikely that this would significantly affect the sector as a whole.

Although our econometric results provide some insights into the potential impacts of CBCR, we are necessarily inferring from the historical relationships between disclosure quality and the outcomes of interest (i.e. banks' cost of equity capital, bid-ask spread, accuracy of earnings forecasts and the likelihood of earnings management) to draw possible conclusions for CBCR. **Caution is therefore required when interpreting the results and conclusions from our study and their applicability to CBCR.** In particular, it seems likely that the benefits of incremental improved disclosure will decline with successive initiatives, as the pre-existing level of disclosure is already higher. Furthermore, it is impossible to quantify the extent to which CBCR will improve disclosure compared with the historical improvements in disclosure quality which we have observed from our data and which form the basis for our model estimation. Nevertheless, our academic literature review and econometric modelling do suggest that, to the extent that there is an improvement in disclosure resulting from CBCR, then directionally this would be expected to be associated with positive outcomes for the economic performance of the reporting institutions and their customers.

The stakeholder survey and our review of the implementation and interpretation of Article 89 as well as our review of the first disclosures of the GSIBs suggest that the beneficial impact of Article 89 could be improved by addressing a number of the issues that have arisen concerning the implementation and interpretation of Article 89.

Without changes to improve the clarity and consistency of the interpretation of Article 89, and a consequent increase in the comparability of the data disclosed, there appears to be a risk that benefits associated with the disclosure could be undermined.



Section two - Background and introduction



Introduction of Article 89 to CRD IV

In February 2013, the European Parliament proposed the inclusion in CRD IV of a requirement for credit institutions and investment firms to publish annually the following tax and financial data for each country in which they operate:

- a) name(s), nature of activities and geographical location
- b) turnover
- c) number of employees on a full time equivalent basis
- d) profit or loss before tax
- e) tax on profit or loss, and
- f) public subsidies received.

Following the agreement of the co-legislators this requirement became Article 89 of CRD IV and will apply in full from 1 January 2015.

Perhaps owing to being introduced late in the legislative process, the CBCR requirements contain little detail and leave many points open to different interpretations. This has been a recurring theme throughout our work.

The full text of Article 89 is included in Appendix 5.

Only GSIBs are required by Article 89 to report items a) to f) by 1 July 2014, with items d) to f) being privately disclosed to the European Commission and items a) to c) being publically disclosed.

All other institutions are only required to make full disclosure of all six items from 2015, but must publically disclose items a) to c) by 1 July 2014.

The fourteen GSIBs² that were required to report to the Commission by 1 July 2014 are:

- a) Barclays
- b) BNP Paribas
- c) BBVA
- d) Deutsche Bank
- e) Groupe BPCE
- f) Group Credit Agricole
- g) HSBC
- h) ING Bank
- i) Nordea
- j) Royal Bank of Scotland
- k) Santander
- l) Societe Generale
- m) Standard Chartered
- n) Unicredit

² FSB update of group of global systematically important banks, 1 November 2012



Requirement to prepare an assessment of Article 89

Paragraph 3 of Article 89 requires that “the Commission, after consulting EBA, EIOPA and ESMA, as appropriate, shall conduct a general assessment as regards potential negative economic consequences of the public disclosure of such information, including the impact on competitiveness, investment and credit availability and the stability of the financial system. The Commission shall submit its report to the European Parliament and to the Council by 31 December 2014.”

Our work, which is detailed in this report, was requested by the Commission, following an open call for tenders (Ref MARKT/2013/205/F), to assist it in preparing its report to the Parliament and to Council. The scope of this work was agreed with the Commission as set out in our contract number MARKT/2013/205/F2/ST/OP. The contract includes the terms of reference from the related invitation to tender and from our response to that tender.

Our work covers the following areas:

- an academic literature review and econometric study to investigate potential links between financial reporting disclosures and a set of economic outcomes for reporting institutions;
- a survey of a range of stakeholders including civil society organisations, governments, regulators, banks and trade associations to obtain their views on likely economic impacts;
- a survey of PwC experts to determine how Article 89 has been implemented in the 28 EU Member States; and
- a review of the first disclosures by GSIBs made under Article 89.

The work that we have agreed to perform seeks to address not only the remit for assessment as set out in Article 89 (3), but also considers whether the Article 89 disclosures will meet the objective of restoring public trust in the financial services sector as set out in recital (52) to CRD IV, namely:

“Increased transparency regarding the activities of institutions, and in particular regarding profits made, taxes paid and subsidies received, is essential for regaining the trust of citizens of the Union in the financial sector. Mandatory reporting in that area can therefore be seen as an important element of the corporate responsibility of institutions towards stakeholders and society”.



Section three - Econometric study



Introduction

Purpose of the study

The macroeconomic challenges of recent years have placed national governments under severe pressure, attempting to balance programmes of fiscal consolidation with the need to maintain public services provision and promote economic growth. This pressure has manifested itself in calls from investors, civil society organisations and the media for companies and individuals to be seen to making adequate fiscal and economic contributions to their jurisdictions of residence. In particular, there is a growing movement towards the development and formalisation of CBCR requirements with a view to promoting greater levels of corporate transparency and accountability.

Within this, a key area of focus for the proponents of greater transparency and quality of corporate disclosure has been the financial services (FS) sector, in part driven by the wider debate on FS sector accountability and regulation following the financial crisis. However, corporate disclosure and CBCR requirements in the FS sector are yet to exhibit the levels of formalisation witnessed in other sectors, most notably the extractives industry. Indeed, the extractives industry currently has a number of voluntary and mandatory CBCR requirements that aim to foster greater governance and accountability in resource-rich countries.³

This study seeks to inform the Commission's understanding of the potential economic impacts of the public disclosure of specific information on a country-by-country basis by reviewing the existing academic research and providing an updated econometric analysis on the relationship between disclosure quality and economic impacts. Our econometric analysis focuses specifically on the financial services sector. We use historical data in order to test the statistical relationship between disclosure quality and a set of economic outcomes. However, as CBCR is yet to be implemented, it is not possible to observe the actual impact of CBCR, so we have sought to infer what the future impacts could be, based on the historical evidence of previous changes in disclosure quality.

Framework for the analysis

We explored the historical link between disclosure quality and a range of outcomes by conducting a literature review of reputable academic papers to form prior expectations for the statistical significance of the link between country-by-country reporting (and disclosure quality more generally) and economic impacts. There is a general consensus in the literature that disclosure quality does have an impact on capital market outcomes, transparency and accounting quality. The literature also provides evidence on the potential spillover impacts that result from improved disclosure quality, such as competitiveness. We have tested the validity of these relationships for our sample of banks, using more robust statistical approaches than observed in the prior literature.

Based on the literature and the results from our econometric analysis, we draw some conclusions on the potential implications of CBCR. Where we have found a statistically significant result linking the quality of firms' disclosures and the outcomes of interest based on historical relationships, this might imply that the additional reporting measures that raise disclosure quality under CBCR will also have an impact on these outcomes. Our approach allows us to identify which components of reporting

³ Appendix 1.1 sets out some of the other country-by-country reporting arrangements that have been implemented worldwide.

(specifically the public availability and quality of segment reporting) drive the relationships between disclosure quality and these outcomes.

We cover the impacts of banks' disclosures on a range of outcomes as disclosure quality can affect firms through a number of different channels. We have focused on capital market impacts, transparency and accounting quality, which enables us to draw conclusions for CBCR across a wide range of channels, and how these link to competitiveness, investment, credit availability and stability.

We developed a methodology to examine the impact of CBCR requirements. An overview of our analytical framework is set out in Figure 1.

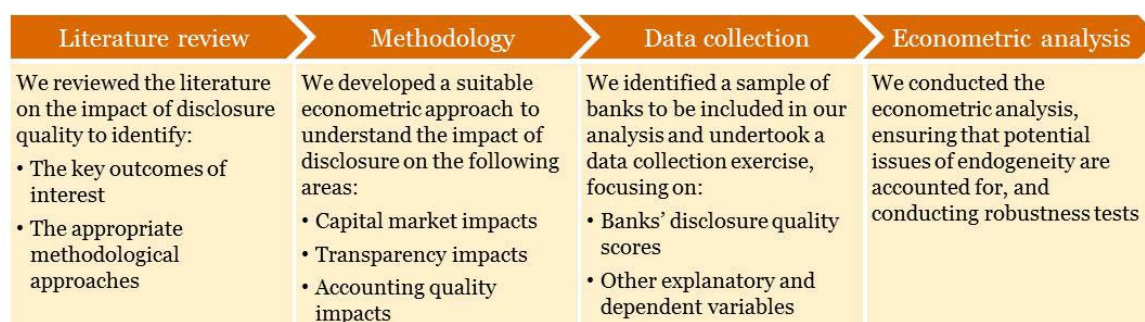


Figure 1: An overview of our analytical framework

- Literature review:** We undertook an extensive review of the literature on the impact of firms' disclosure quality. Based on the existing empirical research, we identified the key outcomes of interest for our study:
 - Capital market impacts: Cost of equity capital and bid-ask spreads. We hypothesise that an improvement in disclosure quality is associated with improved capital market outcomes, i.e. lower cost of equity capital and lower transaction costs in the form of bid-ask spreads.
 - Transparency: the accuracy of analysts' earnings forecasts. We hypothesise that an improvement in disclosure quality leads to an improvement in the accuracy of analysts' forecasts, specifically for earnings.
 - Accounting quality: the likelihood of earnings management. We hypothesise that an improvement in disclosure quality leads to an improvement in accounting quality, specifically earnings management. This is defined as the use of accounting discretion by the firm's management in presenting financial results in order to present the entity in an artificially positive light to investors.

The link between disclosure quality and the outcomes of interest above are explored in more detail in our conclusions in Section one. This exercise also informed our selection of the appropriate econometric methodology to be applied in our assessment.
- Methodology development:** In order to analyse the impact of disclosure quality on the outcomes of interest, we developed a scoring framework to consistently capture the quality of firms' disclosure, on the basis of the amount and quality of information provided in annual reports. We also developed the appropriate econometric methodology to be used in our analysis, which takes into account potential estimation problems such as endogeneity.



3. **Data collection:** Our analysis focuses on large, cross-border banking as CBCR is intended primarily to affect these institutions. On this basis, we identified a set of criteria to select a sample of large cross-border banks to be included in our analysis. Banks were assigned individual scores for disclosure quality, based on the scoring framework we have developed. Other data required for our analysis were collected for our sample of banks.
4. **Econometric analysis:** Using the disclosure quality scores, and drawing from the existing literature and updated econometric approaches, we investigated the relationship between disclosure quality (and specifically the impact of providing segmented breakdowns) on the outcomes of interest.

The outcomes and hypotheses we tested were jointly agreed with DG MARKT. The rest of this section of the report sets out our approach and the results of our analysis in more detail. This study provides an updated view on the impact of disclosure quality, specifically for the banking sector. We also improve on the econometric approaches used in previous studies, by using more sophisticated econometric approaches that take into account possible estimation issues. We also consider the impact of the public availability and granularity of segment information, which relates to CBCR. Our approach also seeks to provide some evidence on other aspects of firms' disclosures that can have an impact on the outcomes mentioned above.

Our study assesses the direct impacts on businesses as a result of an increase in disclosure quality. We acknowledge that there is a range of wider impacts that could result from the implementation of CBCR, such as market-wide/spillover impacts. Due to the lack of readily-available data and in order to maintain the tractability of our analysis this has not been explicitly quantified in our study.



Literature review

This section sets out our review of the existing literature on the impact of firms' disclosure quality. This exercise enabled us to understand the ways in which disclosure quality can influence firm outcomes and to form a view on which of these appear to be the most material. It informed our understanding of the econometric issues we were likely to encounter in our analysis and how these can be mitigated. It also provided a set of previously documented relationships and econometric results against which we were able to assess the plausibility of both the direction and magnitude of our econometric results.

Introduction

Companies provide information externally in a number of ways, either on a voluntary basis or driven by mandatory or legal/regulatory requirements. For example, firms disclose information via formal (mandated) channels such as regulated financial reporting and statements, management discussions and analysis, and other regulatory filings. Firms can also provide information on a less formal basis, such as voluntary disclosures in annual reports, management forecasts, analyst and investor presentations, and press releases.

The literature concludes that firm disclosures are important for various reasons. They have an impact on the way firms are perceived in the market and on how they operate. Firm disclosures improve the ability of external parties such as shareholders and lenders to understand the true economic condition of the business and so help to improve investment decisions. The public can also gain an understanding of a firm's sustainability policies and performance in relation to environmental and ethical standards, as well as stakeholder management activities, which could have an impact on public perception and confidence in the business.

Specifically in relation to the merits of providing disclosure at a more granular level, many users of financial reports are interested in the performance and prospects of a particular business unit within a firm, as opposed to the firm as a whole (Roberts, 2010). For instance, host governments may be interested in the performance of an operating segment that is based in their jurisdiction. Segment information, be it by business unit and/or geographic segment, help meet this need.

Geographic and industry segments can differ significantly in terms of growth opportunities, political stability, potential investors, risk and profitability (Herrmann and Thomas, 1997). Therefore the public availability of granular information, by business unit⁴ and/or geographic segment, enables investors to understand key drivers of growth, predict future cash flows, and make more informed investment decisions.

This raises the question as to why mandatory disclosures are necessary; after all, firms already have an incentive to provide relevant information if the benefits of doing so are present (Ross, 1979). However, the literature concludes that there is a role for regulators to mandate the disclosure of key information by firms.

First, the natural dynamics in capital markets can create incentives for information asymmetries to exist. Firms could have an incentive to withhold information should they incur costs or be disadvantaged (from a competition perspective) as a result. For example, detailed information on segment performance could reveal proprietary information which could be used by competitors, thus reducing the incentives for firms

⁴ The definitions of business units are likely to vary across different entities, and could refer to different product lines within a single entity or subsidiaries within a group.

to report information publicly (Feltham *et al.*, 1992, Hayes and Lundholm, 1996). Harris (1998) finds that operations in less competitive industries are less likely to be reported, which could be intended to avoid disclosing supernormal profits or high market shares. Shleifer and Wolfenzon (2002) show that large shareholders and insiders may be reluctant to commit to disclosures that limit their ability to extract private benefits, even if the disclosures are beneficial to the firm. Jiang, Kim and Pang (2013) show that corporate insiders have an incentive to increase information opaqueness in order to capture unexpected cash flows. Bushee and Leuz (2005) also show that disclosure costs are subject to economies of scale, and hence smaller firms are disincentivised from providing disclosures by the disproportionate costs they face.

Secondly, the literature points out that there could be market-wide effects or externalities associated with firm disclosures which are ignored or not fully internalised by firms when making decisions about what information to disclose. Disclosures can discourage unethical management behaviour, which helps to maintain confidence in markets and prevent the loss of market integrity (Kosaiyakanont, 2011).⁵ It facilitates the market-based monitoring of companies and is central to protecting shareholders' ability to exercise ownership rights and to influence management decisions. Disclosures of operating performance and governance arrangements provide useful benchmarks for managerial efficiency or conflicts of interest that help outside investors evaluate other firms, thereby reducing the overall cost of monitoring for the market (Hail, Leuz and Wysocki, 2009).

In addition, public disclosures also function as a commitment device for companies to provide credible information on a timely basis (Mahoney, 1997, Rock, 2002). In the absence of commitment, firms may choose to withhold information under certain conditions, such as during periods of poor performance (Miller, 2002). Disclosure requirements could therefore function as a commitment device to force firms to reveal information in both good and bad times (Verrecchia, 2001).

The literature therefore finds that regulated or mandatory disclosures seek to capture these externalities which would otherwise be ignored. The mandatory adoption of international accounting standards, such as the adoption of the International Financial Reporting Standards (IFRS) in the EU in 2005 is cited as offering a pertinent example. This stems from the premise that the adoption of internationally-recognised accounting standards in financial reporting increases the quality and quantity of corporate disclosure (Daske and Gebhardt, 2006; Hail and Leuz, 2007). For example, Bischof (2009) finds that the endorsement of IFRS 7 in Europe has led to an improvement in the quality of banks' financial disclosures, with a shift in focus from market risk to credit risk being observed.⁶ The standardisation of financial reporting also promotes easier comparisons of financial performance across firms. This means that the reported information becomes more useful to investors, even when holding the level and quality of disclosures constant (De Franco, Kothari and Verdi, 2010).

According to the literature, a particularly informative aspect of the accounting standards literature that is related to CBCR is the impact of IFRS 8 and SFAS No. 131. These two regulations sought to standardise segment reporting across companies, and has led to the disclosure of more country-specific information which are viewed as

⁵ Agency studies such as Shleifer and Wolfenzon (2002), Shleifer and Vishny (1997) and Lambert (2001) demonstrate how disclosures can mitigate problems of management appropriation.

⁶ IFRS 7, which became effective in Europe for financial years beginning after 31 December 2006, required entities that use financial instruments to provide qualitative and quantitative information on exposures to credit, liquidity and market risks. It also requires the disclosure of the significance of financial instruments and underlying accounting policies, such as underlying fair value assumptions (Bischof, 2009).

useful to investors. Following IFRS 8, several academic studies document an increase in the number of geographic segments for which information is available, and an increase in the number of companies providing country-specific information (Weissenberger and Franzen, 2012a; Nichols *et al.*, 2012; Cereola *et al.*, 2013).

The existing literature can be classified into the following four categories of the impact of disclosure on the economy:

- Capital market impacts, such as the impact on cost of equity capital and market liquidity;
- Transparency impacts, such as the impact on the information environment;
- Accounting quality impacts, such as the impact on earnings management; and
- Wider market impacts, such as the impact on competitiveness and other spillover impacts.

We explain these categories and set out the literature on each in more detail in the sections that follow.

Capital market impacts

The fundamental purpose of capital markets is to facilitate the appropriate allocation of capital from investors, who wish to earn a return on their savings, to entrepreneurs, who need capital in order to establish and expand their businesses.

There are two key challenges in capital allocation identified in the literature. The first is information asymmetry, which, in the context of capital markets, refers to the better information firms' managers have than their prospective investors as to the true value and profitability of the firm. The greater the gap in information between managers and investors, the greater the degree of information asymmetry. This is illustrated in the well-known "lemons" problem (Akerlof, 1970) and means that investors can be unwilling to pay more for securities from high quality issuers because they are unable to distinguish between good and bad quality firms. Because of this, high quality firms face the same borrowing rates as bad quality ones, which is at a higher rate relative to that which they would face if there were no information asymmetries.

If investors anticipate that they will face a price discount induced by information asymmetry when selling shares, investors are more likely to reduce the price at which they are willing to buy shares in firms' equity offerings (Diamond and Verrecchia, 1991; Baiman and Verrecchia, 1996; Ljungqvist and Jenkinson, 2001). For the firm this raises the effective cost of equity capital. If forecasting risks are high due to uncertainty, investors will demand excess returns for their investment, thereby increasing the firm's cost of capital (Barry and Brown, 1984, 1985, 1986).

Information asymmetries among market makers also affect their ability to execute trades at a reasonable cost (Helfin, Shaw and Wild, 2005). Market makers face informed traders who have superior information that is not reflected in market prices and uninformed traders who do not have access to such information. The market maker therefore expects to lose from trading with informed traders and gain from trading with less informed traders. The market maker is therefore incentivised to establish a large spread to minimise potential losses from the former and to maximise potential gains from the latter.

High bid-ask spreads and low liquidity result in the inefficient allocation of securities, which results in additional trading costs for investors for which they need to be compensated in the form of a higher rate of return or cost of capital (Garleanu and Pedersen, 2004). Amihud and Mendelson (1986) and Constantinides (1986) provide

support for the link between lower bid-ask spreads and a lower cost of capital by finding a significant relationship between higher spreads and higher yields.

The second capital allocation challenge identified in the literature is the agency problem. Investors typically delegate the responsibility for overseeing the operations of firms in which they have invested to managers, and these managers have incentives to make decisions that adversely impact on the interests of investors (Jensen and Meckling, 1976).⁷ Examples might include excessive management compensation or taking excessively risky decision because of potential management bonuses.

Corporate disclosures can play an important role in mitigating the information asymmetry and agency problems that could arise in capital markets, which could otherwise impede the optimal allocation of savings to investment opportunities. The disclosure of information reduces uncertainty regarding the true value of the firm, and enables investors to make more informed decisions about investment opportunities and evaluate whether the business has managed its resources in the interests of external owners or shareholders.⁸ Firms that wish to attract capital therefore have the incentive to distinguish themselves from rivals by increasing the quality of their public disclosures in order to reduce their effective cost of capital.⁹

There is an existing body of literature that seeks to establish the empirical relationship between disclosure quality and capital market outcomes. Studies that use the Association for Investment and Management Research (AIMR) analyst rankings of corporate disclosure as a proxy for voluntary disclosure quality tend to find a statistically significant relationship between disclosure quality and capital market impacts. For instance, Botosan and Plumlee (2002) study the association between the cost of equity capital and voluntary disclosure quality for a set of firms including banks, measured by AIMR rankings. They find a significant negative relationship between the firm's disclosure quality rank and their cost of equity capital. Similarly, Healy, Hutton and Palepu (1999) concluded that firms which experienced significant improvements in their AIMR disclosure ratings are associated with improved stock

⁷ Corporate governance refers to the structures and processes in place aimed at reducing the agency problem and aligning manager and shareholder interests (Armstrong, Guay and Weber, 2010), and are one way of mitigating agency problems. Corporate governance arrangements aim to ensure that management is held accountable to external stakeholders and that management takes business decisions that are in the interest of shareholders. The relationship between corporate governance arrangements and improved governance is supported by empirical evidence: Karamanou and Vafeas (2005) argue that the board size improves monitoring diligence and Pearsons (2005) finds evidence that banks with independent audit committees reduce the likelihood of financial statement fraud.

⁸ For example, an increase in disclosures provides analysts with more information to be factored into sophisticated financial models. Disclosure therefore bridges the information gap between what is predicted by analysts' financial models and managers' private information, thereby enabling financial models to become more accurate in reflecting a company's underlying value and to be more informative to investors.

⁹ In the literature, most studies examine the impact of disclosure on the cost of equity capital. We prefer to refer to the effective cost of equity capital. This is because in our view the way in which disclosure quality affects the cost to a firm of acquiring equity capital is through changes in the asymmetry of information between management and investors on future cash flows, rather than changes in the underlying cost of equity itself, which is driven by factors identified in the Fama-French "Three Factor model".



market performance, decreases in investor uncertainty and increases in institutional ownership, analyst coverage and stock liquidity.

Welker (1995) finds that the relative bid-ask spreads for firms with AIMR disclosure rankings in the bottom third were approximately 50 percent higher than spreads for firms in the top third. Espinosa, Tapia and Trombetta (2008) measure disclosure quality by the rankings of annual report quality of Spanish firms published by a business magazine (which is similar to the AIMR rankings for US firms), and also find a significant relationship between increasing the quality of disclosures and lowering bid-ask spreads. Therefore, with greater information disclosures and lower information asymmetries, bid-ask spreads fall, causing excess required returns to fall, and thereby lowering the effective cost of equity capital. By lowering liquidity risks and transaction costs, a firm's ability to raise capital in these liquid equity markets increases and firms are able to increase the price of their shares, lowering their effective cost of equity capital (Leuz and Verrecchia, 2000).

Other studies have constructed their own specific disclosure scoring indices to analyse the capital market impacts of disclosure. Hail (2002), for example, uses a voluntary disclosure quality index developed by the Swiss Banking Institute¹⁰ to directly measure disclosure quality, and finds a highly significant negative relationship between voluntary disclosure quality and the cost of equity capital. Poshakwale and Courtis (2005), unlike other authors, focus specifically on banks, and measured voluntary disclosure quality by incorporating 29 key aspects of financial and non-financial performance summarised under 6 categories: strategy, customers and markets, people and reputation, risk management, financial position, and financial performance. The authors find a significant relationship between voluntary disclosures by European and non-European banks and a lower effective cost of equity capital.

Another way for firms to signal their commitment to disclosure quality is by voluntarily adopting international accounting standards such as IFRS, which prescribe a higher level and quality of reporting than tends to be required by domestic accounting rules. For example, listed companies in the EU have opted to adopt IFRS standards on a voluntary basis before 2005 due to the perceived benefits of providing high quality financial information.

The findings from previous empirical studies on the impact of voluntary adoption of IFRS are mixed. Kim and Shi (2007) find a significant negative relationship between voluntary adoption of IFRS and the cost of equity capital.¹¹ Similarly, based on observing firms which voluntarily switched from German GAAP to US GAAP, Leuz and Verrecchia (2000) find a significant relationship between switching and lower percentage bid-ask spreads and higher share turnover, when controlling for firm size, financing needs, firm performance and ownership dispersion. However, more recent studies by Daske (2006) and Hail and Leuz (2007) find no significant relationship between voluntary IFRS adoption and either a lower effective cost of equity capital, or increased market liquidity.

¹⁰ The index encompasses three broad categories: background and non-financial information, trend analysis and management discussion and analysis and risk, value-based and projected information. Eugster measures disclosure quality of firms using Swiss GAAP, excluding those from the financial sector, on an index which covers impression, background information, non-financials, trend analysis, risk information, value based management, management discussion and analysis of annual financial statements, goals and credibility and sustainability.

¹¹ Their sample excludes firms from the US and those from the financial sector due to differences in reporting behaviour and the heavily regulated nature of the industry.

However, a later study conducted by Daske *et al.* (2013) shows that on average liquidity and costs of capital often do not change around voluntary adoptions of IFRS. However, when firms' discretion in adopting accounting standards are taken into account, the authors show that firms who voluntarily adopt international accounting standards in a genuine attempt to increase their commitment to transparency (i.e. a 'serious' adopter) demonstrate lower levels of cost of capital and higher levels of liquidity. These effects are not observed for firms who adopt the standards in name only while making very few changes to actual reporting practices (i.e. a 'label' adopter). The differences in outcomes help to explain why the previous evidence on the voluntary adoption of IFRS is mixed.

As discussed previously, the literature suggests that firm disclosure decisions do not always internalise market-wide impacts and are based solely on the assessment of firm-specific internal costs and benefits, and this does not lead to the socially optimal level of disclosure. There is therefore a role for regulatory requirements that compel firms to disclose certain information to correct for this market failure.

One such solution is the mandatory adoption of internationally-recognised accounting standards. Regulators expect that the adoption of IFRS will improve the comparability of financial statements, and the quality of financial reporting and transparency, to the benefit of investors.¹² There is a range of literature on the impact of mandatory adoption of IFRS. Studies of the mandatory adoption of the IFRS in the EU in 2005 have generally found a statistically significant relationship between IFRS adoption and capital market outcomes. Daske *et al.* (2007) find that the mandatory adoption of IFRS in the EU is associated with a lower effective cost of equity capital.¹³ This suggests that improving the quality of disclosures is effective when adopted universally, allowing investors to be able to compare disclosures and make more informed decisions. Florou and Kosi (2013) observe similar findings in debt capital markets, and show that IFRS adoption is associated with an increased likelihood of a firm accessing the bond market, and a decrease in their cost of bond issuance¹⁴. Similarly, Li (2009) finds that the mandatory switch to IFRS for EU firms has led to a lower effective cost of equity capital, due to enhanced information comparability; this result is stronger the greater a country's legal enforcement of the regulation.

Studies on segment reporting also show that an increase in the granularity of segment information is associated with improved capital market outcomes. Greenstein and Sami (1994) find that the implantation of the SEC's 1970 "line of business" segment reporting¹⁵ significantly lowered bid-ask spreads. Pelaez, Lara and Gine (2009) assign scores that proxy for the quality and detail of segment disclosures by designing their own index for US firms, and consider if this has an impact on Easton's (2004) measure of cost of equity capital. The authors find that an increase in the score is associated with a lower effective cost of equity capital. Similarly, Saini and Herrmann (2012) developed a scoring index to capture the number of segments and depth of detail of segment reporting in their study of the impact of SFAS No. 131¹⁶ on the quality of

¹² This aim is stated in EC Regulation No. 1606/2002, which mandates the adoption of IFRS for EU listed companies for annual financial statements dated 1 January 2005 onwards.

¹³ See also among others, Hail and Leuz (2007) and De Franco, Kothari and Verdi.

¹⁴ Although the authors do not observe a significant relationship between IFRS adoption and loan rates.

¹⁵ Mandatory requirement issued by the SEC in 1970 for US companies engaged in more than one "line of business" to issues segmented disclosures (Sommer, 1970).

¹⁶ Financial Accounting Standards Board (FASB) pronouncement No.131: 'Disclosures about Segments of an Enterprise and Related Information' (FASB, 1997). It established standards for disclosing information on operating and geographic



segment reporting for manufacturing firms. The authors also find a significant negative relationship between the granularity of segment disclosures and the effective cost of equity capital.

Transparency impacts

Disclosure quality is also linked to transparency. Transparency refers to the extent that disclosures reveal a firm's underlying economic position in an understandable way (Barth and Schipper, 2008). The term therefore encompasses many aspects of disclosure quality, such as the reliability, accuracy and the comparability of statements.

The impact of disclosure on transparency is linked to the role of intermediaries of corporate information. Management disclosures that are provided on a voluntary basis tend not to be directly certified by external parties, in a way that financial statements are subject to external scrutiny by independent auditors. The costs of monitoring for investors and external stakeholders can also be prohibitive, which exacerbates information asymmetries and agency problems. Therefore the credibility of voluntary management disclosures relies on its use and dissemination by external intermediaries, such as financial analysts, industry experts and ratings agencies (whose costs of monitoring are presumably lower), that engage in private information production to provide insights into managers' superior information or to identify any suboptimal use of firm resources. In fact, Schipper (1991) argues that financial analysts are sophisticated users of firm disclosures, and that it is for them that firm disclosures are ultimately intended. These intermediaries interpret firms' disclosures together with other market information in order to provide an independent view on the outlook and future performance of the business, for example by providing earnings and profits forecasts.

Following this logic, greater transparency should therefore allow analysts and other intermediaries to make more informed judgements or arrive at a consensus about the future performance and profitability of the firm, thereby mitigating the problems of information asymmetry and agency. For instance, Lang and Lundholm (1996) report that firms committed to providing informative disclosures are associated with a higher analyst following, more accurate forecasts and lower forecast dispersion and volatility.¹⁷ Likewise, Hope (2003) finds a significant relationship between the extent of accounting policy disclosures (as measured by the CIFAR rankings¹⁸) and lower forecast dispersion and reduced forecast errors. Floyd (2014) finds a significant association between increasing transparency¹⁹ and lowering forecast errors and dispersion. However, the following year; the author finds no association between transparency and analyst coverage, suggesting analysts respond more to longer-term trends in transparency.²⁰ The readability and presentation of reports have also been shown to improve transparency: Leavy, Li and Merkley (2011) demonstrate that less

segments, as well as granular information regarding products and services and major customers.

¹⁷ The authors use data from the Financial Analysts Federation Corporate Information

¹⁸ Centre for International Financial Analysis and Research evaluations of corporate disclosure levels, which consider the income statement, the balance sheet, cash flow, stockholder information and accounting policies of annual statements.

¹⁹ Transparency is measured by the extent to which earnings and changes in earnings co-vary contemporaneously with returns (Barth, Konchitichki, Landsman, 2013)

²⁰ Floyd uses OLS fixed effects and measures transparency using the empirical approach of Barth, Konchitichki and Landsman (2013), which uses a measure of the extent to which earnings and changes in earnings co-vary contemporaneously with annual stock returns.



reporting complexity leads to increased forecast accuracy and certainty (lower forecast dispersion).

The impact of IFRS adoption on transparency is well-documented in the literature. Wang, Young and Zhuang (2008) show that the mandatory transition to IFRS in 2005 for European firms led to lower forecast errors and dispersion, thus increasing transparency. Greater transparency allows analysts to make an informed decision regarding the true value of a firm, allowing a consensus about a firm to develop among analysts. In a similar study on IFRS adoption in the EU, Horton, Serafeim and Serafeim (2008) find that the largest improvement in the information environment (as proxied by analyst forecast accuracy, following and dispersion) are for firms that voluntarily adopted IFRS earlier due to the presence of externalities²¹. They observe a similar effect for firms that were forced to adopt the IFRS, but interestingly, the observed benefits were limited to non-financial sector firms.²² Ashbaugh and Pincus (2000) show that the adoption of the International Accounting Standard (IAS), which preceded the IFRS, has a significant relationship with decreasing the absolute value of the forecast error, increasing forecast accuracy.

The ability to compare financial statements efficiently is of considerable value to analysts, lowering the cost of acquiring information and increasing investor confidence and accuracy. This serves to aid the efficient allocation of capital and encourages cross-border investment and trade, generating much wider impacts. Stickney and Weil (2006) consider that a single firm's disclosures, on their own provide little context and are therefore of little value to investors. De Franco, Kothari and Verdi (2009) find significant relationships between an increase in the comparability of financial statements and greater analyst following, increased accuracy, reduced forecast optimism and a lower dispersion of analyst forecasts.²³

Bradshaw, Miller and Serafeim (2008) also confirm the importance of adopting common accounting methods in improving transparency. The authors find that there is a positive association between US firms which use atypical accounting methods and higher absolute forecast errors and increased forecast dispersion. Atypical accounting methods increase the complexity of analysis and cause frictions in comparing disclosures.²⁴

²¹ Ernstberegger, Krotter and Stadler (2008) show that the voluntary adoption of international accounting standards such as the IFRS or US GAAP by German firms led to improved forecast accuracy compared to firms using German GAAP. These findings are corroborated by Daske and Gebhardt (2006).

²² The lack of improvement for non-financial sector firms may be due to potential estimation errors and managerial bias arising from the application of fair value accounting (Muller et al., 2008) and the increased volatility of earnings, relative to historical-based measures.

²³ De Franco, Kothari and Verdi (2009) conceptually define financial statement comparability in two ways: (1) if for a given set of economic events, two firms produce similar financial statements and (2) if firms with correlated economic events and similar accounting of these events have correlated financial statements over time, and as such measure comparability by (a) the negative value of the average absolute difference between the predicted earnings of firm *i* and firm *j* and (b) the adjusted R^2 of the pair-wise historical correlation between the earnings of two firms.

²⁴ A firm is considered to use an atypical accounting method if they do not use the accounting method used by the mode of their industry (Fama and French industry classifications, 1997). An example is using the "Last In First Out" (LIFO) principle when most firms in the industry use "First In First Out" (FIFO). This is based on the idea that accounting method choices tend to cluster within industry (Bowen, DuCharme and Shores, 1999).

There is also some evidence to suggest that segmental reporting helps to improve transparency. Swaminathan (1991) finds a negative relationship between the SEC-mandated 1970 segment disclosures and the coefficient of variation of analysts' forecasts.²⁵ Similarly, Prather-Kinsey (2000) finds a negative relationship between the number of geographical segment disclosures and forecast dispersion and the median forecast error. Behn *et al.* (2002) find that geographical segment information under SFAS No. 131 lowered analyst forecast errors, proving evidence on the usefulness and importance of granular disclosures to investors. Botosan and Stanford (2005) and Venkataraman (2001) provide support for this result, finding a positive relationship between SFAS 131 segment reporting adoption and higher forecast accuracy. This is supported by Pelaez *et al.* (2009) who use their own segment quality index to find that analysts are better able to forecast the earnings of firms accurately where there is higher quality segment reporting.

Interestingly, other studies have also found that non-financial reporting, specifically corporate governance disclosures, can also have an impact on analyst forecasts. Dhaliwal *et al.* (2012) find that firm transparency in the form of corporate social responsibility (CSR) reporting is associated with lower analyst forecast error in countries where CSR performance is more likely to affect firm financial performance. There are empirical links between the quality of corporate governance disclosures and the accuracy of forecasts. Beekes *et al.* (2012) outline that the more transparent a firm is regarding the disclosures of its corporate structure and the more independent a board is, the more credible a firm's overall disclosures are deemed to be; it is this credibility that drives the relationship, with analysts then placing more weight on the information disclosed when forecasting. Furthermore, Beekes and Brown (2006) find that disclosures by better governed companies are more informative. Karamanou and Vafeas (2005) argue that the board size improves monitoring diligence and disclosures and Ahmad-Zaluki and Wan-Hussin (2010) conclude that effective corporate governance is associated with higher-quality disclosures flowing from managers to investors, increasing forecast accuracy. Therefore, corporate governance also drives accuracy by making disclosures more informative, increasing the overall value of disclosures to analysts.

Accounting quality impacts

The introduction of international reporting standards such as the IFRS (or its predecessor, the IAS) has also prompted research into the impacts of new standards on the quality of accounting information. For instance, in the absence of enhanced mandated disclosures, firms have the ability to engage in earnings management in order to present the entity in an artificially positive light to investors. Changes to reporting and accounting standards that seek to eliminate these incentives could improve accounting quality. Accounting quality is therefore important to ensure that financial reporting reflects the true economic condition of the business, and enables external stakeholders to exert market discipline effectively. Michael (2004) asserts that shortcomings in the comprehensiveness and timeliness of financial information exacerbated the negative impacts of the Asian financial crisis. Biddle and Hilary (2006) also suggest that high accounting quality reduces information asymmetry between managers and outside suppliers of capital and therefore would improve investment efficiency.²⁶ Accounting quality is negatively associated with investment-cash flow

²⁵ The coefficient of variation in analyst's forecasts is the square root of dispersion scaled by the absolute value of the mean forecast.

²⁶ The authors measure poor accounting quality as the presence of the following: earnings aggressiveness, loss avoidance, and earnings smoothing.

sensitivity (Biddle, Hilary and Verdi, 2006). Real earnings management²⁷ can also mask a firm's current unbiased economic performance, and could endanger its competitiveness in the long term (Wang and D'Souza, 2006, Zang, 2007).

