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A review of the IFRS adoption literature

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1. Introduction

This year marks the 11th anniversary since the European Union (EU) mandated International Financial Reporting Standards (IFRS) for all companies listed on the main European stock exchanges. Since its adoption by the EU, IFRS has had its share of supporters and critics. One of its greatest successes has been its global adoption, with tens of thousands of firms in over 100 countries currently reporting under, or at least closely linking their local accounting standards to, IFRS. The greatest criticisms leveled against IFRS have come from practitioners, who have argued against the fair value requirements and the transparency and governance structure of the board that issues the standards.¹ In this paper, we review the academic literature related to IFRS adoption, with a primary focus on understanding its effects and consequences.

Although the 2005 adoption of IFRS was a major regulatory transition affecting several tens of thousands of companies worldwide, its costs and benefits were initially unclear. The debates over the consequences of IFRS adoption at the time were largely constrained to conjectural statements due to lack of data (e.g., Ball 2006; Schipper 2003). Now, with the hindsight of over 10 years of IFRS reporting, we review the academic literature to compile and evaluate the available empirical evidence on the effects of IFRS adoption.

The simultaneous mandatory adoption of IFRS by a large number of countries has provided empirical researchers with an unprecedented experiment to study the consequences of accounting standard setting and how these consequences vary across institutional and legal regimes. However, its effects on academic research have gone beyond simply providing a useful context for researchers. It has also kindled interest in cross-country accounting research and provided an opportunity for greater involvement of researchers from across the globe. Not surprisingly, a vast literature focusing on IFRS adoption has emerged.

If we had to summarize the development of the IFRS literature, the majority of early studies paint IFRS as significantly benefiting adopting firms and countries in terms of (i) improved transparency, (ii) lower costs of capital, (iii) improved cross-country investments, (iv) better comparability of financial reports, and (v) increased following by foreign analysts. Although many of these studies include caveats about drawing strong inferences about the role of IFRS in causing the observed outcomes, these tend to be minimal and often ignored by subsequent research.² These studies also typically do not clarify whether the terms “IFRS mandate” or “IFRS adoption” refer simply to the act of adopting new standards or include concurrent improvements in the enforcement of

¹ Stojilkovic (2011) and Jarolim and Oppinger (2012) discuss these criticisms. See also *Financial Director*, “Long Road Ahead as IASB remedies governance concerns,” April 14, 2014.

² The initial evidence on IFRS effects could also be affected by the publication bias prevalent in social science research, whereby significant results tend to be published, as opposed to studies that fail to reject the null.

financial reports. More recent studies attempt to narrow down the sources of the observed benefits of IFRS adoption and conclude that at least some of the earlier documented benefits are not driven by the adoption of new accounting standards per se. Other recent studies examining the effects of IFRS on the inclusion of accounting numbers in formal contracts (which we refer to as the contracting role of accounting) point out that IFRS has lowered the contractibility of accounting numbers.³

Given the rather limited evidence indicating that IFRS conveys unambiguous benefits to adopters and financial statement users, the widespread adoption by many countries over a short period is somewhat surprising. One possible explanation, identified by Ramanna and Sletten (2014), is that IFRS adoption is self-reinforcing. The perceived benefits, in terms of lowering cross-border transaction costs, increase for a given country as more jurisdictions with economic ties to that country adopt IFRS. Ramanna and Sletten (2014) empirically show that their hypothesis partly explains the prevalence of IFRS adoption.

A variety of other reviews of IFRS-related research have been published. Soderstrom and Sun (2007) provide an early review of studies focusing mainly on the voluntary adoption of International Accounting Standards⁴ (IAS) or reconciliations between IAS and US generally accepted accounting principles (GAAP). Hail, Leuz, and Wysocki (2010) review IFRS studies to determine the implications of US firms potentially switching to IFRS. In particular, they study the effects of potential IFRS adoption by the US on reporting quality, costs, and the capital market. Pope and McLeay (2011) review the empirical IFRS studies emerging from the INTACCT research program and discuss implementation of IFRS in the EU. Bruggemann, Hitz, and Sellhorn (2013) provide an overview of the various IFRS studies without considering the details of individual studies. A review by the financial reporting faculty at the Institute of Chartered Accountants in England and Wales (ICAEW) summarizes the empirical literature related to the effects of mandatory IFRS adoption from the perspective of EU countries (ICAEW 2015). This review also discusses the background of IFRS legislation. Ahmed, Chalmers, and Khelif (2013) conduct a meta-analysis of the IFRS literature, drawing from a wide range of journals and working papers. However, their analysis is limited to studies examining the effects of IFRS adoption on value relevance, discretionary accruals, and analyst forecasts. Their meta-analysis mainly focuses on quantifying the adoption effects documented in prior studies. More recently, Leuz and Wysocki (2016) review the financial reporting regulation literature, drawing on both US and international evidence. Although their focus is not on IFRS per se but more

³ Throughout this review, we distinguish between the contracting and valuation roles of accounting numbers, with the former referring to the use of accounting numbers within formal contracts (such as in debt covenants) and the latter referring to the use of accounting numbers for valuation decisions. We classify the effects of accounting on the initiation and terms of contracts under the valuation role.

⁴ IAS were issued by the International Accounting Standards Committee (IASC) until 2000. In 2001, the IASC was succeeded by the International Accounting Standards Board (IASB), which adopted the earlier-issued IAS and started issuing new standards as IFRS. Throughout this review, we use the acronyms IFRS and IAS interchangeably to describe IFRS.

broadly on the economic effects of disclosure regulation and reporting standards, they provide a brief synthesis of the empirical findings associated with IFRS adoption. In particular, they discuss the empirical challenges that researchers face when employing the IFRS setting and highlight the limitations of drawing causal inferences in regulation research more generally.

In contrast to the preceding reviews, our review is not directed at a specific IFRS-related question or issue or restricted to a specific geography. It is more comprehensive and provides a relatively broad coverage of IFRS research topics. We let the data dictate our selection of IFRS-related topics. We cover all of the topics addressed by IFRS-adoption-related papers published in the following five accounting journals between 1999 and 2015: *Contemporary Accounting Research*, *Journal of Accounting and Economics*, *Journal of Accounting Research*, *Review of Accounting Studies*, and *The Accounting Review*.⁵ We identify IFRS articles published in these journals by searching for the keywords “International Accounting Standards,” “IAS,” or “IFRS” in each title and text. The topics identified from this process include the effects of IFRS adoption on (i) financial reporting, (ii) capital market outcomes, (iii) corporate decision-making, (iv) stewardship and governance, (v) debt contracting, and (vi) auditing. We exclude one study pertaining to taxes due to the limited expertise of authors in that area.⁶ The review covers all other papers published in the five aforementioned accounting journals. Although it also covers IFRS papers published in other journals, its coverage of these other journals is not intended to be complete.

Although our primary focus is on studies based on mandatory adoption, we also review and incorporate evidence from early studies of voluntary adoption. In addition, we link findings from IFRS research to the theoretical and empirical findings reported in other contexts, typically in the US, to help readers appreciate the relevance of these studies and to provide insights into how inferences vary across contexts. In addition to published articles, we incorporate several working papers for certain topics that lack a large body of published works.

Our objective is to provide a cohesive picture of the empirical archival literature related to IFRS adoption. With this in mind, we emphasize similarities and differences across the various studies in terms of not only their findings but also their hypothesis development, methodological choices, and samples. In synthesizing the empirical findings, we outline the theoretical underpinnings and arguments linking IFRS adoption to the given economic or reporting outcomes or both. In addition, we discuss studies that focus on specific attributes of IFRS and provide a detailed discussion of the research design choices and empirical issues researchers face in the IFRS setting.

⁵ Our search period starts in 1999, as we find no published papers related to IAS in these journals before then.

⁶ Chan, Lin, and Mo (2010) examine the effect of IFRS adoption on tax non-compliance.

In terms of structure, we divide the review into sections based on the topics covered and attempt to ensure that each section stands alone as much as possible. People working on specific IFRS-related topics should be able to benefit by reading even a limited part of this review. In line with this approach, each section also typically ends with a summary and suggestions for future research.

The remainder of this paper is structured as follows. The next section provides a brief historical perspective on IFRS adoption. It discusses the objectives and avowed benefits of IFRS adoption as presented around the large-scale adoption in 2005 in addition to the uncertainties and concerns expressed around that time. Our aim is not to track the chronological development of IFRS up to their eventual global adoption, but rather to provide a context for understanding the issues examined in the IFRS literature and to evaluate the contributions of that literature.⁷ The studies discussed in subsequent sections supply empirical evidence relevant to the debate over the benefits and limitations of IFRS adoption.

Sections 3–9 present the documented effects of IFRS adoption along a variety of dimensions. Section 3 reviews the studies that examine the most direct effect of IFRS adoption, i.e., their effect on financial reporting quality. As several studies assume that IFRS improve reporting quality, the discussion in this section outlines the empirical evidence for this assumption. Section 4 examines studies that evaluate the stock market effects of IFRS, how IFRS adoption has affected information asymmetry in the stock markets, and the attendant consequences such as those on liquidity, cost of capital, analyst following, and cross-border capital flows. Section 5 considers papers that examine the real effects of IFRS adoption and how corporate decision-making has been influenced by IFRS reporting changes. Sections 6 and 7 examine the stewardship and debt-contracting roles of IFRS. These sections review studies that examine how the use of accounting numbers in executive compensation, managerial monitoring, and debt markets have changed with IFRS adoption. Section 8 focuses on studies related to the auditing issues surrounding IFRS. Section 9 examines studies that focus on specific accounting attributes of IFRS. Section 10 reviews the empirical choices made by various studies and conducts meta-analysis of these choices in the context of IFRS research. Finally, we present our conclusions in Section 11.

⁷ For a detailed history of the IASC and its evolution into the IASB, we refer the reader to studies by Camffermann and Zeff (2007) and Zeff (2012).

2. Background to IFRS adoption

2.1. History and development of IFRS

The history of IFRS extends over 40 years. The first set of IAS was issued in 1971 by the International Accounting Standards Committee (IASC), which was subsequently restructured to form the International Accounting Standards Board (IASB). The IASB has globally reshaped the map of financial reporting as evidenced by the large number of countries that have adopted IFRS. This holds true even when one excludes EU adoption, which provided the initial impetus for broader acceptance of IFRS.⁸

In the EU, most companies with securities traded on regulated markets have been required to prepare consolidated accounts in accordance with IFRS (as endorsed by the European Commission [EC]) for financial years starting on or after Jan. 1, 2005.⁹ However, a delayed adoption was allowed for companies that had only debt securities traded publicly. Several other jurisdictions such as Hong Kong and Australia chose to adopt IFRS around the same period with several others later following suit.

IFRS introduction seems to have had a substantial effect on the reported financial statements of firms. Even in the UK, where the local GAAP have been viewed as similar to IFRS, the financial reports of some firms have changed dramatically under IFRS. For instance, in its reconciliation of profits under IFRS and UK GAAP, Vodafone disclosed a net profit of £6.5 billion based on IFRS for fiscal 2005 and a net loss of £6.9 billion under UK GAAP, with the difference largely explained by goodwill amortization alone. British Airways similarly reported a decline of nearly two-thirds in its shareholders' equity as a result of having to recognize pension liabilities on the balance sheet under IFRS. Under UK GAAP, the company disclosed the liabilities in its footnotes. These examples show how just one or two accounting items can substantially affect a company's reported profits.¹⁰ This clearly indicates that IFRS adoption has had a major effect on the financial reports of firms, even in countries whose GAAP and IFRS are similar.

2.2. Objectives and rationale for IFRS adoption

Two oft-stated objectives of IFRS adoption are to (i) enhance reporting quality and (ii) improve the comparability of financial statements across countries. This view is enshrined even in the European Parliament's Regulation 1606/2002, which required the EU to adopt IFRS. The regulation states that IFRS adoption is intended to achieve "a high degree of transparency and comparability of

⁸ This regulation (Regulation 1606/2002) was adopted by the Council of Ministers of the EU on June 7, 2002.

⁹ This regulation was subsequently enacted into law by the European Parliament on Sept. 11, 2002.

¹⁰ Barth, Landsman, Young, and Zhuang (2014), who analyze reconciliations of net income across IFRS and local GAAP, find that the effect of IFRS on net income tends to be larger for firms in the UK than in many other European countries.

financial statements and hence an efficient functioning of the (EU) Community capital market and of the Internal Market.”

Confirming these objectives, the IASB states that the main purpose of its work is:

... to develop, in the public interest, a single set of high quality, understandable, enforceable and globally accepted financial reporting standards based on clearly articulated principles. These standards should require high quality, transparent and comparable information in financial statements and other financial reporting to help investors, other participants in the various capital markets of the world and other users of financial information make economic decisions.

2.2.1. Enhance reporting quality

The objective of IFRS to provide “a single set of high quality” accounting standards is often quoted and emphasized by its promoters. Although the goal of enhancing reporting quality should be welcomed, as it promotes business by ameliorating information asymmetry issues, translating it into practice is unlikely to be a smooth or straightforward process. First, this objective is silent as to what “high quality” means. Dechow, Ge, and Schrand (2010) observe that accounting quality is conditional on the decision relevance of the financial information and so is better defined in the context of a specific decision model. For instance, although the liquidation values of assets are important inputs into decision-making by long-term debt holders, they are less useful for equity investment decisions. Dechow et al. (2010) conclude that “there is no measure of earnings quality that is superior to all decision models,” implying that an objective to prepare a single set of high quality standards for all identified users may not necessarily be achievable. Consistent with this concern, some recent studies point out that the emphasis of the role of IFRS in valuation has made accounting numbers less useful for inclusion in contracts (e.g., Ball, Li, and Shivakumar 2015).

Second, the development of high quality accounting standards may not automatically translate into firms providing high quality financial reports. Reporting quality is determined partly by the quality of accounting rules, but it is also affected by the innate reporting incentives facing managers and incentives facing enforcers of the accounting rules, which include auditors, capital market and other financial regulators, courts, etc. There is little reason to expect that the incentives and economic forces faced by managers and regulators of listed companies in a large open economy like the UK are the same as those in a relatively closed economy like Qatar. In general, managerial reporting incentives and accounting enforcement are endogenous to a country’s economic, legal, and cultural environments. For instance, managers’ reporting incentives are affected by how financial statement numbers are used in contracts, which in turn are likely to depend on legal dictates, by cultural values such as the religious beliefs of and trust between individuals, and by institutional factors such as firms’ ownership structures and corporate governance. The enforcement of accounting rules also depends on the extent to which business transactions are conducted at arm’s length. When companies

rely frequently on closed-door dealings that do not require reliance on publicly available financial reports, regulators' incentives to enforce accounting rules are reduced. The reporting and enforcement incentives are also affected by governments' decisions to tie accounting numbers to tax policies.

Fox, Hannah, Helliar, and Veneziani (2013) illustrate the links between accounting numbers and legal, cultural, and institutional factors in relative detail through a comparison of Italy and the UK, which represent extremes within Europe along these dimensions. First, in terms of legal systems, Italy is a civil-law country; its accounting standards are subservient to its Civil Code, and its accounting regulations tend to be incorporated into its national laws. The authors also observe that accounting standards in Italy "are not compulsory but ... have an integrative and interpretative function with respect to the provisions of the law." In contrast, financial reporting in common-law countries like the UK tends to be less heavily regulated by statutes, and national laws tend to be less detailed and permit judgment, allowing accounting standards to play a more prominent role in UK financial reporting. Second, in terms of institutional factors and specifically corporate ownership, UK firms rely on capital markets to raise money, and so financial reporting is needed to ensure transparency and market efficiency. However, companies in Italy are often family owned and financed through banks, making creditors' needs more dominant in financial statements. Finally, in terms of culture, the UK has traditionally relied on accrual accounting as a key concept, while prudence has traditionally dominated in Italy.

The close link between financial reporting and legal, cultural, and institutional factors indicates that the cost-benefit trade-off of requiring firms to prepare high quality financial reports is not identical across countries. Accounting standards that may appear beneficial in the context of an open or developed economy may be less so elsewhere. A glaring example is the emphasis of IFRS on fair value accounting, which provides value-relevant information when fair values are obtained from deep and liquid markets but may permit manipulation in countries where capital markets are illiquid, opaque, underregulated or insufficiently representative of the economy (Fiechter and Novotny-Farkas, 2015).

Finally, in more recent mission statements, the IASB emphasizes the transparency of financial reports as part of the objectives of IFRS.¹¹ However, it is unclear whether greater transparency translates to better quality financial statements, as mandating higher transparency requirements can lead firms to engage in costly real earnings management, i.e., structure their transactions to hide information or achieve specific reporting goals. Although most empirical evidence suggests that transparency in financial statements is useful to capital market participants, these studies are silent as

¹¹ See <http://www.ifrs.org/About-us/Pages/IFRS-Foundation-and-IASB.aspx>.

to how much transparency is optimal and whether greater transparency necessarily promotes overall efficiency.

2.3. Improve reporting comparability

Even without necessarily improving reporting quality, IFRS may prove economically beneficial by merely narrowing cross-country differences in financial reports and promoting international trade. For instance, EU Regulation 1606/2002 states that: “This Regulation reinforces the freedom of movement of capital in the internal market and helps to enable Community companies to compete on an equal footing for financial resources available in the Community capital markets, as well as in world capital markets.” Along similar lines, emphasizing the need for global accounting standards to make cross-country transactions less costly and more efficient, former SEC Chairman Christopher Cox observes the following:

And markets are really just aggregations of people, all of whom communicate better if they speak the same language. ... Breaking down barriers between nations and among social classes, which commerce does, has advanced the cause of civilization. That has always been the idea behind the SEC’s cooperative initiatives with the International Accounting Standards Board, and with the authorities in over one hundred nations that today are using International Financial Reporting Standards. (Cox 2014)

Confirming these benefits of improved comparability, Standard & Poor’s notes that “[g]lobal accounting and disclosure standards will be of great value to our analysts, by improving data consistency and enabling enhanced global peer comparisons.”¹²

However, as discussed earlier, financial reporting quality is determined not only by accounting standards but also by a country’s legal system, culture, and institutions. As a result, researchers and practitioners have questioned the ability of a common accounting standard, even if mandated, to achieve convergence in the quality of reported financial statements (e.g., Ball, Kothari, and Robin 2000; Ball, Robin, and Wu 2003). Ball et al. (2000) provide empirical support for this concern by showing that reported accounting numbers in shareholder-model countries reflect economic losses in a timelier manner than in stakeholder-model countries.

Even if IFRS achieve global convergence in the short term, observers have questioned whether these benefits are sustainable. By adopting IFRS, a country essentially allows a foreign entity with no local accountability to dictate reporting laws and thereby control the economic incentives and activities of its people and businesses. Cox (2014) points to this concern as a reason why a full-scale adoption of IFRS is unlikely to occur in the US. Several major IFRS-adopting economies have protected themselves from this concern by requiring a national standard setter to review and, if

¹² Comment letter to SEC on allowing US issuers to prepare financial statements in accordance with IFRS (August 7, 2007),

needed, modify IFRS before they become the law of the land.¹³ This approach to protecting legislative sovereignty may lead each national regulator to adopt certain standards while rejecting others and over time cause countries to diverge in their accounting standards.¹⁴

Setting aside the achievability of global standardization, Dye and Sunder (2001) and Sunder (2011) question whether having a single global set of accounting standards is even desirable. They point to a variety of benefits to a world that allows firms to follow either IFRS or US GAAP, including the opportunity to empirically evaluate the effects of new accounting standards and to study the pros and cons of principles- and rules-based systems in practice. They contend that multiple reporting regimes would encourage positive innovations in financial reporting quality through the effects of competition.

2.4. Initial fears and uncertainties about IFRS adoption

The initial period of IFRS adoption was riddled with uncertainties. Reflecting this concern, former IASB Chairman Sir David Tweedie warned: “The first year will always be difficult. It’s the biggest change for Europe since the Euro was introduced. Of course, there are going to be a few blips; it’s to be expected.”¹⁵

The frequency and speed with which new pronouncements were being introduced also concerned practitioners. The IASB issued 29 new standards and amendments to existing standards in the 13 months between December 2003 and December 2004. In December 2003 alone, the IASB issued 15 amendments to IAS. Moreover, in 2005, after the firms had started reporting under IFRS, about 10 amendments were issued.

The “100 Group of finance directors” and ICAEW critiqued the IASB approach as substituting clarity for complexity and complained that standards, particularly those related to fair value reporting, were developing in the wrong direction. There were also complaints that IFRS introduced too much subjectivity and compromised comparability.¹⁶

Based on a survey of 149 finance professionals conducted in October 2004, KPMG global director Mark Vaessen noted that uncertainty over the final standards and those that would be applicable in the EU delayed the preparation of many EU companies for IFRS adoption.¹⁷ Based on a

¹³ Along these lines, publicly listed companies within the EU must comply only with IFRS endorsed by the European Commission (EC). The EC is not a national standard setter per se but a transnational EU committee.

¹⁴ On Nov. 19, 2004, the EC endorsed IAS 39 with the exception of two “carve-outs”: one relating to the Full Fair Value Option and the other to hedge accounting. In July 2005, the EU adopted an amended version of the regulation for the fair value option. Some hedge accounting requirements under IAS 39 are still to be endorsed.

¹⁵ “IASB chairman offers respite in big impact pronouncements” (<http://www.cch.co.uk/>, December 17, 2004).

¹⁶ See “IFRS under attack,” *Accountancy*, Sept. 1, 2005.

¹⁷ “Publication of the first quantified explanations of the impact of IFRS heralds the start of a very different phase in their implementation - communicating the findings,” *Accountancy Live*, January 2005.

survey of 60 managers from Australia's top 200 corporations conducted by Jones and Higgins (2006), preparers felt unprepared for adoption and were skeptical about the claimed benefits. Surveyed buy- and sell-side analysts also expressed doubts about their abilities to distinguish between the effects of accounting changes from IFRS adoption and the effects of changes in underlying business performance. The biggest knowledge gaps seemed to involve the most effective reporting issues, with nearly two-thirds of the surveyed analysts stating that they knew little about the new standards for mergers and acquisitions (M&A) and financial instruments and more than half claiming ignorance as to the effects of accounting for share options.¹⁸ These findings led to concerns that share prices could be negatively affected or become more volatile after the introduction of IFRS: "IFRS won't change the underlying performance of a business or cash flow, but the markets may not see it that way."¹⁹

Auditors also raised concerns around the lack of preparation for the introduction of IFRS. The ICAEW claimed that tardy preparation for IFRS adoption by some firms could cause them to receive qualified audit opinions upon IFRS adoption. The chairman of ICAEW's Audit and Assurance Faculty, Andrew Ratcliffe, also pointed out that auditors had to be more alert about the potential for greater earnings management under IFRS.²⁰

IFRS adoption also left uncertainty in the minds of investors over surprises that could emerge during the transition. Peter Elwin, head of accounting and valuation at Cazenove, noted that "one is always slightly concerned about the unknown." Morgan Stanley Vice-President Leon Michaelides expressed a similar sentiment.²¹ These concerns were exacerbated because only a minority of smaller UK companies had provided information about the effects of IFRS for their firms as of July 2005.

Despite the preceding concerns, the adoption of IFRS was relatively smooth. A survey of about 200 fund managers conducted by PwC and Ipsos MORI in 2006 revealed that nearly 75% of respondents felt that IFRS did not adversely affect their perceptions of firm value. In addition, firms' disclosures of the effects of IFRS seemed to alleviate transitional surprises. A review of 1,250 annual reports of required pre-transition disclosures conducted by the Australian Securities and Investment Commission found that "all entities ... had successfully provided the required disclosures of the impacts of AIFRS by explaining the key differences in accounting practices they expected under AIFRS."

However, the smooth transition of IFRS still leaves unanswered the questions of whether IFRS adoption brought tangible benefits and, if so at what cost. These important issues have been evaluated by empirical research papers, which we discuss as follows.

¹⁸ "Avoid nasty shocks: get to grips with IFRS," *Accounting*, February 2005.

¹⁹ "IFRS sparks share price fears," *Accountancy*, December 2004.

²⁰ "Tardy IFRS prep will lead to audit qualifications," *Accountancy*, September 2004.

²¹ "Investors fear IFRS surprises," *Accountancy Age*, July 2005.

3. IFRS and Financial Reporting Quality

Many proponents believe that IFRS reporting is of a higher quality than previous local GAAP and that its adoption improves financial transparency, lowers information asymmetry in capital markets, promotes cross-border comparability, attracts foreign capital flows, and consequently lowers the cost of capital for firms in adopting countries (e.g., Levitt, 1998; IASB, 2002). Given these oft-repeated benefits, it is of little surprise that the earliest IFRS studies typically focus on evaluating the quality of financial reports under IFRS following Europe's mandatory IFRS adoption.

Several studies have attempted to provide direct evidence of IFRS reporting quality by examining the properties of accounting numbers. We begin this section by reviewing the evidence from voluntary adoptions and then discuss the evidence based on mandatory adoption. In a separate subsection, we discuss the effects of IFRS adoption on comparability, a dimension of reporting quality given explicit importance in the IFRS conceptual framework.

3.1. Evidence from voluntary IFRS adoption

Although large-scale mandatory adoption of IFRS did not occur until 2005, a handful of European countries had allowed firms to voluntarily report under IAS since the early 1990s. Focusing on these voluntary adopters, researchers have attempted to provide initial insights into the potential economic consequences of IFRS adoption.

Based on a sample of 80 German industrial firms that voluntarily adopted IAS from 1998 to 2002, Hung and Subramanyam (2007) examine the effects on reported financial statement numbers. They take advantage of the requirement of IAS-adopting German firms to report financial statements under both local GAAP ("Handelsgesetzbuch") and IAS in the adoption year. Analyzing the differences in reported numbers across these accounting standards, they find that total assets and book value of equity are significantly larger under IAS and that there is more cross-sectional variation in book value and net income under IAS relative to German GAAP. They also find that the adoption of IAS does not improve value relevance or timeliness of financial statement information. A notable feature of the study is its ability to control for underlying economic activities, as it focuses on data related to the same firm-year across two accounting standards. As with any evaluation of voluntary adoptions, self-selection bias is a concern, although the study attempts to mitigate this with the Heckman procedure.

Bartov, Goldberg, and Kim (2005) compare the value relevance (as a proxy for overall information related to quality of earnings) across a sample of 417 German firms that reported under IAS, US GAAP, or local German GAAP (HGB). In contrast to the findings of Hung and Subramanyam (2007), Bartov et al. (2005) find a higher value relevance for German firms reporting under either IAS or US GAAP than under local GAAP.²² As there are significant methodological and sample-related differences across the two studies, it is difficult to pinpoint why they reach different conclusions. For instance, Bartov et al. (2005) omit book value of equity from their value relevance regressions, which may bias their coefficient on earnings (Soderstrom and Sun 2007). By focusing on both pre- and post-adoption data, Bartov et al. (2005) may increase the power of their tests relative to Hung and Subramanyam (2007), who focus only on reported numbers in the year of adoption. However, by comparing financial statements for the same year for the same firms under two different accounting standards, Hung and Subramanyam (2007) mitigate the contamination errors and biases arising from omitted correlated variables.

Switching from the German setting, Kinnunen, Niskanen, and Kasanen (2000) examine a sample of 19 Finnish firms reporting under both IAS and local Finnish GAAP from 1984 to 1991 to evaluate how the informativeness of IAS numbers varies across two different sets of investors, i.e., domestic and foreign investors. By comparing the earnings response coefficients for stocks that can be held by either domestic or foreign investors with those for restricted stocks (i.e., those that can be held by domestic investors only), they find that the information content of IAS reported numbers is higher for foreign investors.

For a sample of 35 Swiss firms, Auer (1996) documents an increase in the variance of abnormal returns around earnings announcements for firms switching from local Swiss GAAP to IAS and concludes that IAS-compliant numbers are more informative to Swiss investors. However, these results and those of Kinnunen, Niskanen, and Kasanen (2000) should be interpreted with caution given the small sample sizes and self-selection issues inherent in voluntary adoption studies.

Switching to US capital markets, Harris and Muller (1999) study a sample of 31 cross-listed foreign firms that voluntarily reported under IFRS between 1992 and 1996 and reported reconciliations of IAS earnings and book values of equity based on US GAAP via Form-20F filings. The authors examine the value relevance of the reconciliation items (i.e., their ability to explain stock prices and returns) and find modest evidence of the value relevance of earnings reconciliation adjustments based on market value and return tests. In additional tests, they find mixed evidence as to which accounting method produces amounts that are more highly associated with market values, i.e.,

²² Bartov et al. (2005) do not find evidence to suggest that US GAAP are of a higher value relevance than IAS, suggesting that their results are driven by a higher value relevance of both US GAAP and IAS over local German GAAP.

IAS amounts are more highly associated with prices per share and US GAAP amounts are more highly associated with returns.²³ Notably, the authors document little difference between IAS and US GAAP earnings and book values of equity, reporting average aggregate adjustments of just 0.27% and 0.31% of IAS owners' equity, respectively. However, these relatively small differences may result in part because firms cross-listing to the US are typically large, have better information environments, and tend to choose accounting policies that are more consistent with US GAAP (e.g., Ashbaugh and Olsson 2002).

In a related study, Chen and Sami (2008) examine short-term trading volume reactions to information contained in Form 20-F reconciliations of IAS to US GAAP. Based on a sample of 48 non-US firms cross-listed in the US and reporting under IAS, they find that the magnitude of reconciliation adjustments is significantly positively associated with abnormal volume in the two days around the Form 20-F filing date in both the local and US markets. They conclude that reconciliation adjustments provide information over and above those contained in IAS reports.

Other studies also present country-specific evidence that shows little advantage of moving to IAS. Van Tendeloo and Vanstraelen (2005) find that German firms that voluntarily apply IAS do not exhibit differences in earnings management attributes compared with those applying local German GAAP. Daske (2006) finds that the cost of equity capital is not significantly different across German firms adopting either IAS or US GAAP.

The foregoing studies are based on country-specific settings, which offer the advantage of holding constant institutional factors (e.g., listing requirements, market microstructures, and enforcement). However, generalizations of evidence from these studies could be problematic.

Expanding beyond country-specific analysis, Barth, Landsman, and Lang (2008) study a matched sample of 327 IAS adopters and non-adopters across 21 countries for 1994 through 2003 to examine whether voluntary IAS reporting is associated with better accounting quality. They define accounting quality along three dimensions: the extent of earnings management, timely loss recognition, and value relevance. Their arguments for an increase in quality stem from the assumption that IAS better reflects the economic reality and decreases managerial discretion in terms of accounting choices and that IAS adoption is accompanied by greater enforcement. Based on univariate analysis, they find little difference in accounting quality between adopters and non-adopters in the pre-adoption period. However, the difference turns significant in the post-adoption period, indicating that IAS adoption is associated with lower earnings management, more timely loss recognition, and greater value relevance. Their results support the notion that IAS adoption increases

²³ Venkatachalam (1999) provides a nice discussion of alternative explanations for and interpretations of the mixed results of Harris and Muller (1999).

accounting quality relative to local GAAP. Although the authors are careful not to attribute their findings solely to changes in accounting standards and interpret “IAS adoption” as encompassing all relevant changes to the financial reporting system, including changes in enforcement, subsequent research has often loosely attributed the study’s findings exclusively to changes in accounting standards.

