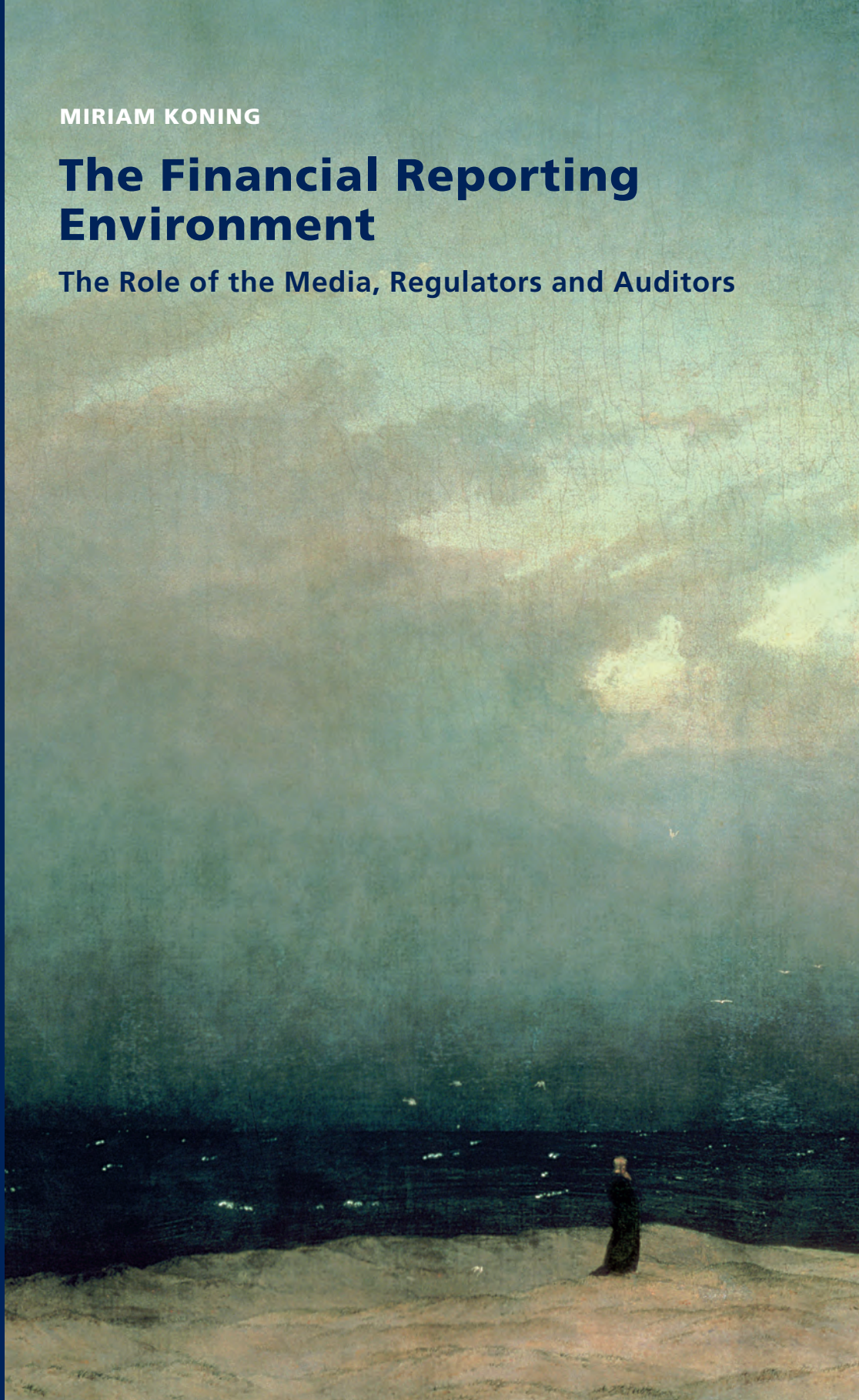
MIRIAM KONING

The Financial Reporting Environment

The Role of the Media, Regulators and Auditors



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De omgeving van financiële verslaggeving
De rol van de media, regelgevers en accountants

Proefschrift

ter verkrijging van de graad van doctor aan de
Erasmus Universiteit Rotterdam
op gezag van de
rector magnificus

Prof.dr. H.A.P. Pols

en volgens besluit van het College voor Promoties.
De openbare verdediging zal plaatsvinden op

donderdag 20 november 2014 om 13.30 uur

Miriam Koning
geboren te Bodegraven

Promotiecommissie:

Promotoren:	Prof.dr. G.M.H. Mertens Prof.dr. P.G.J. Roosenboom
Overige leden:	Prof.dr. A. de Jong Prof.dr. E. Peek Prof.dr. L.G. van der Tas RA

Erasmus Research Institute of Management – ERIM
The joint research institute of the Rotterdam School of Management (RSM)
and the Erasmus School of Economics (ESE) at the Erasmus University Rotterdam
Internet: http://www.erim.eur.nl

ERIM Electronic Series Portal: http://hdl.handle.net/1765/1

ERIM PhD Series in Research in Management, 330
ERIM reference number: EPS-2014-330-F&A
ISBN 978-90-5892-387-5

Design: B&T Ontwerp en advies www.b-en-t.nl
Cover image:Caspar David Friedrich (1809), *Der Monch am Meer*. Alte Nationalgalerie, Berlin.

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The ink used is produced from renewable resources and alcohol free fountain solution.
Certifications for the paper and the printing production process: Recycle, EU Flower, FSC, ISO14001.
More info: http://www.haveka.nl/greening

Acknowledgements

This dissertation could not have been completed without the support of many people along the way. It is a pleasure to express my gratitude to all of them.

First of all I would like to thank my promoter Gerard Mertens. Gerard, I am very grateful for your enduring commitment to this project. Thank you for the insightful discussions and valuable comments. With your optimism and unique sense of humour, you always managed to boost morale throughout the process.

A special thanks to Peter Roosenboom, my second promoter, to whom I am greatly indebted for his support and guidance. Peter, I cannot thank you enough for your untiring enthusiasm and dedication during this dissertation process. Thank you for always finding the time to provide me with invaluable advice and constructive feedback. I truly enjoyed our numerous discussions about research projects, academia and life in general.

I am grateful to the members of the inner doctoral committee for their time and effort spent on reviewing this dissertation and for providing useful comments: Abe de Jong, Erik Peek and Leo van der Tas. I also thank Frank Hartmann, for encouragement and support.

Over the years, I have been lucky enough to be surrounded by great people. I would like to extent my thanks to all my current and former colleagues at the Department of Accounting & Control and the (former) Department of Financial Management at RSM. Although the road to finalizing my dissertation had some detours, you made it easy to enjoy the scenery. I am grateful for the stimulating and pleasant atmosphere that you created.

My final words of gratitude are for my family, whom I wish to thank for their unconditional love and support.

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Chapter 1 Introduction

1.1 The financial reporting environment

Companies have been reporting financial accounting information to external parties for many years and have done so all over the world. But the particular way in which companies report their financial situation to the outside world differs from country to country and evolves over time. Financial reporting is shaped by the interplay of the parties in society that have an interest in this information, including the preparers (managers of reporting companies) and users of the information, information intermediaries, regulators and auditors. Together, these parties constitute the financial reporting environment. Each of the constituents is briefly introduced below. Section 1.2 describes the forces in the financial reporting environment that are central to the core chapters of this dissertation.

Financial reporting includes financial statements and other forms of communication that provide financial information, such as earnings announcements, analyst presentations, press releases and prospectuses. In market-based economies, financial reporting information is used by external parties for at least two reasons: to evaluate investment opportunities (ex-ante) and to monitor management (ex-post) (Beyer et al., 2010; Christensen and Demski, 2003). The ex-ante demand for this type of information arises from information asymmetry[1] between the outside investors (*users* of the information) and the managers of the company (*preparers* of the information). Information asymmetry exists because managers typically have more information about the company's expected performance than outsiders. If outside capital providers lack credible information to evaluate investment opportunities, an efficient allocation of resources in a market economy is impeded. An important role of financial reporting information is therefore to mitigate information asymmetry and provide information that is useful to assess future cash flow prospects and make investment decisions (valuation role). The second, ex-post role of financial information emerges from agency problems between managers and outside capital providers. Once the investment is made,

[1] The information asymmetry perspective in this section is in line with an extensive body of prior literature, as discussed in review papers by Healy and Palepu (2001) and more recently Beyer et al. (2010). The information asymmetry problem was first described in the economic literature by Akerlof (1970). According to Watts and Zimmerman (1986) it was first applied to accounting information by Gonedes et al. (1976) and Gonedes (1978).

potential conflicts of interest between investor (owner) and management arise. In an attempt to alleviate these problems, investors use financial information to monitor management's behaviour. According to this stewardship role of information, the objective of financial reporting is to facilitate contracting.

Together the two distinct, but related, roles of financial reporting provide an information-based perspective on financial reporting, where investors (users) have information demands and managers (preparers) have incentives to supply financial information. From this point of view, the financial reporting environment is shaped by the extent of information asymmetry and agency problems (Beyer et al., 2010).

In an ideal world, the forces of supply and demand would lead management to voluntarily disclose the optimal level and quality of financial information to capital providers[2]. Nevertheless, in most developed market economies, corporate financial reporting is heavily regulated, including substantial mandatory disclosure requirements. The prevalence of financial reporting regulations across countries is generally explained by existing market imperfections or externalities. For example, in the absence of regulations, there would be a free riders problem (potential investors would use the information that shareholders implicitly pay for) which would lead to an underproduction of financial information (e.g. Watts and Zimmerman, 1986).

Although financial reports have been published for hundreds of years, the *regulation* of these reports is a relatively recent phenomenon. In most developed economies, the regulation of accounting commenced in the early twentieth century, when the separation of ownership and management of business entities was on the rise and the information asymmetry problem emerged. Accounting systems evolved independently in most countries which led to considerable variation among countries. Depending on specific characteristics of the legal system, tax regulation and the financing system, countries developed different regulatory institutions and different accounting rules. By the end of the twentieth century, when capital markets became more and more international, the regulatory diversity was considered to be a problem. A demand arose for international accounting standards, which would facilitate the international comparison of financial information. Currently, the vast majority of countries use some form of international accounting standards rather than domestically developed standards. The rise of international accounting standards, especially during the

[2] This idea is central to the unravelling argument or disclosure principle (attributed to Grossmann, 1981) and Milgrom (1981)). The general spirit of the argument is summarized by Leuz and Wysocki (2008, p.15) as "Firms are expected to voluntarily provide information if there are net benefits to disclosure because they ultimately bear the costs of withholding information." As Beyer et al. (2010) explain, the conditions for the unravelling result do not hold.

past decade, has shaped the assumptions on which financial reports are based as well as their primary objective. The most influential accounting standards in the world, IFRS and US GAAP[3], state objectives in their underlying frameworks that emphasize the central role of corporate reporting for the functioning of an efficient financial market. The main concern is the usefulness of financial reporting information for investment purposes. The international consensus with respect to this decision usefulness approach is an illustration of the influence that regulators have over the shape of financial reports.