There are three commonly-used proxies for accounting quality as applied in the literature. The first of these is earnings smoothing, which can be measured by the variability of change in net income, or the variability of change in net income scaled by the variability of change in cash flow operations. A high variability is consistent with less earnings smoothing, and therefore there should be a positive relationship between variability and accounting quality. The second concerns accruals quality. Firms which manage their earnings are more likely to display a larger negative correlation between accruals and cash flows, as managers respond to poor cash flow outcomes by increasing accruals. Similarly, a high magnitude of discretionary accruals indicates a greater level of earnings management, or lower accounting quality.

The third measure concerns managing earnings to achieve consistent positive earnings, which research suggests is a common goal of earnings management. Burgstahler and Dichev (1997) suggest firms have strong incentives to avoid reporting negative losses and exhibit consistent profitability, with the aim of maintaining their equity value (DeAngelo *et al.*, 1996). The theory behind this is that firms manage their earnings in order to report small positive earnings rather than negative ones.²⁸ Therefore, the presence of small positive earnings could be indicative of earnings management (Burgstahler and Dichev, 1997; Beatty *et al.*, 2002; Dichev and Skinner, 2002; Beaver *et al.*, 2003b; Phillips *et al.*, 2003, 2004; Frank and Rego, 2006; Roychowdhury, 2006; Jorgensen, 2007). Burghstahler and Dichev (1997) explain how earnings slightly less than zero occur infrequently, and earnings slightly above zero occur more frequently than a probability distribution of firm earnings would suggest, providing evidence for earnings management to achieve small positive earnings.

Barth *et al.* (2007) conducted a study on the impact of the application of International Accounting Standards (IAS) on accounting quality. In their study, earnings management is proxied by the presence of small, positive earnings. They find that the application of IAS has reduced the likelihood of small, positive earnings being present. The authors also find that net income volatility is higher for IAS firms and the correlation between accruals and cash flow is significantly negative for non-IAS firms, which together, suggest that IAS does lead to improved accounting quality and firms are less likely to manage their earnings.

Further improvements to accounting standards introduced by the IFRS have also led to more recent studies in this area. Barth *et al.* (2008) present three reasons why IFRS adoption leads to an improvement in accounting quality. First, by eliminating certain accounting alternatives and reducing the scope for managerial discretion, IFRS reduces the extent of opportunistic earnings management and thus improves accounting quality (Ewert and Wagenhofer, 2005). Second, the nature of IFRS as a principles-driven standard makes it less susceptible to managerial circumvention, and it is more difficult to avoid recognition of a liability through transaction structuring. Finally, IFRS permits measurements, such as the use of fair value accounting, which

²⁷ Accruals-based earnings management is where managers exercise discretion opportunistically over estimations and judgements that go into the process of preparing financial statements; whereas real earnings management involves managing earnings by changing the timing or structure of operating, investing or financial decisions.

²⁸ In the majority of literature this is measured by the binary variable which takes the value of one if earnings are between 0 and 0.01, where below 0.01 is considered small. Firms that consistently get a one are considered to be managing their earnings.

could better reflect the true financial position of the business than domestic standards.²⁹

In a similar vein, CBCR could lessen incentives for earnings management at the segment level by requiring firms to report detailed financial information. Investors may seek to reconcile the CBCR data with the annual accounts and the external scrutiny in this regard could lessen incentives to manage earnings

However, the evidence on the impact of IFRS on accounting quality is mixed, and is dependent on the conditions under which they are adopted. Barth *et al.* (2008) find that firms that adopted IFRS voluntarily are less likely to manage earnings towards a target after controlling for potential incentives that drive the choice of accounting standard. Christensen, Lee and Walker (2008) use managing earnings towards small, positive values as a proxy for accounting quality. The authors find a significant relationship between the adoption of IFRS and decreased earnings management for firms that voluntarily adopted IFRS, but no such relationship for firms that adopted IFRS only when it became mandatory. This finding provides some evidence for the importance of firm initiatives in driving accounting quality, rather than the imposition of mandatory accounting standards.

Chen *et al.* (2010) analyse the impact of increasing comparability as a result of mandatory IFRS adoption in the EU on accounting quality. In contrast, the authors find that IFRS adoption in the EU led to reduced likelihood of earnings management towards a target, a lower number of absolute discretionary accruals and higher accruals quality. However, the authors also find that firms engage in more earnings smoothing and less timely recognition of large losses even after IFRS adoption. Specific to the FS sector, Gebhardt and Novotny-Farkas (2011) examine the impact of IFRS adoption by European banks on accounting quality, and find that the change in the recognition and measurement of banks' main operating accrual item – loan loss provision – is associated with the reduced likelihood of income smoothing behaviour and increases timely loss recognition.

However, a recent study by Ahmed, Neel and Wang (2013) provides preliminary evidence that firms that adopted the IFRS only when it became mandatory exhibit a significant increase in income smoothing and aggressive reporting of accruals, and a significant decrease in the timeliness of loss recognition relative to benchmark firms. These results provide some evidence to suggest that firms who voluntarily adopt the IFRS are also more likely to have stronger incentives to report higher quality accounting numbers than firms who adopt the IFRS under a mandatory regime.

Botosan and Stanford (2005) find that firms were withholding segment information under SFAS No. 14,³⁰ concealing profits in less competitive industries in order to deter potential entrants, and this concealment was revealed with the mandatory implementation of SFAS No. 131. This suggests segmental reporting contributes to improving the information environment and can have an impact on increasing competitive pressures. Chen and Zhang (2003) also find that segment disclosures are useful for investors and increase firm value as they increase the relevance of accounting numbers to fair value. Pelaez *et al.* (2013) also find that better quality segment information is associated with improved earnings quality.

²⁹ However, Barth *et al.* (2008) also acknowledge that the lack of detailed guidance leaves managers with some discretion over reporting (Langmead and Soroosh, 2009). The lack of accounting alternatives could also lead to managers using less appropriate approaches to communicate the underlying economics of the business which may decrease accounting quality.

³⁰ FAS 14: "Financial Reporting for Segments of a Business Enterprise", 1976. This statement was superseded by SFAS No. 131.

Wider market impacts

The literature also recognises that there could be wider market impacts or externalities that are associated with improved disclosure quality.

There are studies that suggest that improvements in disclosure quality can have a “domino effect”, i.e. encouraging more and more firms to adopt better quality reporting practices. Grossman (1981) and Milgrom (1981) argue that rational consumers will assume that non-disclosing banks offer higher risk shares than others, thereby motivating higher quality banks to improve disclosures and stimulating competition if lower quality banks respond positively to this competitive pressure. However, Verrecchia (1983) argues that this is only true if disclosure is costless; if significant administration costs exist, only those with good news have an incentive to disclose information.

Chen, Young and Zhuang (2011) find that greater cross-border comparability of disclosures attributed to the mandatory adoption of IFRS by European firms, leads to spillover effects on foreign firms’ investment efficiency, although these firms have not adopted IFRS. Sejen (2013) finds a significant relationship between the EU mandatory adoption of IFRS and increased competition, as measured by the Herfindahl index.³¹ The author provides a theoretical explanation for this result: with harmonised accounting, investors are able to directly compare a larger pool of banks, creating incentives for them to differentiate themselves from rivals and thereby stimulating competition. Disclosure can also benefit other firms by revealing information about consumer trends, technological developments and other industry factors (Leuz and Wysocki, 2008).

Banks’ disclosures have also been linked to financial stability. Sowerbutts, Zimmerman and Zer (2013)³² argue that inadequate public disclosures by banks contributed to the financial crisis. The lack of information required by investors to assess bank risk caused a dramatic increase in funding costs as investors withdrew lending in times of systemic stress. Better quality public disclosures could therefore alleviate problems of asymmetric information between banks and investors, allowing capital to continue flowing to healthy banks. Improved disclosures therefore act as a tool for market discipline, by reducing the likelihood of banks taking on more risk than is desirable without the knowledge of investors, thereby reducing the likelihood of future financial crises. In a similar vein, Mehran and Mollineaux (2012) suggest that regulatory disclosure requirements that promote the quality of security prices can improve the governance of financial institutions.

Bischof and Daske (2013) also provide initial evidence that one-time mandatory disclosures about sovereign risk exposure lead to an increase in voluntary disclosures in following periods. The authors argue that the one-time mandatory disclosure can induce a shift in the voluntary disclosure equilibrium for two reasons: first, reporting structure that is implemented to fulfil the one-time requirement can be used in the future, reducing the future cost of providing voluntary disclosures. Second, the information from stress tests is used by investors to update their beliefs about banks’ sovereign risks. If banks do not continue to disclose their risk exposures, investors could interpret the withheld information as unfavourable, resulting in higher risk premia for the bank or lower cash flow expectations. These two factors contribute to

³¹ A measure of the degree of concentration of an industry.

³² The authors set out five areas where improvements in disclosures would be desirable. These are: funding risk, group structure, valuation, intra-annual information and financial interconnections.



the likelihood of firms continuing to provide these disclosures voluntarily following the one-off mandatory disclosure requirement.³³

Applicability of these findings to CBCR

Overall, the literature on the quality of voluntary disclosures and the impact of the adoption of accounting standards provides some evidence that improvements in overall disclosure quality (or improvements driven by the adoption of internationally-recognised accounting standards) are associated with better firm outcomes in capital markets, transparency and accounting quality.

We may be able to infer from the literature that the provision of segmental financial information specifically is likely to lead to an increase in the public availability and granularity of financial information, which contributes to a lower cost of equity capital (Pelaez *et al.*, 2009, Saini and Herrmann, 2012), better transparency (Venkataraman, 2001; Botosan and Stanford, 2005; Pelaez *et al.*, 2009) and improved accounting quality (Chen and Zhang, 2003; Botosan and Stanford, 2005; Pelaez *et al.*, 2013). This suggests that the implementation of CBCR, which requires the disclosure of key information on a country-by-country basis, could result in similarly positive impacts.

If CBCR leads to an improvement in disclosure quality, it may be cheaper for banks to access capital markets, and these benefits could be passed on to non-financial sector firms and households in the form of lower lending rates. Lower borrowing rates for banks can also lead to increased credit availability as banks, with the protection from bigger margins, are more willing to increase lending supply (Greenwald, Stiglitz and Weiss, 1984; and Baker and Wurgler, 2013). An increase in credit availability can also induce further investment, as credit availability has been identified as a key constraint for further investment by non-financial sector firms (Greenwald, Stiglitz and Weiss, 1984). Bassanini, Scarpetta and Hemmings (2001) and Leahey, Schich also show empirical evidence linking credit to the non-financial sector to increased investment.

Reducing the cost of equity has been linked to increased investment within the financial sector as it becomes more profitable to invest when borrowing costs are lower (Blundell-Wignall and Roulet, 2013). Investment decisions are theoretically based on a comparison of the certainty equivalent yield with market interest. If borrowing costs are lower this comparison encourages investment due to its relative greater returns (Modigliani and Miller, 1958).

Firms that undertake earnings management could have a short-term competitive advantage over their competitors due to their ability to report better than actual earnings. However, this can result in the misallocation of resources and result in misleading information provided to external stakeholders. The motivations seen to underlie the decision to manage earnings are avoidance of debt covenant violations, evasion of regulation, manipulation of perceptions held by market participants and maximisation of managers own compensation (Fang, 2012). Earnings management can have damaging, industry-wide effects on the credibility and quality of reported earnings, which leads to the belief that reported earnings do not reflect economic reality. This can cause volatility in stock prices and undermines the allocation of resources in capital markets. For example, it is well documented that earnings management causes inflated stock prices before price offerings, and the overly optimistic expectations then cause drops in stock shares (Tech, Welch and Wong, 1998; and Beneish and Vargus, 2002; Chou, Gambola and Lui, 2005).

³³ They show that although the bid-ask spreads of stress test participants generally increased following mandatory stress tests in 2011, the reduction in market liquidity is almost entirely attributable to participants who failed to commit to maintaining their disclosures on sovereign risks voluntarily.

Although earnings management in part maintains a perception of stability, in the longer term, reducing earnings management will increase financial stability. With less earnings management the market will be more aware of the true value of banks. Thus we could observe fewer cases of over- or under-pricing of stock, which reduces volatility and improves financial stability. If the introduction of CBCR has a credible impact on reducing the likelihood of earnings management, this results in fiercer competition to get the larger market share, earnings etc. in order to attract investors (Healy and Wahlen, 1999), which could also have a beneficial impact on competition.

However, Roberts (2010) sets out several reasons why the granularity of financial information may impart information of limited value externally with few significant impacts in practice. Firstly, although accounting standards have introduced requirements for segment reporting, the lack of detailed technical guidance on segment identification leaves management with significant discretion in identifying its primary and secondary reportable segments (the basis for choosing the main business units and/or geographic segments to report) and how these are presented. This means that companies can report relatively broad segments, covering quite different industries and/or distinct geographies.

Second, even if companies do disclose reasonably granular information, it may not be particularly informative either for management or external stakeholders. Highly integrated companies could have segments for which their individual performance is highly correlated with the performance of other segments, rather than be driven by the economic or institutional factors of the jurisdictions within which they reside. The segments may also not be comparable with the segments reported by other companies, as operating segments are likely to be determined by firm-specific characteristics. Additionally, the larger the common costs that have to be allocated across different segments, the more likely is the performance of individual segments to be dependent on the specific cost allocation method used, which is also likely to differ across firms.

Although the literature offers some interesting insights on the potential impacts of CBCR, the applicability of the evidence in the CBCR setting should be treated with caution.

First, while the research on voluntary disclosure quality generally yields positive impacts in terms of capital market outcomes, transparency and accounting quality, these results may not be generalizable in a mandatory setting, which is the case with CBCR. For instance, Ashbaugh and Pincus (2001), Guan *et al.* (2006) and Bae *et al.* (2008) show that the effects of mandatory IFRS adoption differ from the effects of voluntary adoption. The magnitude and statistical significance of the effects could therefore differ in comparison to previous studies following the implementation of Article 89.³⁴

Second, while the research on segmental disclosures offers some evidence to suggest that the public availability of information provided for individual business units or

³⁴ There is a general point to be made on the usefulness of event studies such as those on IFRS adoption. National accounting standards such as local Generally Accepted Accounting Principles (local GAAP) have been on a long-term pattern of convergence towards IFRS to smooth out the marginal costs of compliance in anticipation of IFRS adoption in the EU. This limits the explanatory powers of event studies that assess the impacts prior to and following mandatory IFRS adoption, as these local GAAPs already resembled IFRS to an extent. Related to this point, Daske *et al.* (2007) also caution that the mandatory adoption of IFRS coincided with improvements in enforcement and governance regimes, making it difficult to attribute the benefits in their entirety to IFRS.



geographic segments can have significant economic impacts, this is based on the impact of existing segment disclosure requirements (e.g. SFAS No. 131 and IFRS 8), which do not require information to be reported on a country-by-country basis specifically. We can only draw general conclusions in this instance on the impact of increasing granularity of financial information.

Third, whilst there is a significant body of literature that considers the impacts of disclosures by non-financial firms, similar empirical studies for the financial sector are generally lacking.³⁵ Such a study that focuses on the financial sector is timely, as the recent international financial crisis and other issues have arguably exposed the need for regulatory reform and improved reporting and disclosure requirements.

Fourth, banks have also gradually improved the quality of their disclosures over time. The historical studies we consider in this section consider the impacts of earlier incremental improvements to disclosure quality, however further improvements could be subject to diminishing returns. Banks are already subject to high disclosure requirements relative to other sectors, and it is unclear whether the increase in disclosures will amount to additional valuable information for investors and the general public.

Finally, econometric studies of this nature could be subject to estimation problems such as reverse causality. For instance, although these studies consider how changes in disclosure quality can influence firm outcomes, there could be some reverse causality, meaning that firm outcomes also influence their decisions on disclosure quality. If these factors are not properly controlled for by using the appropriate econometric techniques, it could lead to misleading results. The findings of more recent empirical research, which use more sophisticated econometric techniques to take into account potential estimation problems, have overturned results that were previously shown to be significant. For example, Eugster (2014) overturns the result in Hail (2002) by adopting a generalised method of moments (GMM) approach to control for dynamic endogeneity to account for the likely correlation between voluntary disclosure quality and the lagged values of cost of equity capital.³⁶ We

³⁵ Many of the studies we reviewed tend to exclude the financial services sector due to the differences in the regulatory environment and the nature and extent of the industry's regulated disclosures.

³⁶ Eugster (2014) uses the disclosure index developed by the Department of Banking and Finance at the University of Zurich and scores a sample of 293 Swiss companies. This index encompasses different aspects of public disclosure, such as overall impression, availability of background information, availability of non-financials, availability of trend analysis, availability of risk information, implementation of value based management, comprehensiveness of management discussion and analysis of annual financial statements, availability of goals and credibility and comprehensiveness of sustainability reporting.



therefore seek to address potential estimation problems using more sophisticated econometric approaches such as the GMM approach. This is discussed in more detail in the following methodology section.

We may conclude from the reasons above, that although the literature can be quite instructive on the impacts of firms' disclosure quality and, specifically, the impact of granular financial reporting, we should remain cautious about extrapolating these impacts to draw definitive conclusions for the impact of CBCR. This is because these studies do not relate directly to CBCR and therefore the results from the literature may not be generalisable in the context of CBCR.

Methodology development and data collection

In this section we outline our econometric methodology and the data and variables we used to assess the impact of disclosure quality. In particular:

- We summarise our key hypotheses and the outcome variables that we focus on in this study
- We set out the sample selection criteria to obtain the list of banks included in our analysis.
- We set out the disclosure quality scoring framework used to score the banks' disclosures in annual reports and discuss the patterns in banks' disclosure quality and how this has changed over time.
- We discuss the econometric methods we use in our regressions.

Hypotheses

Based on the literature review, we identified the following possible firm outcomes associated with changes in disclosure quality to be of interest in our study:

1. *Capital market impacts:* Cost of equity capital and bid-ask spreads. We hypothesise that an increase in disclosure quality leads to a reduction in the effective cost of equity capital and an increase in market liquidity, i.e. lower bid-ask spreads.
2. *Transparency:* The accuracy of analysts' earnings forecasts. We hypothesise that an increase in disclosure quality leads to an increase in the accuracy of analysts' earnings forecasts.
3. *Accounting quality:* The likelihood of earnings management, which is proxied by the presence of small, positive earnings. We hypothesise that an increase in disclosure quality leads to an increase in accounting quality, and hence, a reduction in the likelihood of earnings management, or the reduced frequency of small positive earnings.

We focused on these outcomes primarily because the existing literature provides a significant body of evidence on the relationship between disclosure quality and these outcomes. The literature review also informed the selection of the appropriate econometric methodology to be applied in our assessment.

Our study assesses the direct impacts on businesses as a result of an increase in disclosure quality. We acknowledge that there is a range of wider impacts that could result from the implementation of CBCR, including market-wide/spillover impacts, such as those on competition. Due to the lack of readily-available data, and in order to maintain the tractability of our analysis, this has not been explicitly quantified in our study.

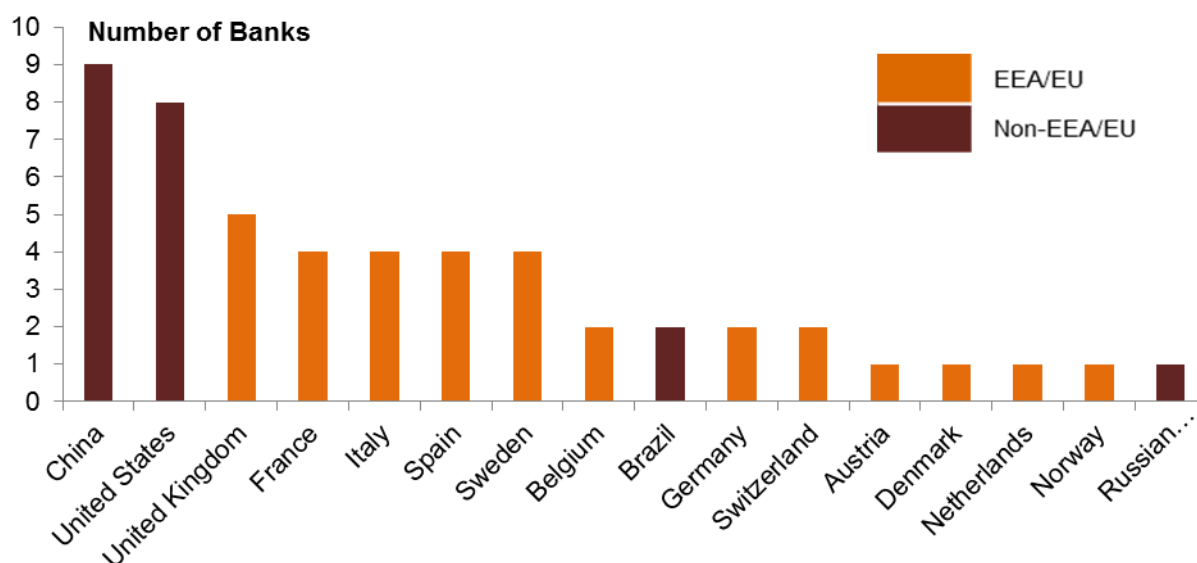
Bank sample

Our analysis focuses on large, cross-border banking groups to analyse the impacts of disclosure quality on the outcomes identified above. We shortlisted banks that meet the following criteria:

- Global systemically-important institutions as identified by the Financial Stability Board;
- Other large European banks identified by the Liikanen report; and
- Other large banks identified by Bankscope (those with assets exceeding €300 bn).

We also restricted the sample to publicly-listed banks where their disclosures are publicly available and where their financial year ends in December.³⁷ On this basis, we shortlisted 51 banks from 16 countries, 30 of which are headquartered in European Economic Area/European Union (EEA/EU) countries. The total assets across these 51 banking groups amount to €50.7 trillion.³⁸ Figure 2 shows the number of banks included in our analysis by country of headquarters. A full list of banks included in our analysis is provided in Appendix 1.2.

Figure 2: Banks included in our analysis



Source: FSB, Bankscope, Liikanen report, PwC analysis

Measuring disclosure quality

Our approach seeks to capture the impact of disclosure quality on the outcomes identified above. In order to analyse the impact of disclosure quality on the outcomes of interest, we needed first to measure the quality of firms' disclosure, looking at the amount and quality of information provided in annual reports.

In order to measure disclosure quality we developed a scoring framework that we have consistently applied to all firms in the sample.³⁹ Approaches of this nature have been widely-adopted in studies seeking to analyse the impact of disclosure quality on capital market outcomes (Hail, 2002; Danske and Gebhardt, 2006; Eugster and Wagner, 2011; Eugster and Wagner, 2013; Sowerbutts, Zimmerman and Zer 2013; Eugster, 2014). Disclosure indices are primarily used to provide researchers with the ability to quantify what is inherently a subjective and heterogeneous subject matter into a comparable metric which permits the application of sophisticated econometric techniques.

³⁷ Firms with non-December year-ends were excluded from the sample so that market information is estimated at the same point in time for each firm-year observation. This condition resulted in the exclusion of banks that are based in Australia, Canada and Japan.

³⁸ Data refers to 2013, source: Thomson Reuters.

³⁹ The scoring framework is drawn partly from the disclosure index constructed by the Department of Banking and Finance of the University of Zurich.

We reviewed the quality and depth of reporting provided in banks' annual reports and/or annual financial reviews for the years between 2000 and 2013. We only reviewed data from annual reports and financial statements as these are publicly-available and are consistently captured, rather than disclosures from other sources such as separate regulatory reporting, so that we focus on the main source of information for investors⁴⁰.

Annual reports of listed banks typically consist of two components. The first part of the report typically contains a narrative-based discussion of corporate strategy, financial year highlights, corporate governance arrangements, risk management and a high-level description of the firm's activities. The second part contains a set of audited financial statements, including the external auditor's report, financial statements and accompanying notes.

We identified a total of 15 specific scoring areas and these form the basis of banks' disclosure quality scores, drawing from the disclosure scoring framework in Eugster (2014). Banks are assigned a score of between 1 and 5 for each of these scoring areas, with a score of 5 representing the highest level of detail and quality of reporting. The maximum disclosure score achievable is therefore 75. The full set of scoring criteria is available in Appendix 1.3. These 15 specific scoring areas can be grouped into the following reporting categories:^{41,42}

- **Non-financials:** The quality and depth of the discussion of future or planned investments, employee and customer satisfaction and the discussion of corporate social responsibility, sustainability and environmental activities. The maximum score achievable is 20.
- **Growth targets:** This covers information on shareholder returns and the clarity of the exposition of specific targets and how they will be achieved. The maximum score is 5.
- **Market Share:** It is considered best practice for a bank to give a detailed explanation of its market share in different areas, by geography and/or by business unit. This category is scored out of 5.
- **Risk management:** This covers the quality and depth of discussion regarding risk management processes in the past year, the reporting of quantitative risk metrics, and risk strategy and objectives for the future. This section was scored out of 15.
- **Corporate governance:** This covers the quality and depth of the discussion of corporate strategy, and the reporting of the board structure, committees and board members. Banks were scored out of 10 for this area.
- **Regional breakdown:** Financial information can be segmented by business unit, geographic unit (e.g. Europe) or by individual country. Best practice would be granular financial data at the country level; additional business unit information is also scored highly. This was scored out of 5.

⁴⁰ Our analysis therefore omits any additional voluntary disclosure provided by companies such as interim reports, conference calls, roadshows and analyst meetings.

⁴¹ For example, under the specific scoring area of "discussion of corporate strategy", a bank which provides a detailed discussion of strategy for each business unit will be awarded a higher score than a bank which only provides a high-level overview of the firm's strategy. Similarly for the scoring area of "specific targets set out", banks that provide a detailed discussion on their growth targets across different business areas will be awarded a higher score than those that only state their future targets.

⁴² The total scores for each category differ as some categories have more disclosure criteria than others. The precise total scores for each category are less important as we consider each of the reporting areas in separate regressions.

- **Shareholder returns:** This section focuses on whether this information is disclosed and if comparisons against other companies are also included. Best practice is detailed information on how returns have changed over time. This was scored out of 5.

Banks are also given a general overall score out of five for general presentation and ease of use. Best practice is considered a report that is easy to navigate around and find information.

We have set out a clear and simple scoring framework to reduce the degree of subjectivity in the assignment of scores. A random sample of banks' reports was also scored independently by internal reviewers to ensure consistent scoring across banks and to minimise the issue of non-replicability.

This tailored approach to assessing reporting quality allows us to quantify the impact of overall disclosure quality, by summing the scores obtained by the banks across the individual scoring components. We do not weight the individual components that make up the disclosure score as we do not take a view on which types of reporting may be more important than others, as is consistent with the approach taken in Eugster (2014), Hail (2002) and Eugster and Wagner (2013). We can also separate out the impacts that can be attributed to specific components of the disclosure quality score, and in particular, the impact of the granularity of financial information (disaggregated at the country or regional level).⁴³

Our scoring areas cover both disclosures which firms voluntarily provide and those which are mandated by external regulations. Some disclosures are provided entirely at the firm's discretion and are not required by regulations, namely those in relation to non-financials, market share information and growth targets.

Other disclosure items are subject to regulatory requirements. For example, reporting on corporate governance arrangements is effectively mandatory⁴⁴ as set out by local corporate governance codes. Similarly, under EU Capital Requirements Directives and Basel II, banks also report on their key risks, such as credit, market, funding and operational risks as part of Basel Pillar 3 disclosure requirements (European Banking Authority, 2012) in their annual reports. However, this leaves some room for management discretion in terms of the breadth and depth of reporting. Our scoring method for the areas of corporate governance and risk management captures the overall quality of these aspects, i.e. both the mandatory and discretionary elements of disclosure.

Financial statements must also be prepared according to recognised accounting standards, such as the IFRS, US GAAP or national accounting standards. These standards set out the general principles for the calculation of financial items and the specific items and statements that must be disclosed. The accounting standards

⁴³ In our analysis, we have implicitly treated the individual scores as continuous. We believe this is a valid approach because our scoring data is drawn from a reasonably large sample of banks which are within the same industry. Second, the scores assigned to banks are applied consistently across the whole sample (i.e. measurement invariant), which means that a score of 3 for one category for one bank is the same as a score of 3 for the same category for another bank, thereby allowing a meaningful comparison across banks. In addition, we can also reasonably assume that equal thresholds of quality apply when moving from one score to another (Lubke and Muthen, 2009). This approach is also consistent with Eugster (2014), who uses the scores from individual components.

⁴⁴ For example in the UK the corporate governance code applies a "comply or explain" regime.



therefore influence the quality of the information provided in the financial statements of annual reports, such as the income statement, balance sheet, cash flow statement and accompanying notes. Our scoring method does not explicitly capture the quality of financial information provided.

We also score banks' annual reports on the public availability and granularity of financial information by geographic and/or business segment, which is particularly relevant to CBCR. We note that IFRS 8 (which applies to annual reports dated 1st January 2009 onwards) does introduce segmental reporting.⁴⁵ However, management retains some discretion in identifying its primary and secondary reportable segments (i.e. there is discretion in choosing the basis of main business units and/or geographic segments) and how these are presented. There is also no external requirement to provide market share information (other than what can be gleaned from segment financial information) for firms. Our scoring method for geographic segments therefore captures both mandatory and discretionary disclosure elements.

Overall, the existing evidence shows that accounting standards are only one of many factors that influence firms' reporting incentives. Even where firms are subject to the same accounting standards, reporting practices nonetheless differ considerably across countries (see, among others: Ball *et al.*, 2003; Ball and Shivakumar, 2005; Burgstahler *et al.*, 2006; Lang *et al.*, 2006). As accounting standards tend to be principles-based, management must use its judgement in providing reliable and relevant information, which could lead to substantial variation between banks. Banks' reporting incentives are also shaped by international and domestic regulatory requirements, investor demands, legal institutions, the strength of the enforcement regime, capital market force, ownership and governance requirements and operating characteristics (Hail, Leuz and Wysocki, 2009; Sowerbutts, Zimmerman and Zer, 2013). Ball *et al.* (2000), Fan and Wong (2002), Leuz *et al.* (2003), Haw *et al.* (2004) and Burgstahler *et al.* (2006) provide empirical support for the importance of firms' reporting incentives in influencing reporting and disclosure practices.

It is important to note that our disclosure quality score therefore captures both the mandatory elements (which are driven by regulatory and legal requirements) and voluntary elements (which are driven by investor demand, firm incentives etc.) of reporting, although we only take into account what is published in annual reports.

The length of banks' annual reports has grown considerably. A report by Deloitte (2011) finds that the average length of annual reports of UK banking groups is 300 pages, which is three times more than for the average listed UK company; the two longest annual reports of over 500 pages were produced by financial services firms (Grant Thornton, 2013). However, the increase in the amount of information provided is not always valuable to investors, especially if the increase in length also results in increased complexity, which can limit relevance and make it more difficult for investors to gauge the financial health of banks and to undertake an informed assessment of risk. The disclosure scoring framework we have employed does not take into account the complexity and attendant relevance of disclosure in order to limit the subjectivity imparted by the scoring method.

⁴⁵ IFRS 8, which introduces segmental reporting for reporting periods beginning on or after 1 January 2009, requires companies to adopt a management reporting approach in identifying and measuring the results of reportable operating segments, which is defined based on the company's internal organisational structure and the way management decisions are made in allocating resources and evaluates performance, which could be based on business segments or the regions in which the firm operates. IFRS 8 is largely similar to segment reporting requirements under US GAAP accounting standards (SFAS No. 131).

Disclosure Quality Scores

The disclosure quality scores are calculated from reviewing banks' annual reports and scoring the quality of banks' disclosures, assigning a score of between 1 (lowest) and 5 (highest).

Each of the 51 banks we reviewed was assigned a score in each of the different areas. The sum of the individual scores makes up the total disclosure quality score, with 75 being the maximum score. Figure 3 shows the boxplot of overall disclosure quality score over time for our sample of banks. The minimum, medium and maximum values rise, on average, from 2003 to 2013. This is consistent with our expectations, as banks' disclosures quality have been driven by increasing regulatory pressure, changes to accounting standards and shocks to investor confidence. The chart also shows significant within-year variation in the quality of disclosure among banks. The standard deviation has varied over time, ranging between 8.93 and 10.82. In general, the variation in quality has increased slightly over time.

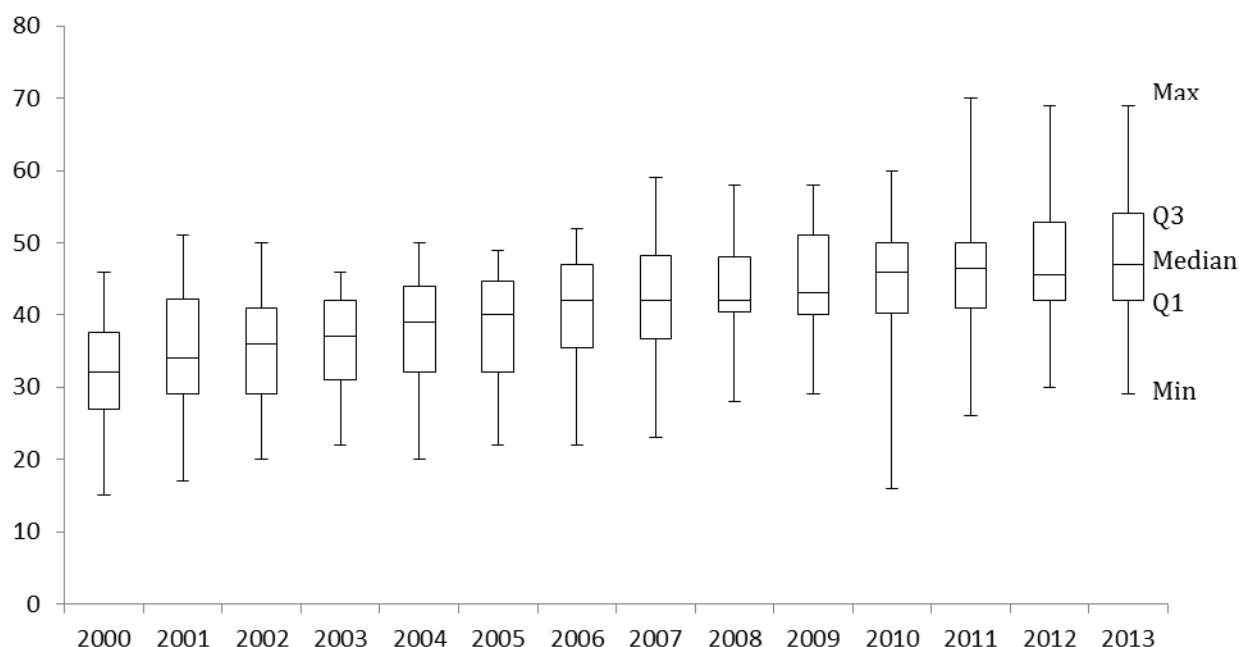


Figure 3: Total disclosure quality score over time, out of a maximum of 75

Source: PwC analysis

Table 1 shows the average across time for the scores of individual components of disclosure quality. Across the categories, the quality of disclosure has generally increased. The non-financial component has achieved the highest relative increase over time, increasing by 64% between 2000 and 2013.



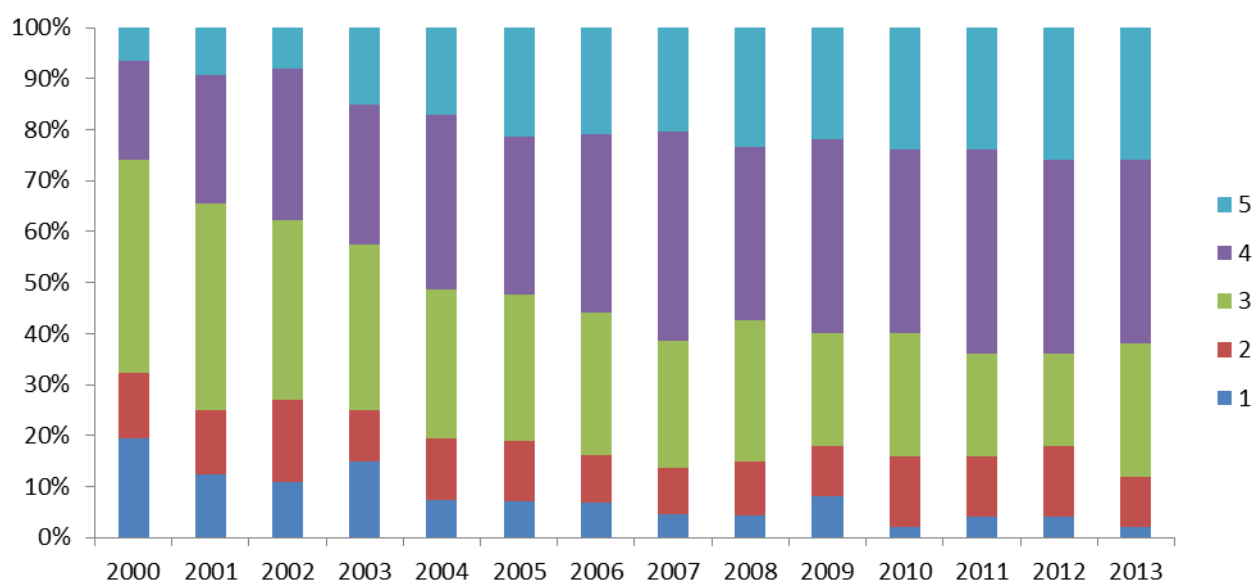
Table 1: Average scores over time of components of total disclosure quality score

	Regional Breakdown (/5)	Risk Management (/15)	Corporate Governance (/10)	Non- Financials (/20)	Shareholder Returns (/5)	Targets (/5)	Market Share (/5)
2000	2.81	8.35	5.29	7.94	2.89	2.58	2.13
2001	3.06	9.13	5.63	9.00	2.87	2.84	2.38
2002	3.08	9.68	5.46	9.03	2.84	2.59	2.32
2003	3.18	9.60	5.83	9.20	2.89	2.70	2.30
2004	3.41	10.07	5.88	9.44	3.09	2.98	2.24
2005	3.48	9.86	6.21	10.02	3.00	2.88	2.29
2006	3.53	10.26	6.51	10.93	2.91	2.86	2.47
2007	3.64	11.45	6.61	11.14	2.84	3.18	2.48
2008	3.62	11.79	6.79	11.83	2.84	2.98	2.55
2009	3.56	11.72	6.80	12.20	2.68	3.16	2.54
2010	3.66	11.80	6.96	12.16	2.89	3.38	2.20
2011	3.68	12.08	6.94	12.56	2.82	3.42	2.40
2012	3.68	12.02	7.26	12.70	2.77	3.60	2.42
2013	3.74	12.10	7.62	13.06	3.02	3.72	2.44

Source: PwC analysis

Regional breakdown is one of the scoring areas which has considerably increased over time. As can be seen in Figure 4, the percentage of banks that score five in this category has increased and the percentage of banks scoring one in this category has decreased over time. Overall, there has been a movement towards higher quality regional breakdown disclosure by banks which, as mentioned previously, could be driven by the changes introduced by IFRS 8.