Christensen, Lee, Walker, and Zeng (2015) revisit the evidence provided by Barth et al. (2008) in the context of a single country, i.e., Germany, where firms could voluntarily adopt IFRS between 1998 and 2005 but have been required to since 2005. The authors conjecture that voluntary adopters, but not mandatory adopters, are likely to represent firms that face net benefits from IFRS adoption. Replicating the methodology of Barth et al. (2008) separately for voluntary and mandatory adopters, they find that the subsample of voluntary adopters exhibit significantly lower earnings management, more timely loss recognition, and greater value relevance, while mandatory adopters exhibit little improvement in accounting quality. They conclude that “the adoption of IFRS does not necessarily lead to higher quality accounting, at least not when the preparers have no incentives to become more transparent in their reporting.” Although their evidence speaks to the effects of IAS/IFRS adoption in only one country, it more broadly raises questions about the role of mandatory IFRS adoption in improving accounting quality.

Overall, research based on large samples has documented that voluntary IFRS adoption leads to improved financial reporting quality. However, these results do not endure when underlying institutional details and economic activities are held constant, as in the study by Hung and Subramanyam (2007). Although these studies attempt to rule out self-selection biases, one should be aware that the potential for such biases remains in any voluntary adoption setting.

3.2. Evidence from mandatory adoption

Following the mandatory adoption of IFRS in the EU and several other countries, several studies have revisited the effects of IFRS adoption on reporting quality. Based on a sample of firms from 20 countries that mandatorily adopted IFRS in 2005, Ahmed, Neel, and Wang (2013) investigate whether IFRS adoption lowers income smoothing, decreases earnings aggressiveness (measured as positive excess accruals and less timely loss recognition), and decreases earnings management to meet/beat targets. Their research design allows them to compare the reporting quality of IFRS adopters to a matched sample of non-adopters, where the matching accounts for proxies for country-level enforcement and firm-level characteristics. Their analyses reveal that mandatory adopters exhibit greater income smoothing, greater earnings aggressiveness, and a more delayed recognition of losses but are not statistically different from matched non-adopters in their earnings management to meet/beat targets. These results are particularly driven by firms in countries with relatively strong

enforcement standards. They conclude that accounting quality in general decreases after IFRS adoption, particularly for adopters in countries with strong enforcement regimes.

In contrast to Ahmed, Neel, and Wang (2013), Barth, Landsman, Lang, and Williams (2012) find that the value relevance of net income and book value of equity following mandatory IFRS adoption increases under IFRS. However, Barth et al. (2012) do not primarily study value relevance; they focus more on evaluating the comparability of financial reports between IFRS adopters and US firms. In a related study, Barth, Landsman, Young, and Zhuang (2014) examine whether reconciliations of local GAAP numbers to IFRS numbers are value relevant to investors. Based on a sample of 1,201 firms in 15 European countries, they find that reconciliation adjustments for net income and book value of equity are value relevant in the sense that they are cross-sectionally related to stock prices. When the authors focus on the value relevance of adjustments that specifically relate to the application of IAS 39 (financial instruments), they find that these amounts are value relevant for financial firms but not for non-financials. The authors interpret this finding as an indication that financial firm investors consider fair value measurements under IAS 39 as more relevant than domestic GAAP measurements. Notwithstanding the preceding findings, the extent to which evidence of value relevance is helpful in assessing accounting standards has been debated (see Holthausen and Watts, 2001; Barth, Beaver, and Landsman, 2001).

Chen and Sami (2013) re-examine investor reactions to information contained in the Form 20-F reconciliation of IFRS to US GAAP during the mandatory adoption period (2005–2006). Based on a sample of 195 firms cross-listed in the US and reporting under IFRS, they continue to find a positive association between the magnitude of reconciliation adjustments and abnormal volume in the two days surrounding the Form 20-F filing date, consistent with prior results of Chen and Sami (2008). However, the reaction is only evident for firms with low institutional ownership and first-time IFRS adopters. Their results suggest that 20-F reconciliations provide useful information to at least a subset of firms and that the elimination of these reconciliations may impose an information loss on less sophisticated investors.

Kim, Li, and Li (2012) examine the stock market consequences of the SEC's decision in 2007 to eliminate 20-F reconciliations. Using a treatment sample of 78 foreign cross-listed firms that mandatorily report under IFRS and a control sample of 162 cross-listed firms that do not use IFRS, they fail to find empirical evidence to support the claims that eliminating 20-F reconciliations harms the information environment measured along a variety of dimensions, including market liquidity, probability of informed trading (PIN), cost of equity, analyst forecasts, institutional ownership, and stock price efficiency. They also partition their sample based on the magnitude of absolute differences between IFRS and US GAAP earnings (before the elimination of 20-F reconciliations) and still find no significant effects on liquidity, PIN, and cost of equity.

Similarly, Chen and Khurana (2015) examine stock market reactions to SEC announcements relating to the decision to eliminate 20-F reconciliations for IFRS reporters. This approach allows the authors to estimate the net cost or benefit of eliminating the reconciliations to investors. They document a positive stock market reaction for US cross-listed firms that report under IFRS relative to a benchmark sample of cross-listed non-IFRS and domestic US firms. In additional cross-section analysis, they find that this effect is positively associated with proxies for cost savings and negatively associated with the magnitude of IFRS reconciliation amounts. The authors conclude that the costs of preparing and auditing the 20-F reconciliations generally outweigh concerns about information loss from their elimination.

Consistent with the mixed evidence presented by cross-country studies, country-specific studies also yield contradictory findings related to the effects of mandatory IFRS adoption on reporting quality. For instance, based on a sample of 150 German high-tech firms that transitioned to IFRS from US GAAP in 2005, Lin, Riccardi, and Wang (2012) find that accounting quality worsened after the switch, with IFRS accounting numbers exhibiting more earnings management, less timely loss recognition, and less value relevance. Based on a sample of 297 large non-financial UK firms that adopted IFRS mandatorily, Horton and Serafeim (2010) find that the disclosure of IFRS reconciliation adjustments provides information when the reconciliations are negative, suggesting that IFRS allows for the credible communication of bad news. The authors also provide evidence of IFRS adjustments having incremental value relevance over and above UK GAAP numbers. Based on a sample of 91 Finnish firms, Lantto and Sahlstrom (2009) find that the adoption of IFRS rules related to fair value, financial instruments, leases, and income taxes significantly affects key financial ratios. Comparing financial ratios based on accounting numbers reported under both IFRS and local GAAP in the transitional year, the authors find that profitability ratios increased by 9-19%, P/E ratios decreased by 11%, and gearing increased by 2.9%. These mixed findings in country-specific studies may partly reflect the differences in local GAAP in place before the IFRS mandate.

Focusing on another aspect of accounting quality, Landsman, Maydew, and Thornock (2012) examine the information content of earnings announcements in countries that mandate IFRS adoption relative to countries that retain domestic accounting standards. The authors measure information content as either abnormal return volatility or abnormal trading volume. These measures are predicated on the notion that the greater the information, the greater the revision of investors' beliefs, leading to a higher return volatility around earnings announcements. Furthermore, greater information content increases the heterogeneity in investors' responses to earnings news, leading to increased trading around earnings announcements. Adopting a difference-in-differences approach, the authors compare changes in information content for firms from 16 mandatory-IFRS-adopting countries against those for firms in 11 countries that retained local GAAP. The results from their sample of

21,703 earnings announcements over the 2002–2007 period reveal a positive association between mandatory adoption and the information content of earnings announcements, indicating that investors view IFRS earnings as being of higher quality than local GAAP. As the increases are persistent, the authors conclude that alternative explanations based on uncertainty around the initial adoption or lack of familiarity with IFRS are tenable.²⁴ However, without knowing the identity of the traders inducing the greater trading and return volatility, it is difficult to attribute the observed changes unambiguously to improved transparency under IFRS. For instance, if IFRS leads to greater informed trading (as may happen if IFRS numbers are easier to manipulate, as argued by Ahmed et al. [2013]), then one would also observe higher volatility and trading around earnings announcements.

The preceding findings based on stock market effects generally indicate that IFRS better meets the needs of stock market participants. However, this evidence is insufficient to attribute the stock market effects to the accounting standards alone, as mandatory adoption dates can be contaminated by other events or changes in the reporting incentives of firms. One explanation for the observed change, which may or may not be endogenous to the IFRS mandate, is the increased tendency of firms to provide management forecasts around IFRS adoption, as documented by Li and Yang (2015). If Li and Yang (2015) are correct in suggesting that the increased management forecasts arise from improved earnings quality under IFRS, then the forecasts provide a mechanism through which IFRS affect stock prices. However, if managers start to provide additional non-financial information along with earnings forecasts, then the preceding results may suffer from contamination bias.²⁵

Stock market investors are only one set of users of financial statements. As reporting must be judged in the context of a specific user, one should be careful not to extrapolate the preceding findings as indicative of the unconditional superiority of IFRS over domestic GAAP or of IFRS adoption benefitting the economy as a whole. Moreover, given the greater emphasis of IFRS on the valuation role of financial reports, the stock-market-based findings are to an extent expected for countries where the local GAAP were developed with users other than stock market investors in mind, such as in cases where the country's economy is not capital market intensive.

Lang and Stice-Lawrence (2015) go beyond the usual analysis of reported financial numbers and extend the IFRS literature to encompass qualitative disclosures in financial reports. Based on textual analysis of 87,608 annual reports of firms from 40 countries between 1998 and 2011, they find that IFRS reports tend to be significantly longer and contain less boilerplate language than non-IFRS

²⁴ Truong (2012) provides corroborative evidence based on analysis of New Zealand firms. He documents a significant increase in information content over the 1994–2009 period, with a marked increase immediately following the adoption of IFRS.

²⁵ We discuss the contamination issues associated with mandatory IFRS adoption studies in detail in Section 10.

annual reports. In addition, they find greater comparability between textual disclosures of IFRS reports relative to that within non-IFRS annual reports. Based on these results, they conclude that mandatory IFRS adoption has probably increased the quality of textual disclosures.

3.3. Financial reporting quality and comparability

Comparability is an important characteristic of financial reporting quality. It is defined as the quality of information that enables users to identify and understand similarities and differences between accounting items (IASB, 2010). That is, financial reports are considered comparable if similar economic transactions yield similar accounting items and different economic events result in different reported items. The importance placed on this attribute by standard setters is evident given the following statement of the IFRS conceptual framework: “Information about a reporting entity is more useful if it can be compared with similar information about other entities and with similar information about the same entity for another period or another date.” The EU regulation for IFRS adoption (EC No. 1606/2002) also states comparability across markets as a reason for its adoption.

As empirical analysis of comparability is relatively new in the accounting literature, we begin by providing a general discussion of the research methods employed to measure comparability before reviewing the comparability literature specific to IFRS adoption.

3.3.1. Measures of reporting comparability

Although the term “comparability” is widely used by practitioners, regulators, and researchers, little effort has gone into estimating comparability until recently. Comparability can refer to the similarity in inputs of a reporting system (i.e., accounting methods, transaction structures, business model), the similarity in recognized accounting numbers (reported earnings or assets and liabilities), or the similarity in reporting structures and disclosures. Early studies of comparability focus on either levels of financial or valuation ratios, such as returns on equity and price-earnings ratios, or stock market valuations of accounting data. For instance, Joos and Lang (1994) evaluate how profitability ratios and value relevance measures vary across France, Germany, and the UK and conclude that country-specific accounting practices affect accounting-based performance measures. Although the authors point out that variations in economic effects across countries are unlikely to explain their conclusions, their approach to estimating accounting comparability does not directly control for the differences in economic transactions across their sample firms.

Subsequent studies develop input-based measures of comparability. For instance, Bae, Tan, and Welker (2008) construct a cross-country measure of comparability based on the degree to which local accounting standards deviate from IAS. This measure has been adopted by several studies, particularly in the examination of cross-country differences in the effects of IFRS adoption. Based on

a survey of partners in large accounting firms in 60 countries (see Nobes 2001), Bae et al. (2008) identify 21 key accounting rules and score them for each country based on their variations from IAS. By comparing the 21 country-specific scores across two countries, they calculate a country-pair measure of GAAP difference equal to the number of items for which the scores differ across the countries. This measure considers two accounting standards as similar (i.e., low accounting distance) when both sets of rules either comply with or deviate from IAS. Although this survey-based approach can help explain the cross-country differences in accounting standards, there are three specific drawbacks due to the way it is implemented. First, the survey data examined by Nobes (2001) are based on accounting standards in place as of Dec. 31, 2001 and ignore any subsequent revisions made to local GAAP in the lead-up to IFRS adoption. In addition, the data ignores any country-specific carve-outs or differences in the application of IFRS by national regulators. Second, this approach assumes that countries whose local GAAP differ significantly from IAS also differ significantly from one another, which may not be true. To overcome the issue presented by an absence of direct comparison between local GAAP, Yu and Wahid (2014) modify the measure by determining whether the countries share the same legal origin. That is, country pairs whose local GAAP differ from IAS are assumed to also differ from each other only if they do not share the same legal origin. Third, the measure captures differences in standards, which may or may not result in meaningful differences in the actual reported amounts or disclosures.

De Franco, Kothari, and Verdi (2011) provide an output-based measure of comparability that has been heavily adopted in recent studies. They characterize two firms' accounting systems as comparable if they produce similar financial statements for a given set of economic events. Relying on stock returns as a proxy for the net effects of economic events relevant to financial reports, the authors calculate comparability based on the ability of stock returns to explain contemporaneous earnings. In the first step, for each firm quarter, they estimate an earnings-returns regression using earnings and stock returns in the previous 16 quarters to obtain model parameters. In the second step, for each firm quarter, they calculate the absolute difference between the earnings predicted using the firm's own parameters and the earnings predicted using a peer firm's parameters. The comparability measure for a firm quarter is the average absolute difference in predicted earnings over the previous 16 quarters.

The measure used by De Franco et al. (2011) focuses exclusively on *earnings* comparability, which, while important, does not capture all of the dimensions of reporting. Moreover, due to its reliance on stock returns as a proxy for economic events, the measure may be affected by cross-firm differences in stock liquidity, price efficiency, growth options, the pervasiveness of non-financial information, and other factors that influence earnings-returns relations. As the measure adopted by De Franco et al. (2011) relies on a linear regression of earnings on returns, it may be affected by

nonlinearity in the earnings-returns relationship. Nevertheless, this measure takes an important step forward by focusing on the outputs of financial reporting systems, which are determined not just by accounting rules but also by enforcement and reporting incentives.

Barth et al. (2012) modify the measure used by De Franco et al. (2011) in several ways. First, they reverse the regression equation, and, rather than using stock returns as the only dependent variable in their analysis, they alternatively use stock returns, stock prices, or cash flows as dependent variables. Second, they extend the list of explanatory variables to include several accounting items such as earnings, book value of equity, earnings changes, and a loss dummy. Similar to the approach of De Franco et al. (2011), they calculate the absolute differences in stock returns (or stock prices or cash flows) predicted using IFRS and US firm parameters. Finally, they calculate the comparability measure by averaging the absolute differences in stock returns, stock prices, and cash flows. A clear advantage of this measure is that it does not rely on stock returns as a lone proxy for economic outcomes and allows a variety of accounting items to be considered simultaneously for comparability. However, this measure continues to rely on the assumption of a linear relationship between earnings and proxies for economic activities.

Seeking to measure earnings comparability for a sample of private firms, Cascino and Gassen (2015) develop a reporting comparability model based on a model that uses contemporaneous cash flows to explain accruals. Following a logic similar to that of De Franco et al. (2011), they calculate comparability as the average absolute difference in predicted accrual values using a firm's own parameters and the fitted values obtained using a peer firm's parameters. As accruals distinguish accounting from mechanical cash counting, this model is more focused on the key role of accounting and can also take advantage of studies that attempt to develop theoretically motivated accrual models. In addition, the measure is not affected by specific aspects of stock market functioning and characteristics.

Disclosure comparability receives the least attention in the literature, partly due to its inherent difficulty. The few studies addressing this issue tend to do so using small samples of hand-collected and manually coded data to compare the existence, type, and length of disclosures across different reporting regimes. For instance, Ashbaugh and Pincus (2001) construct three measures of the cross-country comparability of accounting standards based on differences in disclosure requirements and measurement methods. Using data from 1993 based on an international sample of 80 firms that voluntarily adopted IAS, the authors compare the existence and length of disclosure requirements between the firms' local GAAP and IAS.²⁶ They score the differences in disclosure requirements for

²⁶ The eight items are listed as follows: existence of statement of cash flow, disclosure of accounting policies, disclosure of a change in accounting policies, disclosure of the effect of a change in accounting estimates, disclosure of prior period adjustments, disclosure of post-balance-sheet events, disclosure of related party

eight accounting rules and convert these scores into a disclosure-comparability index (DISCLOSE). The authors also construct a comparability index of the available measurement methods (METHODS) for four accounting rules (depreciation, leases, pensions, and research and development). Finally, the authors combine these two indices to create an aggregate measure of reporting comparability (IASSET). Although these measures attempt to directly compare accounting standards in terms of their disclosure requirements and breadth of accounting choices, the few accounting items for which differences are analyzed and the subjectivity inherent in scoring the differences limit its appeal. Similar to the measure adopted in Bae et al. (2008), using IAS as a benchmark to compare accounting standards does not permit direct pair-wise comparisons of accounting standards. Moreover, relative to De Franco et al. (2011) and Barth et al. (2012), whose approaches can be applied to large samples, the manual coding required under this approach limits its applicability to large samples. It also cannot be easily adapted to capture time variations in disclosure or accounting standards, which matters especially for countries that have faced frequent changes in their accounting regulations.

Lang and Stice-Lawrence (2015) evaluate the comparability of financial reports for a sample of non-US firms using the cosine similarity of words contained in the firms' annual reports. This measure compares the relative word frequencies between two annual reports, with a score of 0 indicating no overlapping words and a score of 1 indicating identical proportions of words. Although this approach has the advantage of comparing disclosures across a large sample of firms, its applicability is limited to firms that provide English-language reports, which would result in a selection bias in an international setting.

3.3.2. IFRS adoption and comparability

Proponents of IFRS have argued that globally mandating a uniform accounting standard should improve financial statement comparability and allow investors and firms to make better investment decisions. The argument rests on the notion that greater comparability increases the information available to decision-makers by allowing them to better understand competitors' financial reports and thereby enhances information transfers across many firms and across countries.

IFRS is in fact well placed to improve comparability due to its focus on principles rather than rules. By encouraging managers to prepare financial statements based on the essence of an economic transaction rather than a set of relatively inflexible rules, IFRS can ensure that managers account for like transactions in a like manner and dissimilar transactions differently (Schipper, 2003). However, for this strength to be realized, strong enforcement is required. Weak enforcement can worsen comparability under principles-based accounting standards, as the flexibility can lead managers to

transactions, and disclosure of segment information. See Table A1 (p. 438) in a study by Ashbaugh and Pincus (2001) for specific details about their measures.

opportunistically select dissimilar accounting methods for the same set of transactions. A related concern is the larger set of accounting choices offered under IFRS. As standard setters observe, “permitting alternative accounting methods for the same economic phenomenon diminishes comparability” (IASB 2010).

Some researchers have questioned the ability of IFRS to provide truly comparable financial reports based on the argument that reporting quality is not only determined by accounting standards, but also by firms’ reporting incentives. In their examination of reporting quality in four East Asian countries, Ball, Robin, and Wu (2003) find that, although accounting standards in these countries are comparable with those in common-law countries (such as UK GAAP, US GAAP, and IAS), their financial statements are of a lower quality. They conclude that merely changing accounting standards in a country would be insufficient to improve reporting quality. Corroborative evidence for this view is provided by Jayaraman and Verdi (2013), who show that greater economic integration following the introduction of the euro is associated with increases in accounting comparability within the Eurozone. Their evidence points to the need for economic integration across countries to achieve better comparability of financial reports.

Empirical studies attempt to illuminate the comparability-related effects of IFRS adoption in two broad ways: (i) by using direct measures of comparability (e.g., Barth et al. 2012) or (ii) by examining observable market outcomes of comparability (e.g., Wang 2014; Brochet, Jagolinzer, and Riedl 2013). The first set of studies is often limited in its ability to draw conclusions about overall comparability, as empirical proxies for comparability focus only on a specific reporting dimension (such as earnings or disclosures). However, it has the advantage of being able to identify the source of comparability. The second set infers changes in comparability based on observed changes in the information environment but cannot attribute the comparability changes to specific reporting dimensions.

Motivated by the debate over US firms adopting IFRS and the 2007 SEC ruling allowing US cross-listed firms to file IFRS-compliant financial statements, Barth et al. (2012) evaluate the relative comparability of the two accounting regimes (i.e., IFRS and US GAAP). Adopting both a modified version of the measure of comparability used by De Franco et al. (2011) and a measure based on a comparison of value relevance, Barth et al. (2012) document that IFRS adoption is associated with a significant increase in the comparability of financial statements across IFRS firms and a size-and-industry-matched sample of US firms. Moreover, the comparability across IFRS and US firms is generally higher when firms adopt IFRS mandatorily, are from common-law countries, or are from countries with higher enforcement. The researchers also find that economic integration arising from globalization has little effect on reporting comparability. Based on these factors, they conclude that

mandatory IFRS adoption and the international co-ordination of accounting regulations have improved the global comparability of accounting numbers.

Some studies attempt to directly evaluate changes in cross-country comparability measures following IFRS adoption. Using the value relevance of earnings and book value of equity to assess the comparability of accounting numbers, Liao, Sellhorn, and Skaife (2012) show that French and German IFRS earnings and book values are comparably priced in the year after IFRS adoption but become less comparable in later years. While Lang, Maffett, and Owens (2010) provide a difference-in-differences analysis of a sample of IFRS adopters and non-adopters, finding that adoption increases co-variation in the earnings of firms from different countries (measured as the adjusted R^2 from the regressions of a firm's earnings on a matched peer firm's earnings) but decreases earnings comparability, as measured by De Franco et al. (2011).²⁷ The findings of these two studies do not support the claim that IFRS adoption enhances the comparability of financial statements.

Through a comparative study of the effects of IFRS adoption on earnings comparability across countries that adopted the euro ("euro adopters") and those that did not ("non-adopters"), Jayaraman and Verdi (2013) investigate whether economic integration complements or substitutes accounting harmonization. Conducting difference-in-differences analysis across 15 countries (11 euro adopters and four non-adopters), they document that IFRS-induced improvements in accounting comparability are around three times larger within euro-adopter countries than in other EU countries. They conclude that IFRS adoption is better at improving reporting comparability when the underlying economic environments are similar.

Cascino and Gassen (2015) focus on the institutional determinants of the link between IFRS adoption and comparability. Rather than using a simple time-series indicator variable to capture IFRS adoption, they examine whether changes in cross-country information transfers following IFRS adoption are associated with the *magnitude* of reporting effects from IFRS adoption. This slight modification to the research approach reveals only weak evidence of a link between mandatory IFRS adoption and improved reporting comparability. To test whether a lack of incentives to comply with accounting rules explains the initial marginal results, the authors hand-collect accounting measurement information and disclosure compliance data from the 2006 financial reports of a sample of German and Italian mandatory adopters. They find that firms that comply better with IFRS enjoy more comparability. When they repeat analysis for a broader sample of IFRS-adopting firms and countries using instruments to proxy for compliance incentives, they reach the same inference.

²⁷ For each firm, Lang et al. (2010) select matched peers from firms that are domiciled in a different country but have the same two-digit SIC classification as the first firm.

Cascino and Gassen (2015) also test the comparability effect of mandatory IFRS adoption using a within-country matched sample of private firms as a control group. As pointed out by Ball and Shivakumar (2005), private firms have lower compliance incentives than public firms. This allows researchers to study the role of compliance while holding the institutional environment faced by the firms constant. Consistent with their earlier conclusions, Cascino and Gassen (2015) report that the comparability effect of mandatory IFRS adoption is mainly observed for public firms. They also find that IFRS adoption causes public firms to become less comparable with local private firms that continue to report under domestic GAAP. Overall, their results show that, although cross-country comparability improvements require compliance with standards, within-country reporting comparability is affected by mandating IFRS adoption for some companies (i.e., listed firms) alone.

In contrast to studies that evaluate comparability directly, Wang (2014) and Yip and Young (2012) study cross-border intra-industry information transfers and draw inferences about the comparability of financial statement information. These studies are predicated on the notion that a firm's investors can extract more value-relevant information from a foreign peer's report when the two firms employ more comparable measures in their reports.

Wang (2014) investigates whether accounting standard harmonization enhances the comparability of financial information across countries by examining changes in cross-border information transfers upon IFRS adoption. She uses a pair-wise research design containing 26,349 firm-pair-year observations for 4,467 unique firms from 46 countries, covering the period 2001–2008. To increase the chances of detecting transnational information transfers, she focuses on 575 earnings announcements made by global industry leaders, defined as the three largest firms in each year for each of the 30 Fama-French industry groups. For each earnings announcement, she examines the price reactions of all other non-announcing firms in the same industry that are domiciled in a country different from that of the announcing firm.²⁸ Consistent with the importance of earnings comparability to information transfers, she reports that non-announcing firms react more strongly to the earnings announcements of a global leader when both firms report under IFRS than when they report under different accounting standards. Moreover, via difference-in-differences analysis, she finds that mandatory IFRS adopters react more strongly to the earnings announcements of voluntary adopters in the post-adoption period than in the pre-adoption period and that this effect is not observed for non-adopters. Her findings are consistent with mandatory IFRS adoption along with contemporaneous regulatory changes improving earnings comparability. However, the larger transnational information transfer between firms using the same accounting standards is significant only for announcing firms domiciled in countries with stricter enforcement regimes and stronger reporting incentives, suggesting

²⁸ To ensure that the transnational information is relevant for a domestic firm, Wang (2014) requires matched non-announcing firms to have foreign sales and to not have announced their own earnings before the earnings announcements by a global leader.

that the mere adoption of standards is insufficient to improve comparability. Furthermore, consistent with Jayaraman and Verdi (2013), Wang (2014) finds that these transnational information transfers are stronger when the firm-pairs are domiciled in countries with tighter economic integration.

In a concurrent study, Yip and Young (2012) find more nuanced results by expanding the measures of comparability for a sample of 2,562 mandatory adopting firms within 17 EU countries.²⁹ They study both facets of comparability, i.e., similarities in accounting items between firms engaged in similar transactions and differences in accounting items between firms engaged in dissimilar economic activities and implement three measures of comparability: (i) similarity in accounting functions that translate economic events into accounting data (e.g., De Franco et al., 2011), (ii) the degree of information transfer, and (iii) similarity in the information content related to earnings and book value of equity. For firms in the same industry but domiciled in different countries, the authors document improvements in all three comparability measures following IFRS adoption. However, for firms in different industries and domiciled in different countries, they find that IFRS contributes little to the changes in comparability measures. The authors conclude that IFRS adoption improves the cross-country comparability of financial information by making reports of similar firms look more alike but does not make reports of firms with different economic activities appear any more dissimilar. However, they note that comparability improvements are primarily observed only in firm-pairs from countries with the same legal origin (measured as either common- or code-law countries). This is consistent with the importance of financial reporting incentives and the effectiveness of legal enforcement in achieving comparability following IFRS adoption.

However, when interpreting the evidence from the preceding information transfer studies, one should keep in mind that cross-border information transfers may increase even in the absence of improvements in reporting comparability. To understand this, consider two countries that have very similar local GAAP that are not oriented to meet the needs of stock-market investors. If one of these countries adopts the more valuation-oriented IFRS, causing financial reports to become more dissimilar across the two countries, then we would still observe an increase in cross-border information transfers, as investors in the second country would react to the increased availability of value-relevant information. Such cross-border information transfers may be even higher when both countries rather than just one adopt IFRS, although the comparability of financial reports need not necessarily change relative to those based on their respective local GAAP.

To isolate the capital market benefits arising from improvements in comparability (defined as the precision of information transferred across firms) as opposed to improvements in information quality (defined as the precision of firm-specific information), Brochet et al. (2013) exploit the UK

²⁹ Wang (2014) and Yip and Young (2012) exclude financial firms from their samples. Wang (2014) also excludes utilities.

setting, in which the domestic GAAP are often viewed as similar to IFRS. They surmise that any capital market benefits associated with IFRS adoption in the UK are likely to be due to improvements in comparability rather than improvements in firm-specific information quality. The capital market benefits from improved comparability arise through greater transnational information transfers engendered by EU-wide IFRS adoption. Examining a sample of 663 large and relatively more profitable UK firms, Brochet et al. (2013) find a significant reduction in abnormal returns associated with insider purchases in the post-IFRS-adoption period. This finding supports the view that IFRS adoption improves reporting comparability for outside investors and thereby lowers the degree of information asymmetry between insiders and outsiders, limiting the ability of insiders to exploit their private information. They further support this finding with cross-sectional tests that show that the greatest reductions in profitability of insider trades occur in firms that experience larger improvements in comparability following IFRS adoption. Finally, they report weak evidence of changes in the profitability of insider trading for stocks listed on the AIM, whose operations tend to be more domestically focused, making transnational information less relevant. Although their results support their predictions, the study is unclear about which types of private information are lost to insiders through cross-country information transfers that are above and beyond any pre-existing intra-industry information transfers from *domestic* companies.

Turning to the effect of comparability on investors' decisions, DeFond, Hu, Hung, and Li (2011) test whether improved financial statement comparability across countries following IFRS adoption leads to greater cross-border investment. Their predictions are based on the notion that improved financial statement comparability decreases the information acquisition costs of global investors, thus removing barriers to foreign investment (e.g., Kang and Stulz 1997; Covrig, DeFond, and Hung 2007).³⁰ However, they note that the cross-border investment benefits of IFRS adoption are likely to be realized only when IFRS is credibly implemented, although they do not discuss which enforcement mechanisms lead to that. They empirically test their predictions for a sample of mandatory IFRS adopters in 14 EU countries and firms reporting under domestic GAAP in 10 non-adopting countries for the 2003–2004 and 2006–2007 periods.³¹ They find that mandatory IFRS adoption results in greater investments by foreign mutual funds in countries with strong implementation credibility and specifically among firms that experience relatively large increases in accounting uniformity. Uniformity is measured for each industry in each country as the number of firms in that industry reporting based on the same GAAP after IFRS adoption relative to the number

³⁰ We discuss these arguments in greater detail in Section 4.3.