In order for the financial reports to be useful they have to be credible. The regulation of financial reports and the use of accounting standards are not sufficient to achieve that. *Auditors* play a key role in this respect. External auditors can provide the outside users of financial reports with independent assurance that the disclosed information is credible. In many countries, public interest companies are required to have their financial statements certified by an independent auditor. Assuming higher quality audits are more costly, companies have an incentive to select an audit firm that provides the optimal level of quality. Understanding this selection process would enhance our understanding of the role that auditors play in the financial information environment.

Finally, *information intermediaries*, such as financial analysts, rating agencies and the financial press, generate new information about business entities and increase their visibility. For example, sell side analysts disseminate the information prepared by companies and provide additional information by means of their reports and recommendations. The role of the financial press as intermediary has not received much attention, although its spreads news from financial reports to the broader public affecting the companies' information environment. But in addition to the informational role, the scrutiny of the press may also have a disciplining effect on company's financial reporting strategy.

From the short description in this section of the forces that shape financial reporting, it may be clear that the financial reporting environment is complex and consists of several

[3] IFRS (International Financial Reporting Standards) are the accounting standards promulgated by an independent private regulatory agency: the International Accounting Standards Board (IASB). These standards are being used at the time of writing by more than 120 countries. US GAAP (the Generally Accepted Accounting Principles of the United States) are the accounting standards that are currently applied in the largest financial market of the world (the U.S.). For years the issuers of both sets of standards have tried to cooperate and to converge the US GAAP and IFRS. Currently, there are many similarities but the remaining differences seem hard to resolve. For example, after years of trying to write a joint conceptual framework for IFRS and US GAAP, the IASB recently decided to continue independently to write its own framework.

interrelated elements, of which some have been researched more than others. This dissertation aims to contribute to our understanding of the financial reporting environment.

1.2 Outline of the thesis

The previous section briefly introduced the main actors in the financial reporting environment: the preparers, users, intermediaries, auditors and regulators. The core of this dissertation consists of three chapters[4] that each focus on a different selection of constituents of the financial reporting environment. This section provides a short introduction to each of the chapters.

Chapter 2 focuses on the users, preparers and intermediaries. More specifically: it investigates the use of a controversial accounting practice by reporting companies and investors (the preparers and users) when this practice is criticized by the press (the intermediaries). In doing so, it addresses the question whether regulation is necessary for the functioning of capital markets even when there are sophisticated information intermediaries. This study is set in the years that a series of accounting scandals occurred, at the beginning of this century. In the U.S., investors' trust was shaken by large scale fraud at high profile companies such as WorldCom and Enron. In response to these scandals, the U.S. regulators decided to take measures and impose additional extensive regulations on financial reporting (SOX and specific SEC regulations). A particular accounting practice that was criticized for being misleading is the disclosure of alternative earnings measures. This was a popular practice both in the U.S. and elsewhere, where companies would report a self-constructed performance measure, usually by excluding certain items from net income (as defined by accounting standards). The financial press accused companies that presented self-constructed earnings measures (rather than using the earnings measures as defined in the accounting standards) of being opportunistic and manipulating investors. In the U.S. the regulators responded to these concerns and part of SOX is dedicated to curtailing the reporting of alternative earnings measures. Several studies investigated these events in the U.S. and report that the use of alternative earnings measures became less misleading under

[4] Chapter 2 of this dissertation is based on a published paper (Koning, Roosenboom and Mertens, 2010). An earlier version of this paper was published in the ERIM Report Series Research in Management (Koning et al., 2007). Chapter 3 and 4 are based on unpublished working papers: Koning, Roosenboom and Mertens (2013a) and Koning, Roosenboom and Mertens (2013b).

the new regulations (e.g. Heflin and Hsu, 2008). But it may be misleading shorthand to conclude that the regulation was effective or even necessary to curtail undesirable reporting practices. The second chapter takes a closer look at this issue by choosing a setting where regulators do not intervene. The setting is the Netherlands in the years 2000-2005, when it faced a similar decline in investor confidence as a result of high profile frauds (most notably Ahold in 2003). Also in the Netherlands, the practice of reporting self-invented earnings measures led to critical newspaper articles, in which the financial press expressed concerns that investors are being misled. But in contrast to the U.S., Dutch regulators did not intervene. The finding that investors' and managers' use of alternative earnings measures alters in the absence of a regulatory intervention in the Dutch setting sheds a different light on the disciplining role of intermediaries versus regulators.

While regulators kept aloof in the second chapter, they are central in the Chapter 3. In this part of the thesis we particularly examine the choices regulators make with respect to mandatory accounting standards. In the past decade we witnessed an unprecedented worldwide shift to one set of accounting standards issued by a private regulatory body: the International Accounting Standards Board (the IASB). At the time of writing, more than 120 countries of various shapes and sizes use International Financial Reporting Standards (IFRS) promulgated by the IASB. The switch to IFRS led to a vast literature investigating the determinants and consequences of IFRS adoption on a company level. Instead, the study presented in chapter 3 focuses on the decisions on a country level, and examines why some countries adopted IFRS when they did. The key benefit of adopting IFRS that has been emphasized by the IASB is increased ability for entities to access capital from international sources. International capital is mobile these days, and governments have incentives to engage in competition for this scarce resource. But the question is if this has really been the driver of the adoption decision for countries with very divers financing needs and infrastructures. Chapter 3 attempts to explain the diffusion pattern of IFRS across globe while allowing for alternative motivations. It applies a framework based on the insights from international relations that distinguishes between four diffusion mechanisms, based on the change that motivated for the policy adoption and the response to the change. The decision to adopt a new policy (IFRS in this case) may be motivated by changes in the expected rewards (changing incentives) or by a change in the perception of the new policy (changing ideas). The response to the change may primarily be driven by the utility of the policy or by the potential effect on the country's international reputation. In a two by two matrix, this constitutes four distinct mechanisms that potentially drive the diffusion of IFRS. In addition to the widely accepted explanation that competition drives the IFRS diffusion, this framework offers three alternative explanations: regulators' decision to adopt IFRS may be driven by coercion, emulation or learning. We attempt to disentangle these mechanisms

empirically and explore the extent to which regulators were motivated by the alternative drivers.

In Chapter 4 the preparers of financial information and the auditors take centre stage. In general, auditors are appointed to provide assurance that the financial statements present a true and fair view of the company's financial position and performance. In the audit literature, it is generally assumed that the services provided by audit firms differ in quality and that larger audit firms offer higher quality. The study in chapter 4 examines the engagement between auditor and client parties at a very special moment in the client's life: at the point that the company is offering (part of) its shares to the public financial market. The issuing company will report its financial position and performance in a prospectus and will select an auditor to certify the prospectus. When a company goes public, information asymmetry is high and disclosing credible information is especially important. Therefore, it is likely that the company will choose its auditor with care. We distinguish between the choice of an audit quality level and the switch to another audit quality level prior to the IPO. We study this selection process in the setting of U.K. initial public offering (IPO's) because of a combination of specific institutional circumstances. Most notably, companies in the U.K. have more to choose from at the audit market as the Big 4 audit firms are slightly less dominant compared to other for instance the U.S. In this setting, we explore why some IPO firms would choose a big audit firm while other prefer a medium size or even small audit firm. In addition, we explore if and how the selection of an audit firm of a specific quality level matters for the pricing of the IPO.

Chapter 5 summarizes the main findings of the studies presented and concludes.

Chapter 2

The impact of media attention on the use of alternative earnings measures[5]

2.1 Introduction

One of the controversial areas in financial reporting that received considerable media attention is the disclosure of self-constructed earnings measures. Regulators such as financial market authorities and accounting standard setters repeatedly expressed their worries about the possibly misleading use of financial information that does not comply with generally accepted accounting principles (GAAP), i.e. non-GAAP measures. In the U.S., the Sarbanes-Oxley Act (SOX) of 2002 and pursuant SEC regulation have addressed the practice of non-GAAP reporting, allowing it only under strict conditions. Several U.S. studies report that non-GAAP regulation seems to be effective, in the sense that the reporting practices became less opportunistic (e.g. Heflin and Hsu, 2008). Additionally, investors act as if non-GAAP information is more informative after the SEC regulation (Marques, 2006). Still, the reporting environment changed in various ways, regulatory changes being only one factor.

This study focuses on the influence of media attention on both firms' reporting behaviour and investors' response to the reported information. It is argued that media attention directed at allegedly misleading non-GAAP information has increased awareness of the use or potential abuse of these alternative earnings measures and has had a substantial influence on the behaviour of companies and investors. To study the impact of the media in the U.S. is difficult, since all listed companies are affected post- Enron by substantial new regulation. This would create the problem of disentangling the effect of regulation from the

[5] This chapter is based on Koning, M., Roosenboom, P.G.J. & Mertens, G.M.H. (2010 published in *Abacus*). An earlier version of this paper was published in the ERIM Report Series Research in Management (Koning et al., 2007).

effect of media attention. We circumvent this problem by exploring non-GAAP reporting in the setting of the Dutch financial market. The practice of non-GAAP reporting also induced a sharp debate in the media in the Netherlands[6], however in this case regulators and policy makers did not respond with additional regulation similar to SOX in the U.S. Hence, the Netherlands allows study of reporting practices and, more specifically, the use of non-GAAP earnings measures of publicly listed companies in an environment of changing public opinions and negative media attention.

The contribution to the literature is threefold. First and most important is the contribution to the debate concerning the effectiveness of regulation in general and SOX more specifically. SOX has been criticized for being a hasty overreaction to corporate scandals, imposing substantial costs on companies without compelling evidence that this would create economic benefits (Romano, 2005). This assumes that financial regulation should be based on scientific evidence, an argument that was made more explicitly by Buijink (2006). Recent papers have tried to fill this gap and investigate the effect of SOX by comparing financial reporting before and after the Act became effective (Bartov and Cohen, 2007; Cohen, et al., 2008; Kolev, et al., 2008; Marques, 2006). However, these studies inevitably suffer from the problem that the effect of SOX cannot be isolated and that other factors may have caused the observed changes in financial reporting (Coates, 2007; Leuz, 2007). Our paper employs a different institutional setting, i.e. the Netherlands, to provide evidence on how companies and investors change their behaviour in the absence of such a regulatory shock.

Second, the study adds to the growing literature on the effects of media on financial markets. While other studies try to infer the effect of company specific media coverage on stock prices (Dyck and Zingales, 2003) or on corporate governance characteristics (Dyck, et al., 2008; Joe, et al., 2009), we focus on the effect of media coverage on financial reporting practices.

Third, we provide additional evidence on the use of alternative earnings measures. Recent studies have examined the use of non-GAAP measures as reported in earnings releases in the United States (Bhattacharya et al., 2003; Bowen et al., 2005; Lougee and Marquardt, 2004). A vast majority of the international accounting literature stresses the importance of institutional factors and market forces in shaping management's incentives to report informative earnings measures (Ball et al., 2003). To our knowledge, no research has

[6] For example, the speech delivered by jury-member Erik van der Merwe at the presentation of the Henri Sijthoff award, an influential annual award for the best corporate financial report for Dutch listed companies, was very critical towards the growing popularity of self-constructed earnings measures (Het Financieele Dagblad, 14 October 2002)

been conducted on the use of alternative earnings measures outside the United States and Canada.