Figure 4: Regional Breakdown Scores as a percentage over time



Source: PwC analysis

Identifying the appropriate methodology

In this section we set out our rationale for using the methods we applied in our regressions.

Regarding the cost of equity capital, bid-ask spreads and analyst forecast accuracy, our approach seeks to make an improvement on previous academic attempts by using more recent and sophisticated econometric techniques. We opted to use a dynamic system GMM approach; this choice was shaped by a number of key factors. For the earnings management regression, we use a logistic regression (as in Chen *et al.*, 2010), due to the nature of the dependent variable, which is binary. We discuss the use of both below.

Dynamic system GMM model

For the cost of equity capital, bid-ask spreads and analyst forecast accuracy, much of the existing research uses an ordinary least squares (OLS) regression approach. However, this method is vulnerable to endogeneity problems, which can stem from three different sources:

- **Measurement error:** this issue can be overcome by carefully choosing the variables used in the econometric model to ensure accuracy;
- **Reverse causality:** this is known as simultaneity and occurs when there is a circular relationship between the dependent and independent variables, specifically that the dependent variable is determining an explanatory variable. This causes bias to the coefficients and the model is unreliable;
- **Omitted variables:** often many variables which influence a dependent variable are unobserved or immeasurable, meaning they are omitted from the specification. If these factors are correlated with an explanatory variable and not accounted for in the model, this generates biased results.

First, in the context of disclosure and the effective cost of equity capital, there is likely to be reverse causality, meaning that a high cost of equity may incentivise banks to improve their disclosure quality (Eugster, 2014). Dhaliwal *et al.* (2012) show that companies with a high cost of equity capital are more likely to initiate voluntary disclosure in order to influence their future cost of equity capital. This problem of reverse causality violates a strong assumption implied by the OLS approach, i.e. where the current observations of the explanatory variable (e.g. voluntary disclosure) are independent of past values of the dependent variable. If this is not corrected for, the estimates we derive for the impact of disclosure quality on these outcomes are said to be *biased*. This suggests that our proposed econometric methodology will need to take into account this potential issue.

Similarly, certain variables, such as the cost of equity capital, can be highly correlated with its past values. This means that our econometric strategy must also take into account the dynamic nature of the relationship between disclosure quality and the outcomes of interest, and the underlying persistence of trends over time that is present in some variables.

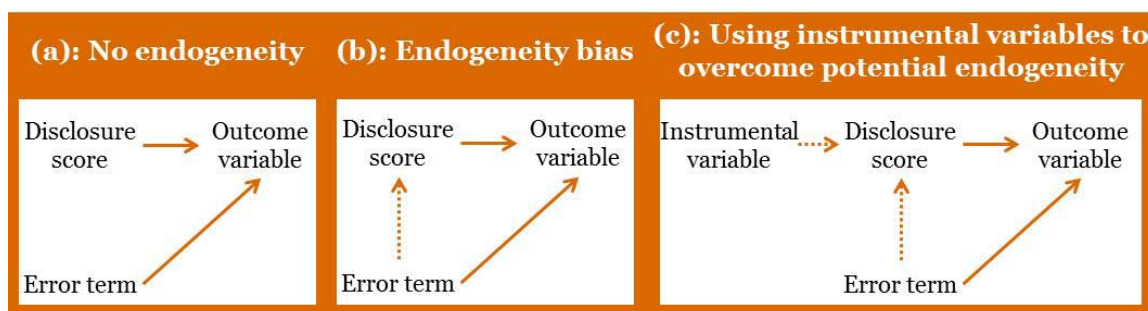
Second, voluntary disclosures could be influenced by unobserved firm-specific characteristics, such as managerial ability or its legal environment. Our review of the literature suggests that the quality of disclosures tend to be influenced by a range of factors, not all of which are observable. These fixed effects are firm characteristics, which are time-invariant, that can directly influence the dependent variable, e.g. managerial ability or the legal institutions to which the firm is exposed to within its country of headquarters.

This implies that our chosen methodology ought to account for banks' fixed effects. The central principle behind the fixed effects (FE) approach is that there is some factor at each firm level which may bias the dependent variable due to correlation between the error term and the explanatory variables. FE models serve to remove the time-invariant characteristics of the independent variables in order to mitigate omitted variable bias and generate unbiased and efficient estimators.

Some of the previous literature uses an FE model, which mitigates unobserved heterogeneity. However, this is still problematic for two reasons: first, the approach fails to overcome the problems of reverse causality endogeneity identified above. Second, related to the first point, introducing a dynamic element to the standard fixed effects framework, i.e. including the lag of the dependent variable as an additional explanatory variable is inappropriate and will result in inconsistent estimates (Wooldridge, 2002).

Figure 5 illustrates the concept of endogeneity and how this can be mitigated using an instrumental variable approach. Panel (a) shows that in the absence of endogeneity, both the disclosure score and the error term are correlated with the outcome variable, but not with one another. The error term typically accounts for, among other things, the influence of omitted variables on the dependent variable. As long as the omitted variables are uncorrelated with the included independent variables – in this case the disclosure score – an OLS regression will produce unbiased estimates. However, endogeneity arises when the omitted variables are in fact correlated with the independent variables (panel (b)), which biases the estimates using the OLS approach. In the context of the impact of disclosure quality on the effective cost of equity capital, we include the lag of the dependent variable (i.e. cost of equity capital) as an additional explanatory variable. However, since the lag of the cost of equity capital is correlated with the error term in the model, this leads to endogeneity.

Figure 5: Explaining endogeneity



One potential strategy to overcome both these issues is to use an instrumental variable (IV) approach combined with fixed effects (Shepherd, 2009).⁴⁶ This would require the use of an instrument, which is a variable that is strongly correlated with the potentially endogenous explanatory variable but also uncorrelated with the error term in the model. The instrument should only influence the dependent variable through the potentially endogenous explanatory variable, as shown in panel (c) of Figure 5.

A good instrument must fulfil two criteria. First, the instrument must be valid, meaning that the instrument must be independent of the error term.⁴⁷ Second, the instrument must be relevant, meaning that the instrument must have some explanatory power over the potentially endogenous variable and whether the instrument is correlated with the endogenous variable you want to instrument for.⁴⁸ In reality, finding an appropriate instrument that meets both the above criteria can be a considerable challenge. In the context of disclosure quality and the cost of equity capital, the instrument must directly influence disclosure quality, but not the cost of equity capital. In addition to the above criteria, Hail (2002), who uses a two-stage IV approach in his study of disclosure quality on cost of equity capital, acknowledges that the IV approach could lead to unreliable results due to a small sample size.

Therefore, a key motivation of this study is to overcome the issues that have been encountered in previous studies by adopting an econometric approach that accounts for these problems, and to improve the credibility of our results and to attempt to improve on the robustness of previous studies.⁴⁹ The above factors coupled with the findings of our preliminary data analysis suggest that a dynamic panel system generalised method of moments (GMM) estimator is appropriate for our analysis.

The GMM approach involves using an instrumental variable-based approach where higher lag values of the lagged dependent variable are used as instruments. In contrast to OLS in which the estimator minimises the squared vertical distances between the observation and the mean (the first moment), system GMM minimises the sample average of the second, third and fourth moments: the variance, the skew and the kurtosis.⁵⁰ The GMM approach overcomes the difficulty of instrument

⁴⁶ Ben Shepherd (2009) 'Development Consultant Dealing with Endogeneity' Trade Economist & International www.Developing-Trade.com.

⁴⁷ It is measured by the Sargan/Hansen J test of exogeneity.

⁴⁸ The Kleibergen Paap under-identification test measures the strength of this correlation.

⁴⁹ Our use of "robust" in this context is in reference to statistical robustness, i.e. statistical methods and results that are not unduly affected by deviations of statistical assumptions (e.g. non-normality, homoskedasticity).

⁵⁰ Kurtosis is a measure of the "peakedness" of the probability distribution.

identification as it works by using lagged historical variables in differences as instruments for the endogenous variables in the level regression (and vice versa), since lagged values are less likely to be influenced by current shocks.

This differencing also serves to eliminate any potential omitted variable bias and unobserved heterogeneity, which means firms' fixed effects, or firm characteristics that are time-invariant, are accounted for. The system GMM approach also does not specify a particular distribution of the errors. The instrumental variable approach can also deal with unobserved bank characteristics that vary over time. This is another reason why the system GMM approach is preferable.

To ensure the statistical robustness of our specifications, first, the instruments used must be valid. Our study uses various statistical tests to ensure that our specifications are not affected by problems of under-identification or weak-identification, as proposed by Baum, Schaffer and Stillman (2007). Second, the correct number of lags must be used. When testing for the correct number of lags (levels and differences), we ensured the model fulfilled certain criteria:

- **Blundell-Bond plausibility check:** the magnitude of the coefficient of the lagged dependent variable (e.g. cost of equity capital) from the system GMM estimation approach must be smaller than that when computed using OLS, but greater than when computed using a fixed effects model, such that $OLS > GMM > FE$. Hsiao (1986) argues that the OLS coefficient of the lagged dependent variable is expected to suffer from an upward bias due to the fact that it ignores specific effects, while Nickel (1981) argues that the coefficient in a fixed effects model is likely to be downward biased. Hence, Blundell and Bond (1998) rationalise that a plausible parameter estimate should lie within the two estimates;
- **The Hansen J test for instrument validity:** assesses the null hypothesis that the model is correctly specified and the over-identifying restrictions are valid; it tests if the instruments as a group are exogenous, ensuring the validity of the instruments. The Sargan⁵¹ test also tests for instrument validity, but it is not robust to heteroskedasticity, unlike the Hansen test. Due to the presence of heteroskedasticity in our model (as tested by the `xttest3` command on Stata), the Hansen test is our primary test. The criterion is that the Hansen J⁵² test result is greater than 0.05, but less than 0.9, such that $0.05 < x < 0.9$, meaning we would be unable to reject the null hypothesis of exogeneity. In addition to testing for instrument validity, Roodman (2009) contends that the test can also be viewed as a test of structural specification; omitting important variables may move components of variation into the error term and make them correlated with the instruments, where they may not be in the correct model;
- **The Arellano-Bond test for autocorrelation:** tests the null hypothesis that the model does not suffer from serial correlation; this test can be applied to different orders of correlation. We expect the AR test of order 1 to be rejected in our dynamic model, due to the historical feedback mechanism between the lag of cost of equity capital and the current period cost of equity. We require the AR

⁵¹ Tests for correlation between the instrument and the error term.

⁵² The Hansen test is used to assess the validity of the instruments, the null hypothesis assuming the instruments are valid. The Hansen test is robust to heteroskedasticity, unlike the Sargan test.

(2) test to not be rejected, to ensure serial correlation is not evident in the model.⁵³

- **The Cragg-Donald Wald F test:** this assesses whether the instruments are weakly identified⁵⁴; it effectively tests the null hypothesis that the explanatory variables are jointly insignificant and equal to 0. The Wald p-value must therefore be smaller than 0.05 in order to reject the null hypothesis and prove joint significance.⁵⁵ When more than one combination of lags met the other criteria outlined above, we judged which lag combination was most appropriate to use by choosing model with the highest Wald statistic.⁵⁶

Our system GMM model specification also applies the 'two-step' command to ensure that the model is robust to panel-specific autocorrelation and heteroskedasticity, and the 'collapse' command to avoid instrument proliferation.⁵⁷

Logistic model

The GMM is a linear regression where the dependent variable is assumed to be continuous and has a normal distribution. However, to test the relationship between disclosure quality and earnings management we use a linear probability model. This is because the dependent variable is binary (a dummy or a two-category variable), meaning that it takes only two possible values, i.e. zero or one. This is used to indicate the absence or presence of some categorical effect, in this case, the presence of earnings management in that particular year. The presence of 'small' positive earnings is considered to be indicative of the presence of earnings management. Therefore, in our study, we use a dummy variable which equals one if net income scaled by total assets is between 0 and 0.01.

Although an OLS model could be used, there are several problems with this. First, the usual interpretation of the slope coefficient, i.e. an increase in the value of the dependent variable given a single unit increase in the explanatory variable, does not hold when the dependent variable is binary. Second, the OLS method also no longer produces the best linear unbiased estimator (BLUE), and will therefore generate biased and inefficient variables. This is because the binary dependent variables are not normally distributed and its errors are heteroskedastic⁵⁸, which violates key requirements of the OLS in order to generate unbiased and efficient estimates.

⁵³ Tests for autocorrelation, also known as serial correlation, in which the error term in time t is correlated with the error term in time $t-n$; this reduces the efficiency of estimators. The AR(1) test checks for correlation between the value of the current dependent variable and its value one period ago; the AR(2) tests for correlation between the value of the dependent variable and its value two periods ago.

⁵⁴ Whether the instruments are weakly correlated with the exogenous variable.

⁵⁵ The p-value measures the probability of a test hypothesis being true.

⁵⁶ The Wald test cannot be used to compare across specifications, only to assess different lag combinations within a specification.

⁵⁷ Instrument proliferation can cause two problems (Roodman, 2009): 1. By being numerous, instruments can overfit instrumented variables, failing to expunge their endogenous components and biasing coefficient estimates towards those from non-instrumenting estimators. 2. Instrument proliferation also leads to imprecise estimates of the optimal weighting matrix used in the two-step variants of DGMM and SGMM estimations. In other words, the standard errors in two-step GMM will tend to be severely downward biased. We therefore use the "collapse" option in Stata to mitigate this problem. See Windmeijer (2005).

⁵⁸ Heteroskedasticity is where the standard deviations of a variable are non-constant.

A linear probability model, on the other hand, allows us to interpret the slope coefficient as the increase in the probability that the dependent variable observation will equal one given a single unit increase in the explanatory variable. We use a logistic regression, as used by Chen *et al.* (2010) and Barth *et al.* (2007), which is a popular technique for modelling dichotomous dependent variables and allows the dependent variable to imply a probability. This is based on a cumulative logistic probability function as follows, where P_i can be interpreted as the probability that the binary dependent variable equals 1:

$$P_i = \frac{1}{1 + e^{\beta_0 + \beta_1 x_i}}$$

A logistic regression transforms the binary dependent variable into a continuous variable by using the log of probability scores as the predicted values of the dependent variable, so that by running a logistic regression we obtain the following:

$$\ln \frac{P_i}{1-P_i} = \beta_0 + \beta_1 x_i$$

Where $\frac{P_i}{1-P_i}$ can be interpreted as the odds ratio, or the probability of a “success” outcome (in this context, where the dependent variable is 1, indicating the presence of earnings management) divided by the probability of a “failure” outcome (where the dependent variable is 0, indicating the absence of earnings management).

In our analysis of the impact of disclosure quality on earnings management, we use a panel logit model with random effects. A random effects model accounts for unobserved differences between banks, but unlike a fixed effects model, it assumes that the unobserved differences are not correlated with the explanatory variables. We used the Hausman test to assess whether the fixed effects or random effects model was more appropriate. The null hypothesis states that unobserved differences are not correlated with the explanatory variables, testing for the random effects model over the fixed effects model.

The estimation for the logistic regression is commonly performed using the statistical method of maximum likelihood estimation, which we use on Stata to perform our regressions. An interpretation of the results for this regression and the specification tests specific to logistic regressions are discussed in more detail in the results section of earnings management. Similar to the GMM however, a Wald statistic can be used to test for joint significance of the included variables.

Impact of disclosure quality on the cost of equity capital

In this section we outline our modelling approach, data and summary statistics, and the results from our modelling in more detail.

Section summary

We hypothesise that increasing the quality of disclosures, as measured by our disclosure quality index, will lower the effective cost of equity capital through mitigating information asymmetries.⁵⁹

We use a dynamic system GMM approach to test the relationship between disclosure quality and the effective cost of equity capital, given the potential estimation problems of endogeneity, reverse causation and unobserved heterogeneity across banks.

Overall, we find that an increase in the disclosure quality score has a significantly negative relationship with the effective cost of equity capital: an increase in disclosure scores by 1 unit lowers the effective cost of equity capital by 0.2 percentage points on average for our sample of banks. We find that of the components of the disclosure score, the regional breakdown of disclosures appears to be driving this relationship with the effective cost of equity capital. An increase in the regional breakdown score is associated with a decrease in the effective cost of equity capital.

Modelling approach

Our model specification is based on the Fama-French 'Three Factor Model' (1993), which states that an asset's expected return is determined by market risk (beta⁶⁰), size risk (market capitalisation) and financial distress risk (market to book value). These variables need to be controlled for because firms with a higher market capitalisation and market to book value are expected to deliver consistent and stable returns, which lower the cost of equity capital, and those with high market risk will have a higher cost of equity capital. These variables form the core of our basic specification, which we then augment to include banks' disclosure quality scores and a dummy equal to 1 if the observation falls in the year 2008 and equal to 0 if otherwise. We augment the Fama-French framework with our disclosure quality score, to investigate the usefulness of such a factor in explaining the time-series variation in cost of equity capital, over and above the role of the Fama-French factors.

We use a dynamic system GMM model due to endogeneity concerns. This model is likely to suffer from reverse causation, in which the relationship between the disclosure scores and the cost of equity capital also works in the opposite direction. If a bank has a high cost of equity capital, they have a stronger incentive to increase the

⁵⁹ In the literature, most studies examine the impact of disclosure on the cost of equity capital. We prefer to refer to the effective cost of equity capital. This is because in our view the way in which disclosure quality affects the cost to a firm of acquiring equity capital is through changes in the asymmetry of information between management and investors on future cash flows, rather than changes in the underlying cost of equity itself, which is driven by factors identified in the Fama-French "Three Factor model".

⁶⁰ Beta is a measure of the volatility of an asset or portfolio of assets in relation to the market as a whole; it measures the systematic risk of an asset due to general market movements, as opposed to idiosyncratic factors.

quality of their disclosures, in order to lower information asymmetries and increase investor demand, thereby lowering their cost of equity capital in the next period (Dhaliwal *et al.*, 2012; Eugster, 2014). Another source of endogeneity may come from omitted variables, in that the cost of equity capital may be determined by immeasurable and/or unobservable factors, such as managerial abilities. Our model is also likely to be dynamic, with past values of the cost of equity partially determining the current cost of equity capital, hence the inclusion of the lagged dependent variable. We estimate the following basic specification using a dynamic system GMM model:

$$\text{Cost of equity}_{it} = \alpha + \beta_1 \text{Cost of equity}_{it-1} + \beta_2 \text{Disclosure score}_{it} + \beta_3 \text{Beta}_{it} + \beta_4 \text{Log of market capitalisation}_{it} + \beta_5 \text{MTBV}_{it} + \beta_6 \text{Year08} + \epsilon_{it} \quad (1)$$

Table 2: List of variables used for econometric analysis

Variable	Expected Relationship	Description
Cost of equity _{it}		Average cost of equity capital for company <i>i</i> at time <i>t</i> , measured by the average of the Claus and Thomas (2001), Gebhardt <i>et al.</i> (2000), Ohlson-Juettner (2003) and Easton (2004) implied cost of equity capital approaches.
Cost of equity _{it-1}	+	Lag of the average cost of equity capital for company <i>i</i> at time <i>t-1</i> .
Disclosure score _{it}	-	Disclosure score, out of 75, using PwC disclosure quality scoring index for company <i>i</i> at time <i>t</i> .
Beta _{it}	+	Measure of an asset's risk in relation to the market of company <i>i</i> at time <i>t</i> .
Log of market capitalisation _{it}	-	Natural log of the equity market value of company <i>i</i> at time <i>t</i> .
MTBV _{it}	-	Market-to-book value of company <i>i</i> at time <i>t</i> .
Year08	+	A binary variable equal to 1 if year equals 2008 and 0 otherwise

The 2008 indicator variable is needed as an additional control because the 2008 financial crisis and subsequent recession imposed a negative shock on investor confidence and market liquidity, increasing the cost of equity capital; this impact needs to be controlled for in our model to avoid omitted variable bias. The inclusion of the dummy also takes into account that the recession may have had a considerable impact on disclosure scores, incentivising firms to increase the quality of their disclosures to help overcome the loss of investor confidence through increasing transparency, preventing bias of the disclosure score coefficient.⁶¹

⁶¹ We tested the inclusion of dummies for all years in our sample, and also tested different combinations of year dummies in our model specifications, in which the

In our regression we use the lag of cost of equity as an additional regressor, as it is likely that the previous period's cost of equity capital will have some impact in determining the current period's cost of equity capital; this introduces the dynamic element in our model.

For the reasons highlighted in the methodology section, we use the system GMM approach to analyse the relationship between disclosure quality and the effective cost of equity capital. To account for endogeneity, the system GMM approach uses an instrumental variable based approach where higher lag values of the lagged dependent variable are used as instruments. First differencing also allows us to control for firms' fixed effects, i.e. time-invariant unobserved heterogeneity.

We also test this specification with the scores of individual disclosure components by replacing the total disclosure score with the individual scoring elements. This serves to identify which types of disclosure (e.g. the public availability of financial information at the regional level or non-financial reporting) may be driving the overall relationship between disclosure score quality and the effective cost of equity capital. Specifying the individual component score separately from the overall score also helps to avoid any multi-collinearity that the individual components may have within the overall disclosure score.

Data and summary statistics

We calculated the cost of equity capital using a variation of equity valuation models that derive an internal rate of return, in which actual share prices are a function of the present value of expected cash flows (dividends). We infer the cost of equity capital by using the valuation models set out in Claus and Thomas (2001), Gebhardt *et al.* (2000), Ohlson and Juettner-Nauroth (2003) and Easton (2004). Using an *ex ante* approach, we reverse engineer these models to back out the cost of equity capital from current prices and future expected dividends. The first two methods are special cases of Ohlson's (1995) residual income valuation model whereas the other two models are abnormal earnings growth valuation models.⁶²

The models assume indirectly that prices reflect the value of the company and at least the semi-strong efficient market hypothesis of Fama (1970) holds. These models rely on earnings forecasts of financial analysts and so the implied cost of equity capital is only assessable for companies with an analyst following, meaning that the company is actively tracked by institutions that publish opinions and forecasts on the company and its equity. The banks in our sample are publicly-listed and all have an analyst following of at least five every year, which allows the estimation of cost of equity capital using the methods outlined above.

Consistent with the literature (Hail and Leuz 2006; Dhaliwal, Heitzman and Zhen, 2006; Daske *et al.*, 2007; Hope *et al.*, 2009; Li, 2009; Dhaliwal *et al.*, 2012; Eugster, 2014) we calculate a cost of equity capital measure for each bank-year observation in our sample which is based on an average of these four methods. The advantage of this approach is that the estimates are less noisy and less susceptible to any idiosyncratic shocks than if one individual method was used. For most banks, all four cost of equity capital measures can be calculated.⁶³

dummy for 2008 appeared to be consistently significant across these specifications. We included the 2008 dummy in our main specification on this basis.

⁶² See Appendix 0 for more details.

⁶³ Due to some of the differences in the model assumptions and data requirements, the number of estimates can vary across years for each bank. We made sure that estimates for at least two of these measures were available before including in our

The data for this analysis, with the exception of the disclosure quality score, is sourced from Thomson Reuters. We take an annual average of the monthly data for each of these variables in our analysis.

Table 3 reports the summary statistics for the independent and dependent variables included in our cost of equity capital specification.

Table 3: Summary statistics for variables used in the cost of equity model

	Mean	Median	Min	Max	Standard deviation
Cost of Equity	0.146	0.126	0.040	1.265	0.092
Disclosure Score	42.168	42.000	20.000	61.000	8.255
Log of Market Capitalisation	10.411	10.475	4.656	12.418	0.985
MTBV	1.533	1.388	0.023	6.001	0.890
Beta	1.302	1.230	-0.807	3.202	0.487

Source: PwC analysis

The cost of equity capital for the banks in our sample is around 15% on average, but this masks significant variation across time. Similarly, although the average disclosure score is around 42, it demonstrates significant variation across banks and also across time.

Table 4: Correlation between independent and dependent variables

	Cost of Equity	Disclosure Score	Log of Market Capitalisation	MTBV	Beta
Cost of Equity	1.000	-	-	-	-
Disclosure Score	0.175	1.000	-	-	-
Log of Market Capitalisation	-0.321	0.061	1.000	-	-
MTBV	-0.363	-0.312	0.183	1.000	-
Beta	0.178	0.117	0.164	-0.211	1.000

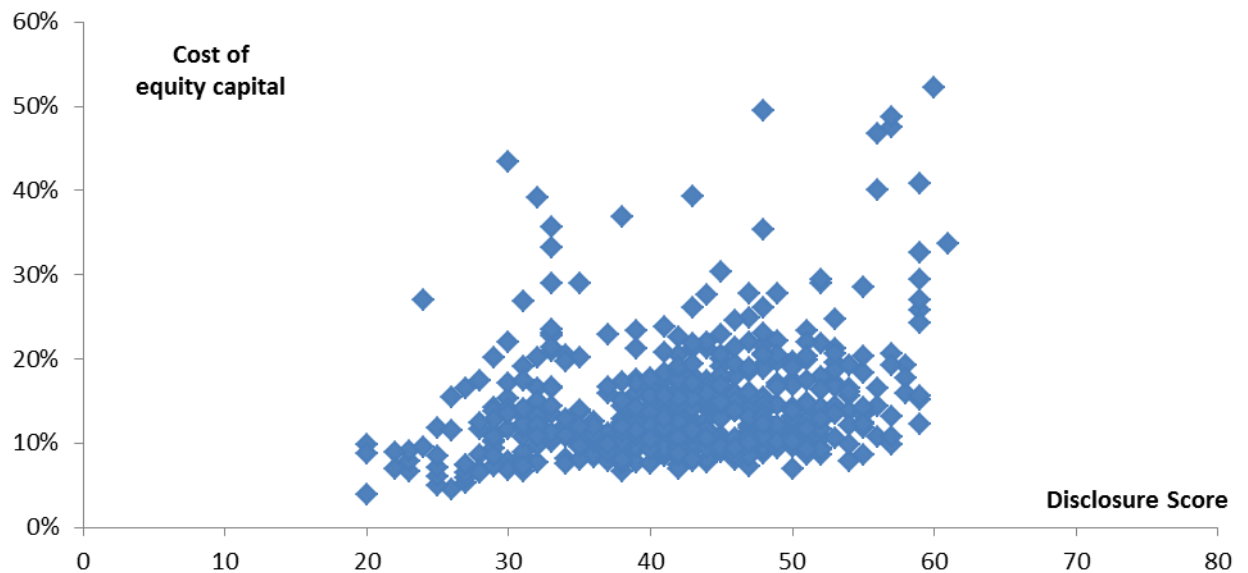
Source: PwC analysis

The correlation coefficients do not appear to indicate any issues of multi-collinearity, with the pairwise correlations of most variables remaining between -0.3 and 0.3. The data shows that disclosure quality score and the cost of equity capital are positively correlated, which is contrary to our expectations. The other explanatory variables included in our specification have the expected correlation with cost of equity capital, i.e. both the log of market capitalisation and MTBV have a negative correlation with cost of equity capital, whereas beta has a positive correlation with cost of equity capital.

analysis. We restrict the implied cost of equity capital estimates to be in the range of 0% to 150% to remove the presence of outliers in the data.

Figure 6: Scatter plot between the cost of equity capital and total disclosure score

Source: PwC analysis



The above scatter plot shows weak to no correlation between the cost of equity capital and disclosure score for our sample of banks, therefore it is not immediately obvious that a higher disclosure quality score leads to a lower cost of equity capital. However, it should be noted that neither the correlation coefficients, nor a simple scatter plot, are as informative as performing an econometric analysis using a dynamic system GMM model.



Results

Overall our regression results suggest that increasing the quality of disclosures lowers the effective cost of equity capital for banks; specifically, regional breakdown scores appear to be the driver of this relationship. Our results are shown in Table 5.

Table 5: Results for the impact of disclosure quality on cost of equity capital using the total disclosure score and regional breakdown score

Cost of equity capital	Total disclosure score	Regional Breakdown score
Total disclosure Score	-0.0017* (0.07)	-
Regional breakdown score	-	-0.018* (0.079)
Lag of cost of equity	0.3277*** (0.002)	0.2725*** (0.001)
Beta	0.0235* (0.07)	0.0328*** (0.001)
Log of market capitalisation	-0.0079 (0.42)	-0.0083 (0.175)
MTBV	-0.0378*** (0.000)	-0.029*** (0.000)
2008 Dummy	0.0252*** (0.000)	0.0187*** (0.001)
Constant	0.2778*** (0.005)	0.2509*** (0.002)
Firm-year	493	493
# of instruments	52	37
F-stat	282.78	316.90
Sargan p-value	0.000	0.013
Hansen p-value	0.514	0.542
AR(1) test p-value	0.006	0.007
AR(2) test p-value	0.137	0.064

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

There is a dynamic positive relationship between the lag of the cost of equity capital and the current period's cost of equity. The Fama-French variables, with the exception of the log of market capitalisation, are statistically significant, and are in the predicted signs: an increase in beta has a significant positive impact on the cost of equity capital. A low market-to-book value ratio, which is an indication of distress, results in a higher cost of equity capital, and conversely, a high market-to-book value puts downward pressure on the cost of equity capital.

The impact of an improvement in disclosure quality on the cost of equity capital could also be large. The modelling results show that an increase in the disclosure quality score by 1 lowers the cost of equity capital by 0.2 percentage points on average for our sample of banks. This relationship is statistically significant at the 10% level.

Market-to-book value and market capitalisation also have a negative effect on the cost of equity capital. Beta and the lag of the cost of equity have a positive impact, all in the expected signs.

However, the log of market capitalisation is insignificant with the inclusion of the 2008 dummy, which could be due to multi-collinearity⁶⁴; the financial crisis had a considerable negative impact on market capitalisation, meaning the two variables would both work to increase the cost of equity capital for observations in 2008. The 2008 dummy, which is highly significant, tells us that the cost of equity capital was 3.2 percentage points higher in 2008 than it was for other years in our sample.

We also test whether the score for regional breakdown has an impact on the cost of equity capital. We observe that the coefficients for beta and MTBV are significant, whereas for the coefficient for the log of market capitalisation is insignificant. The regional breakdown score has a significant impact on the effective cost of equity, consistent with the literature that information asymmetries are mitigated more effectively when investors have a more comprehensive and granular overview of a bank's geographic operations, improving knowledge, confidence and liquidity (Pelaez *et al.*, 2009; Saini and Herrmann, 2012). The regional breakdown coefficient was of a much greater magnitude than that for the total disclosure score, decreasing the cost of equity capital by 1.8 percentage points when the score increases by 1. This shows how important the regional breakdown of disclosures is in driving the relationship between disclosure quality and the cost of equity capital.

We proceeded to test the specific components of disclosure score individually, running six additional regressions. This was aimed at identifying which particular aspect of bank's disclosures is the driver of the significant relationship between disclosure score and the cost of equity capital. This allows us to develop a more comprehensive understanding of the relationship and how these findings can be applied to CBCR. These results are provided in Table 6.

The coefficients of the Fama-French variables appear to be consistently significant, with the exception of a loss of significance of the log of market capitalisation with the non-financials regression. We might have expected to see some significance of the shareholder returns, market share, targets and risk management scores, as it is intuitive to assume that investors would place great emphasis on historical returns, the bank's share of the market relative to its peers and how various types of risk are controlled for. In light of the recent financial crisis, it is reasonable to hypothesise that the risk management element of disclosures would especially be a driver of lowering the cost of equity capital.

A possible explanation for this lack of relationship may be due to the fact that banks have also provided increased disclosures on risk management controls and risk performance via other means, such as regulatory submissions, which reduces the importance of annual reports as the main source of information for investors about these issues.

It is perhaps understandable that the corporate governance and the non-financials component are insignificant. In general, the primary concern of a potential investor is the profitability of a firm and the financial returns they will make on purchasing shares. Therefore, disclosure aspects, such as corporate responsibility and sustainability, are unlikely to be an important driver in capital market outcomes.

⁶⁴ Collinearity arises when two or more explanatory variables are strongly correlated, exhibiting a linear relationship with each other. This causes bias of the coefficients and generates inefficiency of the estimator due to the fact the limited variation in the two explanatory variables is not providing unique information to explain the variation in the dependent variable.

The Hansen J test performed for all model specifications shows that the instruments used in our model are valid. The null hypothesis of instrument validity is unable to be rejected at the 5% level, with a p-value of 0.316 for the disclosure score model.

Regarding the Arellano-Bond test, the AR (1) tests were rejected across all specifications. This implies that the first lag of the dependent variable, in this case the cost of equity, is highly correlated with its current value, which justifies the use of a dynamic specification. The AR(2) test is unable to reject the null hypothesis of no correlation between the second lag of the dependent variable, meaning that serial correlation of order 2 is not an issue in our model specifications.

Before running the system GMM regressions, we tested for endogeneity in our model using Stata's "ivreg2" command, individually testing each explanatory variable for instrument validity and relevance. For validity, we used the endogeneity test and for relevance the Cragg-Donald Wald and Kleibergen and Schaffer tests are used. For many of the variables, we had to increase the lags used on the individual "ivreg2" tests, providing evidence to suggest that we should be using combinations of lags which are slightly higher for the overall GMM model, such as (7 1) and (8 1).

We conclude that increasing the quality of disclosures, specifically the geographic granularity of reports, has a significantly negative impact on the effective cost of equity capital, providing an empirical basis for the theory outlined previously. The disclosure requirement under CBCR is most closely captured by the regional breakdown component of our scoring index. This suggests the implementation of CBCR could lower the effective cost of equity capital in a similar manner.⁶⁵ However, as banks have already reported segmental information, it is uncertain whether incremental disclosures at the country level as required by CBCR will have similarly significant effects.

Robustness and sensitivity tests

Initially we augmented the basic specification to include an indicator variable equal to 1 if for company i at time t if it uses IFRS and equal to 0 if otherwise. The inclusion of the IFRS dummy did not alter the significance of the results, neither did the coefficient on the IFRS dummy appear to be significant. This is perhaps unsurprising, as most of the banks in our sample would have adopted other international accounting standards such as the US GAAP, towards which the IFRS standards are gradually converging. Therefore, introducing an IFRS dummy is unlikely to be sufficient to explain the variation across banks. There is also likely to be significant collinearity between IFRS adoption and disclosure quality, as the IFRS aims to increase the quality of disclosures through international harmonisation and the increased granularity of reporting. Therefore, this variable was excluded from our model.

We also included a dummy equal to 1 if the bank is headquartered in an EU or EFTA country to test whether non-EU/EFTA banks are affecting the significance of the results. The coefficient for this dummy did not appear to be statistically significant in our specification, which suggests that non-EU/EFTA banks are not affecting the statistical significance of the results. The system GMM approach also takes into account banks' fixed effects, which also includes the countries in which they are headquartered.

We also tested the impact of disclosure quality on the cost of equity capital, conditional on the state of the existing information environment as in Eugster (2014).

⁶⁵ Previous evidence from Fama Jr. (2006) show that the 'three-factor model' explains, on average, 95% of an asset's returns, which suggest that these factors could dominate the effects on cost of equity.



Specifically, we tested for the opaqueness hypothesis, i.e. whether the impact of disclosure quality on the cost of equity capital is limited to firms with a low analyst following. If this were true, for firms in a high information environment, an increase in the level of disclosure would be of limited value to investors. We used analyst coverage as a proxy for the information environment, specifically by using the number of forecasts available for each bank; this is included as an additional explanatory variable in our basic specification. We expect that banks in a low information environment with a high level of disclosure quality would have a lower cost of equity capital. We found that the significance of the overall disclosure quality score was robust to the inclusion of the analyst coverage variable, which suggests that firms in both a low- and high-information environment benefit from increased disclosure quality.