³¹ DeFond et al. (2011) omit the year of mandatory adoption (i.e., 2005), arguing that investors may not fully understand IFRS-compliant financial statements or that preparers might not have applied new rules consistently in this transition year.

of firms in that industry before IFRS adoption. These results support the view that harmonization through IFRS increases demand from foreign investors by improving comparability.³²

Young and Zeng (2015) investigate another consequence of improved comparability following IFRS adoption for multiples-based valuation. Based on a sample of firms from 15 EU countries over the 1997–2011 period, the authors document that multiples-based valuations using foreign peers' multiples significantly improves following the mandatory adoption of IFRS.³³ Specifically, they find that pricing accuracy improves by 2% per year on average over the sample 1997–2008 period. To ensure their results are not driven by the general effects of increased economic integration over the sample period, they partition their sample based on the magnitude of IFRS adjustments made to opening shareholders' equity upon transition. They find that the firms that had the greatest reporting differences relative to IFRS experienced the largest gains in pricing accuracy, relative to the firms that experienced greater alignment between local reporting practices and IFRS. They conclude that improved accounting comparability under IFRS has allowed investors to better value stocks through improved peer selection.

In conclusion, although studies focusing on direct measures of comparability yield only weak evidence, studies focusing on the capital market effects of comparability generally show a stronger increase in comparability following IFRS adoption. Taken together, the empirical results for comparability provide a general picture that comparability matters to investors and that improvements in comparability enhance the information environment, particularly for foreign investors. However, the data do not support the notion that simply harmonizing accounting standards can achieve full comparability in financial reporting. The evidence provided by most studies suggests that reporting comparability is affected by a variety of factors in addition to accounting standards, such as reporting incentives, underlying economic integration, and institutional factors.

In spite of advances in our understanding of comparability, much remains to be considered. The research still lacks detailed analysis of why and how accounting comparability arises. Are certain accounting attributes more important in achieving comparability than others? Do greater managerial subjectivity and accounting choices help or hamper comparability? Are the documented effects of comparability improvements around IFRS adoption sustainable in the long run?

³² Given that IFRS adoption is associated with an increase in the issuance of annual reports in English (Jeanjean, Stolowy, Erkens, and Yohn 2015), the evidence related to cross-border capital flow around IFRS adoption may also reflect the benefits of lowering language barriers rather than those of IFRS reporting.

³³ Young and Zeng (2015) assess the performance of multiples-based valuation using three criteria: pricing accuracy (defined as the difference between the actual stock price and valuation implied by foreign peers), the ability of the implied values to explain cross-sectional variations in observed stock prices, and the ability of foreign peers' valuation multiples to predict firms' future market-to-book multiples.

4. Effects of IFRS on stock markets

Regulators and standard setters alike have expressed the view that the adoption of IFRS will “reduce the cost of capital and open new opportunities for diversification and improved investment returns” (Tweedie 2006). Proponents have pointed to an increase in transparency, greater accounting quality, and enhanced comparability as paving the way for an increase in liquidity and reductions in cost of equity capital. The EC regulation mandating IFRS (EC 1606/2002) itself cites capital market benefits as a primary reason behind the switch, observing that they contribute “to the efficient and cost-effective functioning of the capital markets.”

Previous theoretical predictions and empirical evidence related to the link between financial reporting quality and capital market consequences have been mixed. In general, these theories find that increasing firms’ commitment to transparency and disclosure can lower information asymmetry in capital markets and thus increase investors’ willingness to trade, thereby boosting the stock price (e.g., Diamond and Verrecchia 1991; Lambert, Leuz, and Verrecchia 2007; Botosan and Plumlee 2002). Moreover, better quality corporate reporting can reduce estimation risk and improve risk sharing in the economy, thus decreasing firms’ cost of capital (e.g., Barry and Brown 1985).

In the context of IFRS adoption, a number of studies attempt to quantify the effect of IFRS adoption on stock markets by studying changes in information asymmetry, liquidity, cost of capital, valuation, and cross-border capital flows between the pre- and post-IFRS-adoption periods. These studies are motivated by the conjecture that “principles-based” IFRS improve transparency as a consequence of their greater reliance on fair-value accounting, increased disclosures, better cross-country comparability, and more economically motivated reporting and that this improved transparency leads to lower information asymmetry and attendant stock market effects. Further justifications for the link between IFRS and improved financial transparency are also often provided based on initial empirical evidence linking IFRS adoption to improved reporting quality, although as discussed in Sections 3.2 and 3.3, recent studies provide mixed evidence of this link.

Furthermore, for IFRS adoption to noticeably affect capital markets, reporting practices must vary significantly from previously established local GAAP. As some countries’ domestic GAAP are more similar to IFRS than others, researchers exploit this cross-country difference in the effects of IFRS to better link observed stock market effects to IFRS adoption.

The rest of this section is organized as follows. Section 4.1 reviews studies that investigate investors’ responses to IFRS adoption. Section 4.2 discusses evidence pertaining to the effects of IFRS adoption on analyst following and forecasts. Section 4.3 reviews IFRS-related studies of cross-

border capital flows. The final section reviews studies focusing on market liquidity and the cost of capital.

4.1. Investor perception of IFRS

Armstrong, Barth, Jagolinzer, and Riedl (2010) provide early large-sample evidence of investors' perceptions of IFRS adoption by examining the short-window market reactions surrounding 16 events between 2002 and 2005 that increased the likelihood of the EU adopting IFRS to evaluate whether stock investors perceived adoption as value enhancing or destroying. Based on a sample of firms with equity traded on European stock exchanges and therefore affected by the IFRS mandate, Armstrong et al. (2010) document an incrementally positive three-day market reaction to events that increased the likelihood of IFRS adoption, beginning with the decision of the EU in 2002 to adopt IFRS.

The authors find positive market reactions for analyses based on market-adjusted returns, where the choice of market returns becomes important. The average raw market responses to the events examined are negative. Some of the announcement dates examined in their study have world-market returns as large in magnitude as -4.4% . A quick review of Dow Jones News Wire for the reasons behind the large drops in a few IFRS announcement dates reveals that some announcement dates were affected by contaminated events, such as world markets being rocked by profit warnings from the US tech sector on June 19, 2002, and February 3, 2004. To the extent that contaminated events affect the DJ Stoxx 1800 (excluding Europe) index more than European stocks, market-adjusted returns for Europe (measured as European stock returns adjusted for returns on the DJ Stoxx 1800 excluding Europe) may be noisy.

To better link European stock market reactions to IFRS news, Armstrong et al. (2010) conduct a cross-sectional analysis of announcement returns on firm-specific characteristics and find that the positive market reactions are larger for firms that are more likely to benefit from adoption, such as those with lower information quality and higher information asymmetry. The positive stock price reaction is also observed for firms with high quality information in the pre-adoption period, suggesting that IFRS benefits are not simply associated with improving firms' reporting quality but are at least partly attributable to the benefits from accounting standard harmonization. Finally, consistent with investors' concerns over the enforcement of IFRS, the authors find an incrementally negative reaction for firms domiciled in code-law countries (i.e., less investor protection). Although focusing on a narrow (three-day) event window mitigates the effects of confounding events that occur outside the IFRS announcement window, it still leaves open the possibility that investors' responses to the anticipated changes in enforcement and regulation accompany the passage of IFRS adoption.

Although the US has not adopted IFRS reporting, a few studies evaluate the potential benefits of IFRS adoption from the perspective of US investors. Joos and Leung (2013) study the market reactions to 13 events between 2007 and 2012 pertaining to the SEC's contemplation of mandatory IFRS adoption for US firms. They find that investors' reactions to announcements that increase the likelihood of IFRS adoption are more positive for firms that are likely to benefit from convergence but less so for firms with a higher litigation risk. Prather-Kinsey and Tanyi (2014) use a similar setting but focus on the price reactions of firms with American depositary receipts (ADR) that report under IFRS. They also observe a positive market reaction to SEC announcements pertaining to potential IFRS adoption for these ADR firms.

4.2. Effects of IFRS adoption on analyst following and forecast properties

Although they do not focus primarily on IFRS adoption, Bae, Tan, and Welker (2008) provide evidence that is directly relevant to understanding the effects of IFRS on analyst following and forecast properties. The authors explore whether GAAP differences across countries are associated with the number of foreign analysts following the firms and their forecast accuracy.³⁴ Their sample consists of 6,888 foreign analysts covering 6,169 firms from 49 different countries (1,176 country-pairs) between 1988 and 2004. Using two novel measures of pairwise GAAP differences between countries (i.e., the extent of the difference between the GAAP the firm follows and the prevalent GAAP in the analyst's home country), they find that foreign analyst following is negatively related to GAAP differences and weakly associated with forecast accuracy. These results indicate the costs associated with differences in accounting standards across countries and speak of the potential benefit of accounting harmonization. That even sophisticated users of financial information like analysts benefit from accounting harmonization reveals the potential gains for other types of capital-market participants.

Several studies directly evaluate the effects of voluntary and mandatory IFRS adoption on analyst following and forecast properties. Ashbaugh and Pincus (2001) examine an international sample of 80 non-US firms that voluntarily adopted IAS from 1990 to 1993. They contend that IAS adoption improves the predictability of earnings by restricting the choice of accounting measurement methods that managers can adopt. Consistent with this, they find that the absolute values of analysts' forecast errors declined after adoption and that this decrease related cross-sectionally to the effect of adoption on a firm's accounting standards. Although they attempt to control for the variety of observed factors driving voluntary adoption, their analyses remain open to the self-selection concerns usually seen in studies of voluntary adoption.

³⁴ Although Bae et al. (2008) do not focus on IFRS adoption, in a supplementary analysis, they document that analysts familiar with IAS are more likely to start following a firm after its voluntary IAS adoption.

Comparing mandatory IFRS adopters to firms that had earlier voluntarily adopted IFRS, Byard, Li, and Yu (2011) examine how the IFRS mandate affects analysts' forecast errors. They find that the absolute value of forecast errors and dispersion decreases after mandatory IFRS adoption but only for firms domiciled in countries with strong enforcement and where IFRS adoption significantly changed accounting standards. Bilinski, Lyssimachou, and Walker (2013) find that the improved analyst performance following IFRS adoption can also be extended to analysts' predictions of target prices. Tan, Wang, and Welker (2011) extend this line of thinking to study the pervasiveness of the improvements in analyst coverage and forecast accuracy across analyst groups. They find that, although IFRS adoption increases coverage from both foreign and local analysts, it improves the forecast accuracy of foreign analysts only. They find IFRS has little effect on the forecasting ability of local analysts.

Examining *why* IFRS adoption may improve analysts' forecast accuracy for adopting firms, Horton, Serafeim, and Serafeim (2013) test whether the improvement arises from (i) a higher quality of IFRS, (ii) a greater comparability after IFRS adoption, or (iii) the additional opportunities available to managers under IFRS to manipulate earnings to meet the forecasts. To this end, the authors classify analysts into three categories: (i) those who focus on only a single set of local GAAP in the pre-IFRS period but analyze reports under both local GAAP and IFRS in the post-IFRS period, (ii) those who focus on a single set of local GAAP in the pre-IFRS period and switch entirely to IFRS reports in the post-IFRS period, and (iii) those who focus on multiple sets of local GAAP in the pre-IFRS period but switch entirely to IFRS reports in the post-IFRS period. Horton et al. (2013) predict that IFRS adoption decreases comparability for the first category of analysts, leaves comparability unaffected for the second category, and improves comparability for the third category. In contrast, they predict that all three categories of analysts benefit from IFRS adoption if IFRS-related benefits arise through improved reporting quality. Their analysis supports the view that IFRS helps analyst forecasting mainly through the improvement of reporting quality and comparability. They find no evidence that managers engage in greater earnings management to meet analysts' forecasts under IFRS.

One simple explanation for the observed improvements in analysts' forecast accuracy is that managers provide more earnings guidance following IFRS adoption. This view emerges from the findings of Li and Yang (2015), who show that IFRS adoption is associated with an increased tendency of managers to provide earnings guidance. However, as Li and Yang (2015) attribute the increases in management forecasts to improved reporting quality under IFRS and increased demand for such information from analysts following IFRS adoption, the causal relationship between the effects of analyst and management forecasts remains unknown.

4.3. *Effects of IFRS adoption on cross-border capital flows*

Proponents of IFRS have consistently claimed that greater financial reporting quality and improved comparability of financial reports under IFRS lead to more cross-border flow of capital and better integration of capital markets (e.g., European Council 2002). These claims are based on the premise that foreign investors must devote significant resources to interpret the domestic GAAP of other countries and that cross-country discrepancies in accounting rules and practices create significant information barriers, leaving foreign investors at an informational disadvantage relative to local ones.

Along these lines, Bradshaw, Bushee, and Miller (2004) suggest that US institutional investors prefer non-US firms whose accounting methods conform more closely to US GAAP. They find that foreign firms exhibiting higher levels (changes) of US GAAP conformity have higher levels of US institutional ownership. They notably find that increases in US GAAP conformity *precede* increases in US investment, indicating that accounting choice *affects* investor capital allocation decisions and that diversity in accounting choices decreases international investment. However, the recent findings by Fang, Maffett, and Zhang (2015) suggest the opposite causality: US institutional investors *drive* convergence in accounting practices; i.e., an increase in US institutional ownership *precedes* an increase in accounting comparability between foreign firms and their US industry peers.

Studies focusing directly on IFRS adoption and cross-border capital flows offer three major arguments for why IFRS adoption may matter to foreign investors. First, by replacing unfamiliar country-specific reporting standards with a single set of standards with which investors can familiarize themselves at a lower cost, IFRS can decrease the information disadvantages of foreign investors relative to local ones (e.g., Yu and Wahid 2014) and help foreign investors assess foreign firms and markets (Amiram, 2012). Second, as IFRS is often perceived as being of a higher quality than many local GAAP, its adoption can decrease the degree of information asymmetry between local and foreign investors. Finally, the use of harmonized accounting standards may increase the visibility of remote investments, putting these stocks on investors' radars.

Covrig, DeFond, and Hung (2007) provide early evidence of the role of IAS adoption in investor allocation decisions. Focusing on a sample of holdings in non-US stocks by 25,000 mutual funds around the world, Covrig et al. (2007) show that stock ownership by foreign mutual funds increases with the voluntary adoption of IAS. After controlling for many standard determinants of institutional ownership such as size, analyst following, inclusion in the market index, cross-listings, choice of auditor, and an array of financial characteristics, the authors find an almost 50% increase in foreign mutual fund ownership for IAS adopters relative to non-IAS adopters. When they partition the sample into two groups based on firms' information environment or visibility, they find IAS-adoption

induced changes in foreign mutual fund ownership to be pronounced for voluntary adopters located in poorer information environments and with lower visibility, indicating heterogeneity in the adoption effects. As a firm's information environment and visibility are likely to be correlated with its decision to adopt IAS, the last result could also be driven by differences in firms' incentives to adopt IAS.

Khurana and Michas (2011) extend the preceding analyses to the context of mandatory IFRS adoption and find that IFRS adoption decreases US investors' home bias, which is the extent to which investors overweight US stocks in their portfolios relative to stocks in the country mandating IFRS. Based on a sample of 85 countries, 33 of which mandated IFRS from 2003 through 2007, the authors find that US home bias decreased for investments in firms domiciled in IFRS-adopting countries relative to those in firms in countries that did not change their accounting standards. These results are stronger for IFRS-adopting countries that exhibit larger differences between IFRS and domestic accounting standards, a stricter rule of law, and greater incentives to report high quality financial information.

Shima and Gordon (2011) also examine the effect of IFRS adoption on the investment decisions of US investors but scale their main variable of interest (i.e., the dollar investments by US investors in a foreign market) by the GDP of the foreign country rather than by the weight of the foreign country's stocks in world-market capitalization, an approach taken by Khurana and Michas (2011). In contrast to Khurana and Michas (2011), they find no evidence to suggest that IFRS adoption decreased home bias from 2003 through 2006, unless such adoption occurred in a country with a strong regulatory environment.

Florou and Pope (2012) examine how IFRS adoption affects institutional ownership by studying the investment allocation decisions of a large sample of international institutional investors over the 2003-2006 period. They show that the percentage of institutional ownership and number of institutional investors increased in countries mandatorily adopting IFRS relative to a control sample of countries that did not mandate IFRS. Using firm-level data in a difference-in-differences analysis, they report an average increase in institutional ownership of 1.4% in the period immediately following the IFRS transition quarter. These changes in institutional ownership are also more marked for active investors, whose investment decisions rely on financial statement data relative to passive investors, corroborating the claim that ownership changes are caused by IFRS. As the authors do not distinguish between domestic and foreign institutional investors, it is unclear whether the documented ownership changes are due to IFRS improving reporting quality and thereby inducing domestic institutions to increase their ownership or to the harmonization of accounting standards attracting foreign investors.

Yu and Wahid (2014) extend preceding analyses by focusing specifically on foreign mutual fund holdings around IFRS adoption. They show that foreign mutual funds also increase their

ownership stakes in firms domiciled in IFRS-adopting countries. They relate these ownership changes to changes in accounting distance (i.e., differences in accounting standards) between the investee and investor's countries. To give a sense of the economic magnitude of this effect, they point out that, if the differences in accounting standards across the US and South Africa were eliminated, then the US mutual funds would decrease their underweighting of South African stocks by approximately 14%. In an additional analysis, the authors examine changes in accounting distance driven only by IFRS adoption in the investor fund's country, i.e., there are no changes in the accounting standards of the investee firm. Even in this setting, the authors continue to find that mutual funds increase their investment weights in the investee firms, indicating that an investor's increased familiarity with an investee's accounting standards encourages cross-border investments.

DeFond, Hu, Hung, and Li (2011) attempt to more directly identify the specific accounting attributes that explain the increased attention of international institutional investors following IFRS adoption. They contend that increases in cross-border investment following IFRS adoption are driven by improvements in comparability, which lowers information acquisition costs for global investors. Testing this assertion on a sample of 14 IFRS-mandating EU countries and 10 non-IFRS countries for the 2003–2007 period (excluding the IFRS transition year), they find that IFRS adoption results in greater investment by foreign mutual funds for firms experiencing larger increases in accounting uniformity.³⁵

Although progress has been made in understanding the effects of IFRS adoption for institutional investors, very little research has explored the effects of adoption on the trading patterns of retail investors. This is at least partly due to a lack of comprehensive data related to retail trades. Bruggemann, Daske, Homburg, and Pope (2012) attempt to circumvent this problem by analyzing trading volume in the Open Market of the Frankfurt Stock Exchange, a trading venue primarily designed to attract small German investors interested in foreign stocks. Based on difference-in-differences analysis, they document an increase in trading volume following the EU's mandatory IFRS adoption in 2005, suggesting that retail investors benefit from IFRS reports. However, cross-sectional analysis reveals that these effects are more pronounced for trading in stocks that have increased media coverage following IFRS adoption, which raises the possibility that the observed trading effects may not be directly attributable to IFRS adoption but may reflect investors' responses to the greater media coverage.

Although the preceding studies focus on specific subsamples of foreign investors, such as mutual funds, US investors, institutional investors, and retail investors, Amiram (2012) shows that the

³⁵ For each industry-country, Defond et al. (2011) measure accounting uniformity as the number of firms in that industry and country using IFRS in the post-IFRS-adoption period, divided by the number of firms in that industry and country using local accounting standards in the pre-IFRS-adoption period.

evidence in these studies can be generalized to country-level foreign portfolio investments (FPI). That is, the tendency of investors to invest in IFRS countries is observable even when one analyzes data related to all of the non-controlling equity stakes in a country purchased by foreign entities. He also finds that it is primarily investors from countries that use IFRS who increase their investments in other IFRS-adopting countries rather than investors from countries that do not use IFRS, which implies that the increased cross-border investments are mainly attributable to investors' familiarity with IFRS, rather than to IFRS improving reporting quality or appealing to all foreign investors.

Although most studies of cross-border investments around IFRS adoption focus exclusively on equity investments, Beneish, Miller, and Yohn (2014) study both equity and debt investments. They find that post-IFRS increases in cross-border investments of equity, as reflected in country-level FPI data, are mainly driven by US investors. More interestingly, they find that the effects of IFRS on cross-border debt investments are stronger and that IFRS adoption attracts new debt investors from a wider set of countries, including the US and other non-IFRS countries. The authors conclude that IFRS adoption benefits debt investors more than equity investors.

Overall, there appears to be a consensus in the empirical evidence that IFRS adoption is associated with increases in cross-border capital flows. Although initial studies attribute these increases to both improved transparency and comparability under IFRS, more recent studies point toward greater familiarity of investors with IFRS as the source of improvement. However, these findings leave some unanswered questions. What is the causal relationship, following IFRS adoption, between changes in stock liquidity (discussed in the next subsection) and cross-border capital flows? What are the effects of larger cross-border capital flows on the size of equity markets and the economy of IFRS-adopting countries relative to those of the countries from where the investments flow out? How does IFRS adoption affect investment risks and returns on cross-border capital flows?

4.4. Effects of IFRS adoption on market liquidity and cost of capital

Several theoretical models have been developed to understand the link between information quality and liquidity in addition to cost of capital. Although the literature is not specifically directed at IFRS adoption, these models provide a basis for empirical tests of the effects of IFRS adoption on stock liquidity and cost of capital. Hence, we review the literature in Section 4.4.1. Section 4.4.2 then presents the empirical evidence for voluntary IFRS adopters, and Section 4.4.3 discusses the evidence for mandatory adopters.

4.4.1. Theoretical predictions of the effects of reporting quality on liquidity and cost of capital

Two mechanisms are generally employed to link quality of accounting information with liquidity and cost of capital: estimation risk and information asymmetry, both of which are often

referred to as “information risk.” Estimation risk refers to the uncertainty associated with investors’ assessments of the parameters of an asset’s return or payoff distribution, and information asymmetry relates to the risk facing liquidity traders from potentially trading with better informed investors. Increasing information (i.e., greater and more precise accounting disclosures) allows for both a lower estimation risk and convergent opinions on the part of all investors, which improves risk sharing and thus decreases the cost of capital (e.g., Barry and Brown 1985; Coles and Lowenstein 1988). Barry and Brown (1985) show in a Bayesian framework that risk-averse investors prefer securities in which more information is available, as these securities present a lower estimation risk for investors. They point out that, when such investor preferences are consistent across the market, equilibrium prices are higher for firms with better information and such a firm’s cost of capital is lower. This study and subsequent studies conducted along this line (e.g., Coles and Lowenstein 1988) show that parameter uncertainty affects investors’ estimations of beta and so are not diversifiable.³⁶

On a related note, information asymmetry between potential buyers and sellers of shares can introduce adverse selection into the share markets and decrease market liquidity. In response to the lower liquidity, stock prices decrease to compensate investors for holding illiquid stocks and lead to an increased cost of capital for the firm. However, firms can decrease this cost by improving the level or precision of disclosures, which lowers the degree of information asymmetry between investors and eventually the cost of capital (e.g., Amihud and Mendelson 1986; Diamond and Verrecchia 1991; Easley and O’Hara 2004). In addition, Diamond and Verrecchia (1991) provide an alternative path for relating disclosure levels to cost of capital: greater disclosures decrease the adverse price effect of the trade, mitigating investor concerns about taking large stakes in a firm. This increases demand for securities, which, through improved liquidity, decreases the cost of capital.

The preceding models generally derive their results from a single-asset economy (or multiple assets where the cash flows of firms are uncorrelated). In contrast, Lambert et al. (2007) develop a model in which the quality of accounting information can affect the cost of equity capital in an economy with *multiple* assets whose payoffs are correlated. Under a CAPM framework with perfect competition, they show that accounting information quality affects the cost of capital through a firm’s beta and that, once an appropriately measured beta is controlled for, accounting quality should not relate to expected returns.³⁷ Studying the interplay between information asymmetry and cost of capital

³⁶ In an economy where the level of disclosure is the same for all firms, estimation risk can be diversified away. However, Barry and Brown (1985) show that differential information (i.e., cross-firm differences in the amount of available information about the firm) affects pricing.

³⁷ Easley and O’Hara (2004) develop a model in which firms with less public and more private information face a greater information risk and higher expected returns. They argue that, due to their information disadvantage relative to informed investors, uninformed investors end up holding suboptimal portfolios with too many stocks with pending bad news and too few with pending good news. As this risk cannot be diversified away by holding more stocks, the risk gets priced in equilibrium. However, Lambert et al. (2007, pp. 396–397) point out that the information effect on stock prices is diversified away when the number of traders becomes large.

in a large economy, Hughes, Liu, and Liu (2007) similarly show that private information signals affect either market risk premium or factor loadings, depending on whether the private signal relates to systematic risk factors or idiosyncratic shocks. However, the information asymmetry arising from private signals about idiosyncratic shocks does not matter directly to cost of capital. That is, after accounting for betas, the information asymmetry has no effect on cost of capital.

Armstrong, Core, Taylor, and Verrecchia (2011) attempt to reconcile the contradictory theoretical predictions for the effect of information asymmetry on cost of capital by proposing that information asymmetry matters for pricing stocks only when markets are imperfect. They conjecture that, in perfectly competitive markets where individual traders' demands do not affect stock prices, information asymmetry is irrelevant for stock pricing. However, in imperfect security markets, information asymmetry has a separate effect on cost of capital, beyond any effect through other risk factors. Using the number of shareholders a firm has as a proxy for the level of competition surrounding the firm's shares, the authors provide evidence consistent with their conjecture related to US stocks.

In one of the very few theoretical studies to directly evaluate the effect of global harmonization on stock market performance, Barth, Clinch, and Shibano (1999) present a model that shows that the effect of accounting harmonization on price information and trading volume in a market depends on the interaction of two forces: (i) whether the harmonization improves or worsens the information revealed through financial statements and (ii) the extent of the net benefits accrued to foreign investors by becoming more familiar with a firm's financial reporting standards. The latter force is assumed to depend on the former, as poorer information quality increases returns to informed trading. Based on the interaction of these two forces, Barth et al. (1999) show that the harmonization of better quality accounting standards may not necessarily improve stock market performance and vice versa.

The preceding theoretical predictions suggest that IFRS adoption will improve stock liquidity provided it improves reporting quality for stock investors. However, its effect on cost of capital is ambiguous, especially after controlling for firms' betas. We now turn our attention to empirical evidence of the linkage between financial reporting quality, stock market liquidity, and cost of capital.

4.4.2. Empirical evidence based on voluntary IFRS adoption

Early studies of the effects of IFRS adoption on stock markets typically rely on firms from a handful of European countries that allowed voluntary adoption of IAS. In fact, many of the studies focus specifically on German firms, as voluntary adoption was more common among them.

Leuz and Verrecchia (2000) compare proxies for stock liquidity, namely, bid-ask spread, trading volume, and return volatility, across German firms voluntarily reporting under either IAS or US GAAP versus those reporting under local German GAAP. Arguing that IAS and US GAAP have higher quality disclosure requirements, they predict that firms *committing* to report under IAS or US GAAP should have lower information asymmetry and better stock liquidity than those reporting under German GAAP. Consistent with this prediction, they find that firms reporting their 1997 financial reports under IAS or US GAAP exhibit lower bid-ask spreads and higher share turnovers but not different share price volatilities. Although their analysis is based on the greater disclosure levels required under IAS or US GAAP, it does not distinguish between the effects of disclosure quality and those of the quality of recognized financial numbers. Moreover, as it relies on a very small sample of 14 IAS adopters and seven US GAAP adopters, its generalizability presents a problem.

In a related study, Leuz (2003) compares the stock liquidity of firms in Germany's former New Market that report under IAS with firms from the same market that adopt US GAAP. The author argues that, except for differences in accounting regulations, these two groups of firms face identical regulations and therefore any differences in the information asymmetry or stock liquidity proxies across these groups should reflect the relative reporting quality of the two accounting standards. Leuz (2003) finds insignificant differences in the bid-ask spreads and share turnover between the two groups, indicating that the mere adoption of either IAS or US GAAP is not sufficient to improve these firms' reporting quality relative to each other. In a closely related work, Bartov et al. (2005) study how the value relevance of accounting numbers varies across German firms reporting under IAS, US GAAP, or German GAAP. Although they find that firms reporting under US GAAP or IAS have better value relevance, they do not find any significant difference in value relevance between firms reporting under US GAAP and IAS. Their findings, along with those of Leuz (2003), indicate minimal stock market benefits from adopting IFRS relative to US GAAP.

Daske (2006) provides some of the earliest evidence of the link between choice of accounting standards and cost of capital estimates. Using analyst consensus forecasts from IBES, Daske (2006) estimates the implied cost of equity capital for a sample of German firms between 1993 and 2002 and finds no evidence to suggest that it is lower for firms reporting under IAS or US GAAP than for firms reporting under German GAAP. In fact, he finds that the cost of equity increases when firms switch from local GAAP to IAS or US GAAP, which he speculates may reflect the effects of the decreased comparability of these firms' financial reports relative to those of other German firms. Although this study takes an important step by connecting accounting standards to cost of capital, its implied cost of capital estimates are based on analysts' forecasts, whose properties are affected by choice of accounting standards (see the discussion in Section 4.2). These may add noise to the analyses surrounding the accounting standard changes.

Recognizing that firms have discretion in how they implement new accounting standards, Daske, Hail, Leuz, and Verdi (2013) re-examine the observed liquidity and cost of capital effects around voluntary (and mandatory) adoption. Their analysis incorporates *changes* in firm-level reporting incentives and behavior around the time of adoption to classify firms as either “serious” or “label” adopters.³⁸ “Serious” adopters are firms that experienced significant changes in incentives around IAS adoption and for whom adoption forms part of a broader commitment to transparency. “Label” adopters are firms that experienced little or no change in observable incentives around the time of adoption and thus did not make significant changes to their reporting policies. Based on an international sample (spanning 30 countries) of voluntary IAS adopters between 1990 and 2005, the authors fail to find any noticeable effects on liquidity (measured as the effects of trades and bid-ask spreads on price) or implied cost of capital estimates for voluntary adopters, relative to local-GAAP firms and a firm’s own pre-IAS history. However, once they use concurrent changes in reporting incentives as a condition, they find that “serious” adopters experience improvements in liquidity and declines in cost of capital relative to “label” adopters. In addition, they find that serious adopters experience a net increase in Tobin’s Q. They find the same pattern of results surrounding mandatory IFRS adoption. Daske et al. (2013) provide evidence that simply adopting IAS/IFRS does not necessarily lead to the purported stock market benefits unless firm-level reporting incentives are also aligned. Their evidence corroborates the findings of Ball et al. (2003) and also provides some insight into the nature of the heterogeneous outcomes previously observed around IAS/IFRS adoption.