Evidence is reported here that the practice of reporting non-GAAP earnings measures in earnings press releases published during 2000-April 2005 is popular in the less regulated reporting environment of the Netherlands. First, analysis of the financial reporting environment during the sample period reveals a dynamic environment that leads to increased negative attention from the media for non-GAAP reporting. We then measure the popularity of non-GAAP reporting in terms of reporting frequency and prominence. The reporting behaviour is found to change after a peak in negative media attention. Although non-GAAP earnings measures are reported frequently after a peak in negative media attention, the motivation to report these measures seems to have changed. The majority of firms that reported non-GAAP earnings before 2003 stop thereafter. The companies that initiate or continue to report non-GAAP in 2003 and after are more strongly motivated by opportunistic motivations (loss avoidance or meeting analyst's forecasts). In other words, companies stop reporting non-GAAP measures after negative media attention unless the expected benefits of non-GAAP reporting are higher. On the other hand, the difference between reported non-GAAP and GAAP earnings is smaller in 2003 and after. From these results one can infer that companies' reporting behaviour is affected by media pressure, even without regulatory intervention. The effect is stronger for companies whose non-GAAP reporting practices were specifically criticized in the press.

Next the focus shifts to the investors' use of non-GAAP information as a basis for their decisions. The association between abnormal returns and non-GAAP earnings as well as GAAP earnings is investigated. We identify the development of the informativeness over time and find that the appreciation of non-GAAP information has changed. Prior to 2003 investors seem to price non-GAAP earnings rather than operating earnings as defined under GAAP. Starting 2003, the situation changes, as investors seem to turn away from non-GAAP measures and start to price GAAP operating earnings instead. GAAP bottom-line earnings are informative throughout the entire period. Overall, in the period from January 2003 to June 2005 investors seem to turn away from non-GAAP information after a peak in negative media attention.

The empirical results support the conjecture that the use of financial reporting information can change in the absence of any regulatory intervention. Investors' perception of specific reporting practices is shown to change after the public debate, and more specific, media attention. Arguably, investors that become more aware of the possibly negative aspects of certain non-GAAP earnings measures ignore these disclosures in their decision making. At the same time, media attention seems to affect firms' reporting behaviour, in particular those companies that were the subject of a critical newspaper article. Although

overall the frequency and prominence with which non-GAAP measures are reported increases, companies seem to have different reasons to report non-GAAP earnings after a period of increased negative media attention. It seems investors are careful in the absence of regulation and ignore reported information that may not be reliable. Regulation may not be necessary to protect investors against confusing or misleading reporting practices when investors are aware. Nevertheless, regulation may restore the credibility, at least to some extent, of reporting practices that were publicly criticized, as some U.S. findings for non-GAAP reporting seem to suggest (e.g. Marques 2006, Kolev et al., 2008). For companies, cost-benefit comparisons of reporting non-GAAP measures are different in a regulated or non-regulated situation. These findings are particularly relevant for standard setters, policy makers and financial market participants, since the debate on optimal level of regulation is on a new high.

2.2 Literature review

The effectiveness of regulation

The effectiveness and desirability of regulation of financial markets has long been debated (e.g. Stigler, 1964; Benston, 1973). In the aftermath of recent corporate scandals, regulators imposed far-reaching regulation on financial markets to restore investors' trust. These new regulations, such as the Sarbanes-Oxley law of 2002, evoked the discussion on the effectiveness of regulation and led to several academic studies discussing the costs and benefits of SOX (e.g. Romano, 2005; Coates, 2007; Leuz, 2007).

The effects of SEC interventions concerning non-GAAP reporting have been investigated in a number of studies. Looking at firms' reporting behaviour, Marques (2006) and Heflin and Hsu (2008) find that non-GAAP reporting decreases significantly after SEC intervention. Entwistle et al. (2006) also find that the number of firms reporting non-GAAP information after the introduction of SEC regulation declines sharply. They also report that the reported non-GAAP information is less biased and presented less prominently after the SEC regulation. Kolev et al. (2008) find that after SEC intervention the predictive ability of the exclusions from GAAP earnings improves. Companies that stop reporting non-GAAP information had significantly lower quality exclusions in the period before SEC intervention, which suggests that SEC intervention caused the more opportunistic non-GAAP reporters to stop.

These results seem to suggest that SEC regulation was effective in the sense that non-GAAP reporting became less opportunistic. On the other hand, the decreasing frequency of non-GAAP reporting may also imply that some informative reporters stopped publishing non-GAAP measures (Marques, 2006; Heflin and Hsu, 2008). Similarly, Kolev et al. (2008)

report evidence of unintended negative consequences. When exclusions are specified and split into special items and other exclusions, they find that the quality of reported special items deteriorates after SOX. They interpret their results as evidence that managers adapt to the stricter regulation by replacing opportunistic non-GAAP reporting with accounts manipulation[7] through the use of special items.

Besides companies' reporting behaviour, investors' reaction to non-GAAP information has been analysed as well. Investors' response to non-GAAP measures has been compared to the response to GAAP earnings in several studies. Based on actual press releases, investors were revealed to find non-GAAP earnings more informative, more persistent and cause stronger revisions to analysts' beliefs than GAAP earnings (Bhattacharya et al., 2003, Lougee and Marquard, 2004). This evidence suggests that the 'flexible' non-GAAP reporting leads to information that investors find useful.

A number of studies have analysed investors' reactions to non-GAAP information before and after the implementation of SOX and Regulation G. For example, Heflin and Hsu (2008) find a decline in the reaction of investors to forecast errors after the implementation of Regulation G. On the other hand, Marques (2006) reports that investors react more positively to non-GAAP disclosures after the regulation became effective. She suggests the findings may be explained by SEC Regulation increasing the credibility of non-GAAP disclosures.

Taken together, the U.S. evidence suggests that SEC regulation has influenced the use of non-GAAP disclosures, but that there may also be unintended consequences that effectively decrease the quality of reported financial information. Moreover, studies that examine the effectiveness of regulation face the problem of contemporaneous changes in the reporting environment. Our research design addresses precisely that issue, asking what would happen in the absence of additional regulation. First the reporting environment is analysed, identifying media attention for non-GAAP reporting as a changing characteristic that has likely influenced companies and investors.

Media attention

Negative media attention for non-GAAP disclosures is assumed to have changed the reporting environment. This section of the paper deals with the theoretical underpinning of the effect of media attention on regulators, companies and investors.

[7] 'Manipulation' here refers to the practice of deliberately reporting recurring items as non-recurring, as reported by Kolev et al. (2008) in order to arrive at more favourable (non-GAAP) earnings. This practice would explain their finding that the quality of special items decreased following SEC intervention.

Intuitively media attention is likely to influence financial market institutions and regulators. This notion is supported by the institutional crisis literature in political science. Research in political science strongly suggests that policy makers are more responsive to public pressure when the issue is more salient. (e.g. Burstein, 2003; Page and Shapiro, 1983; Monroe, 1998). The financial scandals, the backdrop of the non-GAAP reporting discussion, attracted substantial media attention and yielded several salient stories. Public pressure sustained by media attention can 'force' institutions to respond in order to restore confidence (e.g. Lodge and Hood, 2002; Boin and 't Hart, 2000). According to the literature, regulators can respond to institutional crises by radical departures from the status quo or by a more conservative adaptive strategy. In the U.S., the SEC responded with a radical reform of the financial regulations. In the Netherlands, institutions tried to reinforce the existing regulations by pointing out the importance of the existing regulation and the definition of net income. Framed in this literature, the U.S. and the Netherlands represent two alternative responses to public pressure sustained by media attention.

Other studies show that companies adjust their behaviour in reaction to media attention. For example, Dyck et al. (2008) find that press coverage increases the probability of companies taking action to improve corporate governance. Joe et al. (2009) explore the impact of Business Week's publication of the worst corporate board officers and find that companies are inclined to enhance their corporate governance after negative media coverage and change their financial reporting strategy. On the other hand, Core et al. (2008) find no evidence that negative press coverage influences executive compensation.

Press coverage can also impact investors' trading decisions. An early study by Foster (1979) analyses the effect of the critical articles by the iconoclastic accounting critic Abe Briloff. Foster (1979) finds an average drop in price of 8% for companies whose accounting practices are criticised by Briloff. Brown et al. (2009) adopt a similar approach examining the impact of a leading Australian financial journalist, Trevor Sykes. Dyck and Zingales (2003) find that stock prices react most to the earnings metric that is emphasized by the press. In their study to the effect of Business Week's list of worst board members, Joe et al. (2009) find that individual investors overreact to this negative media coverage.

The empirical evidence from previous research on the effect of media coverage is based on press coverage of individual companies. This media attention is likely to change the reporting behaviour of managers. As Dyck et al. (2008) suggest, the influence of media attention on manager's behaviour works through reputation based mechanisms. This relation is probably stronger in case of company specific media attention[8]. Investors' decisions are influenced by the media because they can provide credibility (Dyck and Zingales, 2003).

[8] For example, when a company's name is in the heading of a newspaper article on specific financial reporting practices, the company may be more inclined to respond than when its name is not mentioned at all.

Conversely, media attention can also destroy credibility. Mercer (2004) identifies the level of external assurance as one of the four factors influencing disclosure credibility. Although the evidence is largely anecdotal, the opinions expressed in the financial press can provide this external assurance to investors. Similarly, negative media attention for certain disclosure practices will harm the credibility of that information and make it less useful for economic decisions. Building on this literature, we argue that the media attention for the misuse of non-GAAP information created more awareness and consequently influenced the behaviour of companies as well as investors.

2.3 The changing environment of non-GAAP reporting

Changing regulation is only one aspect that may influence the disclosure choices and the use of financial information. This is illustrated by considering changes in the financial reporting environment that relate to the use of non-GAAP metrics.

Most notably, during the period of interest the first major accounting scandals in both the U.S (Enron in 2001) and the Netherlands (Royal Ahold early 2003) were revealed. Partly in response to these causes celebres and alleged fraudulent practices, regulators issued several statements that directly implicated the practice of reporting non-GAAP information. Since the financial reporting environment is important for our analysis, developments are described in some more detail.

In the Netherlands, the Dutch Accounting Standards Board (the DASB[9]) noted that Dutch companies were reporting non-GAAP[10] earnings measures in financial reports more frequently. In the 2002 edition of the DASB guidelines, the DASB addresses this issue in the introduction. The increased frequency with which companies report EBITA and EBITDA in the income statement worries the DASB. In that same introduction, they state explicitly that reporting EBITA or EBITDA within the income statement is incompatible with the law and that those measures can only be reported in the notes to the financial statements. This is because neither EBITA nor EBITDA fits into the prescribed formats of the income statement. Interestingly, the DASB does not include any guidelines as to how

[9] From June 2005, the Raad voor de Jaarverslaggeving uses the name Dutch Accounting Standards Board internationally. Before that, the English name was Council for Annual Reporting (CAR). We use the current name.

[10] In the Netherlands, the term generally accepted accounting principles (GAAP) is not defined formally. Instead, the accounting practice is based on the law, the body of case law and guidelines as set by the DASB. Together, the regulation from these three sources is referred to as Dutch accounting rules.

these measures should be reported or disclosed outside the income statement[11]. It therefore seems that the DASB was primarily concerned with the application of the prescribed formats of the financial statements. So, contrary to SOX and Regulation G, the DASB communication is not induced by accounting scandals or alleged opportunistic use of non-GAAP measures. The DASB announcement is an affirmation of existing legislation rather than a change in regulation. Moreover, the affirmation leaves the publication of non-GAAP measures outside the income statement completely free, so it does not affect financial information in press releases or earnings announcements. Nevertheless, the DASB gave a clear signal that any earnings measure that does not fit in the prescribed format of the income statement is a deviation from GAAP.