Table 6: Results for the impact of disclosure quality on cost of equity capital using individual disclosure scoring components

Cost of equity capital	Risk Management score	Corporate Governance score	Non-Financials score	Targets score	Market Share score	Shareholder Returns score
Risk management score	-0.0011 (0.738)					
Corporate governance score		-0.0006 (0.889)				
Non-financials score			-0.0022 (0.272)			
Targets score				-0.0021 (0.583)		
Market share score					0.0022 (0.739)	
Shareholder Returns score						-0.0001 (0.993)
Lag of cost of equity	0.2483** (0.012)	0.257*** (0.000)	0.2563*** (0.000)	0.2918*** (0.000)	0.2614*** (0.003)	0.2757*** (0.000)
Beta	0.0226* (0.079)	0.0318*** (0.001)	0.0286*** (0.003)	0.0208** (0.016)	0.0204* (0.073)	0.0226** (0.026)
Log of market capitalisation	-0.0195** (0.043)	-0.011* (0.086)	-0.001 (0.872)	-0.0153** (0.016)	-0.016* (0.074)	-0.0173** (0.025)
Market to book value	-0.0316*** (0.000)	-0.025*** (0.000)	-0.0296*** (0.000)	-0.0247*** (0.000)	-0.0265*** (0.000)	-0.0244*** (0.000)
2008 Dummy	0.0223*** (0.000)	0.0226*** (0.000)	0.0209*** (0.000)	0.0177*** (0.002)	0.0166** (0.015)	0.021*** (0.000)
Constant	0.3384*** (0.001)	0.2175*** (0.005)	0.1415** (0.049)	0.273*** (0.000)	0.2749** (0.012)	0.2868*** (0.000)
Firm-year	493.000	493.000	493.000	493.000	493.000	493.000
# of instruments	47	42	42	37	37	37
F-stat	278.47	172.40	173.23	268.74	163.51	333.42
Sargan p-value	0.000	0.000	0.000	0.012	0.002	0.006
Hansen p-value	0.423	0.418	0.384	0.544	0.462	0.400
AR(1) test p-value	0.010	0.008	0.007	0.007	0.011	0.008
AR(2) test p-value	0.105	0.090	0.060	0.107	0.101	0.120

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

Impact of disclosure quality on bid-ask spreads

Section summary

We hypothesise that improved disclosure scores will reduce bid-ask spreads due to improved intermediation for a firm's stock as a result of reduced information asymmetries between management and outside investors (Healy *et al.*, 1999; Leuz and Verrecchia, 2000).

We use a dynamic system GMM model to estimate this relationship to overcome possible estimation problems such as endogeneity within the regression.

Our findings suggest there is no statistically significant relationship between disclosure quality and bid-ask spreads. The lack of a relationship could be due to the fact that spreads tend to be driven by short-term changes in the trading environment and market factors, and less so by longer-term, structural factors such as disclosure quality.

Modelling approach

Information asymmetries can create costs by introducing adverse selection into transactions between buyers and sellers of shares. This typically manifests in reduced levels of liquidity for shares or large bid-ask spreads (Leuz and Verrecchia, 2000).

High bid-ask spreads can thus indicate the presence of information asymmetry, with market makers widening bid-ask spreads in order to protect themselves against making losses when transacting with better informed traders and to be compensated for bearing greater risk (Kyle, 1985; Glosten and Milgrom, 1985; Amihud and Mendelson, 1988; Diamond and Verrecchia, 1991; Leuz and Verrecchia, 2000).

We use the specification outlined in Espinosa, Tapia and Trombetta (2008). Prior research further supports the use of our controls (Hanley, Kumar and Seguin, 1993; Welker, 1995; Brockman and Chung, 1999; Healy *et al.*, 1999; Corwin, 1999; Heflin and Shaw, 2000, 2001). We estimate the following using a dynamic GMM approach:

$$\text{Spread}_{it} = \alpha_0 + \beta_1 \text{Spread}_{it-1} + \beta_2 \text{Disclosure score}_{it} + \beta_3 \text{Log of market capitalisation}_{it} + \beta_4 \text{Log of turnover}_{it} + \beta_5 \text{Beta}_{it} + \beta_6 \text{Year10} + \epsilon_{it} \quad (2)$$

As with our cost of equity regressions, we include the lag of the dependent variable to account for the historical feedback between past and current bid-ask spreads. High bid-ask spreads could incentivise banks to lower these in the next period by increasing the quality of their disclosures to lower information asymmetries. For this reason, and for the reasons set out in our methodology section, we use a system GMM approach in order to overcome potential estimation problems. The system GMM approach uses an instrumental variable based approach where higher lag values of the lagged dependent variable are used as instruments. First differencing also allows us to control for firms' fixed effects, i.e. time-invariant unobserved heterogeneity.

Table 7: List of variables used for econometric analysis

Variable	Expected Relationship	Description
Spread _{it}		Yearly average of daily relative bid-ask spreads for company <i>i</i> at time <i>t</i>
Spread _{it-1}	+	Lag of bid-ask spreads for company <i>i</i> at time <i>t-1</i>
Disclosure Score _{it}	-	Total disclosure quality score, out of 75, for company <i>i</i> at time <i>t</i>
Log of market capitalisation _{it}	-	Natural log of the equity market value for company <i>i</i> at time <i>t</i>
Log of turnover _{it}	-	The log of turnover value is the natural log of the annual average of the daily number of shares times the transaction price for company <i>i</i> at time <i>t</i>
Beta _{it}	+	Measure of an asset's risk in relation to the market for company <i>i</i> at time <i>t</i>
Year10	~	A binary variable equal to 1 if year equals 2010 and 0 otherwise

We hypothesise that an increase in disclosure quality leads to a reduction in the bid-ask spread. We include other explanatory variables that are likely to influence the bid-ask spread. These include the market value of a company, which we expect to have a negative impact on the spread. Larger firms often exhibit smaller spreads as there is more information available about them for investors, reducing the information asymmetries that can cause the bid-ask spread to widen. Liquid assets pose lower risks to investors of not being able to turn their holdings into cash, so a higher market capitalisation that is associated with lower information asymmetries and increased liquidity should reduce the risk of investing, and hence, the bid-ask spread.

The spread may also be influenced by other factors of liquidity, such as the share price of the company and the volume of shares traded in a given day. Banks that are traded at a higher volume and higher price (more valuable shares) are likely to have a narrower spread. Firms that are traded in lower volumes and at low prices are considered to be more illiquid, such that the broker needs to be compensated for the liquidity risk in carrying out the transaction, introducing a spread during the execution of the trade. Thus we expect a negative relationship between the spread and the log of turnover value and a positive relationship between the spread and the inverse of the share price.

We also included beta as an additional control variable in our specification. Beta is the CAPM measure of risk, specifically the volatility of stock returns. Banks that are more volatile tend to be associated with higher risks and are less liquid, and as a result will be more likely to face larger bid-ask spreads. We included the 2010 dummy in our specification by testing several model specifications with year dummies, in which 2010 consistently appeared to be significant.

Data and summary statistics

The bid-ask spread is measured as the yearly average of daily relative bid-ask spreads.⁶⁶ The data for this measure is obtained from S&P Capital IQ, while the remaining variables have been collected from Thomson Reuters on an annual basis.

Table 8: Summary statistics for variables used in the spreads model

	Mean	Median	Min	Max	Standard deviation
Spread	0.002	0.001	0.000	0.047	0.003
Disclosure Score	42.518	43.000	19.000	70.000	8.700
Log of Market Capitalisation	10.369	10.444	6.276	12.418	1.003
Log of Turnover	4.723	4.849	-0.047	8.213	1.524
Beta	1.316	1.236	-0.807	3.202	0.504

Source: PwC analysis

The standard deviation of the bid-ask spread is almost three times the size of the mean, suggesting it is highly volatile. The volatility stems from the large range of factors that affect the spread, particularly the array of macroeconomic factors that affect investor knowledge. Beta is also a relatively volatile component of the regression, which is consistent with the fact that banks have undergone a significant amount of volatility, particularly in recent years.

Table 9 shows the correlation matrix for bid-ask spread and the control variables used in our model specification. It provides limited evidence of strong multi-collinearity with most correlations coefficients remaining within -0.3 and 0.3. It also shows that there is not a strong correlation between disclosure score and spread, however, we do observe a negative relationship. The log of turnover does have a significant positive correlation with the log of market capitalisation. Similarly, Table 7 shows a scatter plot between total disclosure score and spread, which does not indicate a strong negative relationship between disclosure score and the spread.

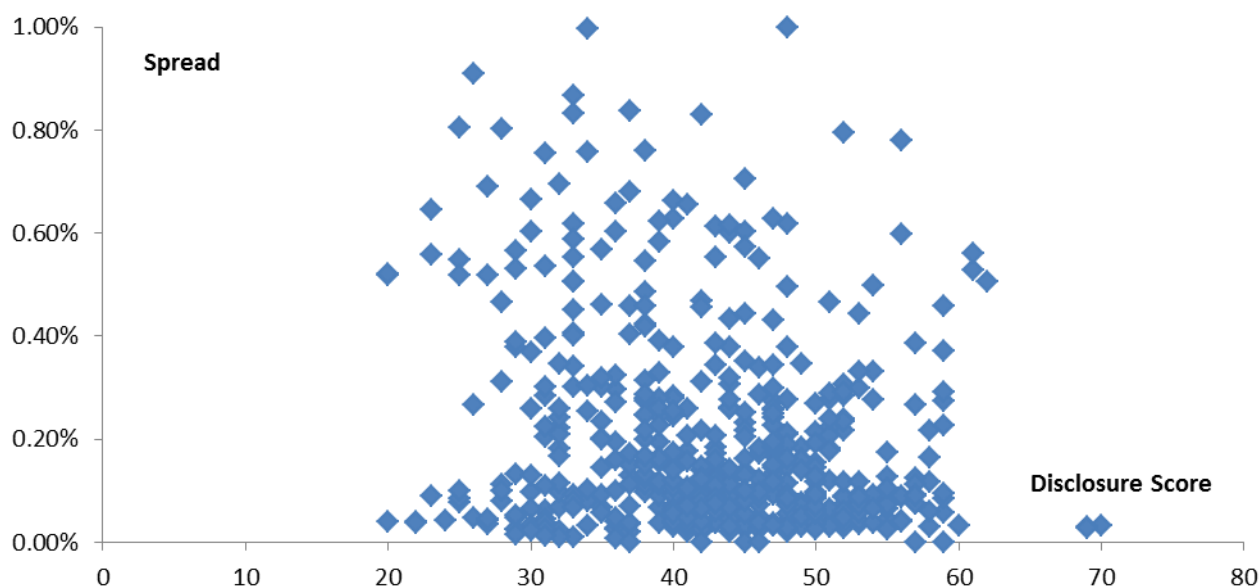
Spread seems to be correlated most strongly with market capitalisation, with the negative correlation implying that a greater market capitalisation reduces the bid-ask spread, which is consistent with the existing evidence that suggests bigger firms have a lower bid-ask spread. Spread is also negatively correlated with the log of turnover (with higher values of turnover indicating higher liquidity levels), however it is negatively correlated with beta, although this correlation is weaker.

Table 9: Correlation matrix for bid-ask spread

	Spread	Disclosure Score	Log of Market Capitalisation	Log of Turnover	Beta
Spread	1.000	-	-	-	-
Disclosure Score	-0.209	1.000	-	-	-
Log of Market Capitalisation	-0.375	0.092	1.000	-	-
Log of Turnover	-0.251	-0.026	0.704	1.000	-
Beta	-0.029	0.176	0.164	0.194	1.000

Source: PwC analysis

⁶⁶ This is the difference between the bid and ask prices, scaled by the midpoint of the bid and ask prices.

Figure 7: Scatter plot between total disclosure score and bid ask spreads

Source: PwC analysis

Results

Our results from the preferred model revealed that increasing the quality of disclosure does not have a significant effect on the bid-ask spreads, which may be because other short-term factors affect bid-ask spreads.

The results in Table 10 show that the lag of disclosure score does not have a statistically significant impact on bid-ask spreads (the coefficient is in the wrong sign but is insignificant). The lag of spread has a statistically significant (at 1%) and positive relationship with spread, as expected. Similarly the log of market capitalisation is significant at the 10% level, providing the relationship we expected. The log of turnover value has its expected sign, though it is not significant, whereas beta has the opposite sign but again is insignificant.



Table 10: Results for the impact of disclosure quality on spreads using disclosure score and the regional breakdown score

Spreads	Total disclosure score	Regional Breakdown score
Lag of Total disclosure score	0.0001 (0.558)	-
Lag of Regional breakdown score	-	0.0001 (0.796)
Lag of spread	0.5777*** (0.000)	0.4841*** (0.000)
Beta	-0.0005 (0.459)	0.0001 (0.878)
Log of market capitalisation	-0.0013* (0.054)	-0.0012** (0.037)
Log of turnover	-0.0001 (0.542)	-0.0002 (0.425)
2010 dummy	-0.0006*** (0.000)	-0.0006*** (0.000)
Constant	0.013** (0.027)	0.0145** (0.017)
Firm-year	506	506
# of instruments	37	37
F-stat	193.21	124.88
Sargan p-value	0.000	0.000
Hansen p-value	0.460	0.292
AR(1) test p-value	0.004	0.002
AR(2) test p-value	0.225	0.175

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

The sensitivity of bid-ask spreads to the macroeconomic environment can be captured in year dummies, with bad industry years having a positive correlation with bid-ask spreads. We ran the regression with all years and found 2010 to be consistently significant. We therefore included a dummy for 2010 in the specification.⁶⁷ The dummy for 2010 is negative and highly significant at 1%.

We also test whether the regional breakdown score has an impact on the spread measure, and similarly, found no statistically significant relationship.

We proceeded to test the other specific components of disclosure score individually, running six additional regressions. These results are provided in Table 11. The coefficients of the individual scoring components have the opposite sign, to the one we would expect; however none of these are significant.

⁶⁷ Removing the year dummies from the specification does not change the significance of any of the other variables.

We test the validity of these results using the Hansen J test. The p-values for all our model specifications are greater than 0.05, which means that the null hypothesis of instrument exogeneity cannot be rejected. The p-value is 0.460 for the specification for total disclosure score. Our specifications that test the impact of individual scoring components also pass the Hansen J test.

The null hypothesis was rejected in the AR (1) test, with a p-value of 0.004 which is well below 0.05 for the specification for total disclosure score. This suggests that the first lag of the dependent variable, in this case bid-ask spreads, is strongly correlated with its current value, justifying the use of a dynamic model in this case. For the AR (2) test we fail to reject the null of no correlation between the second lag of the dependent variable and the current value. Thus the serial correlation of order 2, between the current value of dependent variable and the value of its second lag, is not an issue in our model and does not need to be accounted for.

Before running the system GMM regressions we individually tested whether each explanatory variable was endogenous using Stata's "ivreg2" command and whether its instruments were both valid and relevant. For validity we used the endogeneity tests and for relevance we made sure that both the Cragg-Donald Wald and Kleibergen and Schaffer tests were satisfied. As in the cost of equity capital modelling, the Stata "ivreg2" test for instrument validity and relevance suggests that the optimal GMM model should have higher combinations of lags.

We conclude that increasing the quality of disclosures has little effect on the bid-ask spread. This seems surprising, given the significant results obtained for the impact of disclosure quality on cost of equity capital. Various studies have also documented the relationship between market liquidity and the effective cost of equity capital – a reduction in the bid-ask spread should be associated with a reduction in the effective cost of equity capital as investors require less compensation for being subject to liquidity risks. This suggests that the degree of influence of disclosure quality over the effective cost of equity capital is stronger than for bid-ask spreads, which may be more driven by short-term changes in the trading factors and other transient market factors.

Robustness and sensitivity tests

Similar to cost of equity, we included the IFRS dummy initially in our model specification. However, the IFRS dummy was not significant and its inclusion did not alter any of the results qualitatively. As explained in the previous section, it is unsurprising to observe a statistically insignificant coefficient on this variable, due to the growing similarities between IFRS and US GAAP. Due to this, as well as the potential risk of collinearity between disclosure score and IFRS, we decided to exclude the IFRS dummy from the regression.

We also included a dummy equal to 1 if the bank is headquartered in an EU or EFTA country to test whether non-EU/EFTA banks are affecting the significance of the results. The coefficient for this dummy did not appear to be statistically significant in our specification, which suggests that non-EU/EFTA banks are not affecting the statistical significance of the results.

We test the robustness of our results by using an alternative measure of liquidity as outlined in Amihud (2002), called *ILLIQ*, which is frequently used as a measure of illiquidity in the literature. The higher the value of *ILLIQ*, the lower the level of market liquidity. When a stock has a high value of *ILLIQ*, it suggests that the price moves quite a lot in response to trading volume, and thus the stock is considered illiquid. This involves calculating the annual average of daily stock returns divided by daily turnover value for each bank. This is set out as follows:



$$ILLIQ_{it} = \frac{1}{D_t} \sum_{j=1}^{D_t} \frac{|r_{i,j}|}{vol_{i,j}}$$

D_t is the number of trading days for firm i in year t , $r_{i,j}$ is the daily stock return for firm i on day j , and $vol_{i,j}$ is the dollar daily volume of stock traded for firm i on day j .

This measure therefore replaced the bid-ask spread as the dependent variable in our specification, and was regressed against the same set of explanatory variables as set out in Table 7. We also used the system GMM approach. We found that there is no change qualitatively to the results we obtained using bid-ask spreads. This provides support for the lack of evidence linking an improvement in disclosure quality with improved market liquidity.



Table 11: Results for the impact of disclosure quality on spreads using the individual disclosure scoring components

Spreads	Risk management score	Corporate Governance score	Non-Financials score	Targets Score	Market Share score	Shareholders Return score
Lag of Risk management score	0 (0.799)					
Lag of Corporate governance score		0.0002 (0.417)				
Lag of Non-financials score			0.0001 (0.411)			
Lag of Targets score				0.0006 (0.183)		
Lag of Market share score					-0.0003 (0.62)	
Lag of Shareholder returns score						0.0003 (0.32)
Lag of spread	0.4941*** (0.000)	0.3431** (0.042)	0.5341*** (0.000)	0.5671*** (0.000)	0.4581*** (0.000)	0.4645*** (0.000)
Beta	0.0001 (0.867)	-0.0007 (0.369)	-0.0004 (0.192)	-0.0002 (0.489)	0.0002 (0.609)	0 (0.927)
Log of market capitalisation	-0.001* (0.084)	-0.0029** (0.013)	-0.0015** (0.036)	-0.0015** (0.023)	-0.0011* (0.094)	-0.0014** (0.045)
Log of turnover value	-0.0002 (0.35)	-0.0007 (0.174)	-0.0001 (0.776)	-0.0002 (0.396)	-0.0002 (0.275)	-0.0001 (0.607)
2010 dummy	-0.0007*** (0.000)	-0.0004** (0.027)	-0.0006*** (0.000)	-0.0006*** (0.01)	-0.0005*** (0.003)	-0.0005*** (0.000)
Constant	0.0121* (0.061)	0.0351*** (0.007)	0.0159*** (0.009)	0.0152** (0.021)	0.0138** (0.019)	0.0151** (0.025)
Firm-year	506	506	506	506	506	506
# of instruments	37	42	37	32	22	37
F-stat	103.39	120.69	286.74	177.68	130.22	149.95
Sargan p-value	0.000	0.000	0.000	-----	0.000	0.000
Hansen p-value	0.385	0.291	0.539	nts.)	0.246	0.346
AR(1) test p-value	0.003	0.603	0.003	-----	0.006	0.003
AR(2) test p-value	0.152	0.603	0.293	0.001	0.119	0.207

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

Impact of disclosure quality on transparency

Section summary

This regression is based on the theoretical idea that through being more transparent and providing more information to the general public, banks can reduce investor uncertainty about their future earnings, increasing the accuracy of analysts' forecasts. We hypothesise that an increase in disclosure quality is associated with improved accuracy of analysts' earnings forecasts.

Again, we use the dynamic system GMM approach to this model, due to potential estimation problems, such as endogeneity.

We find some empirical evidence to support this hypothesis, as we observe a significant positive relationship between our disclosure scoring index and the accuracy of analysts' earnings forecasts: an increase in disclosure score by 1 increases forecast accuracy by 0.49 percentage points. We find that the driver of this relationship is disclosures relating to corporate governance and non-financial disclosures. However, our results provide limited support for the potential impacts of CBCR on forecast accuracy, as we find the impact of regional breakdown scores on accuracy to be insignificant.

Modelling approach

We use a model specification based on De Franco *et al.* (2009) to study the impact of higher quality disclosures on the accuracy of analysts' earnings forecasts, which serves as a proxy for the information environment. We hypothesise that an increase in disclosure quality is associated with an increase in analyst forecast accuracy. We use the following model specification:

$$\begin{aligned} \text{Accuracy}_{it} = & \alpha + \beta_1 \text{Accuracy}_{it-1} + \beta_2 \text{Disclosure score}_{it} + \beta_3 \text{Unexpected earnings}_{it} \\ & + \beta_4 \text{Negative earnings}_{it} + \beta_5 \text{Loss earnings}_{it} + \beta_6 \text{Earnings volatility}_{it} \\ & + \beta_7 \text{Earnings predictability}_{it} + \beta_8 \text{Log of market capitalisation}_{it} + \beta_9 \text{Days} \\ & + \beta_{10} \text{IFRS}_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

Accuracy_{it} in this context is defined as the absolute value of the forecast error, or the absolute difference between firm *i*'s actual earnings and the mean of analysts' earnings forecasts for firm *i* that is published in December each year for the following financial year. This is scaled by price and multiplied by -1, so that a higher value indicates increased accuracy and a lower value indicates lower accuracy.

We control for other determinants of accuracy which are commonly used in the literature (Hefflin *et al.*, 2003; De Franco *et al.*, 2009). Firms which experience more volatile earnings, earnings below last year's earnings (negative earnings) or earnings below zero (loss earnings) are likely to cause analysts' difficulty in forecasting as earnings do not demonstrate stability or predictability. The earnings predictability variable captures the extent to which historical earnings have exhibited a pattern over time – the higher the degree of explanatory power of previous years' earnings over current earnings, the more predictable earnings become. This enables analysts to forecast earnings accurately (Kross, Ro and Schroeder, 1990; Lang and Lundholm, 1996). The greater the number of days between the forecast being made and the earnings announcement date, the more likely it is for accuracy to decrease, as more recent forecasts have a greater chance of capturing new industry or market information that may affect earnings (Sinha *et al.*, 1997; Clement, 1999; Brown and

Mohd, 2003; Karamanou and Vafeas, 2005; De Franco *et al.*, 2009). We also control for banks' market capitalisation, as size is positively related to earnings stability, thereby improving forecast accuracy (Jelic *et al.*, 1998), leading to greater consensus among analysts (Beekes *et al.*, 2012).

We use a dynamic system GMM approach to test our hypothesis. This is due to potential estimation problems such as reverse causality: past values of forecast accuracy could influence firms' decisions over the current period's disclosure score. Banks for whom earnings forecasts are consistently inaccurate may have an incentive to increase the quality of their disclosure to reduce the likelihood of inaccurate forecasts. This is because inaccurate forecasts may give investors the perception that the bank's earnings are volatile or that the bank's disclosures are not transparent.

Table 12: List of variables used in the accuracy regression

Variable	Expected Relationship	Description
Accuracy _{it}		The absolute value of the forecast error, or the absolute difference between firm <i>i</i> 's actual earnings and the mean of analysts' earnings forecasts for firm <i>i</i> that is published in December each year for the time <i>t</i> (the following financial year). This is scaled by price and multiplied by -1.
Accuracy _{it-1}	+	Lag of the absolute value of the analyst December forecast error for company <i>i</i> at time <i>t</i>
Disclosure Score _{it}	+	Disclosure score, out of 75, using PwC disclosure quality scoring index for company <i>i</i> at time <i>t</i>
Unexpected Earnings _{it}	-	Absolute value of unexpected earnings, scaled by the stock price at the end of the prior year, where unexpected earnings is actual earnings less the previous year's earnings for company <i>i</i> at time <i>t</i>
Negative Earnings _{it}	-	Indicator variable that equals one if firm <i>i</i> 's earnings are below the reported earnings a year ago, and equals zero otherwise for company <i>i</i> at time <i>t</i>
Loss Earnings _{it}	-	Indicator variable that equals one if the current earnings is less than zero, and equals zero otherwise for company <i>i</i> at time <i>t</i>
Earnings Volatility _{it}	-	Standard deviation of the sixteen most recent quarterly earnings for company <i>i</i> at time <i>t</i>
Earnings Predictability _{it}	+	The R ² of a regression of annual earnings on prior-year annual earnings for the same firm for company <i>i</i> at time <i>t</i>
Log of Market Capitalisation _{it}	+	Natural log of the equity market value for company <i>i</i> at time <i>t</i>
Days _{it}	-	Number of days from the forecast date to the December earnings announcement date for company <i>i</i> at time <i>t</i>

IFRS_{it} - A binary variable equal to 1 if the bank used IFRS accounting standards at time *t* or equal to 0 if otherwise for company *i* at time *t*

We use a dynamic approach to account for autocorrelation in the relationship between forecast accuracy in the current period and in the last period. The more accurate a forecast was in the previous period, the more likely it is to be accurate in the next period due to the analyst becoming more familiar with the bank and adept at interpreting their disclosures. Furthermore, there may also be reverse causation occurring in the model, with less accurate forecasts encouraging firms to increase the quality of their disclosures in order to aid analysts in their predictions and increase investor confidence and liquidity. Therefore, we use a dynamic system GMM approach, as outlined in the earlier methodology sections, to account for endogeneity.

Data and summary statistics

We measure accuracy as the absolute value of the forecast error, multiplied by -1 and scaled by the stock price, so that a higher value implies higher levels of accuracy (De Franco *et al.*, 2009). Earnings announcements are typically made a few months following the end of the financial year and all the banks in our sample have a December financial year end. To construct the accuracy variable, we took the mean of I/B/E/S analysts' earnings forecasts that are published in December. The forecast error is the difference between the December forecasts and actual earnings subsequently announced by the bank.

The earnings predictability variable was constructed by regressing current earnings on lagged earnings (Lipe, 1990; De Franco *et al.*, 2009). A higher R^2 indicates that current earnings are somewhat explained by lagged earnings, suggesting earnings growth exhibits some trend or predictability.

Table 13: Summary statistics of analyst accuracy regression

	Mean	Median	Minimum	Maximum	Standard Deviation
Accuracy	-0.083	-0.036	-0.986	0.000	0.145
Disclosure Score	42.723	43.000	19.000	70.000	8.529
Unexpected Earnings	-0.010	0.003	-2.523	0.878	0.200
Negative Earnings	0.320	0.000	0.000	1.000	0.467
Loss Earnings	0.087	0.000	0.000	1.000	0.283
Earnings Volatility	0.561	0.156	0.000	10.372	1.169
Earnings Predictability	0.637	0.681	0.016	0.973	0.234
Log of Market Capitalisation	10.449	10.496	7.257	12.418	0.937
Days	415.132	413.000	346.000	537.000	26.459
IFRS dummy	0.574	1.000	0.000	1.000	0.495

Source: PwC analysis

The variable 'days' has the largest dispersion. The negative earnings variable is also very volatile, with a standard deviation greater than the mean. There is also a relatively large dispersion of accuracy, the absolute value of the forecast error, and the loss earnings.

Table 14 shows the correlation matrix for the disclosure quality score and other variables included in our model specification. Most of the pairwise correlations indicate

that the risks of multi-collinearity are minimal. There is a negative, but weak, relationship between disclosure scores and accuracy. Earnings predictability has a negative relationship with accuracy, which is surprising as it indicates that an increase in earnings predictability is associated with decreased forecast accuracy, while the volatility of earnings is positively correlated with accuracy. We observe a weak negative correlation between the number of days between the forecast date and the earnings announcement date, which is as expected. The log of market capitalisation is also positively correlated with accuracy.

There appears to be a moderate correlation between the IFRS dummy and disclosure score, which suggests that IFRS adoption is associated with better disclosure scores.

Table 14: Correlation matrix between variables in the accuracy regression

	Accuracy	Disclosure Score	Unexpected Earnings	Negative Earnings	Loss Earnings	Earnings Volatility	Earnings Predictability	Log of Market Capitalisation	Days	IFRS
Accuracy	1.000	-	-	-	-	-	-	-	-	-
Disclosure Score	-0.160	1.000	-	-	-	-	-	-	-	-
Unexpected Earnings	0.094	-0.088	1.000	-	-	-	-	-	-	-
Negative Earnings	-0.044	0.126	-0.322	1.000	-	-	-	-	-	-
Loss Earnings	-0.265	0.178	-0.255	0.313	1.000	-	-	-	-	-
Earnings Volatility	0.013	-0.032	-0.014	0.098	0.261	1.000	-	-	-	-
Earnings Predictability	-0.027	0.087	0.022	-0.095	0.078	0.106	1.000	-	-	-
Log of Market Capitalisation	0.203	-0.096	-0.070	-0.024	-0.140	-0.008	-0.075	1.000	-	-
Days	-0.105	0.134	-0.049	-0.054	0.129	-0.161	-0.003	-0.254	1.000	-
IFRS dummy	-0.166	0.484	-0.059	0.021	0.146	-0.097	0.023	-0.240	0.592	1.000

Source: PwC analysis

Results

Our econometric modelling reveals that the quality of disclosures has a significantly positive impact on the accuracy of analyst's earnings forecasts; this relationship is driven by the corporate governance and non-financial elements of our disclosure scoring index.

The results in Table 15 show that the relationship between disclosure quality and accuracy is significant at the 5% level, with an increase of disclosure score by 1 reducing the absolute value of the forecast error by 0.49 percentage points, increasing accuracy.

Table 15: Results for the impact of disclosure quality on accuracy using disclosure score and regional breakdown score

Forecast Accuracy	Total disclosure Score	Regional Breakdown score
Lag of Earnings Accuracy	0.3405*** (0.001)	0.2599** (0.021)
Total disclosure score	0.0049** (0.04)	-
Regional breakdown score	-	0.0364 (0.36)
Unexpected Earnings	0.1499 (0.374)	0.1653 (0.242)
Negative Earnings	0.0229 (0.203)	0.0293* (0.099)
Loss Earnings	-0.0797** (0.048)	-0.0655** (0.05)
Earnings Volatility	0.0074 (0.517)	0.0134 (0.306)
Earnings Predictability	0.019 (0.582)	0.0341 (0.265)
Days	-0.001 (0.285)	-0.0021 (0.106)
Log of market capitalisation	0.0899** (0.035)	0.1091** (0.013)
IFRS dummy	-0.1187* (0.079)	-0.1362* (0.078)
Constant	-0.7358 (0.183)	-0.434 (0.468)
Firm-year	375	375
# of instruments	51	51
F-stat	28.30	31.87
Sargan p-value	0.000	0.524
Hansen p-value	0.643	0.596
AR(1) test p-value	0.109	0.127
AR(2) test p-value	0.138	0.138

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

Source: PwC analysis

The lag of accuracy has a positive and highly significant impact on current levels of accuracy, which provides support for our dynamic model specification. We also observe that, of our control variables, loss earnings and the log of market

capitalisation exhibit consistent significance throughout our model specifications, both of which are in the expected signs; accuracy is lower for banks whose current earnings are negative, relative to those who had positive earnings. Forecasts for larger firms (as reflected in the log of market capitalisation) are also likely to be more accurate.

Unexpected earnings, negative earnings and earnings volatility are in the opposite signs, but are insignificant. The variable days is negative, i.e. the greater the gap between when the forecast is made and the earnings announcement date, the less accurate the forecast; however, this is also insignificant.

We also test whether the regional breakdown score has an impact on the forecast accuracy measure, and found no statistically significant relationship.

We proceeded to test the other individual components of disclosure score, again aimed at identifying the underlying reason for the significant relationship between disclosure score and forecast accuracy. Of the six individual components, the coefficient on corporate governance and non-financial disclosure scores are significant and positive. Corporate governance refers to the structures and processes in place aimed at reducing the agency problem and aligning manager and shareholder interests (Armstrong, Guay and Weber, 2010). As mentioned in the literature review, Beekes *et al.* (2012) explain how the transparency of disclosures regarding the corporate structure of a firm is related to the credibility of a firm's overall disclosures, meaning that analysts will place greater reliance on disclosures when forecasting. It is important to note that the significance of corporate governance scores is slightly higher than the disclosure score, providing further empirical evidence that the quality of corporate governance disclosures are crucial to the relationship with forecast accuracy. This finding for non-financial disclosure scores is perhaps surprising, as we would not necessarily expect an increase in the quality of non-financial information to have a significant positive association with forecast accuracy. These findings are consistent with Dhaliwal *et al.* (2012), and suggest that non-financial disclosures play a complementary role to financial disclosure and are informative to analysts.

As outlined in previous sections, to ensure the robustness of our model, the specification must meet several requirements. The lag combination of our chosen models met the Blundell-Bond plausibility check and specifies the highest Wald statistic. For the basic specification, and with the 2008 year dummy, we are unable to reject the Hansen J test's null hypothesis of exogeneity, supporting the validity of our instruments. This is also the case for the individual component regressions. Further, we reject the AR (1) test of autocorrelation of order 1, which indicates that there is a correlation between accuracy and its value in the previous period; but the results for the AR (2) test reveal we cannot reject the null of no autocorrelation, thus implying that the model does not suffer from autocorrelation of order two.⁶⁸

Before running the system GMM regressions we individually tested whether each explanatory variable was endogenous using Stata's "ivreg2" command and whether its instruments were both valid and relevant. For validity we used the endogeneity tests and for relevance we made sure that both the Cragg-Donald Wald and Kleibergen and Schaffer tests were satisfied. As in the cost of equity capital modelling, the Stata "ivreg2" test for instrument validity and relevance suggests that the optimal GMM model should have higher combinations of lags.

Our results reveal that there is a significant relationship between higher quality disclosures and the accuracy of analysts' forecasts and it is the quality of the disclosures relating to corporate governance, market share and shareholder returns that drive this relationship. We can only draw limited conclusions on the impact of

⁶⁸ Again, heteroskedasticity was present in this model, so we chose to focus on the results of the Hansen tests, as opposed to the Sargan test



CBCR on analyst forecast accuracy, as our results do not provide any evidence linking the score for regional breakdown and forecast accuracy. On this basis, we may conclude that it is unlikely that CBCR will drive further improvements in forecast accuracy.

Robustness and sensitivity tests

We found a significant relationship between the quality of disclosure score and the accuracy of analyst's forecasts, supporting the theory and the literature. In reality, analysts are likely to consider a much wider range of materials and sources than just annual statements released by the firm itself. Further, forecasts are also susceptible to market shocks and general economic trends. As our results suggest, analysts will place more weight on disclosures the more transparent and credible a bank's corporate governance structure is revealed to be. Similarly, information on the firm's market share in each business segment and shareholder returns also provide additional valuable information to analysts. It is the lag of accuracy which has the largest impact, of the significant variables, on the current period's accuracy, which is also intuitive as this variable captures the intrinsic abilities of analysts and how successfully they have understood the underlying potential of that individual bank.

We also tested for the exclusion of the IFRS dummy in our model specification. This did not alter the significance of the coefficients of the total disclosure score variable and the corporate governance score variable.

We also included a dummy equal to 1 if the bank is headquartered in an EU or EFTA country to test whether non-EU/EFTA banks are affecting the significance of the results. The coefficient for this dummy did not appear to be statistically significant in our specification, which suggests that non-EU/EFTA banks are not affecting the statistical significance of the results. The system GMM approach also takes into account banks' fixed effects, which also includes the countries in which they are headquartered.

We also tested the inclusion of year dummies in our model, specifically for 2008, in order to take into account the potential impacts of the financial crisis that could have impacted forecast accuracy. However, the 2008 indicator variable was insignificant in this specification, which ultimately led to its exclusion in our final specification. This might be explained by the fact that analysts had already anticipated the impacts of the crisis, and adjusted their earnings expectations accordingly.

**Table 16: Results for the impact of disclosure quality on analysts' earnings forecast accuracy using individual disclosure scoring components**

Forecast Accuracy	Corporate Governance score	Risk management score	Non-Financials score	Targets Score	Market Share score	Shareholders Return score
Lag of Earnings Accuracy	0.2931*** (0.001)	0.2846*** (0.005)	0.2881*** (0.01)	0.2915*** (0.002)	0.2894*** (0.002)	0.2624*** (0.002)
Corporate governance score	0.024** (0.042)					
Risk management score		0.0021 (0.781)				
Non-financials score			0.0128** (0.017)			
Targets score				0.0097 (0.206)		
Market share score					-0.0118 (0.593)	
Shareholder returns score						-0.0195 (0.306)
Unexpected Earnings	0.1469 (0.36)	0.1341 (0.453)	0.1512 (0.451)	0.1517 (0.387)	0.1515 (0.362)	0.1346 (0.435)
Negative Earnings	0.0275 (0.236)	0.0183 (0.417)	0.0248 (0.286)	0.0195 (0.371)	0.0208 (0.364)	0.0252 (0.281)
Loss Earnings	-0.0981** (0.023)	-0.0698** (0.043)	-0.0617 (0.163)	-0.061* (0.087)	-0.0747* (0.076)	-0.0669* (0.061)
Earnings Volatility	0.0048 (0.639)	0.0111 (0.389)	0.0115 (0.386)	0.0101 (0.435)	0.0059 (0.642)	0.0098 (0.462)
Earnings Predictability	0.0444 (0.233)	0.0365 (0.295)	0.0203 (0.644)	0.0243 (0.44)	0.0167 (0.599)	0.0447 (0.178)
Days	-0.0016 (0.125)	-0.0015 (0.22)	-0.0016 (0.189)	-0.0024** (0.043)	-0.0021* (0.092)	-0.002 (0.108)
Log of market capitalisation	0.0791** (0.045)	0.0956** (0.026)	0.1115** (0.034)	0.1082** (0.029)	0.0914* (0.078)	0.116** (0.019)



Forecast Accuracy	Corporate Governance score	Risk management score	Non-Financials score	Targets Score	Market Share score	Shareholders Return score
IFRS dummy	-0.0981* (0.085)	-0.0843 (0.201)	-0.1186** (0.045)	-0.0888 (0.116)	-0.0583 (0.4)	-0.0727 (0.236)
Constant	-0.369 (0.507)	-0.4596 (0.447)	-0.6538 (0.36)	-0.2403 (0.679)	-0.1298 (0.866)	-0.3835 (0.542)
Firm-year	375	375	375	375	375	375
# of instruments	51	51	61	51	51	51
F-stat	33.24	33.17	31.67	32.59	32.26	28.79
Sargan p-value	0.372	0.330	0.478	0.358	0.284	0.000
Hansen p-value	0.592	0.859	1.000	0.806	0.775	0.460
AR(1) test p-value	0.110	0.110	0.104	0.101	0.107	0.098
AR(2) test p-value	0.107	0.157	0.123	0.153	0.150	0.161

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

Impact of disclosure quality on earnings management

Section summary

We hypothesise that increased disclosure scores reduce the likelihood of managing earnings as they reduce the possibility of using accounting mechanisms to manipulate earnings.