Overall, the evidence related to voluntary adoption is mixed. Although some studies find evidence of reductions in information asymmetry and stock liquidity (e.g., Leuz and Verrecchia 2000), other studies document little support for the claim that voluntary IFRS adoption by itself improves liquidity or decreases cost of capital (Daske 2006; Daske et al. 2013). Although studies of voluntary adoption typically attempt to control for self-selection using traditional econometric approaches, one cannot be entirely confident that self-selection biases do not affect these results.

4.4.3. *Empirical evidence based on mandatory IFRS adoption*

Using firm-year panel data for mandatory IFRS adopters from 26 countries and covering 2001 through 2005, Daske, Hail, Leuz, and Verdi (2008) examine the effects of mandatory IFRS adoption on stock liquidity, cost of capital, and Tobin’s Q. Relying on a benchmark of firms that do not report under IFRS (due to either being domiciled in a non-adopting country or not being required to

³⁸ Daske et al. (2013) use three proxies to identify major changes in firm-level reporting incentives related to voluntary (and mandatory) IAS adoption. The first is the primary factor drawn from factor analysis of a variety of firm attributes, such as size, leverage, profitability, book-to-market ratio, percentage of closely held shares, and percentage of foreign sales to total sales. The second is the negative of the ratio of absolute value of accruals to the absolute value of cash flow from operations. The final proxy is the number of analysts following a firm. The authors then use the changes in these proxies over six years around IAS to sort firms into “serious” and “label” adopters based on whether the changes are above or below the median change.

mandatorily adopt IFRS in 2005) as control firms, they find a significant improvement in liquidity for mandatory IFRS adopters. They also find a significant increase in cost of capital and a significant decrease in Tobin's Q. However, when the authors examine the stock market effects in the one year before IFRS adoption, they find that cost of capital decreases by 26 basis points and Tobin's Q increases by 7%. They conclude that the IFRS benefits may be reflected in stock prices as soon as IFRS adoption is anticipated. However, from a theoretical perspective, it is unclear why investors decrease the premium for information risk even before the risk is attenuated and despite the significant uncertainty around IFRS implementation and its effect on reporting quality (as discussed in Section 2.4) in the year before IFRS adoption. It is also unclear why cost of capital actually increases if information risk decreases upon the IFRS adoption date. The authors' findings also leave unanswered the question of why the effects on cost of capital and Tobin's Q precede mandatory adoption when uncertainty about the reporting effects of IFRS remained high (see discussion in Section 2.4).

Based on cross-sectional analyses, Daske et al. (2008) document that the observed stock market benefits occur only in countries with strict enforcement regimes and in countries where firms have incentives to be transparent. They are careful to point out that some or all of their results may reflect the effects of a variety of regulatory and enforcement changes that are instituted along with IFRS adoption and that mandatory adoption itself may play a limited role in causing the observed outcomes.

Like Daske et al. (2008), Li (2010) investigates whether mandatory adoption of IFRS affects cost of equity capital. Based on difference-in-differences analysis of a set of 1,084 EU firms, she concludes that mandatory adopters enjoy a significant reduction of 47 basis points in their cost of equity, but that no such change occurs around the IFRS mandate date for a control sample of voluntary adopters.³⁹ A possible reason for these differences in the main results is that, unlike Daske et al. (2008), she does not control for time trends. Notwithstanding these differences, she finds that only firms in countries with strong legal enforcement benefit from reductions in cost of equity capital. This suggests that the differences in the countries covered in the sample may explain the differences in main results across the two studies.

Rather than limiting their focus to IFRS adoption indicators, Platikanova and Perramon (2012) study how new information revealed through IFRS adoption (contained in the reconciliation of IFRS to local GAAP) relates to stock liquidity. They find that, although the reconciliation numbers (relative to industry peers) for shareholders' equity are not unambiguously related to stock liquidity, those for net income are significantly negatively related to it. The authors suggest that larger net

³⁹ Li (2010) measures cost of equity capital as the average implied cost of capital measures estimated from the four different valuation models.

income differences reflect greater uncertainty about IFRS adjustments in the transition year and that this uncertainty lowers stock liquidity.

Christensen et al. (2013) re-evaluate the evidence provided by Daske et al. (2008) after accounting for enforcement and regulatory changes concurrent with mandatory IFRS adoption in some EU countries. Based on a survey of regulators, practitioners, and academics and information from public sources, they classify five European countries (Finland, Germany, Netherlands, Norway, and the UK) as undergoing substantive enforcement changes concurrent with mandatory IFRS adoption. They also compare the liquidity changes surrounding IFRS adoption across four groups of countries: (i) EU countries with concurrent enforcement changes, (ii) EU countries without concurrent enforcement changes, (iii) non-EU countries adopting IFRS, and (iv) countries not adopting IFRS. They document that the effects of IFRS introduction on stock liquidity are limited to the five European countries undergoing concurrent changes in enforcement. Moreover, they find similar liquidity improvements for firms that are experiencing changes in enforcement regimes but are not concurrently changing their accounting standards. Based on these findings, they conclude that changes in reporting enforcement or other correlated omitted factors help explain the liquidity changes observed around IFRS adoption and that changes in accounting standards have had little direct effect on market liquidity. However, Barth and Israeli (2013) contend that the evidence provided by Christensen et al. (2013) is insufficient to attribute the liquidity changes to enforcement changes alone and that both IFRS adoption and enforcement changes may be required for firms to benefit from improved stock liquidity.

In contrast to the preceding studies' focus on the effects of IFRS adoption on stock liquidity and cost of capital, Hong, Hung, and Lobo (2014) illuminate another capital market consequence by evaluating the effect of IFRS adoption on the underpricing of initial public offerings (IPOs). As IPO underpricing is at least partly caused by information asymmetry between informed and uninformed investors, IFRS adoption can help decrease IPO underpricing by decreasing information asymmetry. In addition, the authors point out that IFRS adoption can lower IPO underpricing by attracting more foreign investors' attention to the stock. To test their prediction, they adopt a difference-in-differences research design involving a treatment sample of 1,540 IPO firms from mandatory-IFRS-adopting countries and a propensity-scored matched sample of IPO firms from non-IFRS-adopting countries. Their findings suggest that IPO underpricing decreases significantly (38%–82%) for IFRS-adopting firms. Moreover, they show that IPO firms attract significantly more foreign proceeds (49%–76%) after mandatory IFRS adoption. Cross-sectional analyses reveal that the results are limited to countries with strong enforcement regimes and those that were significantly affected by IFRS adoption (i.e., with large differences between IFRS and prior local GAAP).

In summary, empirical analyses of stock market benefits generally reveal that voluntary and mandatory IFRS adoption have increased market liquidity and decreased the cost of equity capital. However, these benefits have not been experienced by all firms or within all countries. Rather, they have been concentrated in firms that have undergone concurrent changes in firm-level reporting incentives and in countries that have undergone concurrent changes to enforcement. As we discuss in detail in Section 10, studies focusing on mandatory IFRS adoption are susceptible to a confounding-events problem, raising concerns about the precise cause of the observed effects of the IFRS mandate. To address such concerns, more research is required to obtain a clearer understanding of the links between IFRS adoption and its effects on stock markets. For instance, current IFRS studies do not closely tie their empirical analysis of cost of capital to predictions derived from specific theoretical models. It is necessary to do so, as theoretical predictions of the effect of information quality on cost of capital are model-dependent (as discussed in Section 4.4.1). Future research should also delve deeper into the precise properties of IFRS and enforcement that underpin the observed benefits related to liquidity and cost of capital. Which types of enforcement or which specific IFRS attributes yield greater stock market benefits?

5. IFRS and corporate decision-making

5.1. Empirical predictions and US-based evidence

There are several reasons to expect changes in accounting standards and the attendant effect on reporting quality to influence corporate decision-making. Several studies show that better reporting quality decreases information asymmetry between insiders and outsiders, which in turn attracts capital to positive net-present-value projects and increases investment opportunities by lowering investors' required returns (e.g., Biddle, Hillary, and Verdi 2009; Raman, Shivakumar, and Tamayo 2012; Goodman, Neamtiu, Shroff, and White 2014). Better financial reporting quality also enhances the effectiveness of corporate governance mechanisms and thus mitigates managerial excesses, including under- and overinvestments. Reported accounting numbers are often used in debt covenants, and so changes to accounting standards can tighten or loosen covenant slack and affect the funds available for investments and other corporate purposes (Shroff 2015). Furthermore, new accounting standards often require managers to gather additional information, which can affect managerial decision-making.

Changes in accounting standards can also affect the decision-making of firms through spillover effects from other firms' financial reports. For instance, more transparent reporting by all of the firms in an economy can benefit a firm by decreasing its uncertainty over the strategies of peer firms. Durnev and Mangen (2009) posit and show that a competitor's accounting restatements transfer

information about the general profitability of investment projects to other firms. Admati and Pfleiderer (2000) also suggest that, in a world where firm values are correlated, mandating higher disclosure quality enhances welfare, as higher quality disclosures allow investors to arrive at more accurate valuations for not only the disclosing firm but also its peers. This is also likely to affect corporate decisions by influencing capital allocation across firms. A number of US-based studies provide empirical evidence in support of these spillover effects of reporting quality (e.g., Foster 1981; Freeman and Tse 1992; Durnev and Mangen 2009; Badertscher et al. 2013; Shroff et al. 2014).

5.2. IFRS and corporate investment efficiency

One of the first studies to consider investment efficiency in the IFRS adoption context is that by Schleicher, Tahoun, and Walker (2010), who investigate how IFRS adoption affects investment efficiency in an international setting. They argue that improved reporting quality under IFRS should improve investment efficiency and that this improvement should be more pronounced in inside economies (i.e., economies with small stock markets, highly concentrated ownership, weak outside investor rights, poor disclosure levels, and weak legal enforcement) than in outside economies, as the former are more prone to agency problems and financial constraints. Along similar lines, they suggest that the effects of IFRS should be more noticeable for smaller firms, which are generally more financially constrained. Measuring investment efficiency based on the sensitivity of investments to cash flows, the authors report results that are consistent with these predictions, i.e., reductions in investment-cash flow sensitivity following IFRS adoption are greater for insider economies and for smaller firms. Biddle, Callahan, Hong, and Knowles (2013) extend these findings to a larger sample and adopt a difference-in-differences approach that encompasses both IFRS-adopting and non-IFRS-adopting countries and show that the conclusions of Schleicher et al. (2010) are robust.

Chen, Young, and Zhuang (2013) examine the effect of IFRS adoption on the cross-border spillover of investment-related information. They specifically investigate how IFRS adoption affects the relationship between the investment efficiency of a firm and the investment performance of its foreign peers based on a sample of over 1,000 IFRS-adopting firms from 17 European countries between 2000 and 2009. They show that IFRS adoption increases the sensitivity of a firm's investment efficiency to performance-related information about its foreign peers but not to information about its domestic peers. Based on this, they conclude that enhanced cross-border comparability following IFRS adoption drives the documented results.

Louis and Urcan (2014) examine how mandatory IFRS adoption affects managerial decisions pertaining to M&A. As accounting reports play a crucial role in the initial screening and identification of target firms, they argue that acquirers should be able to better screen targets from other countries with comparable accounting standards, suggesting that widespread IFRS adoption should increase

cross-border acquisitions. They also point out that the use of identical accounting standards by both acquirer and target should simplify post-acquisition integrations. This should also increase the likelihood of IFRS-reporting entities merging. Consistent with these predictions, they find that the odds of cross-border acquisitions of listed firms from IFRS-adopting countries significantly increase in the post-IFRS period relative to corresponding increases for either unlisted firms in IFRS-adopting countries or listed firms from non-IFRS countries. This effect is not driven by countries that change their enforcements or regulations concurrently with IFRS adoption. Rather, it primarily occurs when the acquiring firm is also from an IFRS-adopting country. Based on these findings, the authors conclude that improved comparability rather than changes in reporting quality resulting from IFRS adoption causes an increase in cross-border M&A.

Francis, Huang, and Khurana (2015) also investigate whether differences in accounting standards across countries affect cross-border M&A. Using cross-border M&A data from 32 countries over 1998 through 2004, they show that the volume of cross-border transactions is larger between countries with similar accounting standards. They also report that mandatory IFRS adoption has increased cross-border M&A across countries that exhibited larger differences in their domestic GAAP in the pre-IFRS period. However, neither Francis et al. (2015) nor Louis and Urcan (2014) identify the specific costs that are so large as to dissuade the acquisition of targets reporting under an alternative accounting standard.

Shroff et al. (2014) examine whether the information environment in which a subsidiary operates affects its investment decisions using IFRS adoption as an exogenous shock to firms' information environment. The authors hypothesize that more transparent information, such as that presented under IFRS, allows multinational companies to better monitor the investment decisions of their foreign subsidiaries. Consistent with this, they show that the investment decisions of foreign subsidiaries in country industries with more transparent information environments are more responsive to local growth opportunities than foreign subsidiaries in country industries with less transparent information environments.

Relatedly, Loureiro and Taboada (2015) examine whether and how IFRS adoption affects the sensitivity of managerial decisions to stock price information, i.e., whether insiders can "learn" from outsiders. They argue that an improved information environment such as that under IFRS adoption allows managers to learn more from investors' information sets, as reflected in the stock prices. They test this prediction by following a difference-in-differences approach using both non-adopters and voluntary adopters as control groups. Based on a sample of over 32,000 firms from 50 countries over 1990 through 2012, they show that relative to the control sample, IFRS adopters experience an increase in investment-to-price sensitivity, a stronger relationship between market reactions to M&A announcements and the likelihood of deal completion, and an improvement in post-acquisition

operating and return performance following adoption. The authors attribute their results to increases in information provided by new foreign investors, rather than current investors providing more information post adoption.

5.3. IFRS and other corporate decisions

Hail, Tahoun, and Wang (2014) examine how changes in a firm's information environment affect its dividend payout policies. They point out that an improved information environment such as that under IFRS adoption can either increase or decrease dividend payouts by improving managerial monitoring and mitigating agency problems. Although improved monitoring decreases the need for managers to signal their quality by paying out excess cash, causing lower dividend payouts, it can also decrease overinvestment and lead managers to distribute excess cash through higher dividend payouts. The authors test these contradicting predictions based on difference-in-differences analysis of an international sample of firms covering 49 countries over 1993 through 2008. Their logit analysis reveals that the propensity to pay dividends decreases by about 9% after IFRS adoption, relative to a benchmark sample of non-adopting firms.

Wang and Welker (2011) examine whether firms strategically time equity issuances during the transition period leading up to IFRS, when information asymmetry between management and investors was temporarily high. They suggest that managers, who had inside knowledge of the negative effects of IFRS on reported numbers, strategically issued equity before the information was publicly released. Based on a sample of 2,900 non-financial firms from Australia and Europe, they initially provide evidence of greater information asymmetry between managers and investors of equity-issuing firms by documenting a stronger association between abnormal stock returns after IFRS adoption (when the effects of IFRS were revealed publicly) and the difference in net incomes reported under local GAAP and IFRS relative to non-issuing firms. They then document a significantly negative relationship between the earnings differences across IFRS and local GAAP, the probability of issuing equity, and the amount issued in the three years leading up to IFRS adoption.

Chen, Ng, and Tsang (2015) examine whether mandatory IFRS adoption affects cross-listing decisions. They point out that IFRS adoption may increase incentives to cross-list by lowering the costs associated with financial reporting across multiple jurisdictions and lowering investors' costs of processing financial reports prepared under unfamiliar accounting standards. However, IFRS adoption may also decrease a firm's need to cross-list by attracting foreign investors and analysts to local markets. Based on a sample of 1,181 cross-listed firms (including 608 from IFRS-adopting countries), Chen et al. (2015) find that firms in IFRS-adopting countries are more likely to cross-list after mandatory adoption than firms reporting under non-IFRS standards or firms that had voluntarily adopted IFRS earlier. They also find that adopters tend to cross-list in more countries, in other IFRS-

adopting jurisdictions, and in countries with larger and more liquid security markets. Cross-sectional tests reveal that the cross-listing effect of mandatory IFRS adoption is greater for firms domiciled in countries exhibiting larger differences between local GAAP and IFRS, lower disclosure levels, and less access to external capital before adoption.

Overall, although initial efforts have been made to better understand the effects of the IFRS mandate on corporate decisions, this topic offers opportunities for future research. Have improved cross-border comparability and increased cross-border information transfers led to the better economic integration of countries? Have they increased competition in IFRS-adopting countries, especially from foreign firms? By improving monitoring and efficiency of decisions and lowering costs of capital, has IFRS adoption increased the economic profitability of firms? Or has it hurt economic profitability by attracting greater competition, particularly from foreign firms? Future studies should strive to explain the mechanisms through which these real effects occur.

6. IFRS and debt markets

Few studies evaluate the effects of IFRS on debt markets. The arguments related to the effects of IFRS in the context of equity markets cannot always be directly extended to debt markets due to the asymmetric payoff function of debtholders. For instance, although shareholders may care more about the current market value of a borrower's assets, debtholders also care about the liquidation value of the assets. Furthermore, debt is an agreement to repay the principal and interest, not the fair value. Thus debtholders may not find the fair value reporting of liabilities helpful.

Accounting plays two major roles in debt markets: valuation and contracting. The valuation role of accounting helps borrowers and lenders to mitigate information asymmetry by sharing information directly relevant to pricing debt. This role requires accounting numbers to reflect managers' private and forward-looking information, even if it is not immediately verifiable. In contrast, under the contracting role, financial reports supply auditable financial outcome variables for use in efficient contracts with the firm. This role requires accounting numbers to be independently verifiable and enforceable in a court of law. The next two subsections examine evidence in the literature related to each of these aspects.

6.1. Valuation-related effects of IFRS on the debt market

6.1.1. Effects of IFRS on firms' capital structure

Based on Myers and Majluf's (1984) adverse-selection theory, Naranjo, Saavedra, and Verdi (2014) conjecture that, by reducing information asymmetry and the attendant adverse selection costs,

mandatory IFRS adoption enables firms to easily raise external funds. Based on Myers' (1984) pecking order theory, they surmise that IFRS adopters with high debt capacities choose debt as their primary source of external financing. Based on a sample of firms covering 41 countries from 2003 through 2012, they find that mandatory IFRS adopters raise more external financing after adoption and that firms with higher debt capacities issue incrementally more debt than equity and have higher leverage ratios in the post-adoption than firms with lower debt capacities. Consistent with the notion that IFRS helps lower information asymmetry problems, the observed effects are more pronounced for firms with higher ex-ante levels of information asymmetry.

Florou and Kosi (2015) investigate how IFRS adoption affects a firm's choice of the type of debt financing, i.e., public versus private. Compared with public bondholders, private lenders, such as banks, have access to borrowers' private information and superior information-processing abilities and therefore face less of an adverse selection problem (Bharath, Sunder, and Sunder, 2008). This implies that firms with better reporting quality should have better access to public debt relative to private debt. Testing this prediction on a sample of public bond and private loan issuances made between 2000 and 2007, Florou and Kosi (2015) provide corroborative evidence. They find that mandatory IFRS adopters are more likely than non-adopters to issue public bonds rather than private loans. Like the evidence provided by Naranjo et al. (2015), their findings support the prediction of Myers and Majluf (1984) that better information quality increases firms' reliance on external sources of financing. Naranjo et al. (2015) and Florou and Kosi (2015) rely on the argument that IFRS improve reporting quality and lower information asymmetry. However, as discussed earlier in Sections 3 and 4, the evidence for this argument is mixed.

IFRS-related studies of external financing patterns raise several questions for future research. If firms raise more financing through public debt issues following IFRS adoption, then where does the increased availability of funds come from? Are the funds from non-IFRS-reporting firms reallocated? Are there changes in the money supply or multiplier effects at the macroeconomic level? Do the documented effects of IFRS on external funding differ when the supply of capital is limited? Although we recognize that efforts to understand the broader macro-level effects of accounting shocks are not straightforward, these are issues worth pursuing.

6.1.2. Effects of IFRS on the credit relevance of accounting numbers

IFRS studies generally find that the accounting information produced by IFRS is more value relevant for stock market participants (see Section 3). This raises the natural question of whether the same holds true for debtholders. In other words, do IFRS numbers better predict a firm's credit risk than local GAAP numbers? One may argue that IFRS numbers are more credit relevant, as IFRS require recognition of more liabilities, such as pension obligations and employee stock options, which

under local GAAP tend to be either optional or not required. Furthermore, the increased emphasis on the fair value measurement for financial instruments and fixed assets may result in IFRS numbers reflecting losses in a timelier manner than historical cost accounting. However, the increased flexibility and managerial discretion required under a principles-based IFRS regime can compromise the verifiability and reliability of accounting numbers and therefore make financial statements less useful for creditors.

Several studies empirically investigate the effects of IFRS on credit relevance. However, the results tend to be mixed. Florou, Kosi, and Pope (2015) and Wu and Zhang (2014) find that IFRS adoption increases the credit relevance of accounting numbers, and Kraft and Landsman (2014) find that IFRS decrease credit relevance. Furthermore, Bhat, Callen, and Segal (2014) find that IFRS adoption has no effect on credit relevance. These differing conclusions are likely driven by the differences in the researchers' definitions of credit relevance and their proxies for credit risk. For example, Florou et al. (2015) measure credit relevance using R^2 values from regressing S&P credit ratings on accounting variables, and Wu and Zhang (2014) measure it using the *sensitivity* of Moody's credit ratings to the accounting ratios. Bhat et al. (2014) follow a similar approach to that of Florou et al. (2015) but replace credit ratings with credit default swap (CDS) spreads in their credit-relevance regressions. Kraft and Landsman (2014) also rely on CDS spreads to proxy for credit risk but focus on the residuals from regressing CDS spreads on accounting ratios rather than on the R^2 values, as done by Bhat et al. (2014).

The preceding studies vary in terms of not only their methodological choices but also their samples. Wu and Zhang (2014) examine both voluntary and mandatory IFRS adopters from 19 countries between 1990 and 2007 and include all of the countries that did not mandate IFRS in their control sample. They find a significant increase in the credit relevance of accounting numbers for both voluntary and mandatory adopters but only for firms domiciled in countries with strong rules of law. In contrast, Florou et al. (2015), Bhat et al. (2014), and Kraft and Landsman (2014) consider only firms from countries that mandated IFRS in 2005 as their treatment group and use US firms as their control group. However, even within these three studies, the number of countries covered by their treatment samples vary: Florou et al. (2015) include 17 countries from 2000 through 2009, Bhat et al. (2014) consider 12 from 2003 through 2008, and Kraft and Landsman (2014) include 12 from 2000 through 2012.

Bhat, Callen, and Segal (2015) provide indirect evidence of the credit relevance of IFRS numbers by testing how mandatory adoption affects the relationship between the spread and maturity of CDS instruments. Predicated on the term structure model of Duffie and Lando (2001), they argue that, if IFRS adoption increases transparency, then the intercept in the relationship between CDS spread and maturity should decrease and the slope and concavity should increase. They test this

prediction on a treatment sample of 5,943 CDS contracts from IFRS-adopting countries and a control sample of 20,658 CDS contracts from non-IFRS-adopting firms from 2003 through 2009.⁴⁰ Their empirical analysis reveals that the treatment firms' CDS spreads decrease, especially among CDS contracts with short-term maturities, and the slope and concavity in the CDS-maturity relationship increase following the mandatory adoption of IFRS. However, no such changes are observed in the control sample, suggesting that IFRS adoption increases transparency within the debt markets.

Overall, the mixed results obtained from these studies preclude drawing strong inferences about the effects of IFRS on credit assessment. More research is needed to reconcile them. Future research should also attempt to highlight the precise mechanisms and pinpoint the specific accounting rules that affect the credit relevance of IFRS numbers.

6.1.3. Effects of IFRS on the cost of debt

Borrowers' financial reporting quality can affect their costs of debt in several ways. First, Sengupta (1998) argues that lenders and underwriters demand lower risk premiums associated with the potential withholding of adverse private information for firms with better disclosure quality. Second, as discussed in Section 4.4.1, several theories predict that poor reporting quality increases priced information risk and thus a firm's cost of capital, including the cost of debt.⁴¹ Finally, Zhang (2008) argues that timely loss recognition (or conditional conservatism) in financial reports better protects lenders' interests by triggering debt covenants early upon signs of financial distress and thus effectively restricts borrowers' ability to distribute assets as dividends or otherwise squander assets. Consequently, she conjectures that investors are willing to accept a lower rate of return for lending to firms that report losses in a timelier manner.

Based on the assumption that, from a debt holder's perspective, financial reports under IFRS are of a higher quality than those prepared under local GAAP, Kim, Tsui, and Yi (2011) suggest that IFRS adoption decreases the ex-ante information risk faced by lenders and ex-post monitoring and re-contracting costs. They also note that IFRS adoption can improve the coordination between lenders and borrowers in relation to capital investment decisions. Based on these potential benefits, Kim et al. (2011) contend that voluntary IFRS adopters should face a lower cost of debt and test this prediction on a sample of syndicated loans issued between 1997 and 2005 across 40 countries. They find that IFRS adopters pay lower interest rates, have loans with longer maturities, raise larger loan amounts, are less likely to have restrictive covenants, and attract more foreign lenders than non-IFRS adopters.

⁴⁰ In Duffie and Lando's (2001) model, the transparency of the accounting system is specifically characterized as the variance of the noise in asset values, which directly affects creditors' ability to estimate the probability of default. Bhat et al. (2015) empirically measure transparency using analyst forecast dispersion and error.

⁴¹ For US stocks, Francis et al. (2005) and Bharath, Sunder, and Sunder (2008) provide evidence of a negative relationship between reporting quality and the cost of debt using accrual quality as a proxy for reporting quality.

However, only the results for lower interest rates and larger loan amounts are robust to controls for the endogeneity biases arising from firms self-selecting to adopt IFRS.

In contrast to the preceding findings for voluntary adopters, Chen, Chin, Wang, and Yao (2015) study the effects of mandatory IFRS adoption on the properties of syndicated loans. They argue that mandating IFRS can either increase or decrease information asymmetry between lenders and borrowers, depending on whether debtholders view the IFRS as being of better quality than the local GAAP. Based on analysis of syndicated bank loans issued between 2000 and 2011 by firms from 31 countries that mandatorily adopted IFRS, they find that interest rates increased by 24 basis points and loan maturities decreased by one month for IFRS adopters relative to the corresponding changes for non-adopters. They also find that the borrowers experiencing greater effects from IFRS adoption (measured as a score of the total number of restated financial statement items in the transition year or as the inverse of the change in variance of abnormal accruals from the pre- to post-adoption periods) faced higher interest rates and larger declines in loan maturity. These results help better link their findings to IFRS adoption.

Extending the analysis to compare the effects of IFRS on public bond terms with those on private loan terms, Florou and Kosi (2015) find that interest rates are lower for public bonds issued after mandatory IFRS adoption but not for private loans. They attribute this finding to IFRS adoption improving the quality of the *public* information, which bondholders rely on more, as, unlike banks and other private lenders, they do not have private channels of communication with borrowers.

Overall, like the evidence for the effects of IFRS on the credit relevance of accounting numbers, the evidence for the effects of IFRS on debt contract terms is mixed. There are several potential explanations for the differences in the conclusions derived by these studies. First, analysis of voluntary adopters is open to endogeneity concerns and the effects on mandatory adopters may be affected by contaminating events. Second, even within the studies focusing on mandatory IFRS adoption, there are differences across the sample selection choices. Although both Florou and Kosi (2015) and Chen et al. (2015) use DealScan as their data source for the private loan sample, the former have a shorter sample period and a more restricted sample selection process.⁴² As a result, Florou and Kosi (2015) may have less powerful tests to explain the lack of significant increases in interest rates observed for private loan contracts. It is equally possible that the more homogenous sample of firms and greater number of control variables used by Florou and Kosi (2015) yield cleaner results.⁴³ Finally, the average effects observed in the various studies may be affected by specific

⁴² Florou and Kosi (2015) limit their sample period to years before 2008 to avoid the financial crisis period. Chen et al. (2015) end their sample period in 2011. In addition, Florou and Kosi (2015) limit their sample to senior term loans, revolvers, and 364-day facilities.

⁴³ In Florou and Kosi's (2015) study, the indicator variable for mandatory IFRS adoption has a positive but insignificant coefficient in most of their regressions on the cost of private loans. Florou and Kosi's (2015)

countries included in the samples. Although no evidence exists in the debt markets, it is not unreasonable to expect enforcement and adoption incentives to cause cross-country variations in IFRS effects.

By focusing on firms that issue debt to measure the cost of debt, the preceding studies are implicitly conditioned on the decision to issue debt. However, as we discuss in Section 6.1.1, IFRS may affect firms' decisions to issue debt and to issue public versus private debt. Thus, ideally speaking, the decision to issue debt, the type of debt (public or private), and the debt features should be modeled together and simultaneously estimated. That task poses significant econometric challenges.

Following an argument similar to that seen in the preceding studies, i.e., that IFRS improve the transparency and creditworthiness of borrowers, Chan, Hsu, and Lee (2013) predict that IFRS adoption should yield higher credit ratings, as investors and credit analysts account for improved reporting quality when forming their credit ratings. Using a sample of foreign firms cross-listed in the US that mandatorily adopted IFRS in 2005, Chan et al. (2013) find a significant increase in the sample firms' credit ratings after adoption relative to their US-domiciled counterparts and relative to a control sample of foreign firms cross-listed in the US but not subject to the IFRS mandate. Although their findings corroborate those of Kim et al. (2011), focusing on firms that voluntarily cross-list in the US introduces its own self-selection biases, as these firms face unique incentives and are unlikely to represent the population.

Donelson, Jennings, and McInnis (2015) survey a sample of commercial banks in terms of their use of accounting information in making lending decisions. Although their survey mainly relates to US banks lending to private companies, their findings may illuminate how accounting choices and standards affect debt market decisions more generally. Their evidence indicates that lenders are much more likely to require more collateral and guarantees from borrowers with poor reporting quality rather than increasing interest rates. This finding contradicts the effects of interest rates documented in relation to IFRS adoption. Similar surveys conducted in countries that have adopted IFRS may provide further insights into the relevance of IFRS for lending decisions.

Lamoreaux, Michas, and Schultz (2015) provide evidence of the role of IFRS in lending by the World Bank to developing economies in the form of international development aid. The authors point out that the World Bank relies on audited financial statements to monitor the projects funded through its loans and claim that higher accounting quality in a country can help decrease monitoring costs. Using a sample of 258 country-year observations from 42 countries between 1999 and 2008, the

sample has 8,628 observations versus the 11,238 observations included by Chen et al. (2015) for the same period, i.e., 2000–2007. In addition, Florou and Kosi's (2015) regression models include variables measuring default risk, such as O-score and distance to default, which load significantly.

authors find that the World Bank lends more to countries where fewer differences exist between local GAAP and IAS (e.g., Bae et al., 2008) and those that mandate IFRS, indicating that accounting quality plays a role in the allocation of international aid loans. However, accounting quality fails to play a role in the allocation decision for countries that are more closely aligned with US geopolitical interests.