The emergence of EBITA and EBITDA in the Netherlands coincides with changes in international standards on goodwill reporting. Following similar developments in the U.S., in 2001 a new accounting directive by the DASB became effective that required goodwill to be capitalised and amortised. Before 2001, it was allowed to set off acquired goodwill against retained earnings. This new accounting standard was anticipated for some time already and many companies had adopted this goodwill treatment before the standard became effective[12]. On the other hand, even after 2001 there were a small number of companies that ignored the accounting guideline and continued to record acquired goodwill against equity. [13] Anecdotal evidence suggests that among companies that did capitalize

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[11] Comparing this to Australia, one sees a similar approach during the period of interest. Before 2005, there were no specific guidelines for pro forma reporting. In July 2005, the Australian Securities and Investments Commission (ASIC) issued a proposal for specific guidelines for pro forma disclosures (ASIC, Disclosing pro forma financial information; Consultation Paper 69, July 2005). In this proposal, the ASIC interprets the Corporations Act 2001 in order to reveal the specific restrictions on the use of pro forma information imposed by law. According to the act, pro forma financial information may be included in a financial report, but not as part of the financial statements as the statements must comply with specific requirements of the Australian Accounting Standards Board (AASB). Effectively this means that pro forma information can only be reported in the disclosures. The requirement in s295(3) that the additional information needs to be necessary for a true and fair view, seems to be more strict than the Dutch regulations.

[12] Descriptive evidence of goodwill accounting in the Netherlands can be found in several articles in MAB (Maandblad voor Accountancy en Bedrijfseconomie), for example Hoogendoorn, M.N., "Goodwill to amortize or not to amortize" (Goodwill: : afschrijven of niet afschrijven), MAB February 2002.

[13] Dutch law still allowed this accounting procedure, so for a while legislation and guidelines were not aligned. Contrary to some countries (like Australia) DASB's accounting guidelines, however, are not legally enforceable. Moreover, the Dutch law had not been aligned, causing the DASB directives to be inconsistent with the legal requirements. Because of this situation, some companies chose to ignore the guidelines.

goodwill, reporting earnings before interest, taxes, depreciation and amortization (EBITDA) became popular. This non-GAAP earnings measure allowed them to avoid the negative effect of goodwill amortization on net earnings. In the U.S., reporting EBITDA or similar earnings measures was already widespread by that time. The SEC issued a warning in 2001, with the intent to caution companies on their reporting of non-GAAP measures and to call the dangers of these measures to the attention of investors.

Following the Sarbanes-Oxley law of November 2002, the SEC established rules to regulate the disclosure of non-GAAP financial measures. Early 2003, the SEC reduced the flexibility in non-GAAP reporting considerably with the passing of Regulation G. This rule requires all publicly disclosed non-GAAP information to be reconciled with GAAP information. Furthermore, management has to explain why the non-GAAP information is relevant for investors. In addition, the GAAP information must be presented with the same prominence as the non-GAAP information. Besides the costly expanded disclosures that are required under Regulation G, management is also exposed to the risk of litigation if the requirements are not met.

In 2004, the Dutch professional accountants and auditors organization, Royal NIVRA[14] investigated the annual statements of listed companies for the years 2002 and 2003 and found that alternative measures such as EBITDA are reported frequently[15]. In a research report by the Dutch Financial Market Authority (AFM), the various earnings measures reported in the annual reports over 2002 from 50 Dutch listed companies are criticized[16]. Early 2004, the AFM issued a press release to urge companies to adhere to guidelines that were very similar to Regulation G[17]. Royal NIVRA pressed external auditors and their clients that GAAP net income should be paramount in financial reports and that exotic

14 NIVRA is the abbreviation of Netherlands Institute of Registeraccountants. Registeraccountant is a legally protected title, comparable to Certified Public Accountant in the US or Chartered Accountant in Australia.

15 See Hooghiemstra and Van der Tas, "Reporting Financial Performance" (Rapportering over financial performance), in: Backhuijs, R.G. Bosman and Knoops, Het jaar 2002 verslagen. Onderzoek jaarverslaggeving Nederlandse ondernemingen, Kluwer/Koninklijk NIVRA , 2003, and Hooghiemstra and Van der Tas, "Disclosure on performance indicators "(Informatieverschaffing over prestatie-indicatoren), in: Backhuijs et al., Het jaar 2003 verslagen. Onderzoek jaarverslaggeving Nederlandse ondernemingen, Kluwer/Koninklijk NIVRA, 2004.

16 See "AFM critical towards the quality of annual reports" ("AFM kritisch over kwaliteit jaarverslagen" Het Financieele Dagblad, 5 December 2003)

17 "Non Gaap Earnings measures", press release published by the AFM, 17 February 2004

alternative measures should be banned.[18] Audit firms argued that financial disclosures in press releases should be regulated similarly to SOX[19]. Despite this discussion, no specific regulation was issued to address the issue.

To summarize, the reporting of non-GAAP measures has led to discussions both in the U.S and the Netherlands. Although faced with a similar challenge, the response of regulators in the Netherlands has been fundamentally different in comparison to the U.S. In contrast to the SEC, Dutch regulatory agencies such as the DASB and the AFM did not issue any specific rules for the disclosure of non-GAAP information in press releases. They did affirm the existing rules and legislation, stressing the importance of GAAP earnings. In the terminology of the institutional crisis literature, the Dutch regulators' response was 'light' -conservative adaptive-, while the U.S. regulators demonstrated a more 'heavy' radical approach. Overall, the Dutch environment of non-GAAP reporting is characterised by the absence of specific regulation directed at banning opportunistic non-GAAP earnings reporting practices in combination with negative attention from regulators and media. Nonetheless, there was substantial discussion about the practice of publishing non-GAAP earnings, warning against misleading and confusing use of alternative measures and advocating rehabilitation of GAAP net income. This provides a unique opportunity to explore whether the financial reporting practices and investors' response change without regulatory intervention.

Earnings debate in the Dutch press

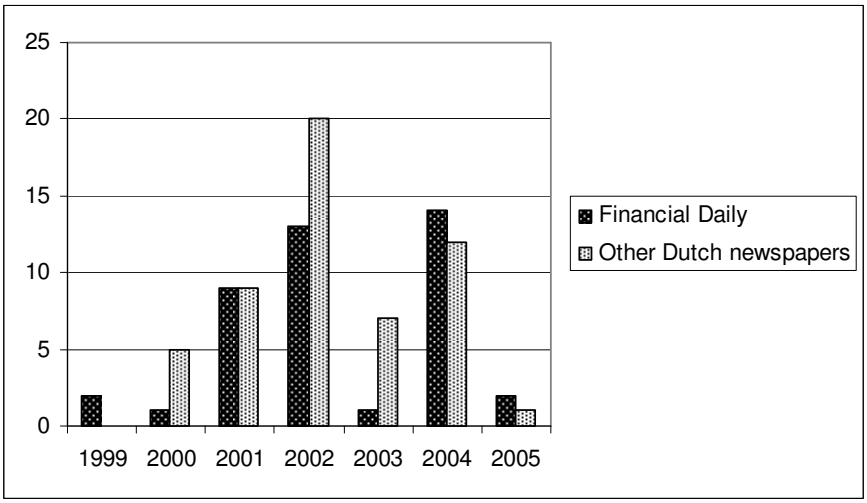
Similar to the U.S. debate, the Dutch discussion on the use of alternative earnings measures was taking place in the media. It was not until late 2003 that financial market institutions (NIVRA, AFM and the DASB) started to participate in the discussion. Several other articles in Dutch newspapers had already warned against the use of alternative earnings measures[20]. In order to get a more comprehensive picture of the media attention surrounding non-GAAP reporting, a search was performed in all Dutch written newspapers in the years 1999-2005 as available in Lexis Nexis. As already explained, media attention is expected to influence behaviour of financial market participants (i.e. companies and investors). Newspaper coverage is used as a proxy for media attention. Articles that specifically cover the earnings-

18 "NIVRA demands rehabilitation of original net earnings" (NIVRA eist eerherstel oud winstbegrip, Het Financieele Dagblad, 14 January 2004)

19 "Ebitda taboo in press releases" (Ebitda taboe in persberichten, Het Financieele Dagblad, 23 February 2004).

20 The discussion, although rather technical, reached the non-financial press as well. See for example "Five lessons from Enron's bankruptcy " (Vijf lessen uit het bankroet van Enron, De Volkskrant, 19 January 2002) and "An earnings measure for every company" (Elke onderneming een eigen winstbegrip, De Volkskrant, 14 May 2002)

Figure 2.1
Earnings debate in Dutch press



Earnings debate in the Dutch press. The number of newspaper articles that appeared in Dutch newspapers from 1999-2005 that focused primarily on the arguments for and against different earnings definitions

measures debate were searched. These articles typically point out that earnings are a hybrid concept that can be calculated in various ways and that this may lead to confusion`. We use several text string[21] searches in order to capture all the newspaper articles published on the subject. For each article, we determine if the central message deals with the earnings debate. For example, articles are removed that discuss the earnings announcement of a specific company and mention the use of non-GAAP earnings metrics in the context of that announcement.

[21] We use variations of 'alternative' or a synonym in combination with 'definition of earnings' (in Dutch: "winstbegrip") or similar wordings. A second search uses Ebitda (and variations) in combination with a financial market institution (DASB, AFM, NIVRA) or references to financial reporting (financial statements, annual report etc.) Together, we use 32 search words in different combinations.

This yields a total of 96 newspaper articles of which 42 were published in the Dutch financial newspaper Het Financieele Dagblad[22] (The Financial Daily). The articles published in the financial newspaper as well as the press in general all had a rather critical tone, warning against misleading reporting practices. As reproduced in Figure 2.1, the flow of articles seems to build up to a peak in 2002, after which the number decreases again.

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Roughly one third (33 of 96) of the newspapers articles concerning the discussion of earnings measures were published in 2002. In 2004, another spike in the interest in the earnings debate occurred. This time, the attention was motivated by concurrent statements of AFM and Royal NIVRA. Companies and their auditors were called upon to adhere to GAAP earnings as the most important earnings measure and to refrain from confusing non-GAAP measures. This led to an extensive debate in the newspapers in January and February of 2004 (17 of the 26 articles of 2004). The statements by the AFM and Royal NIVRA may be considered evidence of the influence of media attention on regulators. Arguably as a result of the negative press of non-GAAP measures regulators had to respond and issued a statement. Regulators reaffirmed the existing rules and regulations, which qualifies as an adaptive conservative response in terms of the institutional crises literature (Boin and 't Hart, 2000).