We use a logistic model to estimate the relationship between disclosure quality and the likelihood of earnings management, due to the binary form the dependent variable takes.

Our results suggest that an increase in the disclosure score of 1 decreases the probability of managing earnings by 3.5% on average for our sample of banks. The drivers behind this seem to be regional breakdown scores and corporate governance scores.

Modelling approach

One of the measures used for earnings management in the literature is management application of accounting discretion to present small, positive earnings in financial reporting to avoid reporting negative ones. The presence of such 'small' positive earnings is considered to be indicative of the presence of earnings management. In our study, we use a dummy variable (Positive Earnings) which equals one if net income scaled by total assets is between 0 and 0.01.⁶⁹ This is underpinned by empirical research that is established in the literature, namely Burgstahler and Dichev (1997), which show that firms with the ratio net income to total assets lying within this interval are statistically more likely to be engaging in earnings management.⁷⁰

This concept of earnings management has also been used in Leuz (2003), which investigated the relationship between investor protection and earnings management. Lang, Raedy and Yetman (2002), use the same measure of earnings management to investigate the impact of accounting differences between firms cross-listing on US exchanges, along with the previously mentioned Chen *et al.* (2010), Christensen *et al.* (2008) and Barth *et al.* (2007).

Because the dependent variable, Positive Earnings, is a dummy variable, a logistic regression is used to model the relationship between disclosure quality and earnings management. A logistic regression estimates the probability of an event occurring, in this case the probability of Positive Earnings, taking the value of one. We can interpret the coefficients given in a logistic regression as the log of the odds ratio.⁷¹ Thus the

⁶⁹ 0.01 is the upper limit that indicates the presence of small, positive earnings.

⁷⁰ Based on an analysis of firms' distribution of earnings, Burgstahler and Dichev (1997) analyse the statistical distribution of earnings scaled by assets and find that earnings slightly less than zero occur much less frequently than would be expected given the smoothness of the remainder of the distribution, and earnings slightly more than zero occurs much more frequently than expected. This irregularity near zero is statistically significant, specifically in the interval between 0 and 0.01.

⁷¹ The odds ratio, or the probability of a "success" outcome (in this context, where the dependent variable is 1, indicating the presence of earnings management) divided by the probability of a "failure" outcome (where the dependent variable is 0, indicating the absence of earnings management).

exponential function of the regression coefficient is the odds ratio associated with a one-unit increase in disclosure quality.

We use a random effects approach in our logistic model. Unlike the fixed effects (FE) approach it assumes that the individual-specific effect is correlated with independent variables, the random effects (RE) approach assumes that individual-specific effects are uncorrelated with independent variables.⁷² Under the RE approach, rather than thinking of each unit as having its own systematic baseline (as in under FE), the intercept is the result of a random deviation from some mean intercept. We employed the RE approach as we have reason to believe that differences across entities have some influence on the dependent variable in our model. In order to test whether an FE or RE model is appropriate in this context, we use the Hausman test which compares the two models with a null hypothesis that the random effects model is preferred. We consistently get a p-value greater than 0.05, which suggests that the random effects model is preferred to fixed effects.

As we are using RE we need to control for the time-invariant heterogeneity across banks' countries of headquarters, hence the use of country dummies in our model. This heterogeneity includes specific domestic regulatory policies, legal systems, as well as institutional structures and socio-economic environments, which can also influence the likelihood of earnings management (Leuz *et al.*, 2003; and Burgstahler *et al.*, 2006).

Our specification is based on Chen, Tang and Jiang (2010), which uses Positive Earnings as the dependent variable, which equals one if net income scaled by total assets is between 0 and 0.01. In our specification we also include a dummy variable IFRS for IFRS adoption, and other controls for log of sales, growth, leverage and other variables which have been shown to influence the likelihood of managing earnings towards target (Lang *et al.*, 2003, 2006; Christensen, 2008; Barth *et al.*, 2008; Chen *et al.*, 2010). Table 17 sets out the variables used in more detail.

$$\begin{aligned} \text{Positive Earnings}_{it} &= \alpha + \beta_1 \text{Disclosure score}_{it} + \beta_2 \text{Log of sales}_{it} + \beta_3 \text{Sales growth}_{it} \\ &\quad + \beta_4 \text{Stock growth}_{it} + \beta_5 \text{Leverage}_{it} + \beta_6 \text{Liabilities growth}_{it} + \beta_7 \text{Sales/Assets}_{it} \\ &\quad + \beta_8 \text{Cash flow operations}_{it} + \beta_9 \text{No. of exchanges}_{it} + \beta_{10} \text{US Listing}_{it} \\ &\quad + \beta_{11} \text{Close shares}_{it} + \beta_{12} \text{IFRS}_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

⁷² A fixed-effects analysis can only support inference about the sample upon which we conduct the analysis, whereas a random-effects analysis allows the inference of the population from which the sample was drawn.

Table 17: List of variables used for econometric analysis

Variable	Expected Relationship	Description
Positive Earnings _{it}		A binary variable equal to one if the annual net income scaled by lagged total assets is between 0 and 0.01 for company <i>i</i> at time <i>t</i>
Disclosure Score _{it}	-	Disclosure score, out of 75, using PwC disclosure quality scoring index for company <i>i</i> at time <i>t</i>
Log of sales _{it}	-	Natural log of sales in millions of US dollars for company <i>i</i> at time <i>t</i>
Sales growth _{it}	-	Annual percentage change in sales for company <i>i</i> at time <i>t</i>
Stock growth _{it}	-	Annual percentage change in common stock for company <i>i</i> at time <i>t</i>
Leverage _{it}	+	End of year total liabilities divided by total assets for company <i>i</i> at time <i>t</i>
Liabilities growth _{it}	+	Annual percentage change in total liabilities for company <i>i</i> at time <i>t</i>
Sales/assets _{it}	-	Sales divided by lagged total assets for company <i>i</i> at time <i>t</i>
Cash flow operations _{it}	-	Annual net cash flow from operations scaled by lagged total assets for company <i>i</i> at time <i>t</i>
No. of exchanges _{it}	-	Number of exchanges on which a firm's stock is listed for company <i>i</i> at time <i>t</i>
US listing _{it}	-	A binary variable equal to one if the bank is also listed on any US stock exchange for company <i>i</i> at time <i>t</i>
Close Shares _{it}	-	Percentage of closely held shares of firm as reported by Worldscope for company <i>i</i> at time <i>t</i>
IFRS _{it}	-	A binary variable equal to 1 if the bank used IFRS accounting standards at time <i>t</i> or equal to 0 if otherwise for company <i>i</i> at time <i>t</i>

Log of sales is expected to be negatively related to Positive Earnings, as larger firms are expected to manage earnings towards a small positive target to a lesser extent. This could be due to the fact that larger firms are placed under more scrutiny, not only from shareholders, but also regulators and are subject to more rigorous auditing processes. The credibility of larger firms – which are often more well-known – is also at stake, so there are larger costs involved with manipulating earnings (Lemma, Negash and Mlilo, 2013). Similarly, stock growth has a negative relationship with



Positive Earnings, as firms with greater common stock are more liquid and therefore have less incentive to manage earnings (Fang, 2012). Similarly, cash flow operations and turnover follow the same relationship and can be seen as proxies of size and liquidity.

Sales growth and Positive Earnings are also negatively associated, as firms with slow growth are more likely to manage earnings. Leverage on the other hand has a positive relationship with Positive Earnings. Although having greater leverage can increase potential returns, it also raises the possibility of disproportionate losses. As such, banks with greater leverage could be perceived as riskier, and may be more likely to manage earnings as they face losses. This is similar for liabilities growth, as firms with greater liabilities have a greater incentive to manage earnings.

We expect the coefficient for US listing to be negative. This is because firms that are listed on any US stock exchange are subject to the US GAAP and the SEC's disclosure rules, which tend to be relatively more stringent than for firms headquartered in other countries contained within our sample. Thus firms listed on a US stock exchange are likely to have fewer opportunities to manipulate their negative earnings into small positive ones (Lang, Raedy and Yetman, 2002).

A firm with more closely held shares – has more shares held by affiliates of the company or its management – is considered to be less likely to manage earnings. Firms with more shares held by the company have less external shareholder pressure to meet earnings targets, so could have less of an incentive to manage earnings.

Our regression approach also accounts for the presence of country fixed effects by including country dummies, which take into account country-specific characteristics that are time-invariant, e.g. legal institutions affecting firms headquartered in different countries. We also include a dummy for IFRS adoption, which was made mandatory in the EU in 2005, but had been gradually adopted by some banks prior to this date. IFRS adoption is likely to reduce the likelihood of earnings management due to the decline in areas where managers could exercise discretion, thereby reducing the likelihood of small, positive earnings being present.

We note that national accounting standards such as local Generally Accepted Accounting Principles (GAAP) have been on a long-term pattern of convergence towards IFRS to smooth out the marginal costs of compliance in anticipation of IFRS adoption in the EU, which limits the explanatory powers of IFRS, and there is some variation across countries on the scope of IFRS adoption, which provides further support for the use of country dummies to control for these effects. We do not have prior expectations over the signs of individual country dummies, as different legal and institutional environments could cause different incentives and attitudes towards earnings management.

Data and summary statistics

Table 18 presents the key summary statistics of the main variables that are used in the regression. The leverage variable is the most volatile of the variables, as can be seen from the wide minimum and maximum differential. Companies in the banking industry naturally operate with a higher leverage as their assets are easily collateralized. The big variation in leverage is not unusual given the different economic climates and countries included in this analysis.

Table 18: Summary statistics of earnings management regression

	Mean	Median	Minimum	Maximum	Standard Deviation
Positive Earnings	0.604	1.000	0.000	1.000	0.490
Disclosure Score	41.558	42.000	15.000	70.000	9.152
Log of sales	17.168	17.263	13.680	18.929	0.994
Sales growth	0.119	0.087	-0.555	2.842	0.289
Stock growth	5.501	0.047	-0.999	3158.714	129.077
Leverage	7.217	6.203	-93.577	99.737	8.091
Liabilities growth	0.156	0.127	-0.453	5.971	0.341
Sales/assets	0.069	0.061	0.017	0.298	0.038
Cash flow operations	0.009	0.011	-0.265	0.136	0.031
No. of exchanges	3.639	4.000	0.000	12.000	2.430
US listing	0.574	1.000	0.000	1.000	0.495
Close Shares	0.278	0.223	0.000	0.969	0.261
IFRS	0.568	1.000	0.000	1.000	0.496

Source: PwC analysis

Table 19 shows the correlation matrix for the variables in our specification. It provides little evidence of multi-collinearity, with the majority of the correlation coefficients lying between -0.3 and 0.3. This means that the variables can be used together in the model specification.

The correlation between Positive Earnings and disclosure score suggests a positive relationship, which runs counter to our expectations that disclosure quality should reduce the likelihood of earnings management. As expected, we observe a negative relationship with sales growth, stock growth, Sales/assets, cash flow operations and Close shares. For the variables log of sales, leverage, number of stock exchanges and US stock exchanges we find a correlation opposite to what we would normally expect. There appears to be moderate correlation between the number of exchanges and log of sales, which is perhaps unsurprising as larger firms with larger sales values are more likely to have multiple listings globally.

**Table 19: Correlation matrix between the variables in the earnings management regression**

	Positive Earnings	Disclosure score	Log of sales	Sales growth	Stock growth	Leverage	Liabilities growth	Sales/assets	Cash flow Operations	No. of exchanges	US listing	Close Shares	IFRS
Positive Earnings	1.000	-	-	-	-	-	-	-	-	-	-	-	-
Disclosure Score	0.150	1.000	-	-	-	-	-	-	-	-	-	-	-
Log of sales	0.019	0.206	1.000	-	-	-	-	-	-	-	-	-	-
Sales growth	-0.118	-0.158	-0.033	1.000	-	-	-	-	-	-	-	-	-
Stock growth	-0.055	0.009	0.034	0.035	1.000	-	-	-	-	-	-	-	-
Leverage	0.179	0.109	0.040	0.020	-0.022	1.000	-	-	-	-	-	-	-
Liabilities growth	-0.124	-0.142	-0.086	0.435	0.040	0.002	1.000	-	-	-	-	-	-
Sales/assets	-0.296	-0.310	0.041	0.429	0.030	0.024	0.434	1.000	-	-	-	-	-
Cash flow operations	-0.015	-0.071	-0.016	0.122	-0.022	-0.121	-0.053	0.141	1.000	-	-	-	-
No. of exchanges	0.290	0.230	0.484	-0.111	0.002	0.165	-0.095	-0.107	0.005	1.000	-	-	-
US listing	0.227	0.042	0.310	-0.208	0.033	0.065	-0.111	-0.202	-0.033	0.576	1.000	-	-
Close Shares	-0.254	-0.061	-0.168	0.075	0.014	-0.033	0.092	0.074	-0.037	-0.343	-0.249	1.000	-
IFRS	0.001	0.371	-0.023	0.065	-0.062	0.069	0.007	-0.267	-0.009	-0.009	-0.121	0.115	1.000

Source: PwC analysis

Results

Based on our preferred model specification which was drawn from our literature review, our econometric results show that:

- Increasing the disclosure quality score reduces the likelihood of earnings management.
- Corporate governance and regional breakdown disclosures underpin the relationship between disclosure quality and earnings management.

Table 20 shows the results for the random effects logistic regression, which also controls for country fixed effects through the use of country dummies.

Table 20: Results for the impact of disclosure quality on earnings management using disclosure score

Positive Earnings	Total disclosure Score		Regional Breakdown score	
	Coefficient	Odds ratio	Coefficient	Odds ratio
Total disclosure score	-0.0353* (0.087)	0.9653* (0.087)	-	-
Regional breakdown score	-	-	-0.3148* (0.069)	0.7299* (0.069)
Log of sales	0.1211 (0.527)	1.1288 (0.527)	0.0211 (0.907)	1.0213 (0.907)
Sales growth	1.2289** (0.032)	3.4175** (0.032)	1.2183** (0.031)	3.3814** (0.031)
Stock growth	-0.3135 (0.246)	0.7309 (0.246)	-0.2794 (0.301)	0.7562 (0.301)
Leverage	0.0201 (0.22)	1.0203 (0.22)	0.0203 (0.231)	1.0205 (0.231)
Liabilities growth	0.4056 (0.456)	1.5002 (0.456)	0.4029 (0.45)	1.4961 (0.45)
Sales/assets	-31.6411*** (0.000)	0*** (0.000)	-29.661*** (0.000)	0*** (0.000)
Cash flow operations	4.8487 (0.277)	127.5806 (0.277)	5.4815 (0.228)	240.2022 (0.228)
No. of exchanges	0.0102 (0.921)	1.0103 (0.921)	0.0686 (0.527)	1.071 (0.527)
US listing	-0.188 (0.693)	0.8286 (0.693)	-0.2557 (0.6)	0.7743 (0.6)
Close shares	-2.324*** (0.000)	0.0979*** (0.000)	-2.6298*** (0.000)	0.0721*** (0.000)
IFRS dummy	-1.0484** (0.022)	0.3505** (0.022)	-1.0251** (0.027)	0.3588** (0.027)
Constant	1.8907 (0.558)	6.6241 (0.558)	2.7052 (0.404)	14.958 (0.404)
Number of obs	503	503	503	503
Country fixed-effects	Yes	Yes	Yes	Yes
Wald chi2(27)	92.02	92.02	88.71	88.71
Prob > chi2	0	0	0	0

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

These coefficients need careful interpretation due to the nature of the logistic model.⁷³ We can interpret the signs on the coefficients to mean an increase (+) or decrease (-) in the likelihood of earnings management. We observe an increase in disclosure score is associated with a decrease in the likelihood of earnings management; and this is significant at 10%.

The magnitude of the coefficients is not particularly meaningful in its original form. The transformation of these values into odds ratios provides for a more intuitive interpretation. As explained before, the exponential of the coefficient needs to be taken in order to transform the values into odds ratios. The odds ratio represents the relative odds that earnings management is present, i.e. Positive Earnings equal to one. The odds ratio of 0.97 for total disclosure score means that a one unit increase in disclosure score will mean banks are 0.97 times as likely to manage earnings, or 3% ($1 - 0.97 = 3\%$) less likely to manage earnings on average for our sample of banks. The Close shares variable is significant at 1% level and as predicted has a negative impact on earnings management, with a 1% increase in Close shares causing a 0.9% decrease in likelihood of managing earnings. The IFRS dummy is significant at the 5% level and negative, confirming previous results that show IFRS adoption reduces the likelihood of earnings management. The adoption of IFRS by banks reduces the likelihood of banks managing earnings in our sample by 65%. The coefficient of sales growth, which is significant at the 5% level, suggests that a 1 percentage point increase in the growth of sales increases the likelihood of managing earnings by 2.4%.

The coefficient on sales/assets is negative and significant at the 1% level, which confirms our expectations that bigger firms are less likely to manage earnings. However, when converted into odds ratios, a 1 unit change in the sales/assets ratio almost eliminates the likelihood of earnings management (almost 100%, or 1-0), i.e. it has a very big effect. Although this is a correct interpretation of the results, it is a misleading one. This is mainly because of the scaling effect, therefore for variables with very small values (such as ratios with a mean smaller than 1), a 1 unit change can have extremely large impacts. The sales/assets variable is the ratio of sales to assets. For banks in particular, which have large amounts of assets, this variable tends to be fairly small, with a mean of 0.0996. Therefore a 1 unit change is unlikely to occur and is less meaningful for interpretation. We can get a more meaningful interpretation of the odds ratio by scaling down the unit increase to 0.01, which results in a change in the likelihood of earnings management of 1%. Similarly, the mean value for cash flow operations is 0.01, which means an increase of 0.001 may be more intuitive, i.e. a 0.001 unit increase in the ratio of cash flow scaled by assets increases the likelihood of earnings management by 12.7%, although this impact is insignificant.

Breaking down the disclosure scores into its individual components enables us to understand the main drivers of the effect of total disclosure score on earnings management. Specifically, the regional breakdown score is significant at the 10% level. This may be because the disclosure of more granular data makes it harder to mask small negative earnings. Increasing regional breakdown scores by one reduces the likelihood of managing earnings by 27%.

The coefficient on the corporate governance disclosure score appears to be negative and the most statistically significant, i.e. at the 1% level. This could be due to the fact that more transparent disclosures over corporate governance disclosures reflect better monitoring and management accountability, which reduces the incentive for managers to manage earnings. Improving the corporate governance disclosure score by one unit

⁷³ As explained in the methodology, we cannot interpret the coefficients of the logistic model as an increase in the value of the dependent variable given a single unit increase in the explanatory variable

reduces the likelihood of managing earnings by 23%. None of the other individual disclosure areas have a statistically significant relationship with the likelihood of earnings management.

We conclude that increasing the disclosure quality results in a significant reduction in the likelihood of earnings management, providing empirical support for our hypotheses. This appears to be driven by regional breakdown and corporate governance disclosures. The disclosure requirement under CBCR is most closely captured by the regional breakdown component of our scoring index. Therefore the implication for CBCR is that if CBCR leads to an increase in the granularity of disclosure, it could lead to a statistically significant improvement in accounting quality and in the credibility of financial results by reducing the likelihood earnings management. However, as banks have already reported segmental information, it is uncertain whether incremental disclosures at the country level as required by CBCR will have similarly significant effects.

Robustness and sensitivity tests

As previously explained, we use the RE approach rather than FE in our logistic regression on the basis of the Hausman test, which suggests that the RE model is preferred.

To make sure the standard errors are robust to the relatively small sample log of sales, we used the “vce (bootstrap)” option offered in Stata. We also conduct a formal test of specification to ensure that our model is correctly specified. The likelihood ratio test can be used to see if the inclusion of an explanatory variable in a model has greater explanatory power over the outcome variable than a model without it. To test the significance of country dummies in the regression we carried out a likelihood ratio test which compares a restricted model (without country dummies) and the unrestricted model (including country dummies). The null hypothesis is that the joint significance of the coefficients of the country dummies is equal to zero. A p-value of less than 0.05 suggests that the joint significance of the coefficients of the additional explanatory variables (in this case, the country dummies) is significantly different from zero. The p-value for this test was 0.000, so we reject the null meaning that the country dummies have significant explanatory power over the dependent variable. On this basis, we included the country dummies in our specification, which controls for country-specific characteristics.

We also applied the likelihood ratio test to test whether to include the IFRS dummy in our specification. The p-value of this test is 0.0176, i.e. the null hypothesis is rejected at the 5% level, and therefore the coefficient on IFRS is significantly different from zero. On this basis, we included the IFRS dummy in our model specification. However, excluding the IFRS dummy does not change the significance of the coefficients on the disclosure quality scores.

We also considered the use of year dummies in our specification to control for time-specific factors, e.g. poor performance across the industry under weak macroeconomic conditions in certain years could have had an influence on the likelihood of earnings management. In order to test whether the year dummies should be added in our specification, we carried out a likelihood ratio test to compare the performance of the restricted model (no year dummies) against the unrestricted model (with time dummies). We fail to reject the null hypothesis which indicates that the joint significance of the coefficients of the year dummies are not significantly different from zero. We therefore excluded the dummies on this basis.



Table 21: Results for the impact of disclosure quality on earnings management using individual disclosure scoring components

Earnings Management	Corporate Governance score	Risk management score	Non-Financials score	Targets Score	Market Share score	Shareholders Return score
Corporate governance score	-0.2639*** (0.008)					
Risk management score		0.0127 (0.792)				
Non-financials score			-0.0777 (0.111)			
Targets score				-0.0581 (0.505)		
Market share score					0.0221 (0.876)	
Shareholder returns score						-0.0686 (0.591)
Log of sales	0.1143 (0.527)	-0.0256 (0.892)	0.067 (0.712)	-0.0027 (0.988)	-0.0145 (0.936)	0.0084 (0.964)
Sales growth	1.2747** (0.024)	1.214** (0.029)	1.2145** (0.032)	1.224** (0.028)	1.216** (0.029)	1.2114** (0.031)
Stock growth	-0.3085 (0.262)	-0.2677 (0.32)	-0.2987 (0.26)	-0.2712 (0.313)	-0.268 (0.321)	-0.2843 (0.293)
Leverage	0.0225 (0.175)	0.0217 (0.204)	0.0184 (0.243)	0.0218 (0.203)	0.0222 (0.205)	0.0221 (0.207)
Liabilities growth	0.2585 (0.654)	0.3921 (0.456)	0.3834 (0.471)	0.3846 (0.471)	0.398 (0.45)	0.4078 (0.439)
Sales/assets	-30.436*** (0.000)	-28.374*** (0.001)	-29.5019*** (0.000)	-29.5854*** (0.000)	-28.8274*** (0.000)	-29.1991*** (0.000)
Cash flow operations	5.3104 (0.247)	4.9211 (0.274)	4.7952 (0.286)	4.8389 (0.279)	4.9358 (0.272)	5.0033 (0.267)
No. of exchanges	-0.01 (0.923)	0.0172 (0.867)	-0.01 (0.922)	0.0191 (0.852)	0.019 (0.853)	0.0185 (0.858)
US listing	-0.1525 (0.745)	-0.207 (0.665)	-0.1384 (0.769)	-0.2078 (0.662)	-0.2031 (0.672)	-0.2309 (0.634)
Close shares	-2.3191*** (0.000)	-2.2487*** (0.000)	-2.3945*** (0.000)	-2.1423*** (0.001)	-2.2216*** (0.001)	-2.2951*** (0.000)



Earnings Management	Corporate Governance score	Risk management score	Non-Financials score	Targets Score	Market Share score	Shareholders Return score
IFRS dummy	-1.0012** (0.028)	-1.1693*** (0.01)	-1.0676** (0.018)	-1.1257** (0.013)	-1.1555** (0.012)	-1.1508** (0.011)
Constant	2.407 (0.449)	2.7083 (0.404)	1.9291 (0.548)	2.7047 (0.4)	2.6329 (0.415)	2.4661 (0.449)
Number of obs	503	503	503	503	503	503
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Wald chi2(27)	95.39	89.48	93.07	91.32	89.28	88.72
Prob > chi2	0	0	0	0	0	0

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

Summary and conclusions

The results from our analysis provide some evidence that disclosure quality has a positive impact on capital market outcomes (by lowering a firm's effective cost of equity capital), improves transparency (by improving the accuracy of analysts' forecasts) and reduces the likelihood of earnings management, thereby improving accounting quality. There is also some evidence to suggest that the public availability and granularity of financial information reduces a firm's effective cost of equity capital, which provides support for CBCR to lead to beneficial outcomes for banks. However, it should be noted that the magnitude of the potential impacts are likely to be small.

These impacts could affect the wider economy through the following channels:

- **Competitiveness:** The evidence from our econometric analysis suggests that an improvement in disclosure quality, which is a key objective of CBCR, is associated with a reduction in earnings management by reducing the ability of firms to mask their true performance, which could have small but positive impacts on firms' competitiveness. Although we have not captured the impacts on competitiveness directly, our review of the literature suggests that greater openness could enable banks to become more competitive and our results suggest that CBCR is unlikely to lead to adverse effects on competition.
- **Credit availability:** Our econometric results suggest that CBCR is unlikely to have any negative impact on banks' ability to access capital markets. The improvement in disclosure quality as perceived by capital markets as a result of CBCR could have a small impact on reducing banks' cost of equity capital, and these benefits could be passed on to non-financial sector firms and households in the form of lower lending rates.
- **Investment:** Related to the point on credit availability, our econometric results suggest that CBCR is unlikely to have a negative impact on investment. The improvement in disclosure quality as perceived by capital markets as a result of CBCR could lead to a lower cost of equity capital for banks, which may translate into lower lending rates and enable firms to invest in their business and expand. However, these impacts are likely to be small.
- **Stability of the financial system:** The evidence from our econometric analysis suggests that an increase in disclosure quality, which is a key objective of CBCR, could have a small but positive impact on accounting quality. This means that following the implementation of CBCR, the information provided by banks could become more informative for external stakeholders, and better reflects the true economic condition of the bank. This could result in lower volatility and increased financial stability.

Overall, our analysis suggests that CBCR could have small but positive impacts on banks' outcomes and is unlikely to have negative effects on capital market outcomes, transparency and accounting quality.

However, as CBCR is yet to be implemented, we do not as yet, have the opportunity to conduct an ex-post "event study", i.e. a study where we are able to compare the differences in outcomes between the pre- and post-implementation period to understand the impacts of introducing the disclosure requirement. Therefore, we necessarily need to infer from the historical relationships between disclosure quality and the outcomes of interest to draw possible conclusions for CBCR. It is therefore important to be cautious when interpreting the results and



conclusions from our study and their applicability to CBCR, for the reasons outlined below.

First, although our results can be a useful proxy for what might happen with CBCR, the differences between the incentives that have driven current reporting practices and behavioural changes likely to be induced by CBCR need to be considered when interpreting these results. Following the implementation of CBCR, firms will be required to report certain key metrics, which have hitherto been largely provided on a voluntary basis. Voluntary disclosures and mandatory disclosure regimes can result in quite different impacts. Voluntary disclosures are largely the result of a strategic choice driven by other factors such as management incentives and other signalling effects, whereas under a mandatory regime, firms have less control over their disclosure choices. For example, Hail and Leuz (2007) note that firms that adopted IFRS voluntarily or ahead of the EU requirement experience larger capital market benefits than those who adopted the IFRS following its mandatory adoption.

However, it could be argued that mandatory reporting could have stronger impacts because possible spillovers or market-wide impacts are now internalised, such as enhancing the comparability of disclosures and increasing transparency across the sector. Therefore it is unclear how the magnitude of the impacts would differ between voluntary and mandatory disclosure regimes with respect to CBCR.

Second, although our analysis points to positive impacts that could arise from CBCR, it is unclear whether this could be subject to diminishing returns. Banks are already subject to a high disclosure requirement relative to other sectors, and it is unclear whether the increase in disclosures will amount to additional valuable information for investors and the general public. The highly-regulated nature of the financial services sector means that banks are already providing a lot of information to regulators, e.g. capital and liquidity requirements, transactions reporting, MiFID II/EMIR, money laundering etc. The large banks which will be affected by Article 89 rules also tend to be heavily covered by information intermediaries such as analysts, and it is unclear how much more this new information will add to analysts' existing information environment.

Finally, while the CBCR is likely to help improve the comparability of financial reporting at the country-by-country level, there are several reasons why the impact of such comparability could be limited. This is because different countries have different sets of rules and interpretations of the disclosure items, as indicated by the results of our legal questionnaire on the implementation status of Article 89 across the EU. Also, there is no requirement to provide granular reporting on individual business units within each country, which limits the ability of investors and analysts to make informed comparisons across banks.



Section four – Stakeholder survey

Overview of the stakeholder survey

While the econometric study seeks to look at some potentially measurable impacts of Article 89, we recognise that it has limitations. Because CBCR is yet to be implemented, the econometrics relies on using historical evidence of earlier improvements in disclosure quality to infer what might happen as a result of CBCR. It is difficult to make such inferences – not only is it difficult to quantify the effects of CBCR on disclosure, but it is uncertain whether the historical relationships will be repeated in the future given the relatively high level of financial reporting disclosure before CBCR. Furthermore, many of the potential economic consequences of Article 89 are either intrinsically difficult to measure, or could only reasonably be measured once the legislation has been in effect for some time.

We therefore devised a questionnaire to obtain the views of stakeholders in three main areas:

1. Respondents were asked to rate the economic impact that they expected Article 89 to have on a range of areas as very positive, positive, no impact, negative or very negative.
2. Respondents were asked to provide comments on certain matters of interpretation relating to the Article 89 requirements.
3. Views were sought on the location of the CBCR disclosure and on the requirement that the disclosure has to be audited.

The survey responses to part one are summarised in this section of the report and the detailed results by question are included in Appendix 2. The responses to parts two and three are incorporated into section 5 and into Appendix 3 which look at the issues with implementation and interpretation.

We sent questionnaires to 156 organisations covering all the EU Member States, the US and Switzerland. The organisations included the GSIBs, other reporting institutions, CSOs, financial regulators, central banks, governments, trade associations and credit agencies. 35 organisations responded to the questionnaire.

The list of stakeholders was developed in consultation with DG MARKT and sought to cover all those with an interest in Article 89 and to be representative of the different stakeholder groups. The geographic location of the stakeholders focussed on the Member States with the largest financial services sectors – the UK, Germany, France, Spain, Italy and the Netherlands, though views were sought from organisation in all Member States, including Scandinavia and Poland and from organisations such as trade associations and CSOs that operate on a Europe wide basis.

From the responses received we concluded that stakeholders were broadly of the view that:

- Article 89 was expected to improve transparency, accountability and public confidence in the financial services sector
- Any impact on competitiveness, investment, credit availability, stability of the financial system would be limited
- Improvements to the implementation and interpretation of Article 89 would enhance its usefulness in terms of clarity and comparability and without such improvements there is a risk that the benefits arising from the disclosures could be undermined.
- The cost of complying with Article 89 was not significant compared to other regulatory compliance burdens on the sector

Survey participants

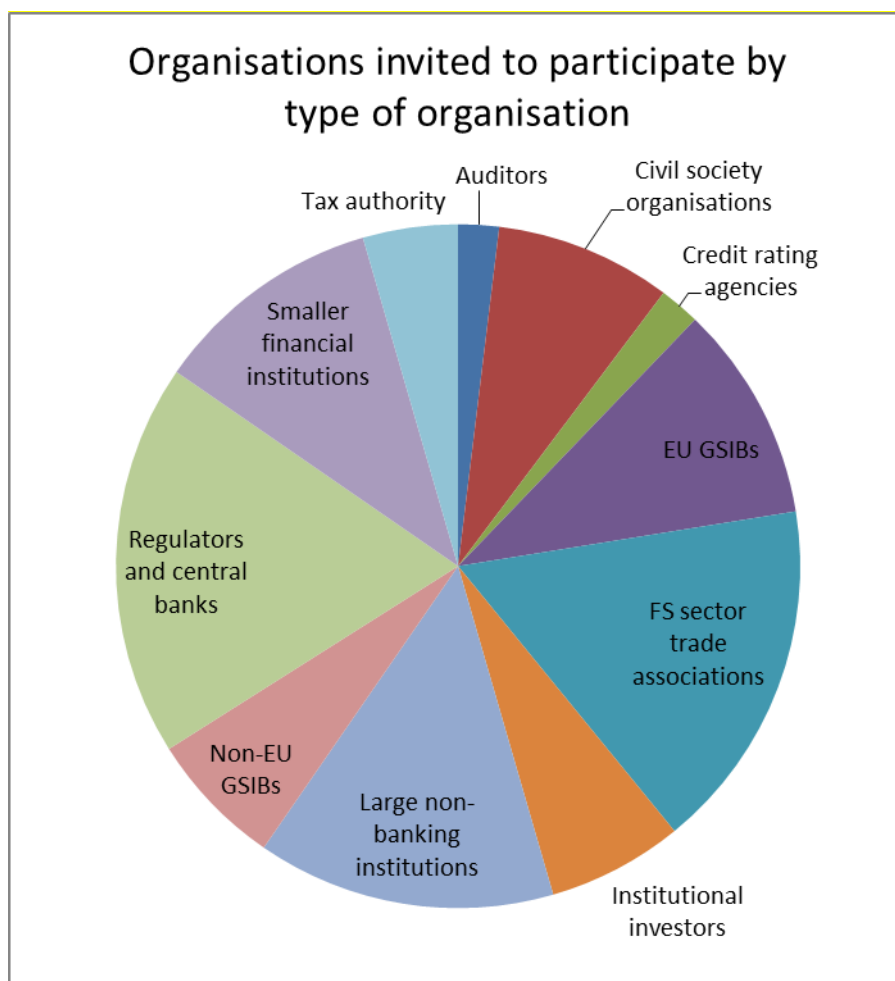
We asked 156 organisations to provide their views on their expectations of the likely economic impact of Article 89

As shown below, these stakeholders were drawn from a range of organisations. While we surveyed regulators and central banks from all the Member States, for the reporting institutions we concentrated on the EU countries with the largest financial services sectors (the UK, Germany, France, Spain, Italy, and the Netherlands). All but one of the GSIBs, Nordea, are located in these countries. We also sought to include a smaller number of reporting institutions from other Member States to participate in our study, in particular from Poland and Scandinavia.

Excluding the multinational companies that were asked to participate, 20% of the organisations asked to complete the survey have a cross-EU remit. These include trade associations, European regulators and CSOs.

For comparison purposes, FS institutions headquartered in the US and in Switzerland were also asked to take part.

The full detail of the responses is included in Appendix 2.



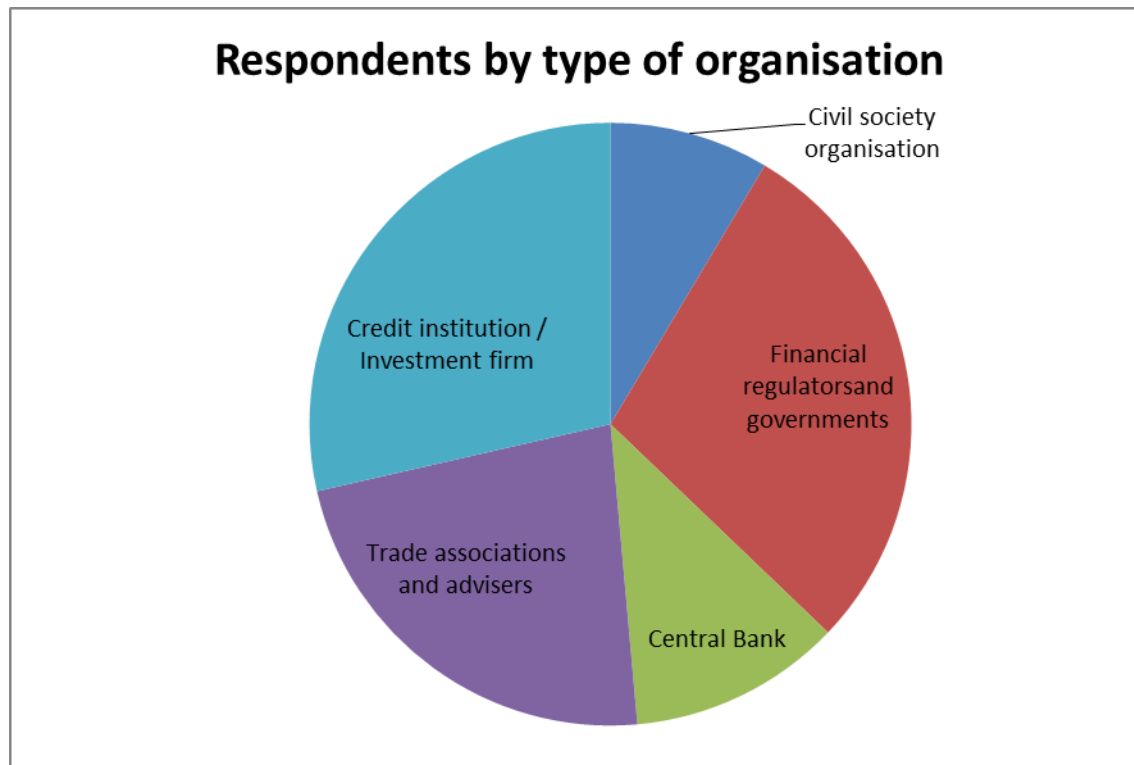
Source: PwC analysis

35 organisations responded to our opinion survey, with an equal split between business and non-business organisations

We received 35 responses with 18 coming from businesses, trade associations and advisers and 14 from governments, regulators and central banks. We received three responses from civil society organisations.