6.2. Effects of IFRS on contractibility in the debt markets

As an accounting system provides timely and verifiable performance measures that indicate the underlying creditworthiness of borrowers, accounting numbers are often used in debt covenants to restrict managerial actions that harm debtholders and act as tripwires that give lenders an option to renegotiate debt terms following a decline in a borrowers' economic performance (Smith and Warner 1979). In fact, based on the finding that little new information is released upon earnings announcements to market participants, Ball and Shivakumar (2008) conclude that a major role of accounting numbers must be their use in contracts, such as debt settlement and compensation contracts (Watts and Zimmerman 1986) and in disciplining prior information released by managers (Gigler and Hemmer 1998; Ball 2001; Ball, Jayaraman, and Shivakumar 2012). However, the extent to which accounting numbers matter for inclusion in debt covenants ultimately depends on the ability of accounting numbers to accurately predict changes in a borrower's credit risks, particularly before the material deterioration of its creditworthiness.

The literature provides good reasons to expect IFRS adoption to either increase or decrease the use of accounting numbers in debt covenants. Ball et al. (2015) argue that the increased managerial flexibility available under principles-based IFRS as well as greater emphasis on fair-value accounting decreases the relevance of IFRS numbers for use in debt contracts.⁴⁴ In contrast, Demerjian (2012) presents a model that suggests that IFRS adoption, by improving financial transparency, would lower the need for all types (both accounting and non-accounting-based) of debt covenants. In his model, covenants are tripwires for renegotiations and are needed for borrowers and lenders to initially contract on limited and potentially asymmetric information.

Kim et al. (2011) study changes in covenant usage around voluntary IFRS adoptions and document that IFRS adopters are less likely to have restrictive covenants. They attribute this to the greater transparency accorded by IFRS reporting, as implied by Demerjian (2012), and conclude that

⁴⁴ Ball et al. (2015) provide the following reasons for why fair value emphasis lowers the relevance of IFRS numbers for inclusion in debt contracts. First, fair value gains and losses from shocks to the cash flows of assets are transitory, making current-period earnings a poorer predictor of future debt service capacity. Second, fair value gains and losses include shocks to the expected returns of assets. To the extent that these shocks are expected to reverse before debt maturity, they are irrelevant for debt contracting. Third, as debt contracts require repayment of the principal and interest and not the fair value of the debt, the IFRS option to fair value certain financial liabilities lowers the contracting value.

a lower likelihood of restrictive covenants is an important benefit of IFRS adoption. Chen et al. (2015) study covenant usage changes after mandatory IFRS adoption and, like Kim et al. (2011), document declines in covenant usage after adoption. However, in contrast to Kim et al. (2011), they attribute the decline in covenant usage to IFRS worsening the accounting quality of at least some firms.

The studies by Kim et al. (2011) and Chen et al. (2015) are subject to a common data problem: they treat debt contracts without covenant information as having zero covenants. However, as covenant-free loans are rare, particularly in Europe before 2010, the covenant-free observations are more likely to represent cases where data vendors have not collected pertinent information (Ball et al., 2015). Therefore it is probably inappropriate to treat observations with missing covenant information as covenant-free, as done in these studies.

Ball et al. (2015) also study the effect of mandatory IFRS adoption on covenant usage in debt contracts. However, in contrast to Kim et al. (2011) and Chen et al. (2015), they consider accounting- and non-accounting-based covenants separately and study whether IFRS adoption leads to a substitution effect between the two. Moreover, they study the effects of IFRS on covenants for both public bonds and private loans. Using a sample of new loans and bonds issued between 2001 and 2010 in 22 IFRS-adopting countries and 21 non-IFRS-adopting countries, Ball et al. (2015) document a significant decline in the usage of accounting covenants in both loan and bond contracts following IFRS adoption. At the same time, they find that firms increase their reliance on non-accounting covenants. This latter result is not consistent with the argument that IFRS improve financial transparency. The authors conclude that their results support IFRS decreasing the contractibility of accounting.

Although the findings of Ball et al. (2015) provide evidence of how IFRS adoption may affect covenant usage, it is unclear whether their results identify permanent changes in borrowers and lenders' use of accounting numbers for debt contracts or whether these are temporary effects observed while borrowers and lenders adapt to new accounting standards. Moreover, as IFRS adoption changes financial reporting in many ways simultaneously, the authors cannot trace the decline in accounting covenant usage to individual IFRS attributes, although their cross-sectional results for banks are consistent with the observation that fair-value accounting plays a role in the decreased reliance on accounting covenants.

Christensen, Lee, and Walker (2009) study the consequences of IFRS adoption for debt covenant violations. They argue that IFRS adoption can mechanically trip debt covenants by changing how earnings are calculated. Relying on the magnitude of IFRS reconciliations as a proxy for mechanical covenant violations and assuming that these covenant violations transfer wealth from

shareholders to debt holders, they predict that stock market reactions relate positively to IFRS reconciliation numbers, i.e., the difference between net income based on IFRS and that based on domestic GAAP. They test this prediction on a sample of 137 UK firms by analyzing the stock market reactions to announcements of IFRS reconciliation numbers in the year before mandatory IFRS adoption in the UK. Consistent with their predictions, they document a significantly positive relationship between IFRS reconciliation numbers and earnings announcement returns. This relationship is also pronounced for firms that are more likely to violate covenants or face greater costs of covenant violation, such as small firms, firms with lower interest coverage ratios, and firms with longer asset maturities. Horton and Serafeim (2010) also report a positive association between IFRS reconciliation numbers and earnings announcement returns and document that this relationship is primarily driven by adjustments pertaining to goodwill and deferred taxes.

Research related to the effects of IFRS on accounting contractibility is nascent. The relationship between IFRS accounting attributes and the use of IFRS numbers in debt contracts and other contracts (such as supplier or customer contracts) requires more research. The lack of comprehensive and detailed contract data, including covenant data, in a cross-country setting is an obstacle for such research. Although companies in the US are required to file their debt contracts with the SEC, such requirements are not common elsewhere, especially for private contracts and loans. As a result, data vendors must rely on private sources or surveys to gather contractual information in an international context. Consistent with this, Ball et al. (2015) note that only 10% of international debt issues have at least one (accounting or non-accounting) recorded covenant and that this probably represents the failure or inability of vendors to collect covenant information rather than the debt being covenant free. Language barriers also make it harder for researchers to compile a meaningfully sized international dataset with detailed contract information. Such data limitations restrict researchers' ability to address basic contracting issues, such as the ability to contract around specific attributes of IFRS.

Further research is also needed to explore several other issues surrounding the use of IFRS numbers in debt contracting, including whether and how public bond and syndicated loan contracts differ in their use of IFRS numbers, whether lenders use more credit-rating-based performance-pricing provisions when accounting systems are weak, and how the use of IFRS numbers in debt contracts is affected by the quality of enforcement in a country. However, the effect of reporting enforcement for contractibility in debt markets may not be straightforward. Strong enforcement may mitigate the opportunistic use of flexibility in reporting and thus increase the usefulness of accounting. However, it may also require borrowers to implement fair value accounting, and to the extent that fair values are less relevant for debt contracting, stronger enforcement may actually decrease the use of accounting-based covenants.

Another promising area for research is to examine how debt market characteristics affect firms' choice of accounting policies under IFRS. IFRS is often considered as a principles-based standard that give managers discretion over both their accounting choices and implementation of specific standards. This increased flexibility may allow managers to opportunistically manage earnings to obtain better debt contracting terms or avoid covenant violations. Several studies document such behavior in the US (e.g., Beatty and Weber 2003; Altamuro, Beatty, and Weber 2005). However, similar evidence in the IFRS context is largely unavailable. One exception is a study by Christensen and Nikolaev (2013), who examine how firms' reliance on debt financing affects their choice between historical cost accounting and fair value accounting under IFRS, i.e., the cost or revaluation model under IAS 16. They argue that debtholders may prefer either the historical cost model (due to its greater degree of verifiability) or the revaluation model (for the purpose of obtaining the current values of collateral assets) and document the very limited use of the revaluation model for long-term assets by UK and German firms.

7. Effects of IFRS on stewardship and corporate governance

Many view the stewardship role in mitigating agency-principal conflicts as a key objective of financial reporting, in addition to the objective of providing information useful for decision making. A notable change in the IFRS framework is its exclusion of the stewardship role as an explicit goal of financial reporting, along with the claim that decision usefulness subsumes the stewardship role.

Although decision usefulness could be broadly defined to include stewardship, a number of authors argue that the overlap between these objectives is incomplete and that the investment-related roles and stewardship roles for financial statements differ in terms of their needs for specific reporting attributes (Gjesdal, 1981). For example, Bushman and Indjejikian (1993) demonstrate that, when managers must be provided with different incentives for different activities, the inability to contract on activity-level outcomes makes biased aggregate accounting information desirable for compensation contracts. The bias enables varying weightings across individual activities in the compensation contracts. Further focusing on timely recognition of gains and losses, Shivakumar (2013) reviews a variety of reasons why the timely recognition of losses, but not gains, is more beneficial from the contracting and stewardship perspectives, even though timely recognition of both gains and losses is useful from a valuation perspective.⁴⁵

⁴⁵ Timely loss recognition removes incentives for managers to continue loss-making projects and invest in new unprofitable projects, particularly when the negative consequences of such projects will be unknown to outsiders for long periods. However, such concerns do not arise for managers continuing profit-making projects. Furthermore, conditionally conservative reporting can aid outside directors by attenuating managerial biases to

We discuss several studies that investigate the effect of IFRS adoption on stewardship and compensation. In the following subsection, we discuss studies that focus on how IFRS adoption influences the use of accounting numbers in compensation contracts that are aimed at mitigating manager-shareholder incentive conflicts. Section 7.2 discusses studies pertaining to the influence of IFRS on the effectiveness of managerial monitoring. As there are significant gaps in the IFRS literature pertaining to the stewardship role of financial numbers, we dedicate a separate subsection (Section 7.3) to discussing these gaps, which future research must fill.

7.1. Effects of IFRS on executive compensation

7.1.1. Empirical predictions of the effect of reporting quality on executive compensation

A large literature examines the role of accounting in aligning the incentives of managers and shareholders by studying the use of accounting numbers in executive compensation plans.⁴⁶ There are a variety of ways that IFRS matter for compensation plans.

First, as IFRS improve earnings comparability across peer firms, as discussed in Section 3.3, IFRS adoption makes accounting-based relative performance evaluation (RPE) more efficient. Second, as IFRS earnings are more value relevant and reflect economic gains and losses in a timelier manner than local GAAP earnings due to their fair value emphasis, IFRS may induce firms to increase their reliance on earnings for compensation purposes. If compensation committees consider accounting earnings under IFRS as a better measure of underlying economic performance, then we would expect them to optimally increase the weight placed on accounting earnings in determining executive compensation and turnover. Such a finding would be consistent with the arguments of Holmstrom (1979) and Banker and Datar (1989), who suggest that the weight placed on a performance signal should increase with its precision and sensitivity to an agent's effort. This view has found empirical support in the US, where Banker, Huang, and Natarajan (2009) show that compensation contracts place more weight on earnings when earnings are more value relevant. Furthermore, Bushman, Chen, Engel, and Smith (2004) find that executive compensation packages in the US include a higher proportion of equity-based incentives when the timeliness of the earnings is lower.

However, several features of IFRS also make accounting-based performance measures less efficient to address stewardship issues. First, the greater discretion afforded to managers under principles-based IFRS can raise concerns about the independent verifiability of the reported numbers, an important attribute of accounting numbers for their use in stewardship and contracting. On a

report favorably. Finally, timely recognition of gains involves greater managerial subjectivity and lower verifiability, which lowers demand for contracting and stewardship purposes.

⁴⁶ See studies by Bushman and Smith (2001), Armstrong, Guay, and Weber (2010), and Shivakumar (2013) for reviews.

related point, IFRS offer a greater choice of accounting policies, which increases the potential for manipulation of reported numbers. These concerns can lead boards to rely less on accounting numbers in compensation contracts.⁴⁷ Such concerns may also affect equity-based executive compensation, as stock prices may also be affected by such manipulation. Studies document evidence consistent with opportunistic earnings management to enhance equity compensation in the US context (e.g., Bergstresser and Philippon 2006; Burns and Kedia 2006).

Second, the greater use of fair values under IFRS lowers the distinction between the role of earnings and that of share prices in compensation contracts. Although stock price has many advantages as an incentive measure, it does not provide a sufficiently precise signal of managerial effort and ability. For instance, Paul (1992) analytically shows that stock-based compensation contracts assign the greatest weight to projects that are the noisiest indicators of managerial effort, if stock market investors observe information about all of the projects in a firm with equal precision. This occurs because the projects most affected by noise are likely to produce extreme values and affect share prices the most. Moreover, share prices are affected by a variety of factors that are beyond a manager's control, such as investor sentiment and macroeconomic factors.⁴⁸ Sloan (1993) emphasizes this point by noting that accounting data can be incrementally useful to stock price in compensation contracts, as it can identify the component of stock price that is under a manager's control. Supporting these points, Bushman and Indjejikian (1993) analytically show that the information content of earnings influences the optimal design of contracts that compensate managers based on earnings and share prices. The findings of these studies, when combined with the effect of IFRS on earnings (making them closer to stock price measures of performance), suggest that earnings numbers under IFRS lose some of their advantage relative to stock prices for use in compensation contracts.

7.1.2. Empirical evidence of the effects of IFRS on compensation contracts

Ozkan, Singer, and You (2012) examine the effect of mandatory IFRS adoption on the usage of accounting-based performance measures in executive compensation contracts. They focus on two aspects: pay performance sensitivity (PPS) and RPE. They base their study on a sample of 892 public firms covering 15 continental European countries that mandatorily adopted IFRS in 2005. They restrict their focus to these countries, arguing that firms in these countries are more comparable and thus more likely to use RPE in compensation contracts. They conjecture that, if compensation committees consider earnings as higher quality after IFRS adoption, then one should observe an

⁴⁷ For example, Indjejikian and Matejka (2009) find a decrease in the reliance of CFO bonus contracts on financial performance after SOX and attribute this finding to firms' wanting to decrease CFOs' incentives to misreport.

⁴⁸ Although Paul (1992) predicts that the valuation role of earnings is independent of the managerial-incentive contracting role of earnings, Bushman, Engel, and Smith (2006) and Banker et al. (2009) extend the analysis and show empirically that earnings can play a role in both valuation and compensation contracts simultaneously.

increase in the weight placed on accounting earnings in compensation contracts, as reflected in PPS. In addition, if mandatory IFRS adoption increases the cross-country comparability of earnings, there should be an increase in the use of foreign peers as benchmarks in accounting-based RPE. Analyzing the cash compensation received by top executives from these firms from 2002 through 2008, Ozkan et al. (2012) document a weak increase in the use of accounting-based PPS and a significant increase in the use of accounting-based performance of foreign peers for RPE after IFRS adoption. At the same time, they find no change in the use of stock-return-based PPS or RPE for stock-based compensation. They also link the increase in accounting-based RPE to greater earnings comparability by documenting that the effect is stronger among firms with greater foreign sales and those with fewer comparable domestic peers.

Although Ozkan et al. (2012) infer the effects of IFRS by evaluating the sensitivity of executive compensation to accounting numbers, Voulgaris, Stathopoulos, and Walker (2014) directly examine contractual terms to identify whether long-term incentive-based executive pay is based on accounting targets, stock return targets, or both. Thus, although prior studies can comment only on the informational relevance of accounting numbers from a compensation perspective, Voulgaris et al. (2014) can clearly identify the changes caused by IFRS to the use of accounting numbers to measure managerial performance. However, this approach is limited; the authors do not observe the levels at which performance targets are set or how compensation committees combine various performance measures in arriving at executive compensation, so they cannot evaluate how IFRS adoption affects the amount of compensation. For instance, although they can identify the use of earnings numbers in a compensation contract, they cannot distinguish between a contract in which most of a CEO's bonus is tied to earnings and one in which very little of the bonus is tied to earnings.

In contrast to Ozkan et al. (2012), Voulgaris et al. (2014) find a decrease in the usage of earnings-based performance measures after mandatory IFRS adoption for a sample of UK CEO compensation contracts. In line with our earlier discussions, they attribute these findings to the greater fair value orientation of IFRS relative to local UK GAAP. Consistent with this, they show that the post-IFRS decline in the use of accounting numbers is greater in financial industries, where fair value accounting typically has a larger effect on reported earnings numbers.

Although the difference in research methodologies between Ozkan et al. (2012) and Voulgaris et al. (2014) is one reason for the differences in their results, there are indications that sample difference may partly reconcile the findings. Based on cross-country analysis, Ozkan et al. (2012) find that their results hold only for countries whose prior domestic GAAP differed substantially from IFRS. In contrast, for countries such as the UK where the differences between local GAAP and IFRS are relatively small, the relationship is negative, though insignificant. The focus of Voulgaris et al. (2014) on a more homogenous sample may explain the significantly negative effects of IFRS on the

use of accounting-based performance measures observed in UK compensation contracts. However, one limitation of the latter study is that it does not have a control sample. Hence its results may be driven by contaminated events, such as the more equity-intensive pay structures adopted by European firms in the 2000s (Fernandes, Ferreria, Matos, and Murphy 2012).

7.2. Effects of IFRS on the role of accounting in managerial monitoring

A relatively large number of US-based studies evaluate the role of accounting numbers in the efficient monitoring of managers. For instance, Engel, Hayes, and Wang (2003) show that boards of directors rely on both earnings and stock prices to monitor managerial performance, suggesting a role for reporting quality in effective corporate governance. To the extent that IFRS adoption has improved corporate transparency and information asymmetry, one may expect managerial monitoring practices to use accounting numbers to become more effective and corporate governance mechanisms to increase their reliance on financial reports in the post-IFRS-adoption period.

Marra and Mazzola (2014) and Marra, Mazzola, and Prencipe (2011) study the effect of IFRS adoption on boards' effectiveness in constraining earnings management. Marra et al. (2011) examine a sample of 222 Italian firms that mandatorily adopted IFRS in 2005 and find that the relationship between board characteristics—such as, board independence and the presence of an audit committee—and earnings management became more negative in the post-adoption (2005–2006) period relative to the pre-adoption period (2003–2004). They interpret their findings to indicate that IFRS facilitate board monitoring. However, in a follow-up study, Marra and Mazzola (2014) point out that the findings of Marra et al. (2011) are driven by a temporarily higher level of attention that boards paid to accounting issues at the time of transitioning to IFRS. Consistent with this argument, they show that the negative association between board independence and earnings management was strongest in 2005, the adoption year, and then gradually decreased in later years (2006 and 2007).

Using the voting premium associated with dual-class shares as a proxy for the effectiveness of managerial monitoring, Hong (2013) examines whether mandatory IFRS adoption changes the voting premium. She argues that the voting premium is lowered when corporate transparency is improved, as greater transparency improves managerial monitoring and lowers the benefits of voting control. Comparing a sample of 133 firms in IFRS-adopting countries that have dual-class shares with firms from non-adopting countries that have dual-class shares, she documents a significant decrease in voting premiums for firms in IFRS-adopting countries after mandatory adoption. The study's reliance on a difference-in-differences methodology helps it to more clearly attribute the observed changes to the IFRS adoption date. However, the study's small sample limits it from conducting more focused

analysis to rule out alternative explanations based on concurrent corporate governance reforms within the EU.

Managerial monitoring also occurs through the market for external takeovers. Reporting quality affects the effectiveness of this corporate governance mechanism, as financial statements are a key source of information for making takeover-related decisions (Raman et al. 2012). Consistent with this view, Francis, Huang, and Khurana (2012) and Louis and Urcan (2014) show that the mandatory adoption of IFRS has increased cross-border M&A between countries with lower degrees of similarity in their domestic GAAP during the pre-IFRS period.

Focusing on CEO turnover as an outcome variable of managerial monitoring, Wu and Zhang (2009) examine how the voluntary adoption of IAS and US GAAP affects the use of accounting-based measures in turnover. Based on the assertion that earnings informativeness is higher under US GAAP and IAS than under domestic GAAP in EU countries, they argue that IAS/US GAAP adoption should increase the reliance of internal performance evaluation on accounting earnings and consequently increase the sensitivity of CEO turnover to earnings. Using a sample of continental European firms that voluntarily adopted either IAS or US GAAP between 1988 and 2004, in addition to hand-collected data related to CEO turnover, they find evidence consistent with the preceding prediction.⁴⁹ Due to the endogenous feature of firms' voluntary adoption decision, the authors are careful not to make any causal claim about the relationship between IAS/US GAAP adoption and changes in earnings performance sensitivity. As the study pools voluntary IAS and US GAAP adopters together, it is difficult to judge whether the results are mainly driven by IAS adoption, US GAAP adoption, or both.

Wu and Zhang (2011) study the relevance of accounting earnings in RPE for CEO turnover decisions after mandatory IFRS adoption. They find that mandatory IFRS adoption in continental Europe has led to an increased reliance on foreign peers' earnings for CEO turnover decisions. This evidence corroborates the argument of Ozkan et al. (2012) that IFRS improve cross-country comparisons of accounting earnings for relative performance evaluation.

In contrast to the preceding studies, which focus on how IFRS adoption affects corporate governance, Verriest, Gaeremynck, and Thornton (2013) take the opposite tack and examine the effect of corporate governance on the firm-level enforcement of IFRS adoption. They find that firms with stronger governance provide more transparent restatements from local GAAP to IFRS, achieve better compliance, and are less likely to opportunistically delay the adoption of IAS 39. This study's findings of firm-level heterogeneity in the enforcement of IFRS adoption are useful for researchers to

⁴⁹ In addition, Wu and Zhang (2009) examine the sensitivity of employee layoffs to accounting earnings after voluntary IAS adoption and find results consistent with those for CEO turnover.

extend their reporting enforcement proxies to the firm level, rather than rely only on country-level enforcement indices. Along similar lines, focusing on the audit committee as a corporate governance mechanism, Chen and Zhang (2010) examine how the incentives of audit committee members affect reported IFRS numbers. Based on a sample of 103 Chinese B-share companies from 1999 to 2004, they document that the incentives of audit committees, along with regulatory enforcement, are the key drivers narrowing the differences between financial numbers reported under Chinese GAAP and those reported under Chinese equivalents of IFRS.

7.3. Limitations and suggestions for future research

A major limitation of IFRS studies focusing on stewardship is that they do not pinpoint the mechanisms through which IFRS adoption affects stewardship or identify the specific accounting attributes that drive these changes. Another common problem associated with IFRS studies focused on stewardship is their inability to find a substitution effect among accounting- and non-accounting-based performance measures. Theories suggest that an improvement in the “signal-to-noise” ratio of earnings after IFRS adoption should lead to a greater relative weighting of earnings in managerial monitoring and compensation. If so, one should equally observe a corresponding shift away from other performance measures, such as market-based performance measures, emphasized in the pre-IFRS period. Such a shift has been documented by empirical studies conducted in the US. For example, Lambert and Larcker (1987) and Engel et al. (2003) document a substitution between accounting- and market-based performance measures. The lack of such evidence surrounding IFRS adoption raises questions about whether the observed effects can be attributed to the adoption of IFRS themselves.

Several interesting questions remain unanswered as to the effects of IFRS on compensation contracts and corporate governance. Do firms modify compensation contracts to undo any effects of IFRS? If so, which IFRS attributes are often adjusted? How do frequent changes to standards under IFRS affect the stewardship role of accounting numbers?

Studies must evaluate whether and how optimal governance structures have been affected by IFRS adoption. Bushman et al. (2004) argue that, when a firm’s accounting system fails to capture economic transactions in a timely manner, the firm opts for costlier monitoring mechanisms, such as hiring more outside and reputed directors. Bushman et al. (2004) also surmise that the optimal level of ownership concentration and stock ownership by inside directors is higher and the timeliness of earnings is lower when the decreased transparency of financial reports exacerbates agency problems. The need to mitigate the agency problems shifts the optimal ownership structure toward greater stock holdings by owner-managers. These issues remain unexplored in the IFRS context.

Finally, firms in different legal regimes rely on different corporate governance models. Those in common-law countries such as the US and UK use a shareholder governance model and rely on public disclosure to resolve agency problems. In contrast, firms in code-law countries such as Germany and Italy use a stakeholder governance model, and information asymmetry is often resolved through private communications. To the extent that IAS/IFRS can be viewed as having a stronger common-law orientation or a stronger shareholder focus, it would be interesting to explore whether mandating IFRS rules within code-law countries leads to shifts in firms' corporate governance structure toward a shareholder-governance model.

8. Effects of IFRS on audit verification

Recognizing the importance of enforcement, the "IAS Regulation" introducing mandatory IFRS reporting in the EU (EC Regulation 1606/2002) explicitly states that "a proper and rigorous enforcement regime is key to underpinning investors' confidence in financial markets" and requires that countries take appropriate measures to ensure compliance. To facilitate a uniform enforcement of IFRS in the EU member states, the Committee of European Securities Regulators (CESR) issued a standard addressing a common approach to the enforcement of standards of financial information in Europe (CESR, 2003a). The standard contains 21 high-level principles of enforcement that member states should adopt in enforcing IFRS. In response, many EU countries implemented significant changes to their enforcement regimes and regulatory institutions.⁵⁰ Turning specifically to the audit function, the International Auditing and Assurance Standards Board (IAASB) issued additional guidance for the auditing of IFRS financial statements (IAASB, 2003). In this section, we review the evidence related to the effectiveness of these regulations with a particular focus on the audit function in mandatory IFRS adoption.

8.1. Empirical predictions of the effects of IFRS on audit verification

Researchers suggest that a decreased emphasis on verifiability as a key concept in the development of IFRS has led to less specific and less prescriptive guidance and hence increased subjectivity in accounting measurement (Jamal et al. 2010), which consequently increase audit risks. Furthermore, studies point out that principles-based IFRS standards can exacerbate litigation risks for auditors, as they are no longer able to rely on compliance with specific guidelines or established rules as a valid defense (Diehl, 2010). The reliance on fair value measurement under IFRS also increases the effort required of auditors, especially in the verification of fair values of assets that do not have active markets, such as specialized receivables or privately placed loans. Finally, the greater

⁵⁰ Christensen et al. (2013, Appendix A) provide a detailed discussion of enforcement changes within the EU.

discretion available to managers under IFRS also increases the effort required on behalf of auditors to verify IFRS-based financial statements.

The increased disclosure requirements of IFRS relative to many domestic GAAP also significantly affect the audit function, as auditors must now sign off on more financial information including management's subjective forecasts and assessments of assets and liabilities. For instance, the increased reporting requirements for transactions designated as accounting hedges call for companies to undertake and document detailed tests of hedge effectiveness. Furthermore, the IFRS provisions relating to share-based payments require substantial disclosure as to the nature and method of executive compensation plans, along with detailed information about the inputs of fair value calculations. As a result of these additional disclosures, IFRS adoption has increased the length of annual reports by up to 60% (Webb 2006; Ernst & Young 2005).

The general uncertainty around the introduction of IFRS may also play a contributing role in the increased compliance and audit costs faced by firms. Uncertainty about the implementation and effects of IFRS is likely to increase investor scrutiny of financial statements following IFRS adoption, resulting in an increase in the likelihood of costly litigation and regulatory interventions. Such concerns lead auditors to protect their reputation capital by increasing their auditing effort, reassessing client risk, or both (e.g., Clarkson, Ferguson, and Hall 2003; Francis and Krishnan 1999), which are likely to manifest through increased audit fees.

8.2. Empirical evidence of the effects of IFRS on audit function

Based on a survey of 60 managers from Australia's top 200 corporations, Jones and Higgins (2006) report that companies viewed their external auditors as the most involved party in the IFRS adoption process. Some of the respondents noted that auditors "would be instrumental—we don't have a big team, so they'll be pretty heavily involved" (Jones and Higgins 2006, p. 640). Other managers exhibited skepticism at the role of the external auditor in the process, saying that their external auditors would not be used extensively in the transition. The expected involvement of external auditors was greater among larger firms (top 25% of the market capitalization), although empirical analysis of the audit fees under IFRS adoption, which we discuss later, suggests otherwise (e.g., De George, Ferguson, and Spear 2013).

Kim, Liu, and Zheng (2012) examine the effect of the IFRS mandate on audit pricing. They argue that because IFRS is comprehensive, fair value oriented, and principles based, it requires more complex estimates and judgments by preparers and auditors, increasing the level of uncertainty and risk of misstatement. Accordingly, they predict that IFRS increase audit fees and that, all else remaining equal, this effect should be stronger in countries with more robust legal regimes, as auditors face higher legal liabilities in these countries. The authors empirically test these predictions using a

broad sample of EU firms from 11 IFRS-adopting countries as treatment firms and firms in three non-adopting OECD countries (Japan, Canada, and the US) as a control group. They report evidence of an IFRS-related audit fee premium that rises in reporting complexity and decreases in reporting quality and in strength of a country's legal regime. However, their use of Japan, the US, and Canada as a control sample may affect their findings, as these countries have different enforcement structures and firms with significantly different reporting incentives compared with EU countries. They also do not consider changes in regulations and enforcements that have concurrently occurred with IFRS adoption in some EU countries. Although they attempt to overcome this contamination concern by using information from a survey capturing the adequacy of firms' implementation of audit and accounting practices, their analysis does not account for concurrent regulatory changes.⁵¹ Thus any observed fee increases may simply be in response to increased regulatory and investor scrutiny, rather than auditing IFRS numbers per se.

Focusing on a single country, De George et al. (2013) examine the costs of audit verification for a sample of 907 listed Australian firms, which cover approximately 80% of the total market capitalization on the Australian Stock Exchange. Using a traditional audit-fee determinants model, the authors find an economy-wide increase in the mean level of audit costs of approximately 23% in the IFRS transition year, relative to pre-IFRS years, that declines to an increase of 8% in later years. In addition, when they examine annual fee changes, they estimate an *abnormal* IFRS-related increase in audit fees in excess of 8% that is incremental to the normal yearly fee increases observed in the pre-IFRS period. They also find that smaller client firms incur disproportionately more IFRS-related audit costs relative to larger client firms. Finally, using a self-constructed measure of IFRS audit complexity based on a survey of senior audit managers and partners, they document that audit fees are increasing along with the complexity of IFRS audits. As in any study of mandatory IFRS adoption, confounding events remain a concern.