The spread of the newspaper coverage supports the notion that 2002 is an important year in the earnings debate examined here. In the year where accounting was front-page news, substantial attention was paid to more technical topics such as alternative earnings measures. This set the spotlight on misleading reporting practices of non-GAAP earnings measures. During the first years of our sample (2000-2002) the negative attention for the use of non-GAAP earnings measures increased. 2002 is the most important year in this discussion, as the media were focused on accounting scandals after the Enron fraud and several scandals that were revealed in 2002 (e.g. WorldCom, Tyco, Qwest). Moreover, in 2002 the legislation concerning the use of non-GAAP information in the U.S. became effective. Two periods are distinguished in our sample based on the peak in negative media attention in 2002 (as depicted in Figure 2.1): the period before 2003, and the period 2003

[22] The Financial Daily is the only financial newspaper in the Netherlands and targets a very specific audience. The impact of the coverage of a specific topic in the Financial Daily is therefore very different from the impact of other newspapers. While the Financial Daily indicates the interest of the financial professionals, the coverage by other newspapers may reflect the impact on the public opinion. In order for a rather technical topic such as non-GAAP reporting to have an impact, it has to be forced out of its usual niche. We hypothesize that media attention is a proxy for public pressure, which is measured more accurately by the coverage of the general newspapers. Based on these arguments, the distinction between the Financial Daily and the general newspapers is functional.

and after. In other words, the sample is divided between press releases that were issued before and after 1 January 2003. This permits analysis of the (1) non-GAAP reporting behaviour by companies (2) investors' responses to GAAP and non-GAAP earnings measures before and after negative media attention.

2.4 Sample selection

The quarterly earnings announcements were retrieved from the companies' websites in order to obtain the earnings release in its original format. Under Dutch regulation, only (half-) year reports are compulsory, but the majority of the companies voluntarily publish quarterly earnings releases.

Non-GAAP measures were collected from original earnings releases for the primary sample. This offers some advantages. For example, it leads to more accurate information on the reporting behaviour of companies. Adjustments to GAAP earnings made by analysts are not necessarily the same as those reported by firms in their press releases. When compared, non-GAAP earnings as reported in press releases on average differ significantly from the street earnings reported by analysts (Bhattacharya et al. (2003), Marques (2006)). A more practical reason for using press releases is that analysts' street earnings are not readily available given that analyst databases such IBES have only limited coverage on Dutch companies.

The Dutch capital market is relatively small, allowing us to collect all earnings press releases of the large and midcap listed companies, and determine whether they report non-GAAP earnings measures or not. This provides a more comprehensive picture of reporting practices in earnings announcements. Prior studies with U.S. data used text searches in order to collect a sample of non-GAAP reporting companies (f.e. Bhattacharya et al., 2003, Lougee and Marquardt, 2004). This way, only the earnings releases with the ex ante defined non-GAAP measures can be selected, which may lead to self-selection problems.

Quarterly, half-year and annual earnings release data are hand collected for (large- and midcap) companies that were listed at Euronext Amsterdam indexes, issued between 2000 and April 2005[23]. In line with prior research, all the collected earnings release data is referred to as firm-quarters, even for companies that report semi-annually.

[23] The collected press releases concern reporting quarters from the fourth quarter of 1999 up to and including the fourth quarter of 2004. For the purpose of our analyses, we classify the earnings releases depending on the year in which they were published.

Table 2.1
Sample selection

Companies listed AEX/AMX 1999-2004		70
No press releases available	[a]	14
		56
Theoretical initial sample	[b]	1,176
Archive starts later than the 4th quarter 1999		188
Not reported 1st and 3rd quarters for firms that report semi-annually	[c]	189
		799
Missing release		33
Sample for descriptive analysis		**766**
No data for four quarters earlier (q-4)		215
Insufficient data to estimate market model		6
Final sample		**545**

[a] The following firms are removed from the list (necessary data not available, often merger-related): ASR Verzekeringen, Baan, Cap Gemini, CMG, Endemol, Gucci, KPN Qwest, Libertel, Pakhoed, PinkRoccade, Rodamco Asia, UPC, Vodafone Libertel and Volker Wessels.

[b] 21 quarters of 56 companies would lead to a maximum of 1,176 earnings releases

[c] Listed companies at the Amsterdam Stock Exchange are not required to report quarterly but semi-annually. Therefore in the first and in the third quarter a number of companies do not report earnings

The analyses in the following sections are based on different samples. The initial sample consists of 766 earnings releases, reported in 21 different quarters for a total of 56 companies. The descriptive evidence of the reporting behaviour of companies is based on the full sample of 766 earnings releases. Analyst data is only available for a subset of 143 firm quarters. For the analysis of the use of non-GAAP earnings by investors, the sample size is smaller due to data requirements. As set out in Table 2.1, data required to examine market reactions are only available for 545 press releases. Therefore our analyses of the response to the different earnings measures are based on 545 press releases.

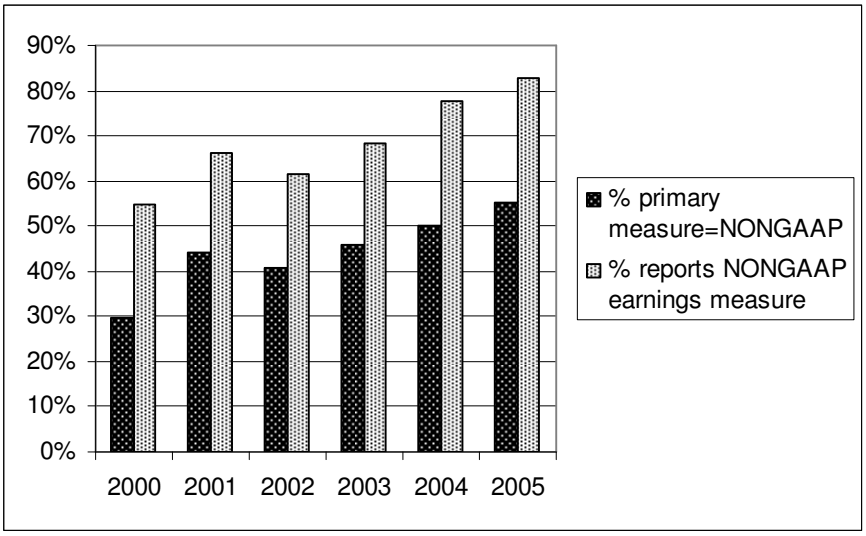
For each of the firm-quarters, earnings releases are read and coded and the reported earnings measures are listed. The non-GAAP earnings measure that is reported first in the earnings release was the focus. Our assumption is that this is the non-GAAP measure that management wants to put emphasis on. An earnings metric is defined to be non-GAAP if the measure is not defined under Dutch regulation. Under Dutch law, the presentation format of the profit and loss account is prescribed.[24] The Dutch standard setter DASB has emphasized in 2001 that the prescribed formats should not be altered in order to present measures such as EBITA or EBITDA as a subtotal. Accordingly, measures that do not fit in the prescribed models of the profit and loss account are considered to be non-GAAP.
In contrast, GAAP earnings are defined as either bottom-line earnings or a recognized subtotal of the profit and loss account not in violation with the prescribed model, such as earnings before extraordinary items. Within these GAAP measures, we distinguish operating result from bottom-line earnings. Proponents of non-GAAP measures claim that these adjusted GAAP measures provide more insight into a company's permanent earnings by excluding transitory items. This can result in non-GAAP measures referred to as adjusted bottom-line measures or adjusted operating measures, depending on the items that management considers to be transitory. In order to compare the information content of the different measures we need both operating GAAP and bottom-line GAAP.

2.5 The non-GAAP reporting behaviour of companies

The frequency and prominence of non-GAAP reporting by Dutch companies is examined first. From the descriptive evidence, we draw some tentative conclusions about companies' motivations. One motivation may be that the underlying economics or the accounting standards have changed. This possibility is explored in the second paragraph, where we analyze the items that are excluded from GAAP earnings to arrive at the reported non-GAAP measure. Finally, to get a more profound understanding of the factors that drive non-GAAP reporting, the likelihood of companies emphasizing non-GAAP earnings in their announcement is analyzed by means of a logit model.

[24] In Dutch referred to as 'Modellenbesluit'. This means that every line item is defined and all line items should appear in a pre-specified sequence.

Figure 2.2
Frequency of non-GAAP reporting 2000-2005



Frequency (relative to the total number of press releases in our sample for the year) of press releases containing a non-GAAP measure and frequency of non-GAAP earnings metrics reported as the first earnings measure (primary measure) in the year of publication.

The frequency and prominence of non-GAAP reporting

To begin, an exploratory analysis is undertaken of the way Dutch companies report non-GAAP measures in their earnings press releases. The popularity of earnings measures in both the frequency and the prominence with which they are reported is observed. Of the initial sample of 766 earnings releases, 523 (68%) contain at least one non-GAAP earnings measure. The companies that report these self-constructed measures present them prominently in their earnings press releases: in 341 firm quarters, a non-GAAP earnings measure is emphasized by reporting it before GAAP earnings (45% of the total sample, 65% of the non-GAAP releases). Figure 2.2 graphically illustrates the development of non-GAAP reporting over time. The frequency of reporting non-GAAP measures increases steadily over the period 2000-2005 (from 55% to 83%). Furthermore, non-GAAP earnings are reported more often as the first and therefore primary earnings measure. In 2005 55% of the press releases publish a non-GAAP measure first, as compared to 30% in 2000. Based on

this we conclude that the popularity of non-GAAP reporting has persisted in a period of negative media attention, even increasing after the turbulent year 2002.

In order to uncover the motivation for non-GAAP reporting, we analyse if the non-GAAP measures are used (more or less) opportunistically. For example, if companies report non-GAAP to mislead investors, one would expect the non-GAAP measures to be more positive than the GAAP measures. A simple way to measure this is to compare the frequency of non-GAAP profits to the frequency of GAAP profits in our sample. In the initial sample of 766 press releases, 93% of the reported non-GAAP earnings measures are a profit, compared to 77% of GAAP bottom-line earnings or 78% of GAAP operating earnings. On average, non-GAAP measures present a more favourable view of a firm's financial performance. For companies in the U.S., similar results have been reported[25].

Another reason why companies report non-GAAP measures is to meet analyst forecasts. We therefore collect median and average analyst forecasts from the IBES database. Not all firms are covered by IBES and therefore sample size is reduced. In 54 cases firms do not meet median analyst forecasts with GAAP earnings. However, in 41 out of 54 cases (76%) firms do meet median analyst forecasts with non-GAAP earnings. Using average analyst forecasts this number equals 40 (75%) out of 53 cases. In 121 quarters with loss according to GAAP earnings, only 32 (26.4%) report losses under non-GAAP earnings. This is consistent with managers using non-GAAP earnings to avoid having to report a loss or to miss an analyst forecasts under GAAP earnings.

At first glance, the growing popularity of non-GAAP reporting suggests that companies are not influenced by negative media attention and possibly increased investor scepticism. However, on closer inspection, one finds that only 9 (41%) out of the 22 firms that reported non-GAAP measures at least once before the 2003, continued to report a non-GAAP earnings measure at least once in 2003 or later years. The majority of 13 firms (59%) discontinue reporting non-GAAP earnings (10 firms stop reporting non-GAAP earnings at one point in 2003 or after and 3 firms before 2003). This is consistent with managers changing their behaviour after negative media attention that previously went unnoticed in our analysis. At the same time, there are also 13 firms that report non-GAAP earnings for the first time in 2003 or after. This explains why overall we do not observe a decrease in the number of non-GAAP reporters. Although the number of companies that report non-GAAP

[25] Bhattacharya et al. (2003) report 66% pro forma profits compared to 52% GAAP operating earnings profits. Although a direct comparison with our results is difficult because of differences in research design (for example different sample selection), it seems that non-GAAP disclosures are at least as favourable in the Netherlands as they are in the U.S.

measures at least once remains stable in the period before 2003 as compared to the years 2003 and after, it is a different group of companies. Given the increased frequency with which non-GAAP measures are reported over time, it seems the companies that report non-GAAP in 2003 or after do so in more quarters.