Within this section, credit institutions, business associations and professional advisers are classed as business organisations while central banks, regulators and civil society organisations are referred to collectively as non-business organisations.

The questionnaire and the list of stakeholders were reviewed by DG MARKT.



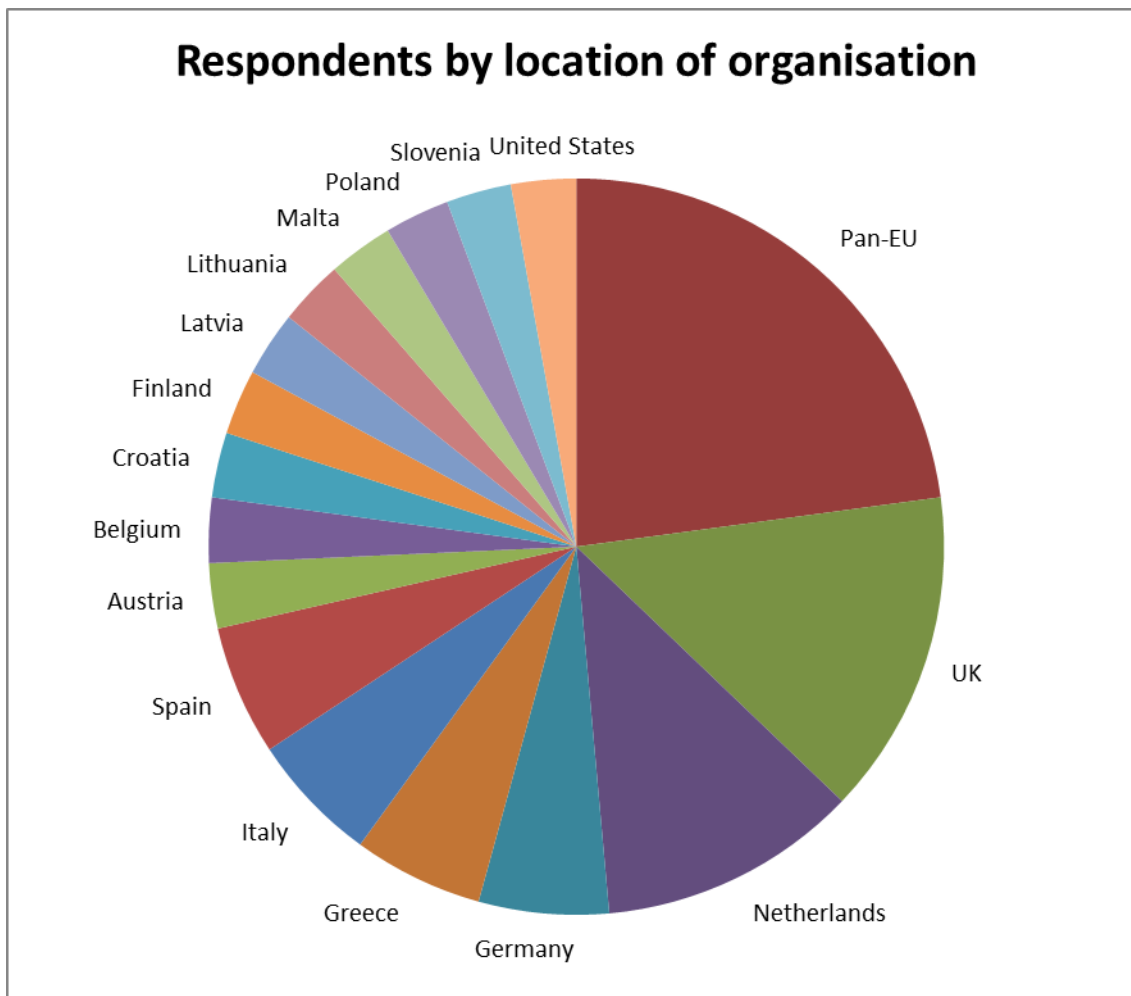
Source: PwC analysis

We had responses from organisations in 15 Member States, with the most responses from the UK followed by the Netherlands.

The overall geographical spread of responses is good and it is not surprising that we received most responses from organisations with a pan-EU remit and, given the size and importance of the FS sector to the UK economy, from UK based organisations.

The responses that we received from the smaller Member States came largely from financial regulators and from central banks, which again is not surprising given that very few credit institutions with sizeable cross border operations are headquartered in these smaller territories.

We received 25 separate responses from investment firms in Greece that are members of the Hellenic Capital Markets Committee. For the purposes of our analysis these have been consolidated into one response (using the most common answer to each question) so as not to give the responses disproportionate weight when compared to the responses from other bodies which provided one view taking into account the views of all of their members.



Source: PwC analysis

Views on transparency, accountability and public confidence

On balance, the stakeholders that responded to our survey expect Article 89 to have a broadly positive impact on the transparency and accountability of reporting institutions and on public confidence in the FS sector

58% of respondents felt that Article 89 would improve the transparency and accountability of reporting institutions, with a further 33% expecting there to be no impact. A negative impact was anticipated by 9% of respondents.

In general, business organisations were less positive about the impact than non-business organisations.

Few respondents provided detailed reasons for their responses, but there was a general view among those expressing a positive view that providing the information required by Article 89 was transparent behaviour of itself.

Some stakeholders with a positive view felt that the disclosure would put information into the public domain for the first time and that this information was being sought by investors and other stakeholders.

A view expressed by several stakeholders who anticipated no impact, and by one that anticipated a negative impact, was that for the full benefit of transparency to be obtained from the disclosure requirements it was necessary for the requirements to be more clearly interpreted so that more meaningful and more comparable data would be disclosed. The other organisations expressing a negative view did not comment on the reasons behind their view.

45% of respondents felt that Article 89 would lead to greater public confidence in the financial services sector. A further 42% felt there would be no impact with 13% anticipating a negative impact.

The views on increased public confidence were more mixed than those on transparency and accountability, with non-business organisations again expressing more positive views than those of the reporting institutions and other business organisations.

Similarly to the views on transparency and accountability, stakeholders with positive views commented that greater transparency would lead to greater public confidence and that it was desired by some investors. One organisation with a positive view felt that transparency alone would not be sufficient to increase public confidence, but factors such as business results and other disclosures would need to be considered.

Again, a lack of clarity as to the reporting requirements was felt by many to have the potential to reduce any positive impact that the disclosure might have. In particular, two of the four organisations that predicted a negative impact cited the lack of clarity and potential for misinterpretation of the disclosures as the reason for their negative view. The other two provided no comments as to the reasons for their view.



Views on the economic impact

Stakeholders broadly expect Article 89 to have limited impact on competitiveness, investment, credit availability and stability of the financial system

Whilst stakeholders expected a broadly positive effect on the accountability and transparency of reporting institutions and on public confidence in the financial system, the overall view was that there would be no impact on the specific criteria of competitiveness, investment, credit availability or stability of the financial system.

A view expressed by a number of stakeholders was that while increased transparency may have an economic impact, it was likely to be incremental, coming on top of other changes in regulation and that there were many other factors that would have a far greater economic impact.

It was also noted by some stakeholders that while any economic effects were likely to be small when looking at the financial services sector as a whole, there may be significant effects for individual companies.

A recurring theme throughout the responses from the stakeholders was that the current range of interpretations and the different statuses of Member States' implementation of Article 89 have resulted in considerable uncertainty as to how institutions should comply with the requirements. This was expected to lead to different institutions using different bases of preparation resulting in disclosures that would not be comparable and which could be prone to misinterpretation.

Generally, it was felt that the impact of Article 89 would be improved if the interpretation of requirements was clearer, more detailed and more consistent so as to allow for meaningful disclosure, including the disclosure of the basis of preparation and assumptions used, and if the requirements were implemented in the same way by all Member States.

The wider economic impact

Some stakeholders expect the Article 89 disclosure to affect the management of companies' tax affairs

Some stakeholders, including businesses, expect CBCR to change how some reporting institutions manage their tax affairs.

One reporting institution commented that "the outlying [tax] positions (i.e. more aggressive [tax] positions) will be abolished under public scrutiny."

One CSO noted that

"CBCR will increase awareness of financial institutions' tax management practices leading to greater reluctance to operate in low tax jurisdictions ... CBCR will lead to greater public awareness of corporate tax payments. This might ultimately lead to an environment of greater tax compliance which will increase public money available for economic development."

While one regulator felt that CBCR would result in a reduced incentive for tax avoidance another expressed the view that

"we doubt that tax minimisation strategies will diminish due to enhanced reporting requirements as these strategies are mainly based on the legal exploitation of gaps and loopholes in national and international tax law."

These comments indicate that CBCR may have an effect that goes beyond the impact on reporting entities themselves. Given the range of views, it is not possible at this stage to know if CBCR will cause reporting institutions to adopt a more cautious approach to tax risk, but if such an approach were adopted, future increases in the effective tax rates of some institutions could be expected, with a consequent reduction in banks' capital base that supports lending.

CBCR is a transparency initiative intended to give a clearer picture of a company's corporate tax footprint across the world. Similar initiatives to improve tax transparency have been introduced, e.g. the OECD's "Base erosion and profit shifting" (BEPS) initiative⁷⁴. However, once a company's corporate tax footprint is made public, the possible reactions are wide-ranging, uncertain and are highly dependent on stakeholders' understanding of the reasons for the amount and geographical distribution of the taxes paid by the CBCR reporting entities. A wider economic impact could be generated if there were a change in a reporting entity's effective tax rate as an indirect result of CBCR – for example if it felt forced to change its tax policies, taking all things into consideration, as a result of stakeholder pressure that it was not paying, in the view of the stakeholders, the "right amount" of tax.

Large-scale economic models are commonly used to analyse the impacts of changes in effective tax rates or changes in taxes on the FS sector (HMRC, 2013, EC, 2011 and 2013) on the wider economy.⁷⁵ While PwC has the capacity to undertake modelling of this type, following discussion

⁷⁴ BEPS data are not to be made publicly-available but are to be provided to tax authorities for risk assessment purposes.

⁷⁵ For instance, HM Revenue and Customs (2013) analysed the effects of corporate tax cuts on the UK economy using a Computable General Equilibrium model, while the EC (2011 and 2013) commissioned analysis using a Dynamic Stochastic General Equilibrium model to examine the effects of the Financial Transaction Tax proposals. Such models are commonly used by governments and institutions to examine the effects of changes in effective tax rates.

with DG Markt it was felt that, given the uncertainty about the possible scenarios through which changes in effective tax rates might occur, this approach might over or under estimate a particular outcome. In particular the magnitude of any changes in effective tax rates can be very difficult to predict. On this basis our analysis is restricted to the following qualitative discussion of the potential impacts of CBCR on the wider economy that is focussed on the scope of stakeholder reactions that might lead to a change in the effective tax rate and subsequent economic effects.

The importance of stakeholder reactions

A wide range of stakeholders might be expected to be interested in and to react to the CBCR disclosures of reporting entities. These include governments, CSOs, customers, investors, employees and the general public. The perceptions of these stakeholders will, in part, depend on the following factors:

- **The reporting entity's performance during the financial crisis.** Some of the reporting entities will have received state support during the crisis and it may be deemed that these institutions are not "paying enough back". Within the countries where the group is headquartered, information relating to corporate tax payments will be published as part of a company's annual accounts. However, the introduction of CBCR will increase the amount of detailed information available and could therefore raise the level of stakeholders' interest in these figures.

The FS sector has faced considerable scrutiny both during and after the financial crisis. The sector facilitates the flow of capital around the economy, and provides financial products to households, businesses, investors and the government. A well-functioning banking sector can improve both capital efficiency and productivity in the economy. However, the sector has inevitably been affected by the knock-on negative economic consequences of the financial crisis and this may lead stakeholders to form more negative perceptions relating to levels of tax payments.

- **The ratio of economic activity generated by the reporting entity to taxes paid.** Some reporting entities may have significant operations in a particular country, but, because of how the local tax rules apply to the profits of that operation or because of its financial performance, the proportion of taxes paid may not match the corresponding proportion of economic activity. Prior to the recent financial crisis, the financial services sector contributed a significant amount of corporate taxes, accounting for around 18% of total corporation taxes paid in the G20 economies⁷⁶. However, extensive tax losses and declining profitability will place downward pressure on the level of taxes paid for some years to come.

As shown by the stakeholder comments, the stakeholder reactions to CBCR reporting will vary. The amount of tax levied on CBCR reporting entities is a governmental policy decision and again is influenced by public perception and also political will, not economic considerations alone. The political stance of some governments may lead them to seek to raise further tax revenues from CBCR reporting entities – the amount of tax paid could be relatively high in the view of some stakeholders, but could at the same time be perceived as not being "enough" in the view of others. This decision will also be affected by economic realities such as fiscal deficits and the circumstances and strength of likely stakeholder reactions.

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- HM Revenue and Customs (2013) "*Analysis of the dynamic effects of Corporation Tax reductions*", joint report by HMRC and HMT, 5 December 2013
 - European Commission (2011) 1st impact assessment on the financial transaction tax (SEC/2011/1102), Brussels: Taxation and Customs Union, European Commission
 - European Commission (2013) 2nd impact assessment on the financial transaction tax (SWD/2013/28), Brussels: Taxation and Customs Union, European Commission

⁷⁶ IMF (2010) "A fair and substantial contribution by the financial sector: final report for the G20", June 2010

The scope of any government policy response to these reactions could fall within the corporate income tax system, or outside it, e.g. through the use of bank levies. However, there is a distinct risk that any stakeholder reaction will only be based on partial information. CBCR under Article 89 only relates to corporate income tax payments, but this represents only a portion of the taxes borne by the reporting entities (e.g. taxes such as employer social security contributions, irrecoverable VAT and bank levies) and the taxes they collect, which are generated by the economic activity they create (e.g. personal income taxes paid by employees and withheld by the companies, employee social security contributions).

Impacts of a change in effective tax rates

As we have mentioned above, some respondents to the stakeholder survey have indicated that CBCR may lead to a change in effective tax rates of some reporting institutions. The probability and magnitude of any such change are however impossible to predict at this stage given the different mechanisms through which change could occur and the fact that change could affect only single entities or the sector more broadly.

Possible changes, for example include a direct change in existing tax rates or allowances, new taxes or a self-imposed reduction in planning that increases tax cost efficiency. If any such change were to occur then the following effects could potentially arise:

- **A corresponding reduction in economic activity in the particular entity.** Economic theory would dictate that an increase in taxation leads to a “deadweight loss” i.e. a loss of economic output. The concept of deadweight loss is explained in more detail in Appendix 4. The scale and magnitude of any reduction in economic activity will depend on the type of taxes raised and their economic efficiency.

The OECD (2010)⁷⁷ ranks capital based taxes at the more distortive end of the tax spectrum (taxes on consumption are considered to be more efficient). Capital taxes (e.g. corporate income taxes and bank levies) reduce the profits of firms, inhibiting both domestic and foreign direct investment and reducing the rate of capital accumulation and lending in the economy. Corporate income taxes also hinder productivity through a number of channels, including distorting relative factor prices, causing high compliance costs and hindering technology transfers and knowledge spillovers. Most importantly, taxes that relate to business inputs are particularly distortive as they affect the allocation of productive inputs within an economy. By increasing the price of the product involved in the transaction, market participants adjust their behaviour to economise on the more expensive products.

- **An offsetting benefit through governments spending any additional taxes raised.** Any additional tax payments to the government could be used to provide benefits to society and the wider economy. The government could use additional tax receipts generated from CBCR reporting entities to fund public services or reduce existing fiscal deficits or levels of national debt. These benefits will offset, either partially or in full, the economic costs of additional tax payments. The extent of this offset is dependent on how effectively any additional taxes generated are spent – unproductive and inefficient spending would do very little to provide an offset, highly productive and efficient spending could more than offset the deadweight loss.
- **Corresponding competition effects amongst reporting entities.** If the average effective tax for a particular reporting entity does increase in a particular country, then this could have pro- or anti-competitive effects. For instance, if a particular entity was forced into paying additional tax after pursuing highly efficient tax planning, then this could benefit entities operating in the same country that have not pursued such planning. However, the corresponding circumstances are key to the outcome. For instance, an entity might only decide to pursue more efficient tax planning if it is struggling to preserve capital to comply with other FS sector regulations (e.g. Basel III or capital ratios set by CRD IV). In such circumstances the consequences of an increase in effective tax rates could be quite severe.

⁷⁷ OECD (2010) *OECD Tax Policy Studies: Tax Policy Reform and Economic Growth*, OECD, 2010.



Alternatively, situations may arise whereby domestically-headquartered entities could be favoured over foreign entities or vice-versa. Or an entity that has engaged in tax efficient planning could be treated in the same way as an entity that has not e.g. through a policy change that affects the whole of the sector.

- **Increases in public confidence.** If transparency results in the amount of tax paid by the FS sector being viewed by the public as “fairer”, there could be a benefit in the form of public confidence in the tax system in general and in the FS sector specifically. This could have benefits that outweigh the economic consequences of the higher effective taxes in the FS sector that might be required to obtain such a view. If effective tax rates rise due to a reduction in tax planning that the relevant tax authority or Government perceives to be unacceptable, then this could be viewed as the tax system functioning better. This could be distinguished from situations where institutions choose, for fear of adverse public opinion, in a situation where public opinion may not be well informed, to adopt a potentially overly-cautious approach to tax thereby unnecessarily and inefficiently increasing their effective tax costs.

Again, these outcomes are not easily predicted, nor is it straightforward to predict their likelihood. Their scope and magnitude will ultimately be dictated by subsequent stakeholder reactions to the published CBCR data and the balancing by companies of differing stakeholder reactions.

Compliance costs

The costs of complying with Article 89 are expected to be limited compared to other regulatory burdens

In addition to the questions asking for the views of stakeholders on Article 89, we also asked the GSIBs and some other reporting institutions for their estimate of the incremental costs incurred in preparing their disclosures.

Only two banks provided any quantitative estimate of the cost with a number of other institutions commenting that either they were unable to accurately estimate the cost, or that the cost was not significant when compared with the other regulatory compliance burdens that the business faced.

The two banks that provided a quantification of the cost are both GSIBs operating across a range of territories. The cost estimate provided was for the central headquarter costs, but there may be additional costs incurred by subsidiaries. One bank estimated the annual recurring cost of complying with Article 89 to be in the region of €50,000 including external audit costs, while the other estimated the cost to be around €20,000 excluding external costs.

The one-off costs for the first year of the reporting were estimated by both banks to be around €10,000 excluding external costs. Only one of the two banks provided information on the external costs which it estimated at €200,000 of initial one-off costs and €40,000 of annually recurring costs. As only two banks provided quantitative data, this cannot be taken as being representative of the sector as a whole and cannot be extrapolated.

The cost of complying with Article 89 is expected to be inherently proportional to the size of the business with smaller institutions operating across only a few territories needing to collect and disclose far less data than large businesses operating across many jurisdictions.

While a number of stakeholders expected the cost not to be significant compared to other regulatory costs, it should be noted that this is in the context of a highly regulated industry that is likely to have already invested significantly in reporting systems.

Many of the financial institutions that have to report under Article 89 are likely to be affected by the country-by-country reporting template that has been developed by the OECD as part of its work on BEPS⁷⁸. While the disclosures under Article 89 are to be public, the disclosures under the proposed BEPS CBCR template are to be made in confidence to tax authorities and the OECD's CBCR template is designed to serve as a high level risk assessment tool for the tax authorities. In view of this purpose, the BEPS template includes extra items of information not required by Article 89. The compliance cost for companies that are subject to both regimes could be reduced if, for those items which have to be reported under both Article 89 and under the BEPS CBCR template, the Article 89 and the BEPS requirements could be made equivalent.

Many groups that are headquartered outside the EU, and which have no, or only partial reporting under Article 89, will have to make data available to tax authorities under the OECD provisions. Although the OECD reporting requirements are expected to apply equally to groups headquartered in OECD countries inside and outside the EU, there will still be an additional burden and additional impacts on the groups that are also required to report publically under Article 89.

⁷⁸

OECD/G20 Base Erosion and Profit Shifting Project Guidance on Transfer Pricing Documentation and Country-by-Country Reporting ACTION 13: 2014 Deliverable, September 2014



Section five - Key challenges with the implementation of Art. 89

This section explains a range of approaches that have been taken by Member States and by reporting entities to the interpretation and implementation of Article 89 as identified by our legal analysis, our stakeholder survey and our review of the initial disclosures by reporting institutions.



Overview

Despite the requirement for CRD IV to be implemented by 31 December 2013, and the first year reporting deadline of 1 July 2014 set out in Article 89, only thirteen Member States had fully implemented Article 89 as at 30 June 2014, with a further four having implemented it only for either credit institutions or investment firms.

Of the jurisdictions that have implemented the requirements, the majority have provided little or no guidance as to how institutions should apply the regulations, leaving uncertainty for many organisations that are required to comply. Further, the first year disclosures submitted privately to the European Commission illustrate a number of areas where there has been a lack of guidance from Member States leading to inconsistent interpretation by institutions.

Although most jurisdictions have provided little clarity on many of the requirements, where they have, a number of inconsistencies have been identified.

- The objective of Article 89, as set out in recital (52) to CRD IV, is to increase transparency which “is essential for regaining the trust of citizens of the Union in the financial sector”.
- To the extent that a lack of clarity leads to inconsistency in how institutions meet their obligations under Article 89, it is likely to undermine the success in meeting that objective.
- The key areas of uncertainty are summarised on the following pages and more detail is provided in Appendix 3. These are:
 - Uncertainty as to which entities within a group are within the scope of Article 89
 - Lack of coherence between the interpretation of terms used in CRD IV and terms used in financial accounting
 - Use of different methods of consolidation
 - Member States having different views on whether tax on profit or loss should be an accounting or a cash measure
 - Lack of clarity as to how amounts should be treated where the taxing jurisdiction and the location of an activity are different
 - Lack of legislation to prevent double reporting by subsidiaries whose parent companies have reported in a different Member State



Initial disclosures

A number of GSIBs have publically disclosed the items required by parts d) to f) of Article 89 (1)

Of the fourteen GSIBs required to report privately items (d), (e) and (f) of article 89 (1) to the European Commission, at least three (Royal Bank of Scotland, Barclays and Standard Chartered) have reported this information publically. In addition, two of these GSIBs have reported significant amounts of additional voluntary information, primarily around taxes paid other than corporate income taxes.

The publication of this information suggests that these organisations are not overly concerned about the potential consequences of the data being in the public domain. The publication of additional information to support the disclosures does however suggest there is a concern that data could be misinterpreted in the absence of additional contextual data and explanations.

Furthermore, we note that since the publication of first year disclosures, there has been limited public interest with, as far as we are aware, significant comments appearing in the media in respect of only one GSIB's disclosures.

The reporting 'institution'

Placing the reporting requirement on 'institutions' can lead to disclosures that cover only part of a group and are difficult to reconcile to consolidated accounting data

Article 89 places the reporting obligation on the 'institution'. The implication of this is that for most (but not all) banking groups, the ultimate parent will be required to comply with the reporting requirement. In the case of almost all non-banking groups and groups headquartered outside the EU, the 'institution(s)' are typically embedded within the group structure.

Where the ultimate parent is not an 'institution', a group may have multiple reporting obligations, one for each of its institutions with each representing only a portion of the group.

In light of this, one credit institution highlighted the disparity between how the regime applies to groups with headquarters inside the EU compared to those with headquarters in third countries:

"we consider it is important to maintain the level playing field for all financial institutions. As far as non EU parent institutions are exempted from this report they will not be subject to the market discipline as EU parent institutions. Moreover these institutions will not suffer the potential adverse consequences of publishing this information (e.g. eventual misinterpretation of the reported information by the media or the public)."

From an analysis of the disclosures produced by the GSIBs and submitted to the European Commission, it appears that the majority have reported at the ultimate parent company level, thereby covering their entire worldwide group. In some cases this may include entities that would not be included within the prudential consolidation required by CRD IV more generally.

That said, there is at least one organisation whose disclosure is not easy to reconcile to the financial statements of their ultimate parent company and therefore their worldwide group.

Whilst all territories have so far maintained the reporting obligation on the 'institution', the UK has implemented an option for groups only partially within the scope of the regulations to report at a parent or sub-parent level rather than the 'institution' level.

This is intended to provide flexibility and empower organisations to choose the most appropriate level at which to report.



Another consideration in respect of the reporting 'institution' is whether or not branches of third country institutions are within the scope of the regime. We recognise that this is a wider issue for CRD IV as a whole; particularly where provisions which would not normally apply to branches can be deemed to do so if not applying the provisions would confer an advantage on those entities that are headquartered outside the EU.

In some territories, the position of branches in respect of Article 89 is unclear, whilst in others, such as the UK, Denmark, Austria, Finland and Malta they have been specifically excluded.

Consolidation

Different consolidation approaches have been followed by different countries and businesses. Many Member States have no provisions to prevent double reporting.

Article 89 includes the requirement to report '*on a consolidated basis*'. This term has not been defined in any level of detail by any territory. In the majority of cases, this wording has been implemented without modification. An exception to this approach is the UK, which has implemented the requirement to report '*in accordance with accepted accounting standards on a consolidated basis*'. The Austrian regulators have adopted a similar approach.

The lack of any detailed framework creates challenges for those institutions required to report under the regime. Not only does it leave questions about whether an accounting or prudential based consolidation approach should be adopted, but it also leaves uncertainties as to how intra-group items should be accounted for.

The first year GSIB disclosures highlight the lack of clarity around consolidations, with several disclosures including a '*consolidation adjustments*' row while others do not.

Exemption to prevent double reporting

To date, only Germany, France and the UK have implemented an exemption to prevent double reporting. The implication of this is that many organisations will be subject to a double reporting requirement where an institution has an establishment which also meets the definition of an institution, but which is established in a different jurisdiction.

Name, nature of activities and geographical location

There is considerable variation in how GSIBs have described the name and nature of their activities and how amounts have been allocated to territories

The requirement to report '*name, nature of activities and geographical location*' has not been prescribed in detail by any jurisdiction. Although the opinion survey results suggest this creates very little uncertainty, a review of the GSIB disclosures suggests it has been interpreted very differently.

Of the disclosures reported on 1 July 2014, there is a large variation in the level of detail reported, from those who have reported every single legal entity within the scope of the requirements, to those who have reported only principal trading entities and those who have not reported the names of any legal entities.

There is a similar variety of approaches to reporting the nature of activities, with the majority of organisations disclosing a high level description, such as 'financial services' or 'commercial banking', however a number of organisations have provided substantially more descriptive narratives of their operations in each territory.

Geographical location is an area that has not been addressed in any level of detail by any jurisdiction, and is an area that is particularly subjective. Areas of particular subjectivity include entities incorporated in one territory but which operate in a different jurisdiction. Other subjective areas include branch top up taxes that are payable in a parent jurisdiction, or tax paid in respect of a controlled foreign company but which is charged on a parent company.

From the data provided it is not possible to interpret on what basis the GSIB disclosures have allocated activities and data to each jurisdiction.

Turnover

There is some variation in stakeholders' preferred interpretations of 'turnover' and 'employment'

Although turnover is not a commonly used term in the financial services industry, most territories have not included a prescriptive definition. That said, the first year disclosures do not appear to be creating particular challenges for institutions.

The results of the opinion survey suggest a broad consensus for a requirement that amounts disclosed as turnover should agree to the institutions' financial statements.

Despite this consensus, stakeholders remain divided as to whether the term should mean total gross income, or net income before certain expenses.

It is also noted that many stakeholders recognise the difficulties in providing a rigid definition given that the 'turnover' reflected in the financial statements of credit institutions and investment firms is often displayed in very different ways.

Employees

In territories such as Denmark and the UK it is clear that the requirement is to report employees based on contractual employment. Other territories have remained silent on the point and therefore there is a level of uncertainty around how employees should be reported.

The results of the opinion survey highlighted some possible alternative approaches, with some stakeholders favouring a strict definition based on contractual employment which would be in line with other reporting requirements, whereas others expressed a preference for flexibility to incorporate the effect of secondees and sub-contractors.

From reviewing the GSIB disclosures, it appears that differing approaches have been taken to reporting employees. In particular, it is noted that the disclosures include the following terms: 'average full time equivalent employees', 'financial headcount', 'no. employees' and 'average FTE including temporary staff'.

Tax on profit or loss

The term “tax on profit or loss” has been taken as meaning tax paid by some Member States, but others have applied an accruals based definition

Member States have interpreted the term ‘*tax on profit or loss*’ in different ways. There are a number of territories such as the UK and Belgium that have defined the term as cash tax paid, whilst others, such as France, Austria, and Malta have defined the term as taxes accrued. Despite the clarity in these territories, many others have not provided any guidance and therefore institutions must themselves interpret the local regulations to determine how the term should be applied.

An analysis of the GSIB disclosures highlights the inconsistent interpretations which are as a result of the inconsistent implementation of Article 89 amongst Member States combined with the lack of implementation in others.

Of the disclosures reviewed, a number of different terms are used in place of the Article 89 requirement, including:

- ‘tax on profit or loss’
- ‘current tax’ and ‘deferred tax’
- ‘tax paid / (received)’
- ‘corporation tax paid’

While some of the disclosures make it clear that the tax figures are limited to corporate income taxes only (e.g. UK GSIBs applying the UK regulations) other disclosures do not make it clear, although where an accounts based tax charge is disclosed, it is likely that withholding taxes are also included within the figures.

In addition, one GSIB disclosure includes a note that their numbers include withholding taxes as well as corporate income taxes.

Of the stakeholders surveyed as part of the opinion survey, 17 of the respondents expressed a view that the term should be interpreted as an accounting based tax charge (6 credit institutions, 4 FS trade associations, 7 regulators/ government bodies), while 4 were in favour of cash tax paid (2 business and 2 non-business organisations) and the remaining respondents did not answer the question.



Public subsidies received

There is a difference of views as to how broad the scope of “public subsidies received” should be.

The term ‘public subsidies’ has not been defined by most jurisdictions, although a number have included guidance. Given the limited number of territories that have addressed the interpretation, two key uncertainties remain. The first is the scope of the term and whether it should be limited to direct taxpayer support or whether the scope should be widened to include implicit support, such as that provided by central banks. The second key question is whether the requirement should be to report on a cash basis or an accruals basis.

Of the territories that have implemented Article 89 to date, Finland has adopted a definition which covers both capital grants and also government guarantees.

Another territory that has implemented the requirement (the UK) has excluded implicit support provided by central banks and governments.

The results of the opinion survey indicate a division of opinion between business and non-business organisations, with business organisations favouring a limited scope based on cash support, compared to non-business organisations favouring a broader definition.

Some stakeholders have commented on the practical difficulties associated with quantifying a figure that includes amounts other than direct taxpayer support.



Location of disclosures

Reporting institutions have used a variety of formats for their disclosures and disclosure on websites appears popular

With the exception of the UK, Member States have not included any guidance on how the term '*where possible, as an annex to the annual financial statements*' should be interpreted.

The guidance provided by the UK is that disclosures should be publicly available and therefore reported in either the financial statements or on the company web site.

Of the respondents to the opinion survey, only fourteen answered the question as to where institutions should report, with views fairly evenly spread between disclosure in the annual accounts and disclosures on company websites. Six reporting institutions favoured disclosure in the annual accounts, five reporting institutions or trade associations favoured disclosure on websites and three organisations opting for disclosure on websites and in annual reports.

Format of disclosures

The first year disclosures submitted to the European Commission highlight the different formats and levels of detail included by each organisation. Key observations include the varying level of detail included within the disclosures, including the varying levels of explanation of the context, approach and framework applied to comply with the regulations, and the differences in additional disclosures around other taxes paid, and footnotes to explain certain numbers.

The other key difference was the presentation of consolidation adjustments by some institutions compared to others who did not explicitly report such items.

No strong opinions were expressed by stakeholders as to the desirability of a standard template for CBCR. The concerns raised relate mainly to inconsistencies in the implementation and interpretation of Article 89, rather than from the lack of a template. Indeed a number of stakeholders have expressed a wish for flexibility in the application of Article 89 and a template may make such flexibility more difficult to achieve.

Interactions between Article 89 and other CBCR regimes

Country-by-country reporting under CRD IV creates a new financial reporting requirement for most institutions

Although the requirements to report employees, turnover, profits and taxes are, to some extent consistent with existing reporting obligations across the European Union, the requirement to report such information on a country-by-country basis is new, and requires much more granular reporting than any existing obligations.

Some groups may include some of the data within their geographic segmental reporting, most commonly for net income disclosures. The level of the reporting is however a matter for each group based on its own materiality considerations and so reporting is often done at a regional rather than a country level. The reporting of tax data and profits, even by region, is uncommon and we are not aware of any example of the reporting of public subsidies by region under IFRS.

The use of detailed reporting by geography is perhaps more common in sustainability reporting than in financial reporting. The Global Reporting Initiative (GRI) has developed a reporting framework for sustainability reporting which, although not mandatory, is well recognised and increasingly used by multinational companies.

All topics listed in the Article are included in the GRI sustainability reporting framework. To be considered 'in accordance' with the GRI Guidelines, an entity is required to report on the same topics as for (a), (b), and (c) of Article 89. Items (d), (e), and (f) are to be reported under the economic category of the guidelines (G4 - EC 1-4) but the reporting is not required to be 'in accordance', provided that the aspects have not been identified as material to the organisation.

Organisations that have adopted the GRI framework may therefore already be reporting some of the data required by Article 89, but the extent of the report and the level at which the data is disclosed will be determined by the reporting organisation based on its materiality considerations and on what it views as important to its stakeholders.

From the responses that we received to our stakeholder survey we noted a difference of views as to whether the data required to be disclosed under Article 89 was already in the public domain.

A number of respondents were of the view that the information was available, albeit not in such a convenient form, while others felt it was a new requirement which placed an additional burden on reporting institutions.

For many large and complex groups, however, the information required by Article 89 is unlikely to be in the public domain. The information is not required for consolidated accounts prepared under IFRS and even if every subsidiary of a group prepared publically available accounts, the data would still need consolidating at a country level to produce the Article 89 disclosures.

The Article 89 reporting is therefore likely to be a new requirement for most multinational groups, unless they already perform detailed and comprehensive CBCR reporting under the GRI or another voluntary framework.



CBCR regimes have historically focussed on the extractive industry, though BEPS CBCR will affect all industries

CBCR was first applied to the extractive industry as a way of alleviating the “resource curse” of poverty in nations that are rich in mineral wealth⁷⁹. The first reporting regime for the extractive sector was the Extractive Industries Transparency Initiative (EITI). While arguably not a CBCR regime in the truest sense, given that each country has to adopt the EITI separately and the reporting is only for that country, the EITI has influenced the US Dodd-Frank and the EU Accounting and Transparency Directive CBCR regimes that have followed.

EITI, Chapter 10 of the EU Accounting Directive and section 1504 of the US Dodd-Frank rules apply only to the extractive sector and include payments to governments, but not disclosure of number of employees, turnover, profits, public subsidies or nature and location of activities. In addition, these regimes include not just corporation tax, but other payments to governments such as mining royalties, license fees and bonus payments. These regimes aim to inform local communities of the amounts that are paid by extractive companies working in their region to allow local communities to hold their governments to account. This would seem to be a different aim from that set out for Article 89.

CBCR under CRD IV differs from the extractive regimes as it includes non-tax financial data which may allow stakeholders to assess in some measure whether the “right amount” of tax has been paid.

The draft transfer pricing documentation rules issued on 30 January 2014 by the OECD as part of its programme to address Base Erosion and Profit Shifting include a requirement for multinational companies to prepare a CBCR template which is intended to serve as a high-level risk assessment tool for tax authorities.

The draft rules include provisions for the disclosure of a number of the non-tax items that have given rise to many of the practical challenges with interpreting and implementing Article 89 of CRD IV.

The final version of the BEPS requirements was made public in September 2014 and items similar to those in parts a) to e) of paragraph (1) of Article 89 are included in the BEPS CBCR template. In view of its purpose to act as high level risk assessment tool for tax authorities, the BEPS template includes further items of information not required by CRD IV, and further information will need to be included in transfer pricing documentation. The reporting burden on companies could be reduced if, for those items which have to be reported under both Article 89 and under the BEPS CBCR template, the Article 89 and the BEPS requirements could be made equivalent.

As part of our work, we also considered whether other financial centres, specifically the US and Switzerland, imposed disclosure requirements similar to Article 89.

We found no evidence of similar reporting obligations in either Switzerland or the US. We note however the existence in the US of CBCR for the extractive sector under section 1504 of the Dodd-Frank Act and also note the various difficulties in the implementation of section 1504 which means that the regime is not yet active in the US, despite originally being added to the statute books in August 2010.