Based on a sample of New Zealand firms, Griffin, Lont, and Sun (2009) examine the effect of the transition to IFRS on audit verification costs. They implement a standard audit-fee determinants model augmented with temporal indicator variables corresponding to the IFRS mandate for 653 firm-year observations over 2002 through 2007. After controlling for company size, complexity, and risk, they find a reliable increase in audit fees around the transition to IFRS (2004–2006). They also find a

⁵¹ They specifically calculate a country-level measure of concurrent reforms using data from the Annual Executive Opinion Survey conducted by the Institute for Management Development. Although the primary purpose of the survey is to provide quantifiable measurements of management practices, labor relations, and corruption, the survey explicitly asks respondents to evaluate the extent to which auditing and accounting practices are implemented in their firms adequately and the extent to which corporate boards supervise company management effectively. The authors measure the changes in these scores from the pre-IFRS to post-IFRS periods.

general decrease in non-audit fees over their sample period, although they do not find that this change is related to the IFRS mandate.

Shifting away from audit fees, Nobes and Zeff (2008) explore the heterogeneity of auditors' statements related to IFRS compliance. Examining the audit reports of all companies in the main stock indices of Australia, France, Germany, Spain, and the UK for the 2005–2006 fiscal period, they find a “widespread failure to assert compliance with IFRS when compliance has probably been achieved.” In particular, the audit reports of firms domiciled in France and Spain uniformly refer to compliance with EU IFRS only, i.e., “IFRS as adopted by the EU.” However, for some firms in the UK and Germany, audit reports assert dual compliance to both local standards and “IFRS as issued by the IASB.” Even more dissimilar, audit reports of Australian firms refer only to compliance with “Accounting Standards in Australia,” even though these standards are based closely and in some instances exactly on IFRS. Nobes and Zeff (2008) argue that these differences in auditors' statements about firm-level IFRS compliance may create problems for investor confidence and comparability. They call for uniformity in audit report language to assert compliance with IFRS.

Loyeung, Matolcsy, Weber, and Wells (2011) attempt to link IFRS adoption errors to audit quality for a sample of 184 Australian firms (from S&P/ASX 500) for which IFRS-compliant earnings turned out to be either overstated or understated. They report that these accounting errors were caused by 19 different accounting standards, indicating a broad difficulty in implementing IFRS. They also find that these transition errors were positively associated with IFRS-related changes in audit fees and bid-ask spreads but negatively related to the tenure of CEOs and CFOs who were qualified accountants.

Overall, the evidence suggests that IFRS adoption has generally increased the audit fees of firms. But, at the same time, there is need for more research on how auditors affect IFRS reports. Future research must also focus on linking the audit literature better to the other observed effects of IFRS. To what extent does the greater auditor effort, as observed in the IFRS-related audit premium, translate into higher reporting quality and help attain benefits for capital market participants? Future research can also examine whether the integration of capital markets increases after IFRS adoption and whether greater arm's length transactions are changing the nature of the audit function. What are the implications of increased comparability of financial reporting for auditor judgments and decisions?

9. Specific attributes of IFRS

This section is devoted to studies that focus on a single or small number of specific attributes of the IFRS reporting requirements. Focusing on specific attributes of IFRS permits a more detailed understanding of the potential mechanisms through which IFRS matter and a better understanding of the measurement and implementation of a specific standard. However, the difficulty in isolating economic consequences attributable to specific standards when the entire accounting regime has shifted presents a major limitation of this setting. Moreover, the small samples typically examined in these studies limit the generalizability of their results to a broader set of companies and countries. Section 9.1 reviews the studies that investigate the effects of fair value accounting. Section 9.2 discusses studies of other attributes of IFRS.

9.1. Studies of the fair value attribute of IFRS

The recent financial crisis has pulled fair value accounting into the spotlight. Under US GAAP, fair value accounting is mainly limited to the measurement of financial assets and liabilities with unrealized gains and losses reflected in that period's earnings or other comprehensive income (FAS 115) and fair values disclosed in footnotes (FAS 117). Proponents of fair value accounting argue that the fair values of assets and liabilities improve transparency by reflecting current market conditions and providing timely information for decision-making. Opponents argue that in many cases fair value provides noisy information, especially for assets and liabilities that are held to maturity or in thinly traded markets.⁵²

Relative to US GAAP, IAS/IFRS allow a greater use of fair value accounting. In particular, fair value measurements are incorporated into valuing various assets other than financial assets and liabilities. For example, under IFRS, firms may choose to measure their property, plant, and equipment (PP&E) (IAS 16), intangibles (IAS 38), and investment property assets (IAS 40) at fair value. Although biological assets must be recognized at fair value (IAS 41), firms are required to recognize the cost of employee stock options using fair values as at the grant date (IFRS 2).⁵³ In addition, IAS 36 (Impairment of Assets) allows firms to reverse previous impairment losses. The equivalent accounting treatments allowable under US GAAP are much more restrictive in their use of fair value accounting, if they are permitted at all. To this end, IAS/IFRS-adopting jurisdictions provide researchers with a better opportunity to examine the implications and consequences of fair value accounting.

⁵² See Barth (2006), Laux and Leuz (2009), and Ball et al. (2015) for detailed discussions about fair value accounting.

⁵³ Elad (2004) provides a discussion of the implementation of IAS 41 and offers a detailed comparison of US GAAP and IFRS in terms of the measurement of agricultural assets. Giner and Arce (2012) and McAnally, McGuire, and Weaver (2010) provide useful background information about the adoption of IFRS 2 and its comparison with SFAS 123 under US GAAP.

To provide evidence of the effects of the fair value accounting rules mandated by IFRS, researchers rely on two alternative approaches. Under the first approach, studies evaluate cross-sectional differences in the effects of IFRS across banks and non-banks to infer the role of fair value accounting in causing the observed effects. This approach is justified because, although IFRS require fair value accounting for a variety of asset classes, they tend to be most relevant for the recognition of financial assets and liabilities (Laux and Leuz, 2009), and banks tend to recognize significant amounts of financial assets and liabilities. The second approach directly relies on the extent of firms' fair value measurements, typically for a small hand-collected sample, through a review of financial statements and policy notes. We discuss the specific findings from these two empirical strategies below.

Studies by Armstrong et al. (2010) and Ball et al. (2015) are two of the many that evaluate differences in IFRS effects across banks and non-banks. However, they reach different conclusions about the effects of fair value for different sets of investors. From the stock market investors' perspective, Armstrong et al. (2010) conjecture that the emphasis of IFRS on fair value accounting leads to an improvement in information quality. Consistent with this premise, they document more positive stock market reactions to IFRS adoption announcements for banks than nonbanks. However, turning to debt markets, Ball et al. (2015) examine the relevance of accounting numbers for use in debt contracts and argue that fair values are not useful for contracting. (See footnote 42 for further discussion.) Consistent with their arguments, they find an incrementally lower usage of accounting-based covenants among debt issued by banks relative to non-banks in the post-IFRS period.

DeFond, Hung, Li, and Li (2015) examine how the fair value consequences of IAS 39 affect the stock price crash risk for financial firms. They observe that, on the one hand, fair value may allow firms to better reflect their underlying economics in financial reports, improving their reporting transparency and thus lowering their crash risk. While, on the other, fair value may increase measurement errors in reported values of risky assets or encourage managers to invest more in risky projects (by amplifying the upside) and thus increase the crash risk. Analyzing financial and non-financial firms separately, the authors find an increase in crash risk only among financial firms in countries with weak banking regulations and a decline in crash risk among non-financial firms. Their results highlight the importance of regulatory quality in determining IFRS outcomes.

Given the cross-sectional nature of these studies, inferences can only be summarized as documenting evidence *consistent* with an increased use of fair value accounting after IFRS adoption rather than a *direct* inference that fair value accounting affects information quality, contractibility of accounting numbers, or crash risk.

An alternative approach that partly mitigates this problem involves relying on exposures to fair value rules by directly measuring them from financial reports. One prominent example is the fair value measurements of investment property assets in the real estate industry, where firms' operating

assets are mainly investment properties. IAS 40 (Investment Property) allows firms to choose between historical cost and fair value models to account for investment properties.⁵⁴ However, if a firm chooses the historical cost model, it must disclose the fair values of its investment properties in footnotes. This setting has two advantages. First, there is a large cross-country variation in the valuation models for investment property assets allowable under domestic GAAP. This allows researchers to explore cross-sectional variations in the adoption effect. For example, only the historical cost model is allowed under domestic GAAP in France and Germany, only the fair value model is allowed under domestic GAAP in the UK and Denmark, and both models are allowed under domestic GAAP in Belgium and the Netherlands.⁵⁵ As firms in all of these countries have converged to IFRS, one can exploit the heterogeneity in the fair value changes that occur as a result of IFRS adoption. Second, as the amount of fair value information is the same whether firms choose the fair value or historical cost model under the IFRS regime, this allows researchers to analyze firms' accounting choices between recognition and disclosure while holding the information environment constant.

Goncharov, Riedl, and Sellhorn (2014) examine the effect of fair value reporting (through both recognition and disclosure) on audit fees. Using a sample of 172 European real estate firms during 2001–2008, they adopt a difference-in-differences design and find that the firms that previously used the amortized cost model under local GAAP exhibited greater declines in audit fees when forced to adopt fair value accounting under IFRS relative to the firms that were already using the fair value model under local GAAP. The authors interview real estate audit partners, who suggest that the higher audit fees initially observed for firms using an amortized cost model stemmed from the greater audit effort required for impairments. They empirically corroborate these interview responses in the data. In addition, cross-sectional analyses reveal that audit fees under IFRS reporting are (1) negatively associated with firms' exposure to fair valued assets, (2) positively associated with the complexity of the fair value measurement, and (3) higher for fair value recognition than for fair value disclosure.

Muller, Riedl, and Sellhorn (2011) evaluate the effects of the increased disclosure of fair values required under IFRS on the degree of information asymmetry faced by investors. Using a sample of 121 European real estate firms during 2003–2007, they find that firms that did not voluntarily disclose fair values before mandatory IFRS adoption experienced larger improvements in information asymmetry, i.e., larger declines in their bid-ask spreads, upon IFRS adoption.

⁵⁴ See a study by Quagli and Avallone (2010) for a detailed discussion of IAS 40. The authors also provide empirical evidence that a firm's decision to adopt fair value accounting for investment properties under IAS 40 is a function of information asymmetry, contractual efficiency, and managerial opportunism.

⁵⁵ See Appendix 1 of a study by Goncharov, Riedl, and Sellhorn (2014) for a full list of countries in relation to this issue.

Turning to the *recognition* of fair values, Liang and Riedl (2014) contrast real estate firms in the UK with those in the US. Before IFRS adoption, UK GAAP required firms to recognize their investment property assets at fair value on their balance sheets and report unrealized fair value changes in a revaluation reserve. However, under IFRS, these firms recognize unrealized fair value changes in net income while continuing to recognize investment property assets at fair value on the balance sheets.⁵⁶ In contrast, US firms can use only the historical cost model to account for investment property assets. Liang and Riedl (2014) exploit this difference in accounting standards between the UK and US to investigate the effect of fair value accounting on analysts' forecasts. Liang and Riedl (2014) conjecture that the recognition of fair value in balance sheets aids analysts by revealing managers' private information about underlying asset values and that the recognition of fair value changes in net income makes earnings more difficult for analysts to predict. Consistent with this conjecture, they find that analysts' forecast accuracy for net asset value (balance sheet based) is higher for UK firms (over a period combining both the pre- and post-IFRS-adoption periods) than for US firms and that the forecast accuracy for earnings is higher for US firms than for UK firms reporting under IFRS. They also find that the former result is attenuated during the financial crisis period when asset values are impaired, causing the numbers reported under the fair value model to converge toward those reported under the historical cost model. Their analysis reveals that analysts' forecast accuracy for earnings is lower for UK firms than for US firms in pre-IFRS-adoption period, although this is not predicted by their conjectures. This result indicates that omitted correlated variables may affect analysis.

Israeli (2015) uses a sample of 86 real estate firms from France, Germany, Italy, and Spain, where the fair value model for investment property assets was not permitted in pre-IFRS domestic GAAP, and examines their choices between fair value disclosure and recognition of investment property assets under IFRS during 2005–2010. The author conjectures that managers opportunistically chose fair value recognition to extract contractual benefits, i.e., to avoid debt covenant violations by reporting higher book values of equity and assets and to receive higher earnings-based compensation by reporting a higher net income. Consistent with this conjecture, he finds that firms with higher leverage (used as a measure for firms' proximity to debt covenant violation) and more ownership dispersion (used as an inverse measure for shareholder monitoring) were more likely to adopt the recognition regime. However, this conjecture is based on the assumption that fair value recognition leads to higher asset values and earnings, which need not be the case in practice.

Muller, Riedl, and Sellhorn (2015) study the stock market implications of fair value disclosure versus fair value recognition of investment property assets for a sample of 245 EU real

⁵⁶ In theory, firms can choose between the fair value and historical cost model under IFRS. However, in practice, all of Liang and Riedl's (2014) sample firms use the fair value model. They attribute this to the UK's legacy of using the fair value model for investment property assets under domestic UK GAAP.

estate firms over the 2003–2010 period. They document that equity prices have a lower association with disclosed fair values than they do with recognized fair values and conclude based on additional analyses that the discount for disclosures arises partly from the lower reliability of disclosed numbers and partly from the greater costs involved in processing disclosed numbers relative to recognized amounts. The authors also evaluate the role of external appraisals in minimizing the stock price discount associated with disclosed fair values and finds that fair values based on external appraisals help to decrease the discount. Their findings contrast with those of Goncharov et al. (2014), who find that the effect of fair values on audit fees is unaffected by the use of external appraisals.

Christensen and Nikolaev (2013) also examine firms' accounting choices but expand on prior studies by including analyses of IAS 16 and IAS 38, which allow firms to choose between the historical cost and fair value models when measuring their PP&E and intangible assets, respectively.⁵⁷ They argue that firms choose fair value accounting only when reliable fair value estimates are available at a low cost and when the estimates convey information about operating performance. Consistent with their argument, they find that few firms opt to use the fair value model to measure their PP&E and intangible assets and that real estate firms especially tend to choose the fair value model to measure their investment property much more frequently. Their results do not rule out the possibility that firms' choice of fair value accounting is driven by factors related to overall IFRS adoption, rather than exclusively by the benefits and costs of fair value accounting on its own. Consistent with this concern, Christensen and Nikolaev (2013) observe in their sample that 44% of UK firms switched to the historical cost model from the fair value model for PP&E upon mandatory IFRS adoption, although these firms had the option to report under the historical cost model, even in the pre-IFRS period. If firms' choice of fair value reporting was independent of IFRS adoption, then these firms should have chosen the historical cost model, even in the pre-IFRS period.

In the midst of the financial crisis, the EU called on the IASB to achieve a "level playing field" with US GAAP and allow entities to reclassify financial assets. This would have allowed banks to use reclassification to switch away from fair value accounting for assets that decreased in value during the financial crisis and avoid recognizing unrealized losses. The IASB responded by introducing an amendment to IAS 39 in 2008 that allowed firms to retrospectively use a non-fair-value method for non-derivative financial assets, provided the firm had the ability and intention to hold such assets for the foreseeable future and had not yet issued its financial statements at the time of the amendment. Lim, Lim, and Lobo (2013) evaluate the effects of this reclassification option for a sample of 98 banks covering 21 IFRS-adopting countries and find that the reclassification choice decreased analysts' ability to forecast earnings in the initial year of amendment adoption (2008–2009) but not in subsequent years when the economic environment was less volatile.

⁵⁷ Stolowy, Haller, and Klockhaus (2001) provide a detailed comparison of IAS 38 and French and German GAAP.

Panaretou, Shackleton, and Taylor (2013) examine the effect of using hedge accounting under IFRS on information asymmetry. They observe that UK GAAP has less strict requirements for hedge designation than IFRS and that, unlike IFRS, UK GAAP permits historical cost accounting for certain hedging instruments. Based on these differences, they predict that IFRS adoption enhances the quality of information provided by firms as to their derivative instruments and corporate risk management practices, which should lower information asymmetry. Using a sample of UK non-financial firms for the 2003–2008 period, they provide evidence consistent with their predictions. They show that firms that applied hedge accounting under IFRS had lower analyst forecast errors and dispersion relative to firms without hedge accounting.

He, Wong, and Young (2012) use a Chinese setting to examine the unintended consequences of implementing fair-value accounting in an emerging economy. Although China has not officially adopted IFRS, Chinese public firms switched accounting standards in 2007 to standards substantially similar to IFRS. He et al. (2012) study earnings management around the switch in accounting standards and report that Chinese firms manage earnings more to offset losses reported under fair value accounting or through strategic reporting of fair value gains and losses in the post-adoption period. They point to specific institutional details in China, such as close relationships between debtors and creditors and political connections, that make such manipulations feasible. However, one limitation of their study involves the generalizability of their results to other countries, as Chinese firms face ownership structures, regulation forces, and capital and business environments that are drastically different from those of firms elsewhere.

One significant departure of IFRS from almost all domestic GAAP is the requirement of fair value biological assets (IAS 41). IAS 41 requires firms to recognize changes in the fair values of biological assets as revenues or expenses in income statements each year. Although this was a substantial change in accounting for biological assets, its effects receive little attention from researchers. Very few studies directly evaluate the effects of this standard. Huffman (2014) studies the value relevance of fair value accounting for biological assets and concludes that book value of equity and earnings are more value relevant for consumable biological assets (i.e., agricultural products such as crops or timber that realize value on a standalone basis and whose value to the firm is linked to what may be exchanged for the asset in the marketplace) measured at fair value and bearer biological assets (i.e., self-regenerating assets such as orchards or oil palm plantations that are used in combination with other assets in the ongoing operations of the firm) measured based on historical costs.⁵⁸ However, using a larger sample, Goncalves and Lopes (2015) find that fair values are value relevant for both consumable and bearer biological assets but do not reconcile their results with those

⁵⁸ Effective January 1, 2016, IFRS require firms to account for bearer biological assets such as property, plant, and equipment.

of Huffman (2014). Focusing on Australia, South Africa, and France, Elad (2004) provides a commentary related to the fair value rules for agricultural assets embodied in IAS 41.

9.2. Studies focusing on the non-fair-value attributes of IFRS

Hamberg, Paananen, and Novak (2011) examine the adoption of IFRS 3 (Business Combinations) on financial reporting among a sample of Swedish firms. Relative to prior Swedish GAAP, IFRS 3 abandons the amortization of capitalized goodwill and instead requires regular testing of goodwill for impairment. They find that firms recognize smaller goodwill impairments under IFRS compared with the combined value of goodwill amortization and write-downs under Swedish GAAP, causing reported earnings to be higher after IFRS adoption. Furthermore, by comparing the returns of goodwill-intensive firms with those of firms with low levels of goodwill, they find that the stock market reacts positively to these higher earnings under IFRS. Their results suggest that stock market participants seem to find that the impairment model of goodwill better reflects underlying economic activities compared with the previous amortization cost model. Chalmers, Godfrey, and Webster (2011) substantiate this view for a sample of Australian firms.

Focusing on recognition rules for intangible assets, Cheung, Evans, and Wright (2008) report that IFRS rules for intangible assets (IAS 38/AASB 138) are more stringent than previous Australian GAAP rules and that firms have consequently had to de-recognize a significant portion of intangible assets following IFRS adoption.

Hsu and Pourjalali (2015) examine the effect of adopting IAS 27 (Consolidated and Separate Financial Statements) on stock markets' ability to predict earnings. The authors argue that compared with local GAAP, IAS 27 decreases managers' flexibility to hide losses and risks in unconsolidated investees, as it gives fewer choices to managers in terms of which investee-entities to consolidate. Using a sample of Taiwanese firms, the study shows that the adoption of IAS 27 led to an increase in forward earnings response coefficients (the proxy for the stock market's ability to forecast earnings) for firms that were forced under IFRS to consolidate at least one investee entity.

Finally, Gebhardt and Novotny-Farkas (2011) examine the effect of IAS 39 adoption on income smoothing and timely loss recognition among European banks. IAS 39 requires banks to recognize only "incurred" losses on balance sheets as opposed to recognizing "expected" losses in prior local GAAP. This incurred loss approach decreases the scope of judgment and discretion in determining the loan loss provision relative to the expected loss approach used in local GAAP. The authors find that the more restrictive IAS 39 impairment rules significantly decrease the income smoothing behavior and timely loss recognition of European banks.

10. Empirical research design of IFRS studies

In this section, we synthesize the research design choices of IFRS studies with an aim to understanding the general trends in publications and research methodologies. This section is intended to be descriptive rather than normative, partly because there are no clear prescriptions for many of the econometric choices involved in IFRS studies. Such choices (e.g., the level at which standard errors must be clustered or what types of fixed effects to include) depend on econometric assumptions related to the unobserved properties of relevant variables. There are also no econometric tests known to us that adequately justify or refute these assumptions. Although one can make a conservative selection of research methods, such an approach comes at the cost of a loss of power in the tests and so is not necessarily preferable. Simulation-based evidence also suggests that seemingly conservative choices can sneak biases into analyses (e.g., Petersen 2011).

Many IFRS studies currently discuss the sensitivity of their results to research choices. However, the discussions tend to be brief and limited in terms of the effect on the final inference. Very few studies tabulate results from these sensitivity checks. Tabulating such results (at least in an Internet appendix) may help other researchers obtain a deeper understanding of the drivers of the reported results, aid in the replication of results, and reconcile the differences in results across studies.

As this section primarily focuses on documenting the empirical choices made by IFRS studies, we keep explanations and discussions of various econometric issues to a minimum and instead restrict our discussions to how studies address these econometric issues. As our analysis is intended to give an overview of trends in research choices rather than exhaustive analysis of all of the research methods adopted in the literature, we limit our focus to the same set of papers identified for this review from *Contemporary Accounting Research*, *Journal of Accounting and Economics*, *Journal of Accounting Research*, *Review of Accounting Studies*, and *The Accounting Review* from 1999 through 2015. We exclude discussion papers, opinion pieces, theory papers, experiments, and surveys from analysis. Our final sample consists of 64 published articles. A majority of these studies consider IFRS/IAS adoption as the primary research objective or use it as the primary research setting. For these studies, our analysis focuses only on their main research designs. A few studies use the IFRS adoption setting not as part of their main analysis but as part of their robustness analysis. For these studies, our analysis focuses on their research design as it pertains to IFRS/IAS adoption.

10.1. Sample distribution

Table 1 lists the number of studies published by each journal and their years of publication. There has been a gradual increase in the number of publications, especially after 2007, probably due to the EU's mandatory IFRS adoption in 2005. Table 2 lists the number of publications by author country, which is determined by the location of an author's affiliation. We count the total number of

articles with at least one co-author affiliation located in that country as shown on the publication. This table shows a wide geographic distribution. Although US researchers continue to dominate, over 50% (i.e., 35 out of 64) of the studies have at least one co-author with an affiliation outside the US. We suspect that no other research topic is likely to have such a large fraction of non-US researchers in studies published in the selected five journals. Researchers from the EU and Hong Kong dominate the list of non-US researchers publishing IFRS-related works. It is likely that these researchers have been stimulated by IFRS adoption in their home countries and have benefited from their proximity to country-specific information about the effects of IFRS.

10.2. Data sources

IFRS studies rely primarily on WorldScope as their primary source of firms' financial information and Datastream as their source of stock market information. Of these 64 studies, 47 use Datastream/WorldScope (Table 3). Some of the studies also use Compustat Global for firm-level information, and many of the studies use both Datastream/WorldScope and Compustat Global. Although WorldScope has a larger coverage, especially for emerging markets in early years, its data were unavailable in a user-friendly format for researchers until recently. Compustat Global has been available longer through Wharton Research Data Service (WRDS), and this has allowed researchers easier access to the dataset and made it easier to merge with other WRDS databases. Some early studies rely on Bloomberg as their data source for firm-level information (e.g., Ashbaugh and Pincus 2001; Ashbaugh and Olsson 2002).

Although it is not yet widely used by researchers, FactSet is a database for firm-level accounting information available through WRDS. FactSet purchased WorldScope in April 2008 and thus acquired its firm-level accounting information for over 43,000 firms globally starting from 1980. Since May 2010, FactSet has started collecting firm-level accounting information by itself.

Some of the studies, particularly those analyzing US GAAP-IFRS reconciliations, use hand-collected data. Such information is extracted from either the financial statements of global firms or the SEC's Form 20-F filings of firms cross-listed in the US.

10.3. Multi- versus single-country settings

Most IFRS/IAS studies use an international sample of firms for their treatment samples. Of the 64 studies analyzed here, 18 use a single-country treatment sample, and one uses a two-country setting.⁵⁹ Of these 19 studies, the UK (seven studies) and Germany (four studies) are the most frequently examined countries.

⁵⁹ Of the studies adopting a single-country research design, five focus on firms cross-listed in the US, and one uses firms cross-listed in the UK. We count these studies as using the US or UK as a single treatment country.

A major advantage of using a multi-country setting is that the results can typically be generalized to a wider variety of firms and a wider set of institutional and enforcement factors. Such studies also can conduct cross-country analysis of the role of country characteristics in influencing IFRS outcomes. The samples used in multi-country analysis are also typically larger, yielding greater power of tests. However, studies focusing on a single IFRS-adopting country have their own advantages. Single-country settings allow researchers to focus on a more homogenous sample of firms with broadly comparable ownership structures and capital market incentives. They also hold legal and regulatory factors constant and enable researchers to delve deeper into analysis of institutional details, adopt better identification strategies, and better control for potential confounding events.

We discuss the unique features of a few individual countries that have been favored in single-country settings as follows.

10.3.1. Studies focusing on German firms

Germany is a unique case in that before mandatory IFRS adoption in 2005 German firms were reporting under a variety of accounting standards, including German GAAP, IAS, and US GAAP. This allows comparisons across firms that are largely similar except for their choices of accounting standards. This approach can help isolate the effects of accounting standards from the effects of legal, regulatory, and political factors. However, these samples generally suffer from self-selection problems associated with firms voluntarily choosing a specific accounting standard or include a nonrandom sample of firms, such as high-tech firms listed on the New Market.

Another feature of the German setting is its stakeholder-oriented accounting system, which overlaps significantly with the country's tax rules. German GAAP also allows only historical cost accounting. Examples of studies that use the German setting include those by Bartov et al. (2005), Christensen et al. (2015), Daske (2006), Hung and Subramanyam (2007), Leuz (2003), and Van Tendeloo and Vanstraelen (2005).

10.3.2. Studies focusing on UK firms

As the UK did not allow early adoption of IFRS, the setting allows researchers to clearly study the effects of mandatory IFRS adoption without contamination based on the influence of early voluntary adopters. Furthermore, outside of the US, the UK has the largest set of actively traded stocks, for which a relatively long history of accounting and stock market data are available. This makes it possible for a single IFRS-adopting country to produce a relatively large sample. Finally, the UK provides accounting data that are electronically readable for the largest sample of private firms.⁶⁰

⁶⁰ Horton and Serafeim (2010) provide a detailed discussion of the effects of IFRS relative to local UK GAAP for key accounting areas, i.e., leases, employee benefits, share-based payments, deferred taxes, goodwill and intangibles, and financial instruments.

Examples of studies that have used the UK setting are those by Brochet et al. (2013), Christensen and Nikolaev (2013), Liang and Riedl (2014), and Panaretou et al. (2013).

10.3.3. Studies focusing on Australia

Australia required all of its firms without exception to adopt IFRS for financial periods beginning on or after January 1, 2005. Thus, unlike many other jurisdictions, there was no staggered adoption. Although voluntary adoption was permitted, very few firms (less than 1%) chose to do so. A distinct feature of Australia's adoption of IFRS is that all corporations in the country, both listed and unlisted, must report under IFRS. This removes incentives for Australian firms to delist to report under an alternative accounting standard. It also makes it a particularly interesting setting to test the effects of IFRS on private firms and the overall economy. Examples of studies that have used the Australian setting are those by Chalmers, Clinch, and Godfrey (2011), Cheung et al. (2008), De George et al. (2013), Jones and Higgins (2006), and Lai et al. (2013).

10.3.4. Studies focusing on cross-listed firms

Since 1982, the SEC has required foreign firms cross-listed in the US stock markets to reconcile their financial statement numbers based in local GAAP to US GAAP. Such reconciliations provide researchers with the opportunity to compare reported financial statement numbers across two different accounting regimes for the same firm and year. However, in November 2007, the SEC voted to allow foreign companies to file financial statements based on IFRS without having to reconcile the data to US GAAP, i.e., eliminate 20-F reconciliations. IFRS studies also investigate cross-listing in other countries, especially in the Stock Exchange Automated Quotations system of the International Equity Market of London, which allows firms to report under either IAS or US GAAP. This setting allows for the comparison of accounting standards for firms from a single equity market.

The cross-listing setting presents a drawback: although these firms are traded in the same equity markets, they are incorporated in different countries and are therefore likely to face different domestic regulatory forces and reporting incentives. Another limitation of this type of research is the potential bias that arises from firms self-selecting to cross-list their shares.

10.4. Empirical methodology

In this subsection, we review the empirical methods adopted in our selected 64 IFRS studies. Although some studies rely on cross-sectional comparisons across firms reporting under IFRS and those reporting under other standards to investigate the properties of IFRS financial reports, IFRS studies and especially those evaluating the effects of IFRS adoption rely predominantly on a difference-in-differences approach. This approach compares changes in specific attributes around the event date for a treatment sample relative to a control sample. We review the crucial methodological elements involved in the empirical analysis approach of IFRS studies in general. Although many of

the issues discussed are relevant to both cross-sectional and difference-in-differences analyses, we pay special attention to the latter approach in Section 10.4.4, given its predominance in the IFRS literature. The subsequent subsections present issues pertaining to the following methodological choices: (i) event selection, (ii) event date identification, (iii) choice of event window, (iv) choice of treatment and control samples, (v) controls for fixed effects, (vi) adjustments for correlated observations, and (viii) measurement of control variables.

10.4.1. Event selection

9.3.1.1. Voluntary adoption and endogeneity concerns

A key issue associated with voluntary adoption studies is the potential endogeneity that arises from firms self-selecting to adopt IAS/IFRS. That is, the unobserved factors driving firms to voluntarily adopt IAS/IFRS may drive the observed changes in the attributes examined, rather than the IAS/IFRS adoption itself. Studies use a variety of techniques to address this concern, the most prominent one being the use of a two-stage Heckman-type treatment effect model. In practice, this approach is often not entirely satisfactory to rule out self-selection concerns due to the absence of valid instrument variables in the first-stage regression that can be excluded from the second-stage regression with appropriate economic justifications (Larcker and Rusticus 2010).