The subset of firms that report non-GAAP earnings in 2003 or later therefore is a mix of 9 companies that already reported non-GAAP earnings before 2003 and 13 new non-GAAP reporters in 2003 and later years. This raises the question why firms start or continue to report non-GAAP earnings. Firms that newly adopt non-GAAP reporting in 2003 and thereafter must see offsetting benefits in the additional disclosure (especially after the negative media attention on non-GAAP reporting). The same argument applies to the firms that already reported before 2003 and continue to do so afterwards.

In sum, the descriptive evidence presented in this subsection reveals that non-GAAP measures as compared to GAAP measures are on average more positive and avoid reporting a loss or missing an analyst forecast more often. Although the proportion of earnings announcements containing non-GAAP earnings measures increases and these measures are reported more prominently, the composition of the group of non-GAAP reporters changes over time. In the next subsection, we explore non-GAAP reporting behaviour in more detail by examining the nature of the adjustments companies made.

Specific exclusions from GAAP earnings

In order to understand the underlying reasons that companies have to report a certain adjusted earnings measure, we take a look at the specific items that they exclude from GAAP earnings. For example, as Entwistle et al. (2006) suggest, the exclusion of certain items may be influenced by changes in accounting standards (for example goodwill amortization) or changes in the business environment (for example acquisition related charges). Moreover, the consistency with which a company chooses to exclude specific items is examined to increase an understanding of companies' motivations.

For each earnings press release, we tabulate the items that are excluded from GAAP earnings to arrive at the reported non-GAAP earnings measure. Based on the descriptions of the non-GAAP measures in the earnings releases, 22 different categories are identified. A list of the exclusions is provided in Table 2.2.

Table 2.2
Exclusions from GAAP earnings

Exclusion	2000-2002 n=225		2003-2005 n=298		TOTAL n=523
Non-Operating Items	114	50.7%	145	48.7%	259
Depreciation***	69	30.7%	53	17.8%	122
Amortization***	175	77.8%	196	65.8%	371
Impairment***	0	0.0%	15	5.0%	15
Exceptional Items**	52	23.1%	95	31.9%	147
Extraordinary Items	52	23.1%	57	19.1%	109
Restructuring Charges	14	6.2%	14	4.7%	28
Acquisition related charges	3	1.3%	1	0.3%	4
Sale of assets*	0	0.0%	5	1.7%	5
Share Compensation Expense***	12	5.3%	2	0.7%	14
R&D***	7	3.1%	0	0.0%	7
Revaluation (fixed/financial assets)**	14	6.2%	34	11.4%	48
Current cost valuation	10	4.4%	9	3.0%	19
Foreign Currency	10	4.4%	13	4.4%	23
Provisions/accruals	7	3.1%	10	3.4%	17
Discontinued operations	8	3.6%	12	4.0%	20
Realized investment gains/losses	11	4.9%	13	4.4%	24
Rent	5	2.2%	6	2.0%	11
Penalties/Claims*	3	1.3%	11	3.7%	14
Pension charges	0	0.0%	2	0.7%	2
Finance related charges	0	0.0%	3	1.0%	3
Excluded Segments**	0	0.0%	6	2.0%	6
TOTAL EXCLUSIONS	566		702		1,268
no specification	4	1.8%	9	3.0%	
Incomplete specification	5	2.2%	9	3.0%	
Switched primary measure	67	29.8%	86	28.9%	153
Switched definition of non-GAAP measure	93	41.3%	128	43.0%	221

Note: For each exclusion we test whether the percentages are equal across the two periods. For exclusions with superscript ***, ** or * equality is rejected at 1%, 5% or 10% significance respectively.

In total, there are 1268 exclusions from the 523 non-GAAP measures reported in the press releases. On average, a non-GAAP measure excludes 2.4 items from GAAP earnings. This number is stable throughout the sample period, suggesting that the average complexity of the non-GAAP measures remains fairly stable. On the other hand, the variation of non-GAAP measures has grown, since the number of categories of exclusions increases from 17

to 21. When comparing the period before the negative media attention (before 2003) with the period after (2003 and after), the overall picture looks relatively stable with 10 types of exclusions increasing and 11 decreasing.

From the 523 non-GAAP measures, 371 exclude amortization charges, which is substantial. This may raise the question as to what extent non-GAAP reporting is driven by changes in goodwill accounting standards. To address this concern, we take a closer look at the goodwill accounting choices of the companies in our sample. For each company we determine the quarter when they first started capitalizing and amortizing goodwill. In the sample, 51% of the companies started to capitalize goodwill before the introduction of the new guidelines in 2001. In addition, 13 companies already voluntarily started to capitalize and amortize goodwill before the beginning of our sample period (fourth quarter 1999). Another 13 firms only have quarters with amortized goodwill included in our analysis. This means that 26 companies (45%) have consistent goodwill accounting across sample quarters.

When comparing the two periods, a significant decrease is evident in the frequency with which amortization is excluded from GAAP earnings, together with an increase in the exclusion of annual impairments. This coincides with an alternative accounting treatment of goodwill that was gaining popularity in this period, according to which goodwill is not amortized but instead tested for impairment annually. Taken together, adjustments related to goodwill (amortization and impairment) have decreased from 77.8% to 70.8%. The declining frequency and the consistent goodwill reporting of 45% of the sample both support the notion that goodwill accounting changes do not drive the findings.

Another accounting guideline that was issued during the sample period relates to the reporting of exceptional and extraordinary items[26]. Exceptional and extraordinary charges are excluded 147 and 109 times respectively. Although the new accounting guidelines effectively prohibit reporting extraordinary items in the income statement, this did cause companies to report a non-GAAP measure excluding extraordinary items more often.

Finally, analysing these exclusions also helps to distinguish between opportunistic and informative use of these measures. Assuming informative incentives for non-GAAP reporting would lead to a consistent way of reporting, one would expect companies to report the same non-GAAP measure in its consecutive earnings releases. Moreover, companies

[26] During the sample period, the DASB issued an accounting standard that effectively prohibited labelling items as extraordinary (except in very rare cases such as earthquakes). Items that are no longer allowed to be categorized as extraordinary are presented as exceptional items under the new accounting standard. Table 2 shows that excluding exceptional items from GAAP earnings has become more popular (with a significant increase from 52 to 95 exclusions). However, it is conspicuous that the relative decrease for extraordinary items is insignificant. Given the fact that standards issued by the DASB are not enforceable, it seems that companies ignored the rules pertaining to extraordinary items.

would emphasize the same earnings measure in its press releases. Exploring the consistency with which the non-GAAP measures are being reported, it is evident that a stable proportion of the sample either switches the definition of the non-GAAP measure. Before 2003, 41% of the non-GAAP measures reported by a specific company is defined differently than the quarter before (43% of the non-GAAP measures in 2003 and later years). 30% of the non-GAAP earnings releases in the period before 2003 report a different earnings measure most prominently in the press release than before (29% of the non-GAAP releases in 2003 and after). Furthermore, in a small number of earnings releases, the company omits explaining the definition of the non-GAAP measure by either reporting an incomplete specification or no specification at all.

In sum, analysis of the excluded items shows that there are some shifts in the use of non-GAAP earnings measures that may have been induced by changes in accounting standards but that these do not explain the overall trend. Moreover, a large proportion of our sample does not report the non-GAAP measures consistently. The next subsection will further examine what drives companies' choice to report non-GAAP measures.

Logit regression

We now take a closer look at these descriptive results and estimate a logit model, trying to explain why firms use non-GAAP earnings as the primary earnings measure in some quarters but not in others. The logit model examines whether the likelihood that the firm uses non-GAAP as its primary earnings measure is associated with quarterly GDP growth and the number of acquisitions undertaken by the firm. Poor economic conditions are expected to be associated with a larger amount of exceptional items, which makes it more likely that firms adopt non-GAAP measures. Similarly, we expect companies to be more likely to report non-GAAP earnings because GAAP earnings are lowered by the goodwill amortization. A dummy variable NEGATIVE MEDIA takes one for quarters in 2003 and later years. This allows investigation of whether firms are less likely to report non-GAAP measures after the peak in negative media attention. Other determinants for non-GAAP reporting such as meeting analyst forecasts and avoiding reporting losses under GAAP earnings are also included.

Table 2.3
Logit regression results: determination of non-GAAP reporting

	Full sample	Before media attention	After media attention	Full sample	Before media attention	After media attention
GDP GROWTH	-3.111	-5.131	-2.435	-19.791	-32.639	-8.947
	(-4.921) ***	(-1.723) **	(-1.233)	(-1.699) *	(-1.927) **	(-0.902)
M&A ACTIVITY	-0.128	-0.281	0.544	0.464	0.026	1.117
	(-0.713)	(-1.15)	(1.633) **	(0.891)	(0.034)	(1.678) **
LOSS	0.493	0.306	0.635	0.930	0.234	1.332
	(3.056) ***	(1.344) *	(2.733) ***	(2.350) ***	(0.393)	(2.293) **
MISS				0.721	0.075	1.524
FORECAST				(1.903) **	(0.135)	(2.798) ***
NEGATIVE	0.191			0.934		
MEDIA	(1.271)			(1.247)		
Pseudo R^2	0.014	0.016	0.023	0.132	0.084	0.159
Wald Chi2	14.564 ***	8.557 **	10.563 **	21.291 ***	6.264 *	12.393 ***
Number of firm-quarters	766	419	347	143	82	61

Note: Table shows the logit regression results using a dummy variable PRIM_NON as the dependent variable. PRIM_NON takes on the value one if the firm uses non-GAAP earnings as the primary earnings measure in its press release. GDP GROWTH is the quarterly growth in Gross Domestic Product from the Dutch Statistical Office (CBS). M&A ACTIVITY is the number of acquisitions the firm undertakes in that quarter and is downloaded from Thomson's SDC M&A database. LOSS is a dummy variable that indicates one if the firm reports a loss under GAAP earnings. MISS FORECAST is a dummy that indicates one if the firm fails to meet the median analyst forecast in that quarter. Analyst forecasts come from IBES. NEGATIVE MEDIA is a dummy variable that indicates one if the quarter is in 2003 or later years. We split the sample in observations before and after the negative general media attention. z-statistics are shown in parentheses. * statistically significant at the 10 percent level (one-tailed), ** statistically significant at the 5 percent level (one-tailed) and *** statistically significant at the 1 percent level (one-tailed).

The first column of the table shows that firms are more likely to report non-GAAP earnings as their primary earnings measure in quarters with poor economic growth and when they report a GAAP loss. Interestingly, there is no difference in the likelihood of reporting non-

GAAP earnings when comparing the period before and after the negative media attention on non-GAAP earnings. This is consistent with the earlier finding that non-GAAP reporting does not decline over time.