⁷⁹ <http://eiti.org/eiti/history>



Appendix 1 – Detailed reference material for the econometric study

Appendix 1.1 Other country-by-country reporting initiatives

The table below sets out more detail the various country-by-country reporting initiatives that have been implemented worldwide.

Table 22: Extractives industry country-by-country reporting initiatives

Reporting initiative	Who does it cover?	Key objectives	Reporting requirements
Extractive Industries Transparency Initiative (EITI)	All companies extracting natural resources operating in a country implementing EITI.	EITI aims to improve the transparency and accountability of extractives regimes in natural resource-rich countries with a view to strengthening governance.	EITI requires extractives companies to disclose payments to governments. It also requires governments to disclose the payments they received from extractives companies. The two sets of figures are then independently reconciled
Dodd-Frank Wall Street Reform and Consumer Protection Act	All SEC registered extractives companies (both upstream and downstream).	The Dodd-Frank Act aims to promote better governance and accountability of extractives regimes.	SEC registered extractives companies are required to file an annual SEC report disclosing payments made by the company, its subsidiaries or entities under its control to the US government and foreign governments for the purpose of extracting natural resources.
EU Directives on Accounting and Transparency	EU public interest entities (notably listed entities) and large EU undertakings in the extractives industry.	EU Directives aim to promote transparency and accountability of the extractives industry and national governments to local communities.	EU Directives require disclosure of payments over €100,000 made to governments on a country-by-country basis, or where possible, on a project-by-project basis.

Source: PwC analysis

**Appendix 1.2 List of banks included in our analysis**

Bank name	Headquarter country
Bank of America	United states
Bank of China	China
Bank of New York Mellon	United states
Barclays	United kingdom
BBVA	Spain
BNP Paribas	France
Citigroup	United states
Credit Suisse	Switzerland
Deutsche Bank	Germany
Goldman Sachs	United states
Group Crédit Agricole	France
HSBC	United kingdom
Industrial and Commercial Bank of China Limited	China
ING Bank	Netherlands
JP Morgan Chase	United states
Morgan Stanley	United states
Nordea	Sweden
Royal Bank of Scotland	United kingdom
Santander	Spain
Société Générale	France
Standard Chartered	United kingdom
State Street	United states
UBS	Switzerland
Unicredit Group	Italy
Wells Fargo	United states
Lloyds Banking Group	United kingdom
Commerzbank	Germany
Intesa	Italy
Danske Bank	Denmark
KBC	Belgium
Handelsbanken	Sweden
SEB	Sweden
Banca Monte dei Paschi Siena	Italy
Erste Bank	Austria
Swedbank	Sweden
UBI	Italy
Agricultural Bank of China Limited	China
Bank of Communications Co. Ltd	China
Natixis	France
CITIC Group	China
Banco do Brasil S.A.	Brazil



China Merchants Bank Co Ltd	China
Industrial Bank Co Ltd	China
China Minsheng Banking Corporation	China
Shanghai Pudong Development Bank	China
Sberbank of Russia	Russian federation
Dexia	Belgium
Itau Unibanco Holdings	Brazil
Caixabank, S.A.	Spain
DnB ASA	Norway
Banco Financiero y de Ahorros SA-Bankia	Spain

Source: PwC analysis



Appendix 1.3 Disclosure quality scoring framework

This section sets out our disclosure scoring framework in more detail, with information on the criteria for each of the seven individual components.

Reporting Area		Notes for scoring	Score scale
Risk Management	Discussion of risk management strategy and objectives	Best practice would be a good discussion of the company's strategy for dealing with risk and the objectives for the company's risk strategy. Information is usually at the start of a Risk section of the report although summaries at the start of a report may also mention this area.	5 = a very detailed discussion of both strategy and objective 4= a detailed discussion of both 3= detailed but maybe missing discussion on strategy or objectives 2 = lacking detail 1= little or no discussion
	Details of risk management in the past year	Again this is usually found in the risk section of the report. Best practice would be a good description of risk management procedures or activities within the company over the past year with some discussion or examples perhaps of how that has fitted in with the overall strategy or objectives.	5 = a very detailed discussion of previous years' risk management 4= a detailed discussion 3= detailed but maybe missing some specifics 2 = lacking detail 1= little or no detail
	Quantitative data reported	Best practice would be some data or statistics that detail risk. Again usually found in the Risk section of reports.	5 = very detailed data covering a wide range of areas 4= detailed data covering some areas 3= detailed data but missing some areas 2 = some data 1= little or no data
Corporate Governance	Board Structure and Board members	Best practice would be an outline of the structure of the board and its committees. Also a detailed biography of each board member. A record of attendance of board members at meetings is also a plus. Information usually found in a Corporate governance section or in a summary at the start of a report.	5 = a very detailed description of the board structure and board members 4= a detailed discussion and some biographies of board members 3= detailed but maybe missing some specifics 2 = lacking detail 1= little or no detail



Reporting Area	Notes for scoring	Score scale
	Discussion of corporate strategy	Best practice would be a detailed description of the overall strategy for the company in years to come. Usually outlined in the Chief executive's Summary or Chairman's Report. May also be in a separate section dedicated to a discussion on overall strategy.
Non-Financials	Discussion of future or planned investments	5 = a very detailed description of corporate strategy 4= a detailed discussion 3= detailed but maybe missing some specifics 2 = lacking detail 1= little or no detail
	Employee satisfaction	5 = a very detailed description of planned investments 4= a detailed discussion 3= detailed but maybe missing some specifics 2 = lacking detail 1= little or no detail
	Customer satisfaction	5 = a very detailed review of employee opinion 4= a detailed discussion of employee opinion 3= some discussion 2 = mentions employees but no real detail 1= very little or no detail
	Discussion of corporate responsibility / sustainability / environment	5 = a very detailed review of customer opinion 4= a detailed discussion of customer opinion 3= some discussion 2 = mentions customers but no real detail 1= very little or no detail
	Discussion of corporate responsibility / sustainability / environment	5 = detailed look at all these issues 4= a detailed look at two of these issues or very detailed of one at least 3= some discussion of one or two of the issues 2 = brief mentions 1= no real discussion



Reporting Area		Notes for scoring	Score scale
Market Share	Market share data	Best practice would be a detailed explanation of the company's market share in different areas, either geographical or business unit. Can be mentioned sporadically throughout the report. Sometimes if there are reviews by heads of business units then they may discuss market share. Also there should be as much data as possible rather than just a vague discussion.	5 = broken down into individual countries and business units 4= broken down into geographical region 3= broken down by business unit 2 =some mention of market share 1= very little or no mention of market share
Regional Breakdown	Regional Breakdown data	In the financial review section the results will be segmented to a certain degree but it can vary. Some will break down and discuss results by business unit, others will do by a broad geographic unit (e.g. Europe), some may break down results by individual countries. Best practice would be granular data at the country level; additional business unit information is a plus.	5 = broken down into individual countries and business units 4= broken down into geographical region 3= broken down by business unit 2 = broken down into broad business 1=not broken down
Shareholder Returns	Shareholder returns data	The report should include information about shareholder returns. Usually found in a summary at start or in the financial review section. Can also give comparisons against other companies and how returns have changed over time.	5 = very detailed and some form of comparisons 4= detailed and maybe some comparisons 3= discussed in some detail 2 = some/little discussion 1= not discussed
Growth Targets	Specific targets set out	Best practice would be a clear exposition of specific targets that the company is looking to hit in the years ahead. May be key performance indicators or something similar. Could be found in financial review, summary section at start or Chief execs review or may even have a separate section.	5 = key targets laid out clearly and in detail 4= key targets laid out clearly 3= some targets laid out 2 = targets briefly discussed 1= no targets laid out



Reporting Area	Notes for scoring	Score scale
	Discussion of how to achieve targets	Best practice would be a discussion of how the business has tried to achieve the targets in the past year or how they will try to achieve them in future years
		5 = a very detailed and specific description of how targets will be achieved 4= a detailed discussion 3= some detail but maybe missing some areas 2 = lacking detail but some sort of discussion 1= little or no discussion
Overall	General Presentation and ease of use	Best practice would be a report that is easy to navigate around and find information. Also looking for good use of graphics and charts that highlight key information.
		5 = Excellent graphics, easy to navigate 4= some good graphics, quite easy to navigate 3= decent graphics, can navigate ok 2 = lacking graphics and not easy to navigate 1=poor use of graphics and hard to find information



Appendix 1.4 Disclosure quality score summary statistics

Table 23 shows the descriptive statistics for the disclosure quality scores each year from 2000 to 2013.

Table 23: Descriptive statistics of total disclosure quality scores over time

	Mean	Median	Min	Max	Standard Deviation
2000	31.68	32.00	15.00	46.00	9.43
2001	34.84	34.00	17.00	51.00	9.92
2002	35.30	36.00	20.00	50.00	9.15
2003	36.33	37.00	22.00	46.00	8.46
2004	37.46	39.00	20.00	50.00	9.35
2005	38.38	40.00	22.00	49.00	9.09
2006	40.53	42.00	22.00	52.00	9.34
2007	42.52	42.00	23.00	59.00	10.11
2008	43.36	42.00	28.00	58.00	8.92
2009	44.04	43.00	29.00	58.00	9.43
2010	44.62	46.00	16.00	60.00	9.85
2011	45.32	46.50	26.00	70.00	10.00
2012	45.96	45.50	30.00	69.00	10.29
2013	47.06	47.00	29.00	69.00	10.19

Source: PwC analysis

Appendix 1.5 GMM methodology tests

In general, to ensure that our findings do not suffer from endogeneity, we use two different tests on whether a possibly endogenous regressor can be treated as exogenous. We use the statistical software Stata to conduct our econometric analysis and explain these issues with reference to the commands in Stata that can be used to carry out relevant tests.

The first test of exogeneity we use is by Davidson and MacKinnon (1993) which has been adapted for use in a panel data context by Baum and Sillman (1999), through the "dmexogxt" procedure following Stata's "xtivreg". A key issue with this method is that the fixed effects instrumental variable (IV) estimator available from Stata's "xtivreg" imposes the constraint of constant correlation of individual observations within group (Baum, Shaffer and Stillman, 2003). As Hoxby and Paserman (1998) demonstrate, however, the presence of intra-cluster correlation can readily cause a standard over-identification statistic to over-reject the null.

We also use a second test based on the endogenous option of Stata's "ivreg2" procedure which can report test statistics that are robust to various violations of conditional homoscedasticity. Each model is then specified accordingly based on both evidence gathered from our literature review and on our endogeneity test results.

Using two distinct tests for endogeneity in our analysis does come at a cost. In some cases, we obtain conflicting results between the two tests as a given explanatory variable is found to be endogenous or exogenous depending on the test we use. In such a situation, we adopt the following approach:

- We first treat the variable as exogenous, and change our estimator and model specification accordingly.
- We next treat the variable as endogenous and use the IV estimator depending on our modelling context.
- We then use a number of key diagnostic statistics to choose, where possible, the most robust model.

There is an argument that there might be forward looking expectations within the aviation industry. If this is true, such forward looking expectation will be detected by our endogeneity test and subsequently dealt with. Although the endogeneity tests cannot tell us what is causing the observed endogeneity problem, they can nevertheless identify any endogeneity caused.



Appendix 1.6 Cost of equity estimation methods

The table below sets out the four implied cost of equity capital methods used in our approach to estimate the impact of disclosure quality on the cost of equity capital:

Method	Description	Advantages	Disadvantages
Claus and Thomas (2001)	<p>This model is based upon the residual income valuation model, which derives the expected future residual income series. Residual income is forecasted earnings per share up to 5 years ahead, minus a cost of capital charge for book value of equity per share at the beginning of the fiscal year. After the fifth time period, the model assumes that residual income grows at a rate equal to expected inflation, g; a proxy of median, country-specific, one-year ahead realised monthly inflation rates is used.</p> $P_t = bv_t + \sum_{\tau=1}^T \frac{(\hat{x}_{t+\tau} - r_{CT} \cdot bv_{t+\tau-1})}{(1+r_{CT})^\tau} + \frac{(\hat{x}_{t+T} - r_{CT} \cdot bv_{t+T-1})(1+g)}{(r_{CT} - g)(1+r_{CT})^T}$ <p>A clean surplus is assumed, whereby future book values are imputed from current book values, forecasted earnings and dividends. (Daske <i>et al.</i>, 2007).</p>	Time-varying discount rates can be calculated by splitting the discount factor into the risk premium and risk-free rate (Schroder, 2007)	Confusing results are generated if the book value of equity exceeds its market capitalisation (Schroder, 2007)
Ohlson and Juettner-Nauroth (2005)/Gode and Mohanram (2003)	<p>This model is based upon the abnormal earnings growth valuation model and uses one-year ahead forecasted earnings and dividends per share to determine the expected price. To yield a logical numerical solution, the change in forecasted earnings must be positive; this permits zero expected dividends for any period. It is assumed that the growth of abnormal earnings per share, beyond the first year, is equal to the expected rate of inflation, which is calculated as the country-specific median of one-year-ahead realised monthly inflation rates; this sets a lower bound to the cost of equity capital estimates. (Daske <i>et al.</i>, 2007).</p>	Does not rely on a dividend pay-out parameter. Permits zero expected dividends for any number of future periods. Provides risk premium estimates that reflect the market's perception of risks (Ohlson and Gao, 2006)	Usefulness in measuring the risk premium is empirically debatable (Gode and Mohanram, 2003)

$$P_t = (\hat{x}_{t+1}/r_{OJ}) \cdot (g_{st} + r_{OJ} \cdot \hat{d}_{t+1}/\hat{x}_{t+1} - g_{lt}) / (r_{OJ} - g_{lt})$$



Method	Description	Advantages	Disadvantages
Easton (2004)	<p>This model is based upon the abnormal earnings growth valuation model. Abnormal earnings growth is calculated using one- and two-year ahead earnings per share forecasts and expected dividends per share. The model assumes that growth in abnormal earnings continues infinitely after the initial period. Again, this model requires the change in forecasted earnings to be positive. (Daske <i>et al.</i>, 2007). This method simultaneously estimates the implied market expectation of the rate of return and the implied market expectation of the long-run change in abnormal growth in earnings.</p> $P_t = (\hat{x}_{t+2} + r_{PEG} \cdot \hat{d}_{t+1} - \hat{x}_{t+1}) / r_{PEG}^2$	<p>Isolates the respective roles of: forecasts of the next period's accounting earnings, forecasts of short-run growth in accounting earnings and expected growth in accounting earnings beyond the short forecast horizon (Easton, 2004).</p>	<p>PE ratio, expected abnormal growth in earnings and expected long-run change in abnormal growth in earnings are all interdependent, resulting in bias (Easton, 2004).</p>

Where,

P_t	= Market price of a firm's stock at date t
bv_t	= Book value per share at the beginning of the fiscal year
$bv_{t+\tau}$	= Expected future book value per share at date $t + \tau$, where $bv_t = bv_{t-1} + E_{t-1,t} - d_{t-1}$
$E_{t+\tau}$	= Expected future earnings per share for period $(t + \tau - 1, t + \tau)$ using either explicit analyst forecasts or future earnings derived from growth forecasts, g, g_s, g_l respectively
$d_{t+\tau}$	= Expected future net dividends per share for period $(t + \tau - 1, t + \tau)$, derived from the dividend pay-out ratio times the earnings per share forecast, $E_{t+\tau}$
g, g_s, g_l	= Expected (perpetual, short-term or long-term) future growth rate
$r_{IT}, r_{ES}, r_{D}, r_{PEG}$	= Implied cost of capital estimates, calculated as the internal rate of return solving the above valuation equations respectively



Appendix 1.7 Logistic regression interpretation and results using odd ratios

The table below sets out odd ratios for the individual specifications.

Table 24: Results for individual the impact of disclosure quality on earnings management using individual disclosure scoring components (coefficients presented as odds ratios)

Earnings Management	Total disclosure Score	Regional Breakdown score	Corporate Governance score	Risk management score	Non-Financials score	Targets Score	Market Share score	Shareholders Return score
Total disclosure score	-0.0353* (0.087)							
Regional breakdown score		-0.3148* (0.069)						
Corporate governance score			-0.2639*** (0.008)					
Risk management score				0.0127 (0.792)				
Non-financials score					-0.0777 (0.111)			
Targets score						-0.0581 (0.505)		
Market share score							0.0221 (0.876)	
Shareholder returns score								-0.0686 (0.591)
Log of sales	0.1211 (0.527)	0.0211 (0.907)	0.1143 (0.527)	-0.0256 (0.892)	0.067 (0.712)	-0.0027 (0.988)	-0.0145 (0.936)	0.0084 (0.964)
Sales growth	1.2289** (0.032)	1.2183** (0.031)	1.2747** (0.024)	1.214** (0.029)	1.2145** (0.032)	1.224** (0.028)	1.216** (0.029)	1.2114** (0.031)
Stock growth	-0.3135 (0.246)	-0.2794 (0.301)	-0.3085 (0.262)	-0.2677 (0.32)	-0.2987 (0.26)	-0.2712 (0.313)	-0.268 (0.321)	-0.2843 (0.293)
Leverage	0.0201 (0.22)	0.0203 (0.231)	0.0225 (0.175)	0.0217 (0.204)	0.0184 (0.243)	0.0218 (0.203)	0.0222 (0.205)	0.0221 (0.207)
Liabilities growth	0.4056 (0.456)	0.4029 (0.45)	0.2585 (0.654)	0.3921 (0.456)	0.3834 (0.471)	0.3846 (0.471)	0.398 (0.45)	0.4078 (0.439)
Sales/assets	-31.6411*** (0.000)	-29.661*** (0.000)	-30.436*** (0.000)	-28.374*** (0.001)	-29.5019*** (0.000)	-29.5854*** (0.000)	-28.8274*** (0.000)	-29.1991*** (0.000)



Earnings Management	Total disclosure Score	Regional Breakdown score	Corporate Governance score	Risk management score	Non-Financials score	Targets Score	Market Share score	Shareholders Return score
Cash flow operations	4.8487 (0.277)	5.4815 (0.228)	5.3104 (0.247)	4.9211 (0.274)	4.7952 (0.286)	4.8389 (0.279)	4.9358 (0.272)	5.0033 (0.267)
No. of exchanges	0.0102 (0.921)	0.0686 (0.527)	-0.01 (0.923)	0.0172 (0.867)	-0.01 (0.922)	0.0191 (0.852)	0.019 (0.853)	0.0185 (0.858)
US listing	-0.188 (0.693)	-0.2557 (0.6)	-0.1525 (0.745)	-0.207 (0.665)	-0.1384 (0.769)	-0.2078 (0.662)	-0.2031 (0.672)	-0.2309 (0.634)
Close shares	-2.324*** (0.000)	-2.6298*** (0.000)	-2.3191*** (0.000)	-2.2487*** (0.000)	-2.3945*** (0.000)	-2.1423*** (0.001)	-2.2216*** (0.001)	-2.2951*** (0.000)
IFRS dummy	-1.0484** (0.022)	-1.0251** (0.027)	-1.0012** (0.028)	-1.1693*** (0.01)	-1.0676** (0.018)	-1.1257** (0.013)	-1.1555** (0.012)	-1.1508** (0.011)
Constant	1.8907 (0.558)	2.7052 (0.404)	2.407 (0.449)	2.7083 (0.404)	1.9291 (0.548)	2.7047 (0.4)	2.6329 (0.415)	2.4661 (0.449)
Number of obs	503	503	503	503	503	503	503	503
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald chi2(27)	92.02	88.71	95.39	89.48	93.07	91.32	89.28	88.72
Prob > chi2	0	0	0	0	0	0	0	0

*** Significant at the 1% level; ** Significant at the 5% level; *Significant at the 10% level

Source: PwC analysis

The odds ratio indicates the probability of a “success” outcome (in this context, where the dependent variable is 1, indicating the presence of earnings management) divided by the probability of a “failure” outcome (where the dependent variable is 0, indicating the absence of earnings management). A coefficient value of less than 1 indicates that an increase in the explanatory variable it is less likely for earnings management to occur, and a value exceeding 1 indicates that it is more likely to occur. For example, the coefficient on the regional breakdown score indicates that an increase in the score of one unit means that earnings management is 0.73 times likely to occur, meaning that it is less likely to occur. This could also be interpreted to mean that an increase in the score of one unit means that banks are 27% ($1-0.73=27\%$) less likely to manage earnings.

Appendix 1.8 Bibliography

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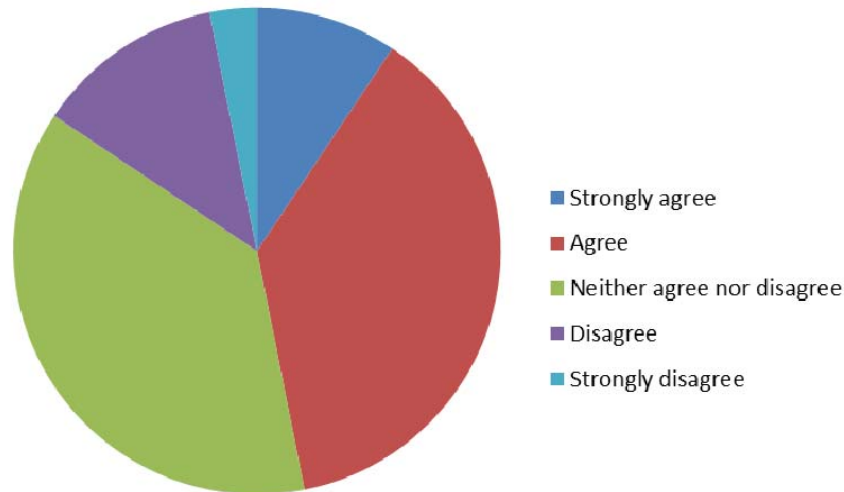


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Appendix 2 – Detailed results from the stakeholder survey

How strongly do you agree that Article 89 is justified as a reporting requirement and serves a legitimate public interest?



32 out of 35 respondents answered the question

Non-business respondents were more positive than business respondents that Article 89 is in the public interest

While three quarters of respondents either agreed, or neither agreed nor disagreed, with the statement, there was a split between business and non-business, with non-business respondents more likely to agree with the statement.

Of the non-business respondents, two strongly agreed with the statement, ten agreed with the statement, three neither agreed nor disagreed and one disagreed.

There was a wider range of views among the business respondents with one strongly agreeing with the statement, two agreeing, three disagreeing, one strongly disagreeing and the remaining nine neither agreeing nor disagreeing.

A number of contributors felt that the public interest would be better served by having legislation that could be consistently applied across all Member States and business contributors expressed concerns that the data to be provided would not be easily understood by the general public. One trade association regretted that there had not been time for a full consultation including preparers and auditors of the information to create effective legislation.

A couple of contributors were of the view that while the concept of transparency was a positive one, they were not convinced that this measure helped to achieve it. It was also noted that in some Member States the legislation would only apply to a small number of institutions.

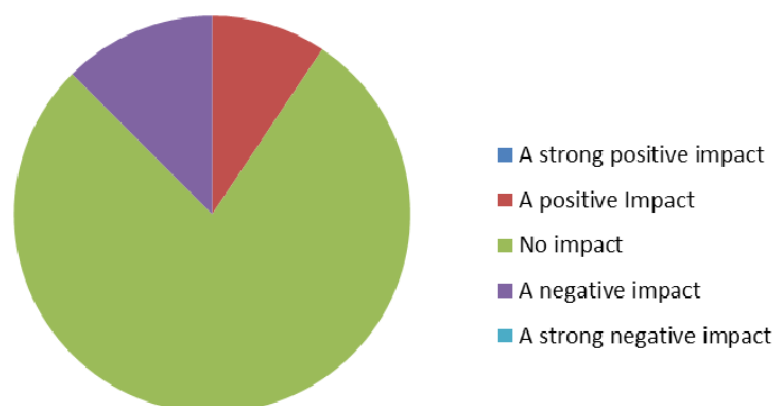
Only one bank expressed concerns around the confidential nature of some of the data to be made public, particularly with regard to the disclosure of profit or loss before tax and of public subsidies received. The bank noted that the required form of the disclosure was not in line with those required under its accounting policies and so would not reflect the view of management. The bank was therefore concerned about full public disclosure and recommended that the Commission allow reporting entities to include information on how the disclosure would differ from figures reported in the consolidated financial statements.



One CSO expressed a clear view that the reporting was in the public interest as the disclosures would “enable the public to make an informed judgement about a company’s contribution to the society in which it operates. They can help flag up corruption risks by shedding light on any special arrangements between companies and governments. They can improve the oversight exercised by authorities. They allow investors to gain an insight into the political risks a company faces and the sustainability of its tax strategy”. The concerns raised by many about the lack of consistency in the implementation of the regulations and the consequent risk of misinterpretation of the data would seem to put at risk the usefulness of the data for the purposes outlined by this CSO

One bank felt that the public interest was not best served by having the disclosure requirement included within CRD IV which is primarily focussed on prudential regulation. Indeed, the confusion between prudential and accounting bases of preparation of the data gives rise to some of the confusion described elsewhere in this report. The bank was of the view that the public interest would be better served by extending the disclosure requirements to all public companies and not just those in the FS sector.

What sort of impact will Article 89 have on the willingness of institutions to be (or to stay) established within the EU?



32 out of 35 respondents answered the question

78% of respondents were of the view that Article 89 would not affect the willingness of reporting institutions to remain in the EU

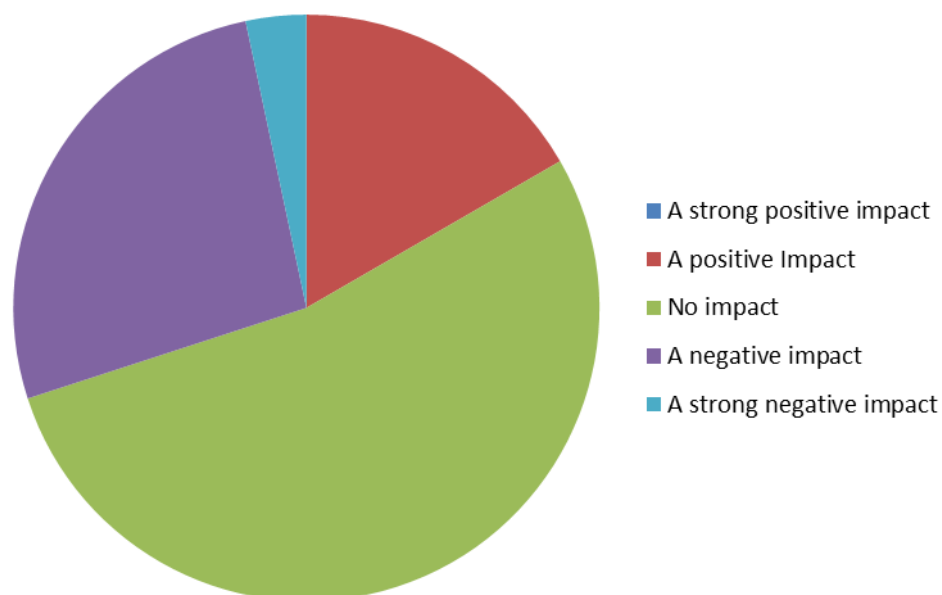
Several of those who felt that there would be no impact in this regard noted that while Article 89 created an extra burden for companies, it would not be significant enough to affect the willingness of businesses to remain in the EU. It was felt that other factors were far more important for businesses when determining where to locate.

One regulator felt that additional transparency would increase public confidence in the financial sector thereby making the EU a more attractive place for companies. Similarly, one CSO felt that the additional disclosure would increase investor confidence, lower the cost of capital and increase the attractiveness and competitiveness of EU banks.

One business organisation noted that non-EU headquartered groups would be affected differently from EU headquartered groups and that the structure of groups would affect the extent to which they were affected by the legislation. The impact of the legislation was however unlikely to cause companies to cease doing business in the EU.

Of the four organisations predicting a negative impact, one was a financial regulator and the other three were financial institutions. One of these financial institutions was concerned that the information would be misunderstood as there were likely to be inconsistencies with the group accounts and with the local statutory accounts on which tax calculations are based.

What sort of impact will Article 89 have on the competitiveness of reporting institutions, particularly as against non EU parented groups, who may be wholly or partially exempt from the requirement?



30 out of 35 respondents answered the question

53% of respondents felt that Article 89 would have no impact on the competitiveness of EU institutions, over a quarter felt it would be negative.

The majority of respondents felt that Article 89 would have no impact on the competitiveness of EU institutions. Seven business organisations and one financial regulator thought the impact would be negative, while two regulators, two CSOs and one trade association felt it would be positive.

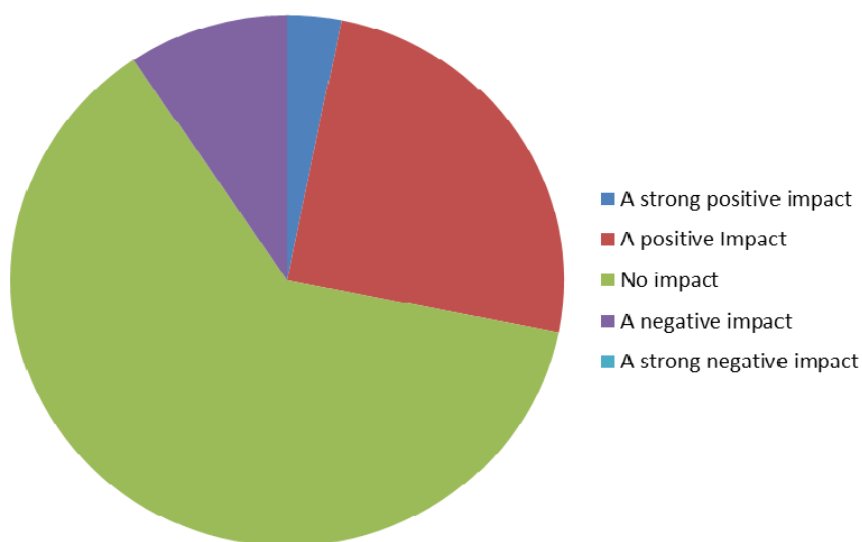
Those with a negative view were mainly concerned the legislation would mean that there was no level global playing field given the absence of similar regulations in other financial centres.

One of those with a negative view referred to current global initiatives, a view that was shared by another respondent who felt that the OECD's BEPS project would have a greater effect.

Other contributors with a negative view noted that non-EU institutions could face problems with applying the legislation. This view was shared by another business organisation which noted that it would expect the cost to be proportionately greater for non-EU institutions reporting on their EU operations.

One CSO expressing a positive view noted that a number of companies are already making CBCR disclosures and that it was hard to see that their competitiveness had been eroded. It also commented that the need to disclose would encourage banks to consider political risk more carefully thereby increasing competitiveness and reducing corruption.

What sort of impact will Article 89 have on the investment in reporting institutions, e.g. the availability of capital markets funding, and decisions whether or not to invest in institutions in the EU?



32 out of 35 respondents answered the question.

62% of respondents felt that Article 89 would have no impact on investments into reporting institutions.

The majority of respondents felt that Article 89 would have no impact on the decisions of investors whether or not to invest in reporting institutions, while three business organisations and five non-business organisations felt the impact would be positive.

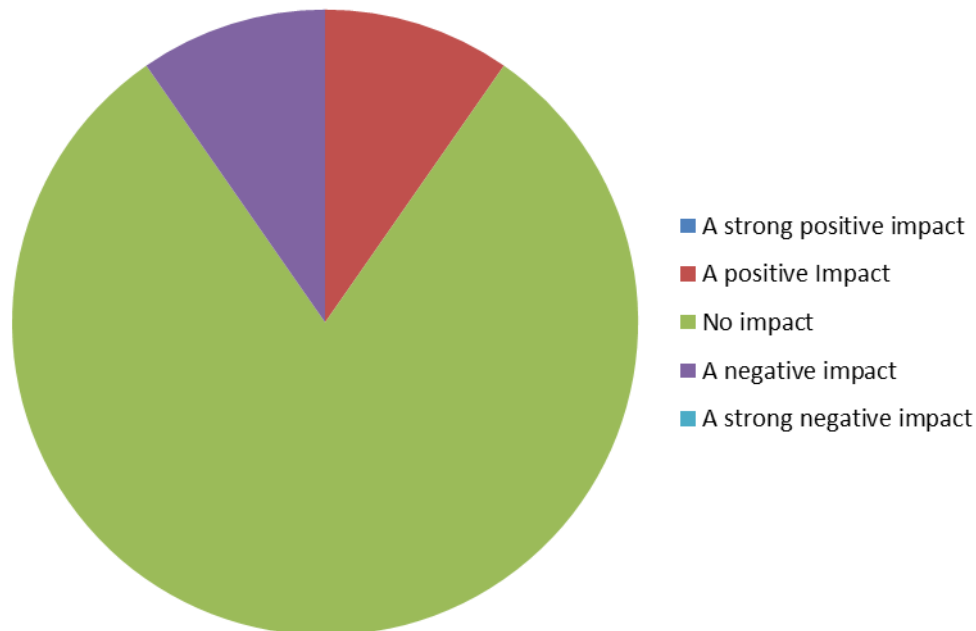
The one CSO with a strongly positive view felt the disclosure would allow investors to understand where businesses operate and the associated political risks. This would lead to better risk management by institutions.

Two organisations with a positive view noted that investors are increasingly considering factors such as sustainability and transparency in investment decisions.

Of those expecting no impact, it was noted that the disclosure may attract more investment from socially responsible investors, but the effect was expected to be minimal. Another view was that negatively perceived disclosures could lead to customer revolt, making investment less attractive; this was not expected to have a significant impact. A general view was that investment decisions were based on other factors other than the data to be disclosed under Article 89.

Finally, it was noted that institutions applying for funding on the capital markets have already to provide more information than is required by Article 89.

What sort of impact will Article 89 have on the investment by reporting institutions, and decisions as to whether to invest in the EU or not?



31 out of 35 respondents answered the question

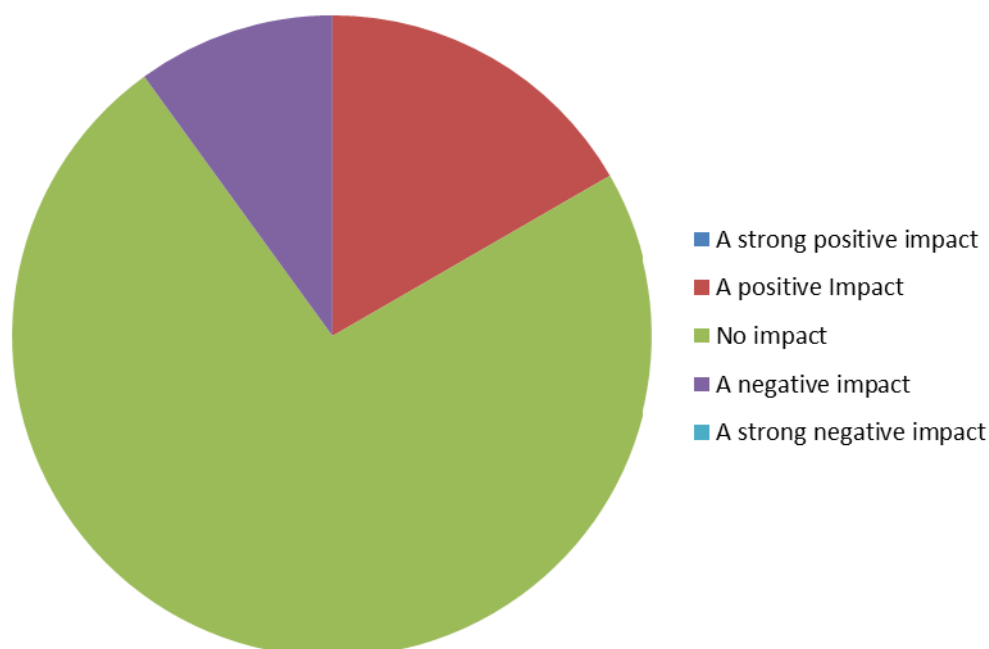
81% of respondents felt that Article 89 would have no impact on investments by reporting institutions

The vast majority of respondents felt that Article 89 would have no impact on the investment decisions of institutions and in particular whether or not to invest in the EU.

Two non-business organisations and one business organisation felt there might be a positive impact with one of them expressing the view that the increased information could aid investment decisions.

A couple of those who felt there would be no impact commented that there were other more important factors in investment decisions. One trade association noted that the lack of a level playing field could make the EU less attractive, but nevertheless no impact was foreseen.

What sort of impact will Article 89 have on the provision of credit to reporting institutions, e.g. the effect on the cost of debt/equity, cost of obtaining wholesale loan finance?