However, a few studies go beyond relying solely on the Heckman approach. For instance, Kim and Shi (2012) show that documented differences across voluntary adopters and non-adopters exist only after IFRS adoption and not before, indicating that the observed changes for voluntary adopters are likely to be attributable to the adoption itself. They also confirm that their results are driven only by changes occurring to treatment firms rather than by changes occurring in control firms. Furthermore, they present their results using the propensity-score matching and two-stage least squares approaches as alternative econometric techniques to address self-selection biases. Finally, they provide cross-sectional evidence that pre-adoption divergence between local GAAP and IFRS relates to the changes observed around IFRS adoption. Although none of these approaches can entirely rule out self-selection biases on its own, the robustness of the results to various econometric checks increases confidence that the documented changes around IFRS are unlikely to be driven by omitted correlated variables or unobserved factors that drive firms to voluntarily adopt IFRS.

Christensen (2012) raises an interesting point in the context of voluntary IFRS adoption. As several studies document significant benefits arising from voluntary IFRS adoption, he asks why so very few firms voluntarily adopt IFRS. Almost all of the firms that voluntarily adopted IFRS in the pre-2000 period were located in the EU, and, as the EC had outlined its strategy to eventually mandate IFRS, Christensen (2012) argues that these adoptions were not truly voluntary. He rules out the possibility that it was the high cost of voluntary IFRS adoption that discouraged firms. Although the

costs of IFRS compliance are likely to be low in weak enforcement countries, there is little evidence of voluntary IFRS adoption in such countries. Christensen (2012) concludes that the benefits observed from voluntary IFRS adoption must be driven by endogeneity problems or correlated omitted variables, suggesting that the controls for these biases in current studies are insufficient. Consistent with the concerns of Christensen (2012), Daske et al. (2013) find that the change in disclosure incentives for adopting firms drives the documented capital market benefits following voluntary IAS adoption.

9.3.1.2. Mandatory adoption and contamination concerns

Mandatory IFRS adoption is less subject to the endogeneity criticism, as adoption is performed at the country level and is beyond the choice of individual firms. From this perspective, mandatory adoption is naturally a preferred event for researchers. However, this setting presents its own empirical issues. First, as most countries mandated IFRS between 2005 and 2008, the IFRS adoption dates are clustered in time, raising contamination concerns from events that are entirely unrelated to IFRS adoption. Second, changes in regulation or enforcement bundled with IFRS adoption, such as the EU regulation that requires member states to introduce relevant enforcement and compliance mechanisms along with mandatory IFRS adoption, can also confound the direct effects of IFRS adoption.

Christensen et al. (2013) illustrate the contamination concerns in the context of liquidity changes documented by prior studies around mandatory IFRS adoption in the EU. They find that previously observed improvements in liquidity are actually isolated within five EU countries that substantially changed their enforcement of financial reporting around the time IFRS became mandatory. They find no evidence of liquidity improvements surrounding the IFRS mandate in countries without concurrent changes in enforcement. Moreover, in additional analysis of voluntary adopters only, they continue to find significant liquidity improvements around the mandate event in countries with concurrent changes in enforcement. Given that these firms had already voluntarily adopted IFRS before the mandate, the findings suggest that liquidity improvements occurred absent a change in reporting standards. The authors conclude that changes in financial reporting enforcement play a crucial role in explaining liquidity changes around IFRS adoption and that IFRS adoption itself is unlikely to be a primary source of capital market benefits.

Although the findings of Christensen et al. (2013) underscore the importance of addressing confounding effects, Barth and Israeli (2013) point out that the evidence presented by Christensen et al. (2013) is insufficient to completely rule out the effects of IFRS adoption. They specifically note the following, referring to Christensen et al. as “CHL.”

Importantly, the specifications in CHL Tables 3, 4, and 5 do not distinguish effects of changes in enforcement from effects of IFRS adoption. Although the findings in these tables allow CHL to rule out an effect of IFRS on liquidity for countries that did not adopt concurrent changes in enforcement, the findings do not rule out an effect of IFRS for countries that did adopt concurrent changes in enforcement. In other words, the findings in CHL Tables 3, 4, and 5 do not tell us the effect of changes in enforcement by themselves and, thus, we cannot compare the liquidity of IFRS adopters with changes in enforcement to that of non-adopters with changes in enforcement ... This comparison is necessary if one is to rule out an effect of IFRS.⁶¹

Recent research has aimed to address concerns about the confounding effects of mandatory IFRS adoption by checking the robustness of results to (i) focusing only on IFRS-adopting countries that did not concurrently change their regulation or enforcement practices, (ii) using countries outside the EU that adopted IFRS at different periods (such as Canada), and (iii) relating the effects of IFRS to cross-sectional differences between IFRS and domestic GAAP. The logic behind the last set of analyses is that, if IFRS adoption produces certain benefits, these benefits should be larger in countries where IFRS adoption has a larger effect on reporting standards.

Overall, the debate over whether the observed changes in financial reporting outcomes and capital market benefits are due to the IFRS mandate or changes in enforcement may never be settled empirically. Results in extant literature may need interpretation assuming that IFRS adoption represents the entirety of the changes to the financial reporting system, including the application of new accounting standards and the changes in enforcement and litigation.

In addition to the contamination concern, Ramanna and Sletten (2014) show that mandatory IFRS adoption at the country level is not always entirely exogenous. They find that a country's decision to adopt IFRS is an endogenous choice determined by the country's perceived network benefits. That is, a country is likely to adopt IFRS if the other countries with which it has close economic ties have already adopted IFRS.

9.3.1.3. Type of IFRS adoption investigated

To provide some insights into researchers' choice of adoption event to study, Figure 1 plots the number of articles classified by adoption type and publication year. Before the large-scale mandatory adoption of IFRS in 2005, studies had little choice in exploring the adoption event, a point emphasized given that almost all studies until 2008 focused on voluntary IFRS adoption. In contrast,

⁶¹ Christensen et al. (2013) present a test in Table 6 of their study to separately identify the liquidity effects arising exclusively from enforcement changes. They investigate liquidity changes for Japanese firms around 2004, when Japan changed its enforcement practices without changing its accounting standards. Although their analysis provides some evidence that supports the enforcement changes affecting stock liquidity, it is unclear whether these results can be generalized to other contexts or countries, as Japan saw large changes in the functioning of its banks and capital markets between 2001 and 2007, when regulators introduced new laws aimed at decreasing non-performing loans on banks' balance sheets.

since 2008, only a handful of published studies focus exclusively on voluntary adoption. Many studies after 2008 examine both voluntary and mandatory IFRS adopters. We surmise that the trend toward using both as alternative subsamples is at least partly driven by the econometric concerns related to each of these adoption types. Based on the presumption that econometric biases are independent for mandatory and voluntary adopters, researchers interpret a consistent set of results for both subsamples, providing greater confidence in the inferences drawn about the role of IFRS.

10.4.2. Identification of event date

A key issue in any event study is the accurate identification of the event date. For studies of mandatory IFRS adoption, the event date is relatively straightforward, as it is publicly released by the regulators in each country. However, even in this case, care is needed to identify the event date, as adoption dates may be staggered. Table 4 lists the country-level adoption dates with notable exceptions and carve-outs. When the EU initially mandated IFRS, firms that had their equity securities traded in major stock exchanges had to adopt IFRS for fiscal periods beginning on or after Jan. 1, 2005. However, companies that had only publicly traded debt securities or reported under US GAAP could delay adoption of IFRS to 2007 if the country allowed it. Moreover, some countries, such as Austria, Belgium, and Germany, allowed early adoption of IFRS, and other countries, such as France, Spain, and the UK, prohibited early adoption. Examining the actual adoption and compliance rate after the EU's official mandate in 2005, Pownall and Wieczynska (2012) find that as much as 35% of the firms did not adopt IFRS in 2005. Consistent with staggered adoption, they show that this figure subsequently dropped to 20% by 2007 and further to 17.8% by 2009.⁶²

The correct identification of IFRS adoption dates is more challenging for firms that voluntarily adopt IFRS. Most studies identify adoption dates through time-series comparisons of accounting standards listed in either the WorldScope (data field 07536) or Compustat Global (variable name: ASTD) databases. However, Daske et al. (2013, see appendix) point out significant differences in the coding of accounting standards across these two databases. When they classify accounting standards into three broad categories (IAS-IFRS, US GAAP, or local GAAP) and compare the coding of reporting standards across the two databases, they find classification differences for about 5% of the firm-year observations covered by both databases. However, when attention is restricted to the subsample of firm-year observations coded as IFRS followers by either database, this value jumps to nearly 30%. Even more worryingly, when they compare the accounting standards reported in these two databases against corresponding data hand-collected from annual reports, they find classification differences in about 25% of the observations for WorldScope and about 40% for Compustat Global. Although Daske et al. (2013) check the data for annual reports that are electronically downloadable

⁶² For details about the options available to EU member states in relation to mandatory IFRS adoption, see Table 1 in a study by Pownall and Wieczynska (2012).

from Thomson Reuters, their hand-collected sample covers only about 15% of the firm-years covered by WorldScope and Compustat Global. Given the large discrepancies in reporting accounting standards observed in this subsample, further research is required to clearly understand these classification differences. Until such time, researchers should be better off using the data that Daske et al. (2013) make available online and acknowledging this data limitation.

10.4.3. Selection of event window

Researchers have chosen a variety of event windows, such as a fixed number of years around the event date or the entire sample period for which data are available. For example, DeFond et al. (2011) and Hong, Hung, and Lobo (2014) use 2003–2004 as the pre-adoption period and 2006–2007 as the post-adoption period and exclude the adoption year, 2005. The former examine the effect of IFRS adoption on institutional ownership, and the latter examine the effect of IFRS adoption on IPOs. Meanwhile, Chen, Young, and Zhuang (2013) use a sample period between 2000 and 2009 to examine the cross-border spillover effects of the EU’s mandatory adoption of IFRS in 2005 on the investment efficiency of firms. Although their sample includes 10 years in total, they do not determine from the data whether the effects of IFRS occur immediately after adoption or take time to be observed.

In general, a lack of consistency in empirical choices across IFRS studies makes it difficult to compare their results. Although a short window around the adoption date has the advantage of mitigating contamination concerns, such an approach may be affected by transitory changes (e.g., from learning) that occur around IFRS adoption and suffer from a lack of power in tests when a sufficient number of observations is unavailable in the short window. Studies should ideally focus on both shorter and longer event windows to show whether observed effects are persistent or temporary and provide useful evidence related to inter-temporal trends. (See Table 4 in a study by Hail et al. [2014] as an example.) This approach would also help researchers better link evidence across various studies.

10.4.4. Estimation of the difference-in-differences model

A typical approach used to measure the effects of IFRS adoption is to estimate a difference-in-differences model, such as the following:

$$DV = \beta_1 IFRS + \beta_2 Post + \beta_3 Post \times IFRS + Controls + \varepsilon, \quad (1)$$

where DV is the outcome variable of interest, $IFRS$ is an indicator variable that takes the value of 1 for IFRS-adopting firms (treatment firms) and 0 for control firms, and $Post$ is an indicator variable that takes the value of 1 for fiscal periods after the IFRS adoption date. β_3 , which captures the difference-in-differences effect, is the main coefficient of interest. In the absence of control variables in Equation

(1), β_3 can be interpreted as the change in DV for treatment firms relative to the change in DV for the control group. We discuss a few of the issues that frequently arise when estimating the preceding equation as follows.

10.4.4.1. Sample of control or non-treated firms

Studies of mandatory IFRS adoption often choose one of two sets of firms as the control (or non-treated) group: (i) firms reporting under local GAAP (including US GAAP) from non-IFRS-mandating countries or (ii) voluntary adopters from countries that subsequently mandated IFRS. In contrast, studies of voluntary adoption use firms from the same country as the treatment sample and firms that do not report under IFRS as the control group.

Almost all IFRS studies present a major concern about the comparability of firms in the treated and non-treated groups. Control and treatment groups should ideally be formed by randomly allocating firms to the two groups, so that the two groups do not differ in any dimension other than the treatment effect on average. However, this is unlikely to be the case in almost all studies. A key assumption of the difference-in-differences model is that the average change in outcome is the same for both the non-treated firms and counterfactually for treated firms *if* they have not received the treatment. As such, whether observable or unobservable, the differences in characteristics across treatment and control groups in the pre-IFRS-adoption period always present a concern for the inferences drawn from Equation (1).

In fact, the preceding concerns simply increase in severity as more and more countries mandate IFRS, leaving fewer countries and fewer firms for inclusion in the control group. As Table 4 indicates, only four major economies (namely, the US, Japan, China, and India) remained non-IFRS adopters at the end of 2013. However, IFRS have affected the local reporting of even these countries. For example, the Chinese Accounting Standards that have been mandatory since Jan. 1, 2007, have substantially converged with IFRS. US GAAP have been influenced through the Norwalk Agreement signed in September 2002 to achieve convergence between US GAAP and IFRS. Both India and Japan currently allow voluntary IFRS adoption. A related concern about using firms from non-IFRS-adopting countries as control firms is the potential convergence of local GAAP with IFRS in anticipation of mandatory adoption. For instance, some of the countries included in control groups in studies of mandatory IFRS adoption subsequently adopted IFRS, e.g., Canada adopted IFRS in 2011 but also allowed early adoption of IFRS. A Canadian firm might have started to prepare for this transition before actual adoption, contaminating its role as a control.

Studies attempt to account for observable differences across treated and non-treated firms by including additional factors linearly into Equation (1). However, the success of this approach depends

on whether the control variables are correctly measured and specified in the model. Another approach that is adopted to deal with observable differences is the matched-firm approach, in which each treatment firm is matched to a control firm (or a set of control firms) along certain dimensions such as industry, size, or propensity score. The matched firm is particularly relevant if one believes that the true relationship between control and outcome variables is non-linear. After proper control or matching, one should observe no differences between the treatment and control groups in the pre-IFRS-adoption period, i.e., an insignificant β_l . However, as DeFond, Erkens, and Zhang (2015) point out, any conclusions drawn from propensity-score matching analysis may be very sensitive to the design choice, including the number of control firms matched to each treatment firm, the non-linear terms included in the propensity score construction, and whether the matching is done with or without replacement. They suggest an alternative matching procedure, i.e., coarsened exact matching, which matches control and treatment firms based on ranges rather than the exact covariate values. Even if the preceding approaches satisfactorily control for observable differences across treated and non-treated groups, concerns remain in relation to unobserved differences across treated and non-treated firms.

Considering all of the advantages and shortcomings of each control group, a relatively parsimonious approach would involve presenting the results using three different samples of firms for the control group, including (i) all non-adopting firms from non-IFRS-adopting countries, (ii) propensity-score-matched firms from non-IFRS-adopting countries, and (iii) voluntary adopters preferably from IFRS-adopting countries. DeFond et al. (2015) provide an example of such an approach and nicely summarize the pros and cons of each control group as follows.

Each of the three benchmarks has its advantages and limitations. Voluntary adopters share economic and regulatory commonality with mandatory adopters, but they are often regarded as a non-random group subject to potential self-selection bias. Non-IFRS adopters or PSM non-IFRS adopters, on the other hand, control for contemporaneous effects that are unrelated to the introduction of IFRS, but are potentially influenced by unspecified cross-country differences. In addition, while PSM non-IFRS adopters reduce differences between treatment and control firms, the theoretical underpinning of our PSM model is limited because we should be using country-level factors to model the choice of mandatory IFRS adoption in order to derive our propensity scores. However, because we need to match at the firm level, we necessarily use firm-level determinants.

Because of the limitations of the benchmark groups, we draw our conclusions based on the results of all three benchmarks in our primary analysis. For parsimony, we present our subsequent partitioning and sensitivity analysis using just one of our benchmarks, the non-IFRS adopters. Besides having the largest sample size, this benchmark avoids the self-selection bias with the voluntary adopters, and the limited theoretical underpinning with the PSM non-IFRS adopters.

Yet another concern related to difference-in-difference models is that estimated outcomes can reflect the effects of either IFRS adoption or contaminated events for the *control* sample. Unlike the

ideal setting, in which treatment firms differ from control firms only in terms of the treatment received, IFRS settings do not rule out the possibility that control firms are affected by contamination events that influence the outcome variables. In such a case, the estimated difference-in-differences coefficient may appear statistically significant even though the IFRS adoption itself has no significant effect on the treatment firms. Thus, in the context of Equation (1), a significant value of β_3 may be interpreted to indicate a significant IFRS adoption effect for treated firms or alternatively that effects from a contamination event on the control firms are irrelevant for the treated firms. A few studies (e.g., Kim and Shi 2012; Ball et al. 2015) attempt to mitigate this concern by documenting that inferences are insensitive to dropping control firms from analyses.⁶³

Furthermore, IFRS adoption may cause sample attrition or enlargement. Such changes cause the firms included in the sample in the pre-IFRS period to differ from those included in the post-IFRS period. If IFRS adoption relates to the sample changes in the sense that IFRS adoption affects the probability of sample attrition/enlargement, then the coefficient estimates from the difference-in-differences model are biased. For example, in the context of external financing, IFRS adoption may improve financial transparency and thereby increase investors' willingness to invest in publicly traded securities. This would incentivize more firms to raise external financing in the post-IFRS period, potentially biasing the difference-in-differences estimates obtained from a sample of firms issuing debt or equity around IFRS adoption. Similar concerns arise when IFRS adoption causes sample attrition by affecting the probability of liquidation or acquisition. One approach that studies use to test the sensitivity of results to this sample bias is to focus on a constant sample of firms, i.e., include only firms for which outcome variables are available in both the pre- and post-IFRS periods. However, requiring firms to be present in both the pre- and post-IFRS periods may introduce its own data snooping biases, such as survivorship bias.

10.4.4.2. Inclusion of fixed effects

To control for firm-specific determinants of the outcome variable of interest, some studies include firm fixed effects in Equation (1). These fixed effects essentially ensure that the estimated difference-in-differences coefficient does not reflect differences in time-invariant characteristics across control and treatment firms. Studies alternatively include country fixed effects to control for unobservable country characteristics, industry fixed effects to control for unobservable industry characteristics, or both. In addition, IFRS studies also typically include period fixed effects (e.g., year or quarter) to control for unobservable time effects.

⁶³ Although insignificant values for β_1 and β_2 in Equation (1) would provide some comfort that IFRS-adopting and control firms are comparable and that IFRS adoption does not affect control samples, the values for these coefficients are not often reported separately, as they are subsumed by the inclusion of fixed effects in the difference-in-differences model.

Figure 2 plots the percentage of the 64 publications using different dimensions of fixed effects in their main analysis. Before 2008, when most studies focused on voluntary IFRS adoption, fixed effects were rarely used in main analyses. Only 14% of the studies published before 2008 use fixed effects models. In contrast, all of the studies published in 2015 include at least one dimension of fixed effects. In all of the periods, firm fixed effects appear to be the least frequently used relative to either country or industry fixed effects. Only four of the sixty-four studies, including those by Daske et al. (2008); Horton, Serafeim, and Serafeim (2013); Chen, Young, and Zhuang (2013); and Lang and Stice-Lawrence (2015), include firm fixed effects in their main regression models. This is perhaps due to the large loss in degree of freedom that results when firm fixed effects are included, which lowers the power of tests.

10.4.4.3. Clustering standard errors

Figure 3 plots the percentage of the 64 publications, using different choices for standard error clustering. No IFRS study conducted before 2008 used clustered standard errors in their main analysis. However, this changed with the publication of a study by Petersen (2009), who shows that clustering of standard errors often results in better estimates of standard errors than a variety of alternative approaches, such as the Fama-MacBeth and Newey-West approaches. In theory, the level at which observations are clustered for the computation of standard errors is a choice that should depend on the covariance-variance matrix of the residuals. However, as the covariance-variance matrix is unobservable, researchers have to make relatively ad-hoc choices at the clustering level.

As the majority of these studies conduct cross-country analyses, they suggest that standard errors should ideally be clustered at the country level to address within-country correlations in residuals. This preference to cluster at the country level is clearly noticeable in Figure 3, which shows a significant increase in the number of publications using country-level clustering in recent years. However, country-level clustering substantially limits the degrees of freedom to estimate standard errors. Moreover, Petersen (2009) shows that the estimates of clustered standard errors may be biased if the number of clusters is lower than 40. Thus the choice of clustering at the country level may yield biased standard errors unless there are enough countries in the sample.

Researchers considering small samples may consider clustering using bootstrapped standard errors (Cameron, Gelbach, and Miller 2008; Gow, Ormazabal, and Taylor 2010). Given the lack of clear theoretical guidance at the clustering level and the advantages and disadvantages to clustering at different levels, it seems prudent to at least discuss the sensitivity of inferences to various clustering choices.

10.4.4.4. Measurement of control variables

As discussed earlier, IFRS studies often include control variables in Equation (1) to account for heterogeneity in characteristics across treated and non-treated firms. These variables are often based on reported financial statements (such as total assets, book value of equity, book leverage, earnings), which themselves are altered by IFRS adoption. This may alter the quality of control variables between the pre- and post-IFRS periods and thereby influence the conclusions drawn from Equation (1). Although few studies explicitly discuss this concern, it seems reasonable to allow the coefficients of the accounting-based control variables in Equation (1) to vary between the pre- and post-adoption periods and to test the sensitivity of results to including controls from only the pre-IFRS periods. The latter approach would be problematic if the sample characteristics were to significantly change between before and after adoption. In such cases, a post-IFRS sample should ideally be restricted to the period immediately following IFRS adoption to mitigate the problem.

10.5. Cross-sectional variation in the effects of IFRS

To corroborate an identification strategy and attribute observed changes in outcomes to IFRS adoption, studies conduct cross-sectional tests that relate observed changes in outcomes to differences in accounting standards between IFRS and local GAAP. These tests are predicated on the notion that if observed changes in the dependent variable are caused by IFRS adoption, then the changes should be related to the degree to which IFRS adoption alters the country's accounting standards. These tests typically use the Bae et al. (2008) index to measure the difference between local GAAP and IFRS.

However, the Bae et al. (2008) index is a noisy measure of differences in accounting standards. First, it is based on Nobes's (2001) GAAP survey, which compares local GAAP and IAS as of 2001. However, since 2001, the local GAAP in a variety of countries and IAS/IFRS have evolved, including in the years before the EU's large-scale adoption of IFRS in 2005. For example, after the 2002 EU vote to adopt IFRS, several EU countries started modifying their domestic standards to both ease the transition to IFRS and make financial statements more comparable across listed firms mandated to report under IFRS and large unlisted firms using domestic GAAP. Therefore this measure may be a noisy measure of differences in accounting standards after 2001. Second, the GAAP survey ignores the differences that arise from alternative accounting choices available under one set of standards but not the other. If IAS allows multiple accounting choices but domestic rules allow only one of those alternatives or provide more detailed or restrictive standards, then these differences are not captured in the GAAP survey and consequently not captured in the Bae et al. (2008) index. Finally, the index is calculated as a simple aggregation of the differences in 21 accounting rules that deal with the measurement, recognition, and disclosure of financial numbers. However, not all of these accounting rules are necessarily relevant in every context examined by IFRS studies. Thus studies that are primarily focused on accounting recognition, for instance, may find disclosure differences reflected in the index to add noise.

Some studies examine an alternative cross-sectional prediction for the effects of IFRS: the effects should be stronger in countries with greater enforcement of IFRS rules. This logic follows from the work of Ball et al. (2003) and holds that accounting standards per se play a limited role in affecting firms' financial reporting practices unless combined with proper enforcement. Studies generally confirm this relationship using the rule-of-law or security regulation indices (e.g., Byard et al. 2011; Daske et al. 2008) to measure the strength of enforcement. However, Ball et al. (2015), who study changes in debt covenants around IFRS adoption, are an exception and do not find evidence to support the observation that enforcement is related to the effects of IFRS. They interpret their finding as evidence that the limitations of IFRS for debt contracting, such as those resulting from the fair valuing of liabilities and the inclusion of transitory shocks in earnings, are not resolved by stronger enforcement.

Most of the IFRS studies that evaluate the cross-sectional differences caused by enforcement tend to interact or partition their samples on the legal enforcement variable based on a study by La Porta et al. (1999) (e.g., Leuz 2003; Burgstahler et al. 2006; Li 2010). This enforcement measure captures the efficiency of the judicial system, rule of law, and corruption. These measures notably appear to neglect any dimension of *financial reporting* enforcement or auditing characteristics. Therefore it is unclear whether these enforcement variables are capturing enforcement and the incentives related to financial reporting outcomes. Another common measure of enforcement is the rule-of-law index compiled by Kaufman et al. (2007). Their measure is based on the views of private and public sector experts, citizens, and firms; the extent to which they have confidence in and abide by the rules of society; and the likelihood of crime and violence. Although a dimension of this measure covers contract enforcement and property rights, it does not directly measure financial reporting regulatory strength or capital market protections. It is unclear whether this construct reflects the enforcement that many studies purport to capture. However, it has been shown to yield the strongest differential in IFRS benefits, adopted in studies such as those by Daske et al. (2008), DeFond et al. (2011), and Li (2010).

Several studies use output measures of enforcement/implementation based on earnings quality scores before and after IFRS adoption. For instance, DeFond et al. (2011) measure credibility of implementation as an earnings quality score developed by Leuz et al. (2003), using outcomes to measure credibility that implicitly account for audit quality (given these are reported numbers). De George (2015) also calculates country-level changes in reporting quality scores as the post-IFRS-adoption earnings quality less the pre-adoption period score as a measure of the strength of implementation.

Kim et al. (2012) calculate country-level measures of regulatory reforms using data from the Annual Executive Opinion Survey conducted by the Institute for Management Development.

Although its primary purpose is to provide quantifiable measures of management practices, labor relations, and corruption, the survey explicitly asks respondents to evaluate the extent to which auditing and accounting practices are implemented in their firms adequately and the extent to which corporate boards supervise company management effectively. The authors measure changes in regulatory levels using the changes in these scores from the pre- to post-IFRS periods.

Brown, Preiato, and Tarca (2014) argue that the current enforcement index used by the IFRS literature is deficient for capturing compliance with accounting standards. They instead propose an index measuring the quality of auditors' working environment and the degree of accounting enforcement by independent enforcement bodies. They use data from the International Federation of Accounts, World Bank, and national securities regulators and calculate three new indices for 51 countries for 2002, 2005, and 2008. Testing these new enforcement indices in the context of analyst forecasts, the authors find that they have incremental power over the rule-of-law index in explaining analyst forecast errors and dispersion. They conclude that their enforcement indices are better at capturing accounting enforcement than the traditionally used legal enforcement indices.

Overall, although there are a variety of approaches used to reflect the impact of IFRS adoption and changes in enforcement, no one measure dominates. The extent to which the broad rule-of-law proxies considered by La Porta et al. (1999) and Kaufman et al. (2007) are relevant to understanding the enforcement of financial reports remains unclear. The evidence provided by Brown et al. (2014) suggests that these proxies are unlikely to sufficiently capture reporting enforcement. There are also concerns surrounding the current proxies for the accounting effects of IFRS adoption. Attempts to identify accounting-specific enforcement proxies and measures of the effects of IFRS on financial reports should provide a fruitful direction for future studies.

11. Conclusion

Since the large-scale mandatory adoption of IFRS over 10 years ago, a number of research studies have evaluated the effects of IFRS adoption. The early studies understandably focus on the direct effects of IFRS on reporting quality. In contrast to the findings reported based on voluntary IFRS adopters, studies of mandatory adopters provide, at best, mixed evidence that adoption improves the quality of accounting reports. However, this conclusion changes when one focuses on capital-market-based proxies of reporting quality or the capital market outcomes of IFRS adoption, such as stock liquidity, trading volume, or price reactions to earnings announcements. There is strong evidence that capital market outcomes and proxies for reporting quality improve after IFRS adoption, at least for some countries. However, researchers do not agree on whether the observed outcomes are

attributable to IFRS adoption itself or to other institutional changes that occur concurrently with IFRS adoption.

Although the evidence based on direct measures is mixed as to whether IFRS adoption increases comparability, studies based on capital market effects of comparability generally show that adoption improves comparability across countries. There is also convincing evidence that IFRS have triggered greater interest from foreign investors and foreign analysts, although whether such increased interest is of any benefit to domestic firms is unclear. Given that an oft-repeated objective of IFRS adoption by regulators has been the achievement of financial reporting comparability, researchers have begun paying more attention to better understanding and measuring comparability. That said, simply harmonizing accounting standards does not appear to achieve full comparability in financial reporting.

Research into the effects of IFRS adoption on contracting, stewardship, decision-making, and auditing is still in its infancy. Very few studies conducted in these areas have been published, and even when one considers the evidence in working papers, there is no clear understanding of how IFRS matter to contracting or stewardship or how audit verification interacts with the use of IFRS numbers in contracts. For instance, although almost all of the debt contracting studies document a decline in accounting-based covenants following IFRS adoption, they offer contradictory interpretations. Some studies argue that the decline is caused by improved transparency under IFRS, whereas others suggest that it is a result of IFRS numbers being irrelevant for use in contracts. More research is required to determine the causal mechanisms underlying the link between IFRS numbers and their use for stewardship and contracting. Nevertheless, the observed differences in IFRS outcomes for stock and debt markets highlight the multidimensional effect of IFRS adoption on firms. An accounting standard that is developed to enhance the valuation role of accounting may not be optimal for stewardship or debt contracting purposes. A fruitful avenue for future research is to evaluate whether and how each attribute of IFRS affects valuation, stewardship, and contracting roles differently.

One major obstacle to a proper cross-study comparison of IFRS results is the varied empirical choices made by researchers. Although some of these differences are driven by the nature of the questions examined, IFRS studies could do more to provide results that are based on a more consistent set of empirical methods. Discussions and online appendices related to the sensitivity of results to alternative empirical choices would be a step forward. Many IFRS studies are also hindered by a lack of reliable international data. Although some of these problems are institutional and cultural and require changes in the laws of many countries, we expect that some of these concerns will decrease over time as better computing techniques for data collection become available.

Finally, although IFRS is now required for listed firms in many countries, several countries permit or even require private companies also to adopt them. The need of private firms for financial reports differs vastly from that of listed firms, raising questions about whether requiring private firms to report under a relatively complex set of accounting standards passes the cost-benefit test. Overall, although the literature is making progress, research conducted across a variety of dimensions is required before researchers can claim to have a decent understanding of the mechanisms based on which IFRS affect the various facets of a business.

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Table 1: Number of publications by year

This table lists the number of articles on IFRS-adoption-related topics published in five accounting journals, *Contemporary Accounting Research (CAR)*, *Journal of Accounting and Economics (JAE)*, *Journal of Accounting Research (JAR)*, *Review of Accounting Studies (RAST)*, and *The Accounting Review (TAR)*, between 1999 and 2015. The list only includes studies that use an empirical archive research methodology and excludes studies on tax-related topics. Journals are listed in alphabetical order.