If one compares the period before (second column) and after (third column) the negative media coverage the coefficient on the loss dummy is found to have doubled in size. This increase in the coefficient is statistically significant at the 5% level and suggests that companies that report losses under GAAP are more likely to emphasize non-GAAP earnings in their press releases after the negative media attention in 2002. In the period after the negative media attention firms are also more likely to use non-GAAP earnings as their primary earnings measure in quarters in which they conduct more mergers and acquisitions. Next, it is examined whether firms report non-GAAP earnings to meet analyst forecasts that they would not meet with GAAP earnings. Column four supports this hypothesis. If firms miss the median analyst forecast they are more likely to highlight non-GAAP earnings in their press releases, but only after the negative media attention in 2002 (column six).

These results confirm the descriptive evidence here that turning GAAP losses into non-GAAP profits and meeting analyst forecasts are important motivations for firms to report non-GAAP earnings. Especially after the negative media attention these two motivations have increased in importance. In this period firms are also more likely to make use of non-GAAP earnings measures when they conduct more mergers and acquisitions. In the period before the negative media attention, poor economic conditions increase the likelihood of non-GAAP reporting.

To take a further look at this, the influence of these factors on the size of the adjustments is also investigated. Adjustments are measured as the difference between non-GAAP and GAAP earnings[27]. Table 2.4 shows the results. Adjustments are found to be larger when economic conditions are poor; the company reports a GAAP loss or when the company misses the median analyst forecast with its GAAP earnings. Interestingly, significantly lower adjustments are found after the negative media coverage on non-GAAP earnings in general. This suggests that managers decide to deviate less from GAAP earnings when reporting non-GAAP earnings after the latter have been criticized in the media.

[27] More precisely: adjustments are the difference between the variables UE NONGAAP and UE GAAP, where UE is short for Unexpected Earnings. Unexpected earnings, either GAAP or non-GAAP, are defined as the difference between earnings per share for this period minus GAAP earnings from four quarters earlier (q-4). These are the same variables used in the analyses in the next section “Investors’ use of non-GAAP measures”.

Table 2.4
Determinants of adjustments

	Model (1)	Model (2)
GDP GROWTH	-0.969	-1.466
	(-3.041) ***	(-2.552) ***
M&A ACTIVITY	-0.026	-0.001
	(-1.124)	(-0.081)
LOSS	0.012	0.023
	(1.454) *	(1.563) *
MISS FORECAST		0.024
		(1.456) *
NEGATIVE MEDIA	-0.036	-0.052
	(-4.103) ***	(-2.935) ***
R^2	0.093	0.184
F-statistic	8.866 ***	3.294 ***
Number of firm-quarters	379	90

Note: Table shows the OLS regression results using ADJUSTMENTS as the dependent variable. ADJUSTMENTS is the difference between UE NONGAAP and UEGAAP. GDP GROWTH is the quarterly growth in Gross Domestic Product from the Dutch Statistical Office (CBS). M&A ACTIVITY is the number of acquisitions the firm undertakes in that quarter and is downloaded from Thomson's SDC M&A database. LOSS is a dummy variable that indicates one if the firm reports a loss under GAAP earnings. MISS FORECAST is a dummy that indicates one if the firm fails to meet the median analyst forecast in that quarter. Analyst forecasts come from IBES. NEGATIVE MEDIA is a dummy variable that indicates one if the quarter is in 2003 or later years. We split the sample in observations before and after the negative general media attention. t-statistics are shown in parentheses. * statistically significant at the 10 percent level (one-tailed), ** statistically significant at the 5 percent level (one-tailed) and *** statistically significant at the 1 percent level (one-tailed)

Finally, we investigate whether managers of firms that are criticized in the media for their use of non-GAAP earnings also changed their reporting behavior; in particular, whether these managers are less likely to continue to use non-GAAP earnings as their primary measure in their press release one quarter after they were criticized in the media. As Dyck et al (2008) suggest, managers respond to negative media attention to reduce reputation

effects and therefore the effect of negative publications is probably stronger when a company is named specifically in a negative newspaper article. Managers are found less likely to emphasize non-GAAP earnings in their press releases after negative media attention and adjust their behaviour. Of the 12 firms that were criticized, 6 (50%) turn away from non-GAAP reporting the next quarter. However, 4 of these 6 firms (83%) take up non-GAAP reporting after some period. This is consistent with the press having at least a transitory impact on the behaviour of managers.

In conclusion, although companies continue to report non-GAAP measures and do so more frequently and more prominently, evidence is found of a disciplining effect of negative media attention on the reporting of non-GAAP metrics. About 60% of the firms that reported non-GAAP before 2003 stop reporting non-GAAP earnings afterwards. The firms that continue to report non-GAAP earnings, or that are new non-GAAP reporters deviate less from GAAP earnings. This suggests that even though the frequency of non-GAAP reporting has not decreased over time, the magnitude of the adjustments did decrease in 2003 and thereafter possibly as a result of the negative media coverage of non-GAAP earnings in general. Furthermore, there is evidence of short-term disciplining effect on companies that were 'named and shamed' in the media for their non-GAAP reporting. On the other hand, several indicators of opportunistic non-GAAP reporting practices, such as avoiding losses or avoiding missing a benchmark, persist or even increase after the negative attention.

2.6 Investors' use of non-GAAP measures

In order to determine investors' use of non-GAAP earnings measures as compared to GAAP earnings, we examine the informativeness of the identified earnings metrics. First an event study is performed for the entire sample. Next, to delve deeper the sample is split between the period before 2003 and 2003 and after to analyse the effect of media attention in general. After that there is an examination of the effect of specific media attention by distinguishing between companies that were criticized in the media for their non-GAAP reporting and companies that were not. The section is concluded with a subsection on robustness tests.

Event study for the entire sample

A standard event study procedure is used to assess if stock prices change in response to the different earnings measures disclosed in the press releases[28].

Using a random-walk earnings expectations model we define unexpected earnings as the three EPS figures (GAAP, operational GAAP and non-GAAP) minus GAAP earnings from four quarters earlier (q-4). Unexpected earnings are used instead of forecast errors, because analyst forecast data is lacking for most Dutch companies during our sample period. We calculate three measures of unexpected earnings or earnings surprise: UE GAAP, UE OGAAP and UE NONGAAP. On average, the non-GAAP measures result in unexpected earnings of 5.3%, compared to UE GAAP of minus 0.2%. The mean market capitalisation MCAP (€10,397 million) is much higher than the median (€1,593 million), revealing that a few firms in our sample are much larger than most of the sample firms. This is in fact a characteristic feature of the Dutch financial market, which is dominated by a few large multinational companies.

[28] The market model is used to calculate daily abnormal returns. We estimate the market model parameters or a pre-event estimation period of 100 trading days from of –110 to –10 days before the press release. Abnormal returns are computed during the event period. Our event period is from –10 to +10 days. Abnormal returns are then averaged across firms to generate the average abnormal return (AAR_t). Cumulative average abnormal returns ($CAAR_{-1,+1}$) are calculated by summing the average abnormal returns or an event window [-1,+1 relative to the event date (i.e. the date of the press release), which is labeled day 0.

Table 2.5
Summary statistics

Variable	Mean	Median	Standard deviation	N
EARN GAAP	255.991	44.000	952.908	538
EARN OGAAP	433.674	69.000	1,329.333	363
EARN NONGAAP	474.054	106.000	870.280	381
UE GAAP	-0.002	0.001	0.053	538
UE OGAAP	0.018	0.017	0.072	363
UE NONGAAP	0.052	0.022	0.090	381
MCAP	10,397.640	1,592.690	19,653.910	545
CAR (%)	-0.073	-0.430	7.376	545

Note: Table shows summary statistics for quarterly earnings press releases issued by Dutch listed companies from January 2000 to April 2005. EARN GAAP, EARN OGAAP and EARN NONGAAP denote the GAAP earnings, operational GAAP earnings and non-GAAP earnings (in millions of euros), respectively. UE GAAP, UE OGAAP and UE NONGAAP denote the unexpected earnings (earnings surprise) for GAAP, operational GAAP and non-GAAP earnings, respectively. We use the random model to compute unexpected earnings and use the GAAP earnings four quarters earlier (q-4) as our proxy for expected earnings. The UE GAAP is computed as (EARN GAAP -EARN GAAP (q-4))/MCAP, UE OGAAP is computed as (EARN OGAAP-EARN GAAP (q-4))/MCAP and UE NONGAAP is computed as (EARN NONGAAP-EARN GAAP (q-4))/MCAP. The unexpected earnings (earnings surprise) is trimmed at the 5th and 95th percentile. MCAP denotes the market capitalization five trading days before the press release (in millions of euros). CAR denotes the cumulative abnormal return during the three trading day interval from one day before to one day after the press release

We first examine which definition of earnings investors pay attention to: non-GAAP earnings or GAAP earnings (either bottom-line or operating). To gain insight into the degree to which the market is processing each measure in prices, we investigate a short-window association between abnormal returns on each earnings surprise (unexpected earnings) measure separately. If the market finds non-GAAP earnings to be a better summary measure of performance, returns will be more highly correlated with UE NONGAAP than with UE GAAP or UE OGAAP.

Table 2.6
Regression results

	Model (1)	Model (2)	Model (3)
UE GAAP	0.155		
	(2.585) ***		
UE OGAAP		0.033	
		(0.602)	
UE NONGAAP			0.107
			(2.432) ***
Intercept	-0.001	-0.004	-0.004
	(-0.177)	(-1.007)	(-0.979)
R^2	0.012	0.001	0.015
F-statistic	6.684 ***	0.363	5.916 ***
Number of observations	538	363	381

	Comparison of earnings measures	
	Vuong's Z-statistic	Probability
UE OGAAP vs. UE GAAP	7.48	<0.0001
UE NONGAAP vs. UE GAAP	-1.62	0.1056
UE OGAAP vs. UE NONGAAP	7.75	<0.0001

Note: Table shows the regression results using CAR as the dependent variable. We refer to Table 5 for variable definitions. *t*-statistics are shown in parentheses. * statistically significant at the 10 percent level (one-tailed), ** statistically significant at the 5 percent level (one-tailed) and *** statistically significant at the 1 percent level (one-tailed).

Table 2.6 presents the results of regressions of abnormal returns on unexpected earnings. The regression is estimated separately for UE GAAP, UE OGAAP and UE NONGAAP (Model 1-3 respectively). The regression is not estimated for the three unexpected earnings metrics together, because of high correlations between the earnings definitions (correlations above 0.95).

In the separate unexpected earnings regression reported in Table 2.6, UE GAAP, UE OGAAP and UE NONGAAP are positively related to short window returns. The coefficients on both UE GAAP and UE NONGAAP are statistically significantly positive. These results indicate that the different definitions of unexpected earnings have different explanatory

power with respect to short window abnormal stock returns. Remarkably, bottom-line earnings are informative whereas operating earnings are not. Normally it is argued that operating earnings are closer to core earnings and are therefore more relevant to investors. Furthermore, non-GAAP earnings are informative, which is in line with prior research. Consistent with U.S. studies, non-GAAP earnings are found to be more informative than GAAP operating earnings (Bhattacharya et al., 2003), but this does not hold for GAAP earnings.

Before and after negative media attention

If negative media attention has an effect on the way investors perceive non-GAAP information and if they adjust their behaviour accordingly, the information content of the respective earnings measures should change from 2003 onwards. The results of the regressions in these two periods are reported in Table 2.7.