30 out of 35 respondents answered the question

73 % of respondents felt that Article 89 would have no impact on the availability of credit to reporting institutions

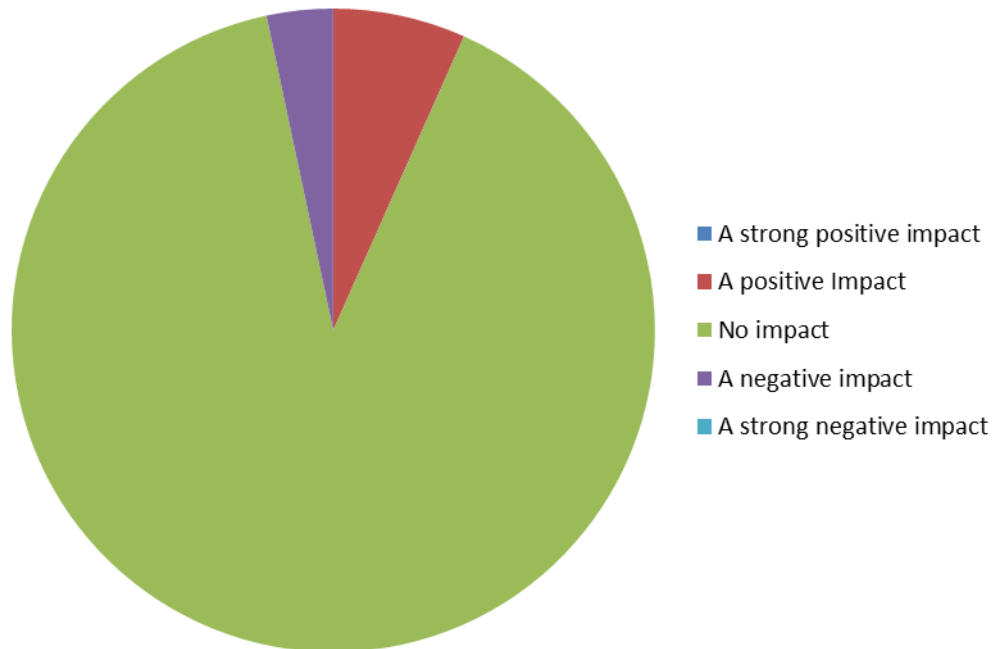
Five non-business organisations felt that there would be a positive impact. One commented that the increased transparency could improve confidence in reporting institutions, while another pointed to transparency leading to a better understanding of company risk and therefore better risk management and lower levels of risk in the longer term.

One credit institution felt that there may be a negative effect as the disclosures were likely to be misunderstood by many readers of the disclosures potentially leading to negative sentiments.

One regulator noted that far more information than is required by Article 89 is usually provided by institutions seeking loan finance.

One business organisation commented that the information on public subsidies could lead to a perception of a bank being “propped up”, leading to increased costs of wholesale funding. Overall however the organisation felt there would be no impact.

What sort of impact will Article 89 have on the provision of credit by reporting institutions considering the level of financial services provided, as well as the price and quantity of credit available to businesses and households?

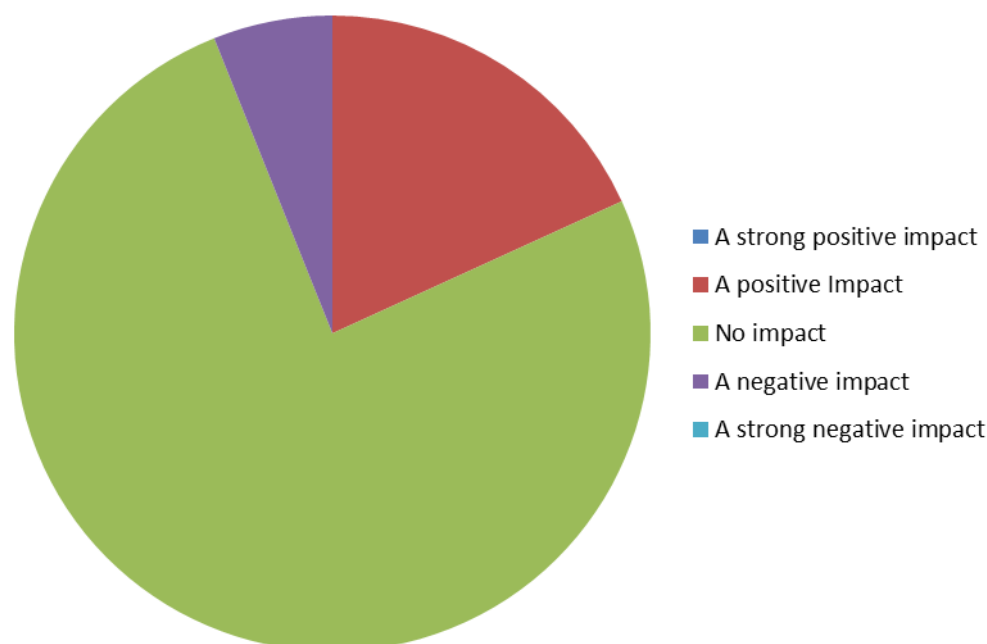


30 out of 35 respondents answered the question

90% of respondents felt that Article 89 would have no impact on the provision of credit by reporting institutions

The vast majority of respondents felt that Article 89 would have no impact on the provision of credit by reporting institutions while two non-business organisations felt it would have a positive impact and one business organisation felt that there would be a negative impact.

What sort of impact will Article 89 have on the stability of the financial services sector in the EU e.g. any effect on financial market volatility from the change in disclosure requirements



33 out of 35 respondents answered the question.

76 % of respondents felt that Article 89 would have no impact on the stability of the financial services sector.

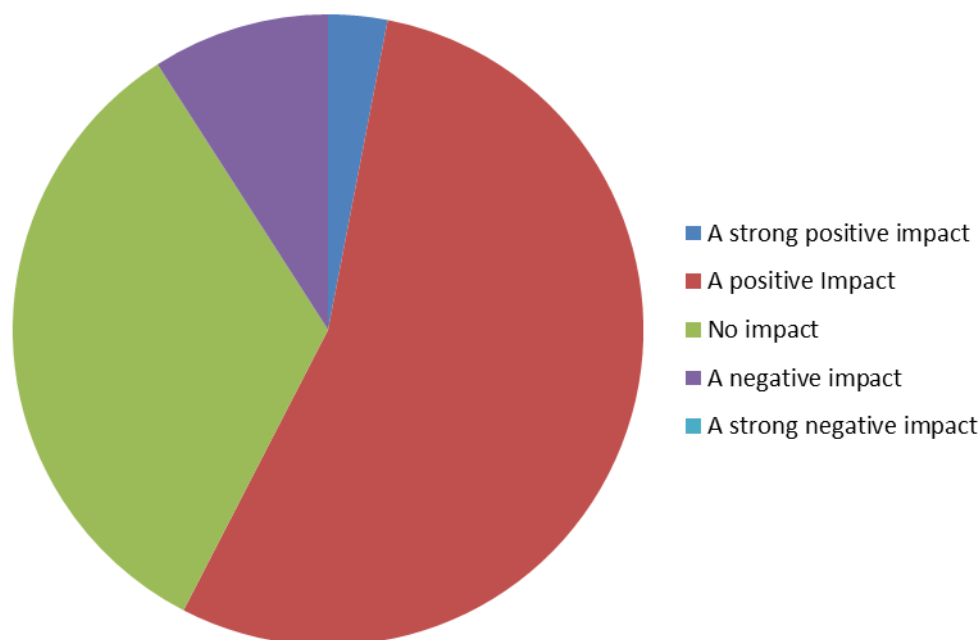
Two credit institutions felt that there would be a negative impact with one of them mentioning that the availability of detailed information could affect interbank lending.

One business and five non-business organisations expect a positive impact, with one commenting that increased disclosure would increase confidence and reduce market volatility. One CSO expected a positive impact as they felt the disclosures respond to the demands of investors and CSOs, while another CSO felt that there would be increased trust in the market as more transparency would lead to better understanding and better management of risks.

One comment from those expecting no impact was that while individual businesses may experience volatility, this would not affect the sector as a whole. Another noted that volatility was due to a number of causes and it would not be possible to identify volatility arising solely from Article 89 disclosures.

Finally, one business association noted that there may be some risk of the disclosures affecting the perception of the sector, but they still did not expect a noticeable impact.

What sort of impact will Article 89 have on the transparency and accountability of reporting institutions towards their consumers and investors?



33 out of 35 respondents answered the question

55% of respondents felt that Article 89 would improve the transparency and accountability of reporting institutions

One CSO thought Article 89 would have a strongly positive impact as "CBCR enables investors to know which corporations operate in tax havens and in highly corrupt environments, politically unstable regimes, conflict zones and other sensitive areas enabling them to assess their political and other risks and potential return on investment."

Thirteen non-business and five business organisations expect a positive impact on transparency and accountability. Their comments included views that it would be easier to obtain and compare data, that some stakeholders were requesting this data and that it would mean companies having to take more account of public opinion when considering their tax policies.

Two non-business organisations and nine business organisations felt that there would be no impact on transparency and accountability. One of these business organisations commented:

"We hope that the reporting will have a positive impact on the perceived transparency and accountability of relevant institutions but note that this will be hard to capture and measure in the early reporting. Review and consideration of the cost/benefit of reporting will be needed. We further note that lack of proper due process in the development of the disclosure makes it difficult to establish if users' needs will be met, whether they will examine, and indeed understand, the information and therefore the benefits in terms of transparency and accountability will be limited."

Another business organisation that expected no impact commented that flexibility should be given to institutions in preparing their disclosures so that they can reflect the fiscal reality of the business and be transparent about the definitions and criteria



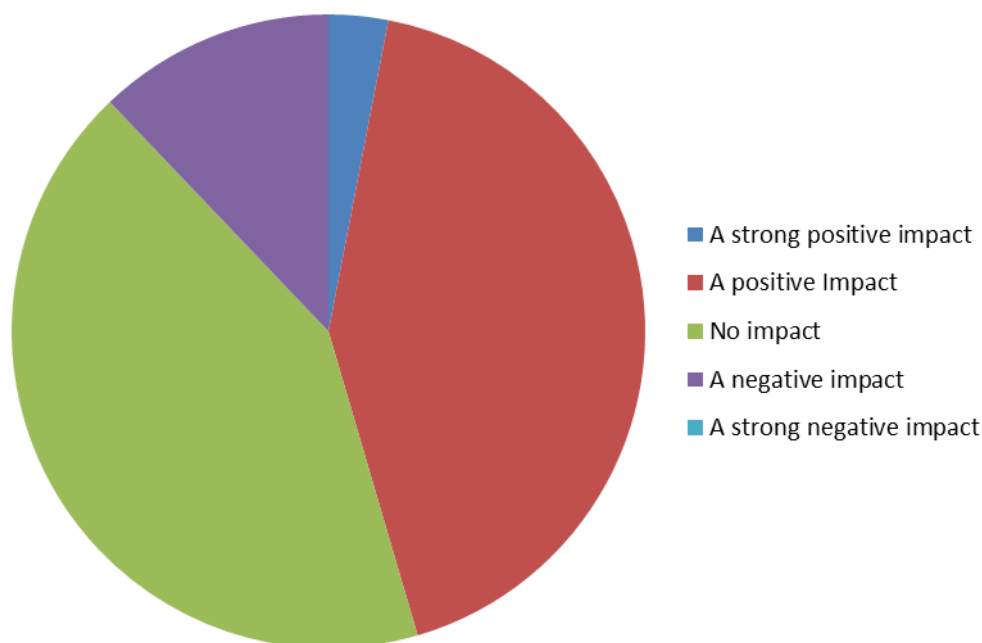
used. Overly prescriptive criteria were thought likely to result in disclosures that were misleading and would generate meaningless “noise”.

One regulator that expected no impact noted that this was because it “saw no merit in the CBCR requirements.”

Another business organisation felt that the regulation was unlikely to lead to transparency as it did not provide a complete picture of an institution’s activities, particularly for non-EU headed groups and could lead to voluntary reporting to contextualise the required disclosures.

The one business organisation that expected a negative impact referred to the lack of clarity around the requirements, the likely lack of consistency in implementation which could lead to negative perceptions of institutions and of the reporting system itself.

What sort of impact will Article 89 have on public confidence in the financial services sector in the EU e.g. the effect on public image of the sector, the demand for financial services, the trust that the public has in the sector?



33 out of 35 respondents answered the question.

42% of respondents felt that Article 89 would lead to greater public confidence in the financial services sector. A further 42% felt there would be no impact.

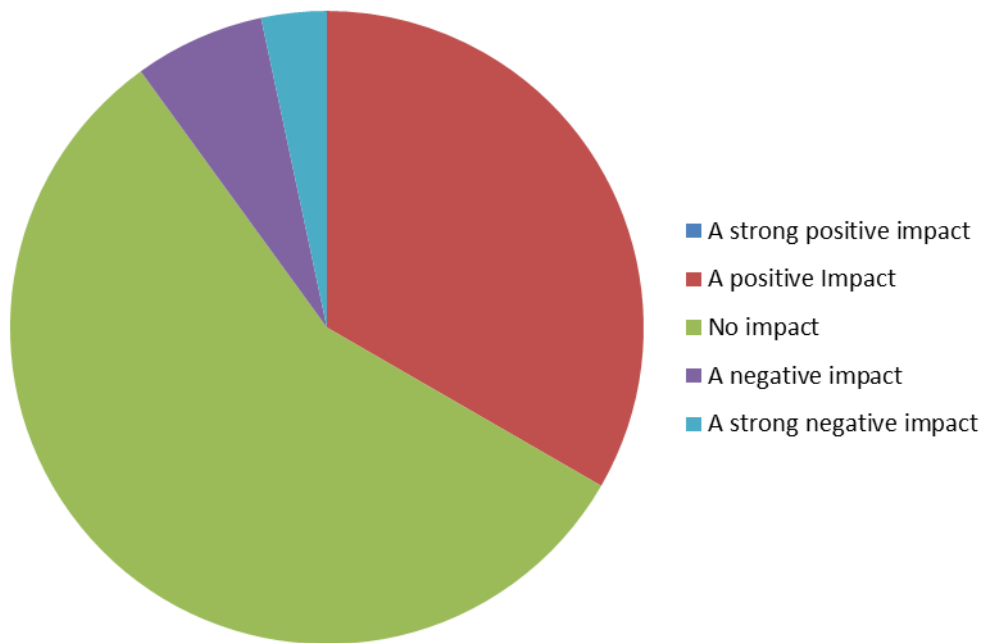
Views on whether Article 89 would lead to increased public confidence were more mixed than those on whether it would improve transparency.

Those expecting no impact were largely business organisations, with four business organisations expecting a negative impact. Three business organisations, and all except one non-business organisation, expected a positive impact.

Those predicting a negative impact were concerned that the lack of clarity in the regulations, its potential to be implemented differently in different Member States and the fact that it may not present a complete picture would lead to misunderstanding and misinterpretation of the data. This could lead to a reduction in public confidence.

Others, some of whom felt the impact would be positive and some of whom expect no impact, felt that of itself Article 89 would have little impact, but it might have an incremental positive effect when considered alongside other changes in the financial services sector. One credit institution was of the view that the impact would be positive as CBCR data is requested by a number of stakeholders. Again, the risk that disclosures would be misunderstood was highlighted as a key risk.

What sort of impact will Article 89 have on the cohesion of the EU's tax regimes as a result of potentially highlighting the practical impact of tax competition between states?



30 out of 35 respondents answered the question

57 % of respondents felt that Article 89 would have no impact on the cohesion of the EU's tax regimes

A number of respondents had a similar view that Article 89 might highlight some of the differences between tax regimes in the EU, but that the lack of clarity in the rules and inconsistent application of the rules could mean that the differences highlighted are meaningless, confusing or inappropriate.

The different respondents had varying views as to the strength and nature of the resultant impact with one non-business organisation thinking it might lead to harmonisation while another non-business organisation felt that tax competition between Member States was desirable.



Respondents were asked to comment on any other impacts that they expected to arise from Article 89. Below are three detailed comments provided by business organisations.

Respondents from business are concerned that the lack of clarity and consistency around the regime will lead to confusion and misunderstanding

"The lack of consistency across country-by-country reporting initiatives is bad for investors and stakeholders. We would encourage the pursuit of regimes that are internationally consistent as well as consistent across sectors. "

"...due to the lack of clarity in the requirements and the resulting likelihood of inconsistent application there is risk of increasing public misunderstanding or that the disclosures will be disregarded resulting in costs but no benefit. Given that there was not a proper impact study before the requirements were introduced or a due process to ensure that the requirements themselves were understandable and worked within the existing reporting regimes where, for example, sub-consolidations are not required if the group consolidation is publicly available, it seems likely that the administrative burden will outweigh any benefits from the disclosures. In addition, we believe that the question of whether the disclosure of public subsidies is in the wider public interest should be carefully considered since such disclosure could prove counterproductive in the event of a banking crisis."

"I believe that the rules will lead to greater confusion over the contribution a financial institution makes in a jurisdiction. Disclosures such as tax paid for some financial institutions that are still carrying tax losses may lead to a zero disclosure whilst showing significant profits. In addition where an institution has overpaid taxes in one year and receives a refund in the subsequent year this may deliver an inaccurate message to the reader. This is likely to lead to a misinterpretation of a financial institutions contribution to the exchequer and therefore further disillusionment with the financial sector.

Whilst compliance with Article 89 on its own is unlikely to be excessively onerous on most financial institutions that are impacted, there is likely to be wider implications of compliance for example a financial institution may be cornered into making further voluntary disclosures to prevent public misinterpretation, further institutions may need to provide reconciliations to other tax transparency agenda's such as the BEPS Action Plan - Action 13. Further where voluntary disclosures are made, this may led to new data sets being collated and therefore an increase in costs in investing into systems and reporting capabilities. From a social perspective the disclosures are likely to increase confusion over the way financial institutions operate and the tax laws that govern a financial institutions requirement to pay taxes, this again is likely to increase the lack of trust the public have in financial institutions."



Respondents were asked to comment on any other impacts that they expected to arise from Article 89.

One CSO believes that CBCR will lead to better risk management, less corruption and potentially greater tax compliance, commenting:

"Country-by-country reporting of key financial information such as that listed in Article 89 is a good measure of a multinational company's commitment to a culture of transparency and dialogue with its stakeholders. In addition, these disclosures can deliver real benefits for citizens, investors and governments around the globe. They enable the public to make an informed judgement about a company's contribution to the society in which it operates. They can help flag up corruption risks by shedding light on any special arrangements between companies and governments. They can improve the oversight exercised by authorities. They allow investors to gain an insight into the political risks a company faces and the sustainability of its tax strategy. Such disclosures also have a deterrent effect on tax avoidance. The benefits of a detailed disclosure regime of corporate tax payments are corroborated by an analysis of US companies that shows that lowering corporate disclosure requirements directly prompts companies to practice more tax avoidance and reduce their tax burden further, on average by an additional significant 4.8 percentage points (O. Hope, M. Ma et al. (2013): "Tax Avoidance and Geographic Earnings Disclosure", working paper available at SSRN.com, May 28, 2013)"

"CBCR will increase awareness of financial institutions' tax management practices leading to greater reluctance to operate in low tax jurisdictions (see also recent research cited above). CBCR will lead to greater public awareness of corporate tax payments. This might ultimately lead to an environment of greater tax compliance which will increase public money available for economic development. Greater transparency will help reduce the potential for corruption. Key financial data gives citizens the possibility to understand the activities of a particular financial institution in their country and to monitor the appropriateness of payments to governments."



Respondents were asked to comment on any other impacts that they expected to arise from Article 89.

Some expect the disclosures to increase public pressure on business's tax arrangements, while others think it is too early to tell

One business and one non-business organisation expected that there could be some effect on how businesses organise their tax affairs if the disclosures lead to increased public scrutiny and increased pressure from the public and shareholders.

One regulator commented that it was too early to tell what the impact of Article 89 would be.



Appendix 3 – Detailed issues arising from the transposition, implementation and interpretation of Article 89



Only half of Member States had implemented Article 89 by 30 June 2014

- Thirteen Member States had transposed Article 89 into domestic law as at 30 June 2014. A further four had partially transposed the law with it applying to either credit institutions or investment firms.
- Of the remaining Member States, there is a mixture between those who have clearly indicated when Article 89 will be implemented and those where the authorities have given no indication of the timeframe.
- In respect of the jurisdictions that have implemented the requirements, the common approach has been to copy and paste the wording of Article 89.
- Despite this approach, there are a number of areas where member states have departed from the wording of Article 89 and implemented their own interpretation or altered the scope of the regime.
- Only a limited number of territories have implemented local requirements that include additional detail beyond the wording of Article 89.
- We set out on the following pages the key differences that we see in the interpretation and application of Article 89 across the EU. The differences arise through differences in transposition, differences in interpretation that have been noted by respondents to our surveys, differences that we have noted from public disclosures made by reporting institutions and from the confidential disclosures submitted by the 14 GSIBs to DG MARKT.

Placing the reporting obligation on “institutions” means that the extent of reporting can be affected by group structures

- Article 89 places the reporting obligation on the CRD IV regulated ‘institution’. At times this therefore results in groups being partially within the scope of the regulations and also often results in multiple reporting entities within the same ‘group’.
- In France, the regulations have broadened the scope to include not only institutions, but also non-institution holding companies, whilst the UK has also widened the scope of the regime to include optional reporting at a parent level.
- Although most banking groups are regulated at the top holding company, and therefore are only required to report once for the worldwide group, not all banking groups are structured in this way.
- The CBCR disclosure produced by [**one GSIB**] includes four separate tables, presumably representing four separate sub groups within the [**GSIB**] group.

There remains uncertainty as to whether branches of third country institutions are within scope

- EU branches of third country institutions are ordinarily outside the scope of CRD IV and therefore CBCR, although in some territories, branches are expected to comply with their jurisdiction’s CBCR requirements.
- In some territories, the position remains unclear, however certain territories such as the UK, Denmark, Austria, Finland, Malta and Croatia have clarified that they remain outside the scope.



The audit requirement has been relaxed in some Member States for first year reports, but maintained for subsequent years

- The audit requirement has not been applied to first year disclosures in a number of territories.
- In many jurisdictions, it was unclear whether the requirement applied.
- All territories that have implemented Article 89 have maintained the audit requirement for all subsequent reporting periods.

There is a division in interpretation amongst Member States in respect of 'tax on profit or loss'

- The interpretation of 'tax on profit or loss' has been interpreted inconsistently by Member States.
- At one end of the spectrum, the UK and Belgium have defined the term as meaning corporate income taxes paid during the accounting period. At the opposite end, territories such as France, Austria and Malta have interpreted the term as meaning taxes accrued.
- Of the territories that have not provided any guidance or clarity on how the term should be interpreted such as Denmark, Croatia and Finland, the consensus appears to be that the local regulations should be interpreted as meaning taxes accrued.
- In addition, draft regulations in the Netherlands adopt an accruals based approach.
- From some of the disclosures privately submitted by GSIBs to the European Commission, it is also noted that some disclosures simply include the term 'tax on profit or loss' but do not include an indication as to whether the disclosures are based on cash payments of tax or taxes accrued.
- It is also noted that the GSIB disclosures include all of the examples below:
 - 'Tax on profit or loss'
 - 'Current tax' and 'deferred tax'
 - 'Tax paid / (received)'
 - 'Tax on profit before tax'
 - 'Corporation tax paid'
- 20 of the respondents to our opinion survey expressed a view as to how the term 'tax on profit or loss' should be interpreted. 16 organisations (5 credit institutions/ investment firms, 3 FS trade associations and 8 non-business organisations) indicated that the term should mean tax on an accruals basis and several mentioned it should be in line with the accounts. 4 organisations were in favour of cash tax (2 business and 2 non-business organisations).
- One business organisation felt that there were issues with both cash tax and an accruals basis approach, noting that cash tax does not always relate to the year in question and that the accrued tax charge included deferred tax which should perhaps be eliminated.
- One non-business organisation expressed a wish for a cash basis, but without providing further detail while one regulator felt that it should be as defined by the local legislation.



Consolidation is an issue most Member States have not addressed, with most businesses and regulators preferring an accounting based approach

- The term 'on a consolidated basis' has not been clearly defined by any of the territories who have implemented Article 89 to date and only a couple have explicitly relied on the definition in Article 3 (1) of CRR.
- Without any further framework or guidance, there is uncertainty as to how intra-group transactions should be accounted for when producing CBCR disclosures. For example, whether intra-group transactions should be consolidated on a group basis or on a country wide basis.
- The UK regulations include the requirement to report 'in accordance with accepted accounting standards on a consolidated basis', while Austrian regulations adopt a similar approach.
- Despite this, all other territories simply include the requirement to report 'on a consolidated basis'.
- The lack of any detailed framework creates challenges for institutions who are required to comply with the regime, and this can be illustrated by referring to the disclosures by the GSIBs which in some cases include consolidation adjustments and in others do not:
 - [**One GSIB**] includes [**amount**] of consolidation adjustments, [**one GSIB**] includes [**amount**] and [**one GSIB**] includes [**amount**] of turnover within consolidation adjustments.
 - [**Seven GSIBs**] do not separately disclose consolidation adjustments
 - [**One GSIB that included consolidation adjustments to turnover**] also included consolidation adjustments to profit before tax of [**amount**] although no other submission included any such adjustments to profit before tax
- Seven of the business organisations and three of the non-business organisations expressed a desire that consolidation should follow accounting rules whether those were local or international rules depending on which applied to the institution in question,
- Three regulators were of the view that consolidation for these purposes should be read in the light of the definitions in CRR.
- One respondent's answer did not specifically address this point and the others provided no comment on the interpretation of the term.
- One of the business organisations commented that as there were no clear guidelines as to how to deal with intra-group and intra-country transactions, there may be diversity in practice.

In practice, most GSIBs have made their Article 89 disclosures on their websites, while legislation replicates the wording in the Directive.

- Although many territories have not included any further guidance on the term 'where possible as an annex to the annual financial statements', most have adopted the same wording in their local implementation.

- The exception is the UK, which has instead included the requirement that the disclosure be made publicly available. In practice, this allows institutions to either publish disclosures on a website or include within their financial statements.
- There is however a distinction to be made between first year reporting, which was subject to a fixed reporting deadline, and subsequent reporting, which could be expected to align with existing financial reporting obligations.
- Only four business and one non-business organisation responded to our survey questions on the location of disclosures. Three business organisations favoured disclosure on a website, while one intended to include it in its annual report. The one non-business organisation that expressed a view felt that the disclosure should be in the annual report and on a website.
- It should also be noted that the location of the disclosure could affect the type of audit to which the data is subject. If it is included within the annual report then it could be included in the statutory audit report. If it is disclosed separately then it would have to be subject to a separate form of audit procedure.

There is a difference of view as to how 'public subsidies' reportable under Article 89 should be defined

- The definition of subsidies is not defined by most jurisdictions. However some territories have included guidance on this. The key questions which remain unclear in most territories are:
 - Should the definition be limited to direct taxpayer support or should it include implicit support provided by central banks and other government bodies.
 - Should public subsidies be reported on a cash or an accruals basis.
- For example, in Finland, the definition adopted covers the total amount of capital grants received and loans as well as guarantees given by public entities.
- In the UK, the government has included guidance that the definition should be limited to direct support by the government and should not include central bank interventions.
- Of the GSIB disclosures, only [**two GSIBs**] have included any public subsidies.
- [**One GSIB**] has included [**amount**] in respect of [**country**]
- [**One GSIB**] has included [**amount**] the majority of which relates to [**a guarantee provided by a city within an EU country**].
- There is a clear division in our opinion survey between business and non-business organisations as to how 'public subsidies' should be interpreted.
- Five business organisations and one regulator preferred a limited definition based on cash support received, with another business preferring a definition of direct support.
- Six non-business organisations preferred a broader definition that would reflect implicit government support.
- One business organisation expressed the view that a wide definition including implicit support seemed unlikely to be workable in practice.

Some survey respondents have questioned whether 'establishment' refers to legal incorporation or location of activity

- Where a definition of 'establishment' has been provided, it seems to have consistently been interpreted as meaning branch or subsidiary and there does not appear to be any inconsistent application by any particular jurisdiction.
- A number of questions have however arisen in practice as can be seen from the responses to our opinion survey,
- There appear to be a number of considerations as to how the term should be interpreted:
 - Limited to subsidiaries and branches
 - Based solely on legal incorporation
 - Based on location of actual activity
 - Based on taxable presence similar to a definition of permanent establishment
- Most non-business organisations and some business organisations prefer a more legal definition based on the inclusion of companies and branches and looking at legal incorporation.
- A number of business organisations would favour a definition that took into account the actual location of activities. One business organisation expresses the issues succinctly by saying:

"We believe disclosure which allows entities to present the geographical substance of their business, not necessarily based on where they are legally incorporated, will be more useful, but may also be more ambiguous. Where there is not an alignment in the location of incorporate and economic activity, an explanatory narrative will certainly be required."

No definition of employees has been provided by most Member States, though survey respondents have expressed slightly differing views

- Most territories have not provided any definition beyond the wording of Article 89.
- Other territories such as the UK and Denmark have specified that employees should be reported with reference to contractual employment. This therefore excludes contractors and would ignore the effect of employees employed in one country, but who work in other countries.
- Seven of the respondents favoured a strict definition based on contractual employment and potentially in line with other reporting requirements around headcount. A couple of these noted that a definition based on actual location of employment might present a more accurate picture of an institution's activity, but felt it would be too complex to implement in practice.
- Five business organisations expressed a wish that the requirement should be based on, or at least have flexibility to take account of, the location in which employees actually work.



Turnover is not a widely used term within the financial services industry, contributors prefer reporting in line with accounting standards

- Although 'turnover' is not a widely used term in the financial services industry, most territories have not provided a detailed definition.
- In the UK, the regulations and guidance provide that turnover should be consistent with that disclosed in financial statements. The UK Government has also stated that the general principle is that turnover should broadly represent net interest income, net fee income and other income, net of impairments.
- In Austria the term 'turnover' has been defined and replaced in the local regulations as the term 'net income from interest plus operating revenues'.
- The total turnover figures included within the GSIB disclosures agree to those included within consolidated financial statements.
- From the responses to our survey, there seems to be broad consensus that the term should be interpreted in line with an institution's financial statements, though there seems to be some difference as to exactly which line in the financial statements should be used.
- One regulator was of the view that 'turnover' should mean total revenue, while most others took the view that it should be net income before certain expenses, but it was not universally agreed which expenses should be included or excluded.
- In contrast, profit or loss before tax appears to be a commonly understood term within the financial services sector that can, and should be, taken directly from an institution's financial statements.

Only a limited number of territories have included an exemption to prevent double reporting

- The UK, France and Germany have all implemented an exemption to prevent institutions established in their territories that are themselves subsidiaries of other EU based institutions from having to report twice, provided the parent institution has complied with the regulations in their home territory.
- All other territories have remained silent on this point, creating the possibility that institutions will be required to duplicate their reporting.
- We note that Chapter 10 of the EU Accounting Directive on reports of payments to governments by the extractive and logging sectors has a provision that precludes double reporting and which could be used as a template.

Name, nature of activities and geographical location has been interpreted differently by each of the GSIBs

- The requirement to report 'name, nature of activities and geographical location' has not been prescribed in any additional detail in any jurisdiction.
- Respondents to our survey were of the view that there should be little difficulty in interpreting this requirement, but we have seen that GSIBs have interpreted the requirement inconsistently in practice.
- Whilst some GSIBs have included the 'name' of every legal entity in the disclosure, others have limited the disclosure to principal trading companies, whereas others have not named any legal entities



- In terms of the 'nature of activities', GSIBs have varied the level of detail they provide. On the one hand, some groups have included minimal descriptions, using terms such as 'commercial banking' and 'retail banking', whereas at the other end of the spectrum, Barclays included a more detailed description of their operations.
- Jurisdictional location is not addressed by any of the Member States that have implemented the requirements so far.
- It is not clear, without further discussion with GSIBs as to how they have assigned data, such as turnover, profits and taxes to jurisdictions. For example, where a branch is subject to tax locally and in its parent jurisdiction, how the tax is included in the CBCR disclosure is unclear.

There is no consistent format or template for institutions to use

- From the first year submissions made to the European Commission, and also from the publication of disclosures by other non-GSIB institutions across the EU, there is a large difference in the format and content of the publications.
- Key differences include the level of detail, the context provided and the inclusion, or not, of additional voluntary disclosures.
- Some organisations have provided context to their disclosures whereas others have simply reported the basic numbers and included no further information.
- Another anomaly that is apparent from the first year disclosures, as well as from one survey respondent, is whether it is necessary to consolidate all the different activities into one disclosure or whether it is permissible to report by business unit.



Appendix 4 – The concept of deadweight loss from a tax perspective

In basic economic terms, the equilibrium price and quantity that prevails in the market for a product, including a banking product, is determined by the intersection of the market demand and market supply curves. We illustrate this graphically in below.

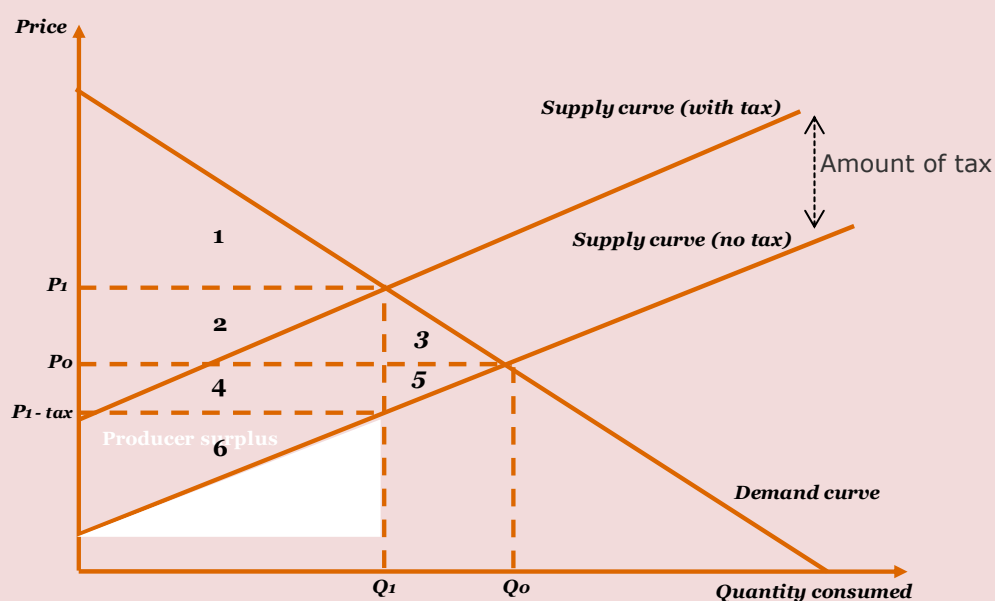
Before the application of a tax, the quantity consumed in the market is shown as Q_0 and the equilibrium price as P_0 . Once a tax is applied, the market supply curve shifts upwards by the amount of the tax (i.e. suppliers are only willing to supply a given quantity at a price which is higher by the amount of the tax). The equilibrium price for consumers (the market participants who buy the product) is now higher (P_1), so they demand less of the product (Q_1).

As a result, consumer surplus (a measure of consumers' welfare associated with trade in this product, being the difference between what they are prepared to pay for the product and what they actually pay) falls from the amount represented by areas 1, 2 and 3 at equilibrium before the tax was imposed, to the amount represented by area 1 only at the new equilibrium.

At the same time, the price received by the producer (the market participants that originate or sell products) falls from P_0 to ' P_1 -tax' and therefore, producer surplus (the counterpart to consumer surplus, and hence a measure of producers' welfare) falls from areas 4, 5 and 6 at the original equilibrium to area 6 at the new equilibrium.

The government captures a portion of the consumer and producer surplus lost through tax receipts (areas 2 and 4) – this is essentially a transfer of welfare from producers and consumers in this market to government or taxpayers. However, some of the original surplus in the market is lost entirely – represented by areas 3 and 5. Economists refer to this as a 'deadweight loss' – a loss of welfare to society, or a loss of economic output, caused by 'distorting' the market outcome through the imposition of a tax, and reducing the benefits of trade.

Figure 8: Deadweight loss caused through application of indirect tax



Source: Varian (2010), PwC analysis



Of course, this analysis does not take into account the outcomes that tax revenue helps achieve in the economy. Governments use the proceeds of taxation to provide goods and services that would otherwise be underprovided by a free market and to correct other market failures. The money raised from taxation is spent by governments, bringing about a positive multiplier effect and higher economic activity. However, the most important question for policymakers is the 'net' effect to society which results from the balance between the deadweight loss created by taxation and the stimulus created from government spending.



Appendix 5 – Text of Article 89



Article 89 of Directive 2013/36/EU on access to the activity of credit institutions and the prudential supervision of credit institutions and investment (CRD IV)

Article 89

Country-by-country reporting

1. From 1 January 2015 Member States shall require each institution to disclose annually, specifying, by Member State and by third country in which it has an establishment, the following information on a consolidated basis for the financial year:

- (a) name(s), nature of activities
- (b) turnover;
- (c) number of employees on a full time equivalent basis;
- (d) profit or loss before tax;
- (e) tax on profit or loss;
- (f) public subsidies received. and geographical location;

2. Notwithstanding paragraph 1, Member States shall require institutions to disclose the information referred to in paragraph 1(a), (b) and (c) for the first time on 1 July 2014.

3. By 1 July 2014, all global systemically important institutions authorised within the Union, as identified internationally, shall submit to the Commission the information referred to in paragraph 1(d), (e) and (f) on a confidential basis. The Commission, after consulting EBA, EIOPA and ESMA, as appropriate, shall conduct a general assessment as regards potential negative economic consequences of the public disclosure of such information, including the impact on competitiveness, investment and credit availability and the stability of the financial system. The Commission shall submit its report to the European Parliament and to the Council by 31 December 2014.

In the event that the Commission report identifies significant negative effects, the Commission shall consider making an appropriate legislative proposal for an amendment of the disclosure obligations set out in paragraph 1 and may, in accordance with point (h) of Article 145, decide to defer those obligations. The Commission shall review the necessity to extend deferral annually.

4. The information referred to in paragraph 1 shall be audited in accordance with Directive 2006/43/EC and shall be published, where possible, as an annex to the annual financial statements or, where applicable, to the consolidated financial statements of the institution concerned.

5. To the extent that future Union legislative acts for disclosure obligations go beyond those laid down in this Article, this Article shall cease to apply and shall be deleted accordingly.