Publication year	CAR	JAE	JAR	RAST	TAR	Total
1999	0	1	0	0	0	1
2000	0	0	1	0	0	1
2001	0	0	1	0	0	1
2002	0	0	0	0	1	1
2003	0	0	1	0	0	1
2004	0	0	0	0	0	0
2005	0	0	0	0	0	0
2006	0	0	0	0	0	0
2007	0	0	1	1	0	2
2008	1	0	2	0	1	4
2009	0	0	1	0	1	2
2010	0	0	0	1	2	3
2011	0	1	3	1	0	5
2012	1	3	1	1	3	9
2013	5	1	1	1	5	13
2014	0	0	2	1	5	8
2015	1	1	2	3	6	13
<i>Total</i>	8	7	16	9	24	64

Table 2: Number of publications by co-author affiliation country

This table lists the number of articles included in Table 1 by the geographic location of the co-author affiliation. We count the total number of articles with at least one co-author affiliation located in a particular country at the time of publication.

Co-author affiliation country	CAR	JAE	JAR	RAST	TAR	Total
Australia	0	0	0	0	1	1
Austria	0	0	0	1	0	1
Canada	0	0	3	0	3	6
China	1	0	0	1	0	2
Germany	0	0	2	2	1	5
Greece	1	0	0	0	0	1
Hong Kong	1	0	4	2	6	13
Israel	0	0	0	1	0	1
Netherlands	0	0	0	0	2	2
New Zealand	0	0	0	0	1	1
Portugal	0	0	1	0	0	1
Singapore	0	0	0	0	1	1
Taiwan	1	0	0	0	0	1
United Kingdom	2	0	4	3	3	12
United States	6	7	13	4	16	46

Table 3: Most commonly used data sources

This table lists the most common data sources used by the 64 studies included in Table 1. Each study may use multiple data sources. The Thomson Ownership databases include the Thomson Reuters CDA/Spectrum database, Thomson Financial Securities Mutual Fund database, and Thomson Financial Ownership database.

Data sources	No. of publications
Datastream/Worldscope	47
IBES	29
Hand-collected	20
Compustat Global	12
Thomson Ownership databases	9
Bloomberg	4
SDC	4
DealScan	4

TABLE 4 - IFRS adoption dates by country between 2001 and 2013

This table presents the adoption dates by country for a broad sample of countries from 2001 through 2013. We report the date at which local regulators **required** the use of IFRS and the fiscal period end date at which the first annual reports were prepared in accordance with the IFRS mandate (based on the majority of firms' year-ends in a given country). We obtain information about IFRS adoption dates from multiple sources: PWC IFRS adoption reports (April 2013); the IASPlus website maintained by Deloitte; the IASB website; Adoptifrs.org, maintained by academics; and the websites of multiple local exchanges around the globe. Note that in the instances where the majority of firms within a country follow a non-December year-end (e.g., Australia), we try to take that into account in the dates used in the “First IFRS annual report dates” column.

Country	Current GAAP	IFRS mandated for fiscal periods beginning:	First IFRS annual report dates (FPE)	Notes on country-level adoption (where relevant).
<i>IFRS adopting countries</i>				
Albania	IFRS ^(a)	01-Jan-08	31-Dec-08	Requirement that all listed, large unlisted, and financial institutions prepare their legal entity and consolidated reports under IFRS.
Argentina	IFRS ^(a)	01-Jan-12	31-Dec-12	Requirement that all entities whose securities are listed and are regulated by the CNV adopt IFRS as adopted by IASB. Voluntary adoption allowable from Jan. 1, 2011. Exception: Banks and Insurance Companies. On Feb. 12, 2014, the BCRA issued Communication A5541 announcing a plan to converge the BCRA accounting standards for banks with IFRS. The converged standards will become mandatory on Jan. 1, 2018.
Australia	IFRS	01-Jan-05	31-Dec-05	Requirement that all listed and unlisted (private) firms adopt IFRS. Given IFRS need to be incorporated into Australian law they are issued as “Australian Accounting Standards” although entities effectively adopt IFRS word-for-word. Note that virtually no voluntary adoption was allowable in Australia before the mandate. Researchers should also be aware that as the majority of Australian companies report June 30 year-ends (over 85% of listed firms). The first date at which the majority of annual IFRS compliant financial statements were issued is the fiscal period ending Jun. 30, 2006
Austria	IFRS ^(c)	01-Jan-05	31-Dec-05	In addition to the requirements of the EU IFRS mandate (i.e., mandatory adoption for consolidated accounts of entities listed on EU regulated markets), Austria allowed voluntary IFRS adoption for firms not listed on regulated exchanges. In Austria, the two regulated exchanges are Wiener Boerse AG Amtlicher Handel and the Wiener Boerse AG Geregelter Freiverkehr

Bahamas	IFRS ^(a)	01-Jan-06	31-Dec-06	
Belgium	IFRS ^(c)	01-Jan-05	31-Dec-05	In addition to the requirements of the EU IFRS mandate, Belgium required IFRS reporting for all listed and unlisted banks from Jan. 1, 2006, and all listed and unlisted insurance companies from Jan. 1, 2012. In addition, from Jan. 1, 2007, IFRS was required for separate company financial statements of REITs.
Bosnia and Herzegovina	Local IFRS ^(b)	01-Jan-05	31-Dec-05	IFRS adopted locally, i.e. translated into local language by the national standard setting body. Note that a legal requirement was adopted in June 2005 that required all public and private firms to adopt IFRS.
Brazil	IFRS ^(b) and CPC	01-Jan-10	31-Dec-10	The IFRS mandate required listed firms to prepare financial statements under both IFRS and local GAAP (CPC). Note that unconsolidated (separate) financial statements still report under Brazilian GAAP (BR GAAP). However, BR GAAP have been fully converged with IFRS since 2010. Therefore both listed and private firms follow IFRS given the local GAAP convergence. Exception: carve-out of revaluation requirements from IAS 16, as these are not permitted under Brazilian corporate law.
Bulgaria	IFRS ^(c)	01-Jan-03	31-Dec-03	Exception: Banks had already adopted IFRS in 1997.
Canada	IFRS (and U.S. GAAP)	01-Jan-11	31-Dec-11	Exceptions: Investment companies, life insurance companies, and entities subject to rate regulation do not follow IFRS. U.S. GAAP is still acceptable for US issuers.
Chile	IFRS (and SBIF)	01-Jan-09	31-Dec-09	Staggered IFRS adoption: Major listed open corporations (i.e., > 500 shareholders) were required to prepare IFRS statements for financial periods beginning on or after Jan. 1, 2009, with smaller listed open corporations (i.e., <500 shareholders) to adopt IFRS from Jan. 1, 2010. All other entities were then permitted, but not required, to prepare IFRS financial statements from Jan. 1, 2011.
Costa Rica	IFRS ^(a)	01-Jan-01	31-Dec-01	Adopted for both listed and unlisted firms. Exception: Banks, financial institutions, and government bodies do not follow IFRS.
Cyprus	IFRS ^(c)	01-Jan-03	31-Dec-03	Before 2003, Cyprus had adopted IAS (international standards that pre-date current IFRS requirements) from 1981 onward.

Czech Republic	IFRS ^(c)	01-Jan-05	31-Dec-05	In addition to the requirements of the EU IFRS mandate, firms listed on nonregulated (non-EU) markets and those with only public debt adopted IFRS from 2007 (i.e., delayed adoption).
Denmark	IFRS ^(c)	01-Jan-05	31-Dec-05	
Ecuador	IFRS ^(a)	01-Jan-10	31-Dec-10	Exception: Financial institutions not subject to IFRS
El Salvador	IFRS ^(a)	01-Jan-11	31-Dec-11	Exception: Banks, insurance, and other regulated financial institutions are not subject to IFRS. However, regulators require that these entities provide a summary of the differences between regulatory GAAP and IFRS. Note that IFRS is required for separate company financial statements of listed firms and that unlisted firms are required to apply IFRS to SMEs.
Estonia	IFRS ^(c)	01-Jan-05	31-Dec-05	
Finland	IFRS ^(c)	01-Jan-05	31-Dec-05	Exception: Firms listed on OMX First North (nonregulated non-EU market) not subject to IFRS.
France	IFRS ^(c)	01-Jan-05	31-Dec-05	IFRS is also permitted for consolidated statements of private firms.
Georgia	IFRS ^(c)	01-Jan-00	31-Dec-00	IFRS was adopted locally, i.e., translated into the local language by the national standard setting body.
Germany	IFRS ^(c)	01-Jan-05	31-Dec-05	Following EU IFRS requirements, IFRS is required only for consolidated accounts of firms with debt or equity listed in regulated markets. German GAAP is permitted for separate financial statements. At the time of writing, Germany has no current plans to adopt IFRS for SMEs. Voluntary adoption was allowed from 1998 (IAS)
Ghana	IFRS ^(a)	01-Jan-07	31-Dec-07	
Greece	IFRS ^(c)	01-Jan-05	31-Dec-05	Extended EU adoption requirement to stand-alone accounts too, i.e., IFRS required for separate unconsolidated financial statements.
Greenland	IFRS ^(c)	01-Jan-05	31-Dec-05	
Hong Kong	HKFRS ^(b)	01-Jan-05	31-Dec-05	Full convergence between local standards (HKFRS) and IFRS. However some additional disclosures were added. The transitional processes also differed relative to other countries.
Hungary	IFRS ^(c)	01-Jan-05	31-Dec-05	IFRS also permitted (voluntary) for consolidated statements of unlisted/private companies.

Iceland	IFRS ^(c)	01-Jan-07	31-Dec-07	Permitted (voluntary) from 2005, with mandatory adoption occurring from 2007 onward.
Ireland	IFRS ^(c)	01-Jan-05	31-Dec-05	Irish GAAP and U.S. GAAP allowed for certain entities (i.e., U.S. issuers and parent entities not listed on EU-regulated markets)
Israel	IFRS ^(a)	01-Jan-08	31-Dec-08	Note that IFRS had been permitted (voluntary) since Jan. 1, 2006. Exception: Banks report under US GAAP.
Italy	IFRS ^(c)	01-Jan-05	31-Dec-05	
Jamaica	IFRS ^(a)	01-Jul-02	30-Jun-03	IFRS requirement extends beyond listed firms to nonlisted firms.
Latvia	IFRS ^(c)	01-Jan-05	31-Dec-05	
Lithuania	IFRS ^(c)	01-Jan-05	31-Dec-05	
Luxembourg	IFRS ^(c)	01-Jan-05	31-Dec-05	
Macedonia	Macedonian IFRS ^(b)	01-Jan-10	31-Dec-10	Exceptions: IFRS 9 to IFRS 13 are not included in local harmonized GAAP, and there is no current timetable on their inclusion.
Malaysia	MFRS ^(b)	01-Jan-12	31-Dec-12	For the most part, Malaysian FRS are identical to IFRS. Exception: “Transitioning Entities” were not required to adopt until 2014. These are, in general, entities covered by IAS 41 (agriculture) and real-estate entities.
Malta	IFRS ^(c)	01-May-05	30-Apr-06	
Mexico	IFRS ^(a)	01-Jan-12	31-Dec-12	Voluntary adoption allowed from Jan. 1, 2008, onward.
Montenegro	IFRS ^(a)	01-Jan-05	31-Dec-05	Exceptions: Banks follow other specific regulations prescribed by the Central Bank of Montenegro that differ from IFRS (e.g. specific rules about loan loss provisions).
Netherlands	IFRS ^(c)	01-Jan-05	31-Dec-05	
New Zealand	NZ-IFRS ^(b)	01-Jan-07	31-Dec-07	Fully converged to IFRS with some additional disclosure requirements. Exception: Tier 2 firms, i.e., those with no public accountability apply a reduced disclosure version of NZ-IFRS. Note that voluntary adoption was allowed from Jan. 1, 2005.
Norway	IFRS ^(c)	01-Jan-05	31-Dec-05	In addition to the EU IFRS mandate requiring adoption from 2005, Norway required IFRS adoption for standalone entities (i.e., unconsolidated reports) from 2011 onward.

Pakistan	IFRS ^(a)	01-Jan-09	31-Dec-09	All IFRS are required to be approved by the ICAP and Pakistani SEC (SECP). Thus it is common for delays to arise in adopting new standards. The SECP and the Institute of Chartered Accountants of Pakistan (ICAP) have agreed, in principle, to take urgent necessary steps so as to ensure full compliance with IFRS, as far as the financial statements of the listed companies (other than banks and financial institutions) are concerned for the year ending Dec. 31, 2009.
Philippines	PFRS ^(a)	01-Jan-05	31-Dec-05	PFRS are based on IFRS as issued by the IASB. However, some notable differences exist.
Poland	IFRS ^(c)	01-Jan-05	31-Dec-05	
Portugal	IFRS ^(c)	01-Jan-05	31-Dec-05	IAS adopted since 1995. IFRS mandate required for consolidated <i>and</i> standalone/separate financial statements. Note that all listed companies are usually registered as limited liability companies in Qatar (joint stock company), and as such these companies are required to follow Commercial Law No. 5 of 2002. As such, financial statements should be prepared in accordance with IFRS. Exception: Some financial institutions (mainly Islamic financial institutions) listed on the Qatar Exchange are allowed to file financial statements prepared under Financial Accounting Standards (FAS) issued by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI). Otherwise, they should follow IFRS where AAOIFI guidance is not available.
Qatar	IFRS ^(a)	01-Jan-02	31-Dec-02	
Romania	IFRS ^(c)	01-Jan-05	31-Dec-05	
Russian Federation	IFRS ^(a)	01-Jan-12	31-Dec-12	Formally adopted IFRS beginning in 2012 for all publicly traded entities. Note that banks delayed adoption and were required to report under IFRS from 2007.
Serbia	Serbian IFRS ^(b)	01-Jan-04	31-Dec-04	Almost fully converged with only some minor differences that have yet to be updated.
Singapore	IFRS and Sing-FRS ^(b)	01-Jan-03	31-Dec-03	Singapore closely models its Financial Reporting Standards (FRS) according to IFRS. Before a standard is enacted, consultations with the IASB are made to ensure consistency of core principles. IFRS as issued by the IASB is permitted if (i) the company is also listed in another stock exchange outside of Singapore and that exchange requires IFRS financial statements or (ii) an exemption is granted by the authority. Other listed companies are required to apply Singapore FRS (substantially converged).

Slovak Republic	IFRS ^(c)	01-Jan-05	31-Dec-05	
Slovenia	IFRS ^(c)	01-Jan-05	31-Dec-05	
South Africa	IFRS ^(a)	01-Jan-03	31-Dec-03	Since 2003, standard setters have issued IFRS as local SA GAAP without amendment, required by all firms (listed and unlisted). From Jan. 1, 2005, however, the Johannesburg stock exchange required all firms to use IFRS directly, as opposed to issued local SA GAAP.
South Korea	IFRS ^(a)	01-Jan-11	31-Dec-11	Voluntary adoption allowed since 2008. Exception: Financial institutions.
Spain	IFRS ^(c)	01-Jan-05	31-Dec-05	
Sweden	IFRS ^(c)	01-Jan-05	31-Dec-05	Exception: Local GAAP allowed for public firms in unregulated (non-EU) markets.
Switzerland	IFRS ^(c) or US GAAP	01-Jan-05	31-Dec-05	Firms listed on “Main Standard” (i.e., attracting international investment) must use IFRS or U.S. GAAP. Firms listed on “Domestic Standard” (i.e., seeking capital only from Swiss domestic) use IFRS, U.S. GAAP, or Swiss GAAP. As of 2013, 138 of 266 firms use IFRS; 27 of 266 firms use U.S. GAAP; and 47 of 266 firms use Swiss GAAP.
Taiwan	T-IFRS ^(b)	01-Jan-13	31-Dec-13	Firms currently follow T-IFRS, which is the 2010 version of IFRS as issued by the IASB.
Turkey	IFRS ^(c)	01-Jan-08	31-Dec-08	Note that a number of firms (voluntarily) followed the EU directive and issued IFRS statements from Jan. 1, 2005
UK	IFRS ^(c)	01-Jan-05	31-Dec-05	Stocks listed on the AIM exchange delayed adoption until 2007.
Ukraine	IFRS ^(a) and local GAAP	01-Jan-12	31-Dec-12	Public firms and all banks and insurance companies required to adopt IFRS from Jan. 1, 2012.
United Arab Emirates	IFRS ^(a)	01-Jan-03	31-Dec-03	
Uruguay	IFRS ^(a)	01-Jan-09	31-Dec-09	Exception: Banks and other financial institutions follow local GAAP (issued by CBU).
Venezuela	IFRS ^(a)	01-Jan-05	31-Dec-05	

Non-adopting countries:

Belarus	Belarusian GAAP	N/A	Not mandatory	Exception: Banks and selected state-owned companies are required to prepare IFRS financial statements in addition to their local Belarusian GAAP statements
Bolivia	Bolivian GAAP	N/A	Not mandatory	
China	Chinese Accounting Standards	N/A	Not mandatory	Chinese Accounting Standards (CAS) that have been mandatory since Jan. 1, 2007, have substantively converged with IFRS to the degree that IFRS principles form the base of CAS. However, enough differences exist (e.g., impairment of assets, related party disclosure provisions, and certain fair value provisions) that most studies do not see China as an IFRS adopter. Mandatory adoption to occur from Jan. 1, 2015.
Colombia	Colombian GAAP	N/A	Not mandatory	
Egypt	Egyptian GAAP	N/A	Not mandatory	Partial convergence occurred in 2007 with no timeline for further amendments.
India	Indian GAAP	N/A	Not mandatory	Listed companies have the option of using IFRS or Indian GAAP, although in practice most Indian companies choose Indian GAAP. Plans are underway to converge to IFRS, called “Ind IAS,” but potentially with many carve-outs.
Indonesia	Indonesian GAAP	N/A	Not mandatory	IFRS is neither required nor permitted. However, as of Jan. 1, 2012, the Indonesian GAAP is actually based on IFRS principles.
Japan	Japanese GAAP	N/A	Not mandatory	Voluntary adoption for qualifying entities allowed for fiscal periods ending Mar. 31, 2010.
Morocco	IFRS	N/A	Not mandatory	IFRS only required for banks and permitted (voluntarily) for all other entities
Paraguay	Paraguay GAAP	N/A	Not mandatory	
Saudi Arabia	SOCPA local GAAP	N/A	Not mandatory	Exception: Only banks are required to report under IFRS.
Thailand	Thai GAAP	N/A	Not mandatory	Thai GAAP has slowly been converging to IFRS in two stages (2011 and 2015). Currently, TFRS is based on IFRS as issued at Jan. 1, 2009.
United States	US GAAP	N/A	Not mandatory	
Vietnam	Viet GAAP	N/A	Not mandatory	Vietnamese GAAP is based on now out-of-date IAS (not current IFRS). Exception: Only state-owned banks are required to use IFRS.

(a) IFRS as issued by the IASB, translated into the local language where applicable.

(b) Local equivalents to IFRS—effectively equates to adherence to IFRS as issued by the IASB, with additional disclosures or specific carve-outs.

(c) IFRS as adopted by the E.U.

Figure 1: Number of publications by adoption type

This figure plots the publications as listed in Table 1 by adoption type. “Voluntary Only” includes studies focusing on voluntary IAS adoption only. “Mandatory Only” includes studies focusing on mandatory IFRS adoption only. “Mandatory & Voluntary” includes studies focusing on mandatory IFRS adoption but using voluntary adoption as an alternative benchmark group. We first count the number of publications under each adoption type. We then divide this number by the total number of publications in that year to get the percentage.

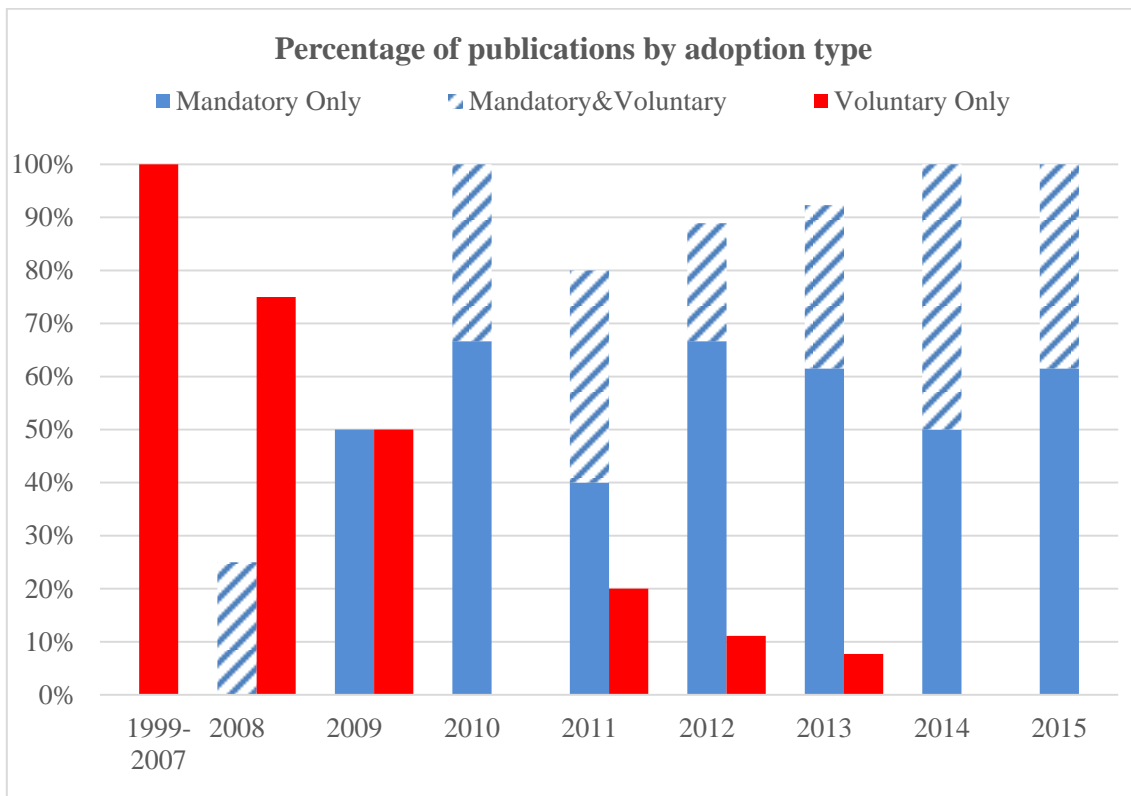
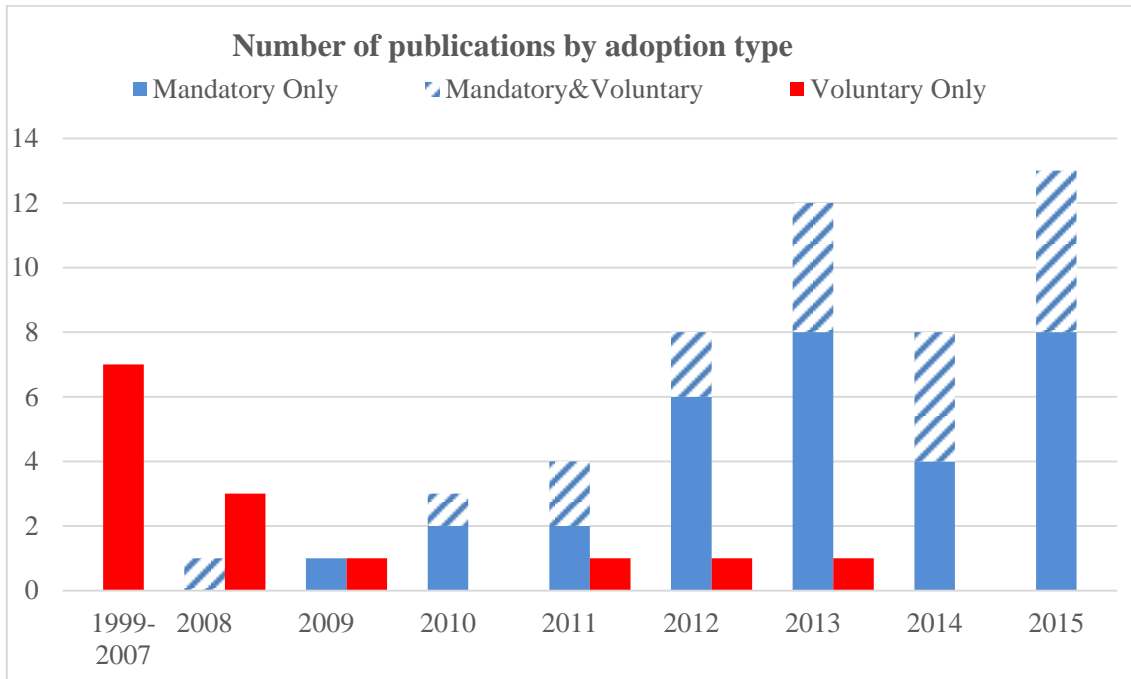


Figure 2: Number of publications using fixed effects models

This figure plots the publications as listed in Table 1, including the fixed effects in their main regression models. We first count the number of publications with industry, country, time, or firm fixed effects. We then divide this number by the total number of publications in that year to obtain the percentage. Time fixed effects include year, quarter, or month fixed effects. A paper may use a model with multiple fixed effects, i.e., country and year fixed effects, or with fixed effects in multiple dimensions, i.e., country-year fixed effects. In both cases, each paper is included in the country and time categories.

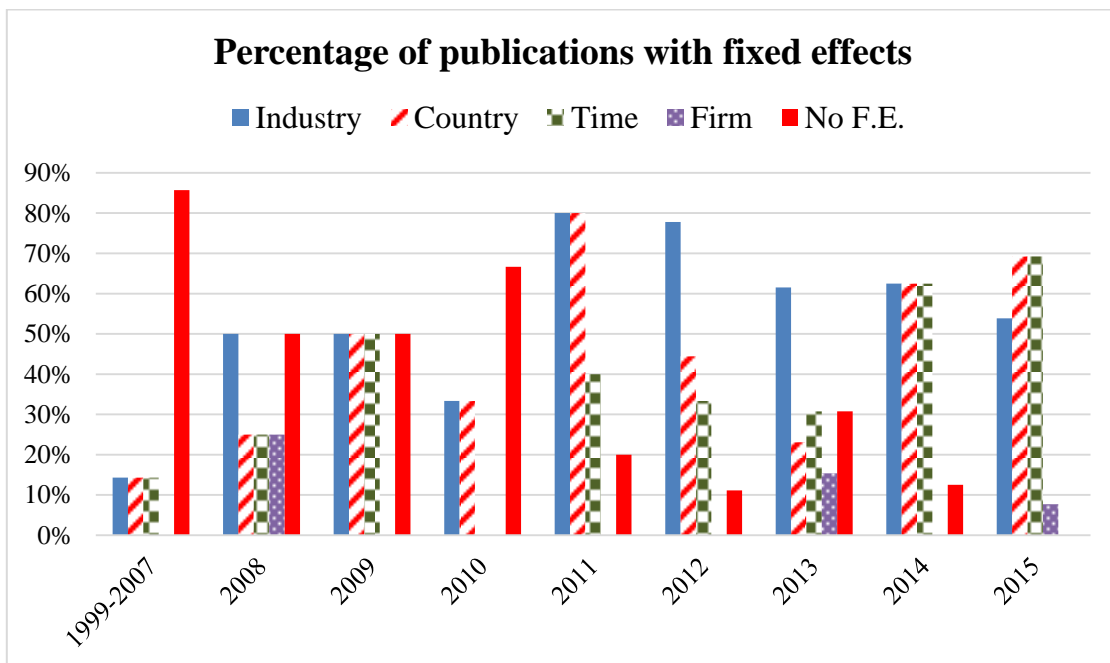
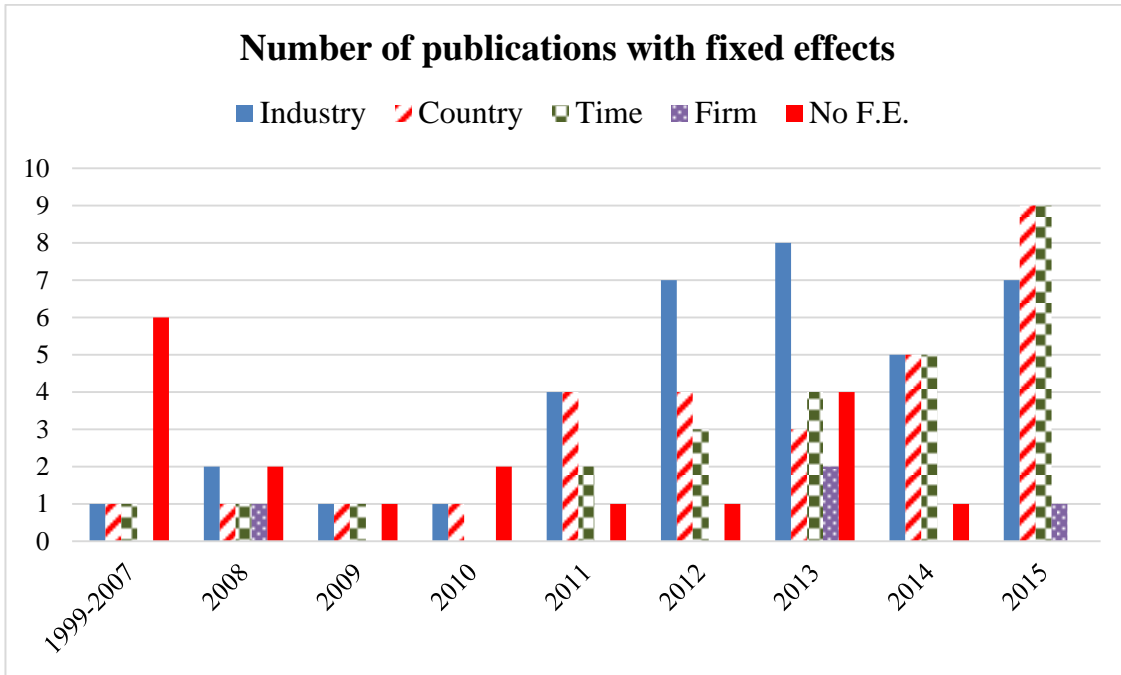


Figure 3: Number of publications using clustered standard errors

This figure plots the publications as listed in Table 1 using clustered standard errors in their main empirical models. We first count the number of publications with standard errors clustered by industry, country, time, or firm. We then divide this number by the total number of publications in that year to obtain the percentage. Time includes year, quarter, or month. A paper may use a model in which standard errors are clustered in two ways, i.e., by country and year, or in which standard errors are clustered in one way but in two dimensions, i.e., clustering by country-year. In both cases, each paper is included in the country and time categories.