Table 2.7
The rise and fall of value relevance of non-GAAP earnings

	Before negative media attention			After negative media attention		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
UE GAAP	0.207			0.108		
	(2.140) **			(1.522) *		
UE OGAAP		-0.021			0.098	
		(-0.240)			(1.445)*	
UE			0.130			0.061
NONGAAP			(1.808) **			(1.148)
Intercept	0.004	-0.005	-0.003	-0.004	-0.004	-0.005
	(0.754)	(-0.720)	(-0.331)	(-1.247)	(-0.890)	(-1.099)
R^2	0.018	0.001	0.020	0.008	0.010	0.006
F-statistic	4.580 **	0.058	3.272 **	2.317 *	2.089*	1.318
Number of observations	248	160	166	290	203	215

Comparison of earnings measures

	Before negative media attention		After negative media attention	
	Vuong's Z-statistic	Probability	Vuong's Z-statistic	Probability
UE OGAAP vs. UE GAAP	6.76	<0.0001	0.42	0.6759
UE NONGAAP vs. UE GAAP	0.55	0.5831	-0.66	0.5110
UE OGAAP vs. UE NONGAAP	4.29	<0.0001	1.02	0.3103

Note: Table shows the regression results using CAR as the dependent variable. We refer to Table 2.5 for variable definitions. We split the sample in observations before and after the peak in negative media attention. *t*-statistics are shown in parentheses. * statistically significant at the 10 percent level (one-tailed), ** statistically significant at the 5 percent level (one-tailed) and *** statistically significant at the 1 percent level (one-tailed).

The Models 1-3 depict the results of the regression in the period before 2003, the Models 4-6 refer to the period 2003 until April 2005. Before 2003, both the bottom-line GAAP and the non-GAAP unexpected earnings measures are significantly positive. The coefficient on UE OGAAP is not significant during this period. This result is similar to the aggregated results for the entire period. So before 2003, investors seem to price both GAAP bottom-line earnings and non-GAAP earnings.

In the second period (2003 and after) however, the results change. UE NONGAAP is no longer significant, while the unexpected earnings on bottom-line GAAP and operating

GAAP earnings are significant (at the 10% level). According to our results, the decreased use by investors of non-GAAP information coincides with an increasing popularity of operating GAAP earnings. The coefficient on UE OGAAP switches to a positive sign, and is significant.

The coefficient on UE GAAP is statistically significant for the entire sample period as well as for the two sub-periods. This may suggest that bottom-line earnings are in fact informative to capital market participants. This contradicts the critics of bottom-line earnings, who claim that this earnings measure is not useful to investors because it includes items that are non-operating or transitory. The use of net income in financial reports is strongly encouraged by Dutch financial market authorities and regulators such as the DASB. Based on the results, it seems investors agree with the regulators on the importance of bottom-line GAAP earnings. Although the explanatory power (R^2) of the Models is low, as reported in Table 2.6 and 2.7 is low, it is in line with other research (Bhattacharya, et al., 2003). Vuong's (1989) Z-statistic is calculated to compare the explanatory power of the Models and find that for the entire period UE GAAP and UE NONGAAP have significantly more explanatory power than UE OGAAP, suggesting that investors find operating GAAP the least informative earnings measure. This result holds for the first period of our sample, before the negative media attention. After negative media attention, the explanatory power of the models does not differ significantly, suggesting that investors find the earnings measures equally (un)informative.

Effect on companies that were specifically criticized

As argued in earlier research (e.g. Dyck et al., 2008) the effect of media attention may be stronger for companies that were specifically criticized for their use of non-GAAP earnings in newspaper articles. A regression is estimated using the stock market reaction surrounding the earnings press release as our dependent variable. In order to test whether there are any differences between firms that received negative media coverage and the ones that did not, a dummy FIRM IN MEDIA is included that indicates one if the company was criticized in the media for using non-GAAP earnings. This dummy (FIRM IN MEDIA) tells us whether there is a different intercept for these firms compared to firms that do not receive negative media attention. This dummy is then interacted with UE NONGAAP. This interaction term captures differences in slope coefficients between the two group of firms and test whether investors perceive non-GAAP earnings differently between the two groups.

Regressions are run before and after the negative media attention in general, enabling one to compare the effect of general media and firm-specific media coverage. The results are reported in Table 2.8. Results show that investors assign less value relevance to the non-GAAP earnings of firms that are targeted in the media. The interaction term turns statistically

Table 2.8
General media and firm-specific media coverage on non-GAAP

	Before negative media attention	After negative media attention
UE NONGAAP	0.276	0.136
	(2.031) **	(1.701) **
FIRM IN MEDIA	-0.021	-0.012
	(-0.478)	(-1.141) *
UE NONGAAP*	-0.237	-0.128
FIRM IN MEDIA	(-1.09)	(-1.34) *
Intercept	-0.004	-0.031
	(-0.51)	(-0.600)
R^2	0.059	0.032
F-statistic	1.622 *	2.271 **
Number of firm-quarters	166	215

Note: Table shows the regression results using CAR as the dependent variable. FIRM IN MEDIA is a dummy variable that indicates one if the firm was mentioned in the press as an opportunistic non-GAAP reporter. We interact this dummy with UE NONGAAP. We refer to Table 2.5 for variable definitions. We split the sample in observations before and after the peak in negative media attention. t-statistics are shown in parentheses. * statistically significant at the 10 percent level (one-tailed), ** statistically significant at the 5 percent level (one-tailed) and *** statistically significant at the 1 percent level (one-tailed).

significant for 2003 and after. This suggests that the negative effect of negative firm-specific media attention on the use of non-GAAP measures is stronger when there is also more widespread critical discussion of the use of non-GAAP earnings.

Investors continue to assign value relevance to non-GAAP earnings in 2003 and later years for firms without negative company-specific media attention but the regression coefficient has halved in size (from 0.27 to 0.13). This drop in regression coefficients is significant at 5% level. This shows that also for these firms the market awards less information content to non-GAAP earnings compared to the period before 2003.

Overall, it seems that firm-specific media attention has a large impact on how investors perceive non-GAAP numbers, especially when it is part of a general discussion on the use of non-GAAP earnings. However, the negative media attention on non-GAAP earnings in general also has an impact on firms that are not targeted in the media. Investors continue to perceive their non-GAAP earnings as informative in 2003 and after but less so compared to the period before 2003.

Table 2.9
The change in value relevance of non-GAAP earnings after firm is targeted in media

	Before negative media attention on company			After negative media attention on company		
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
UE GAAP	-0.122			0.157		
	(-0.394)			(1.625)*		
UE OGAAP		-0.245			0.036	
		(-1.211)			(0.405)	
UE NONGAAP			0.215			0.016
			(2.203)**			(0.233)
Intercept	0.003	-0.004	-0.003	-0.018	-0.019	-0.018
	(0.335)	(-0.250)	(-0.263)	(-2.427)**	(-2.081)**	(-2.081)**
R^2	0.002	0.025	0.032	0.048	0.003	0.001
F-statistic	0.152	1.461	4.844**	2.245*	0.163	0.053
Number of firm-quarters	53	29	51	67	45	67

Note: Table shows the regression results using CAR as the dependent variable. We refer to Table 2.5 of the paper for variable definitions. We split the sample in observations before and after the negative media attention on a company. t-statistics are shown in parentheses. * statistically significant at the 10 percent level (one-tailed), ** statistically significant at the 5 percent level (one-tailed) and *** statistically significant at the 1 percent level (one-tailed).

An additional analysis is performed on firms that were named specifically in the newspapers articles. Twelve firms that were targeted in the media for their (opportunistic) use of non-GAAP measures allow us to examine the effect of the media more closely. Five firms were targeted before 2003 and seven in 2003 and later. Here one is able to identify the exact quarter in which the media reported negatively on the use of non-GAAP earnings measures by these firms. We then compare the quarters before and after the negative media attention and examine whether the stock market response is more negative after the firms are "named and shamed". The results are reported in Table 2.9. The informativeness of non-GAAP earnings is found to decrease whereas the informativeness of GAAP earnings increases after the company was mentioned in the media as an (opportunistic) non-GAAP user.

Robustness tests

We perform additional tests to determine if our results are robust for alternate model specifications. First, results are tested for sensitivity to the exact date that we chose to separate the observations before the negative media attention from the ones after (1 January 2003). While remaining within the boundaries of the period of intensified media attention, we shift the date partitioning the sample one quarter backward (30 September 2002) and forward (30 March 2003) and run the regressions again. Similar results occur, suggesting our findings are insensitive to the exact date.

Next, a panel data analysis is performed, which adds the time-series dimension to our cross-sectional analysis presented in Table 2.6. Panel data help also to control for omitted variables that change over time but not across companies (i.e. accounting policies, economic conditions etc.) and for unobserved differences in business practices across companies. Random effects are used to estimate the panel data regression (the Hausman test rejects the use of fixed effects). Unreported results show that analysing the data using random effects does not yield materially different results than using OLS. Furthermore, regressions are repeated after excluding firms with a cross listing at a U.S. exchange. The results are consistent with the results for the entire sample. This alleviates concerns that the findings are driven by cross-listed firms that respond to the regulation in the U.S.

Moreover, in addition to the original specification of the regression presented in Table 2.6, we re-estimate the regression using UE GAAP and ADJUSTMENTS (defined as the difference between UE GAAP and UE NONGAAP). The (unreported) results show that the magnitude of the adjustments matters, as larger adjustments are more informative. This finding only holds in the period before 2003. This corresponds with our finding that non-GAAP earnings are not informative in the period 2003 and after.

Finally, in addition to the tabulated results, the regressions are performed including the market capitalization five days before the press release was published. The results of this test are similar to the models excluding market capitalization.

2.7 Concluding remarks

This paper investigates the use of different definitions of earnings: earnings calculated according to generally accepted accounting principles (GAAP earnings, both bottom-line and operating) and alternative versions of earnings that exclude various items recorded under GAAP (non-GAAP earnings). Our study is placed in the turbulent period where financial scandals are front-page news and investors trust is on a historical low. During this period, influenced by the accounting scandals, the use of alternative earnings measures received

negative media attention. Building on the growing literature on the influence of media attention and press coverage on the behaviour of managers and investors, it is argued that this negative media attention may have affected non-GAAP reporting. The Dutch setting offers us the possibility to study the effect of the negative attention while the rules and regulations remain the same as before the scandals.

In 2003 and later years, companies are found to have different motivations for non-GAAP reporting and that the difference between reported GAAP earnings and non-GAAP earnings is smaller. The change in reporting behaviour is stronger for companies that were named specifically in the media. This evidence suggests that companies' reporting choices may be influenced by factors such as media attention, even without regulatory changes. Investors seem to take the warnings in the media seriously and turn away from non-GAAP measures. From 2003 on, the evidence shows investors consider GAAP earnings to be informative, whereas they do not price non-GAAP earnings measures. This contrasts with the findings before 2003, where investors seem to find non-GAAP earnings useful, as well as bottom-line GAAP earnings. Collectively, the findings here suggest that market participants perceive non-GAAP earnings measures to be less informative after a peak in negative media attention.

This study is important to regulators and standard setters. Critical opinions in the media and warnings by regulators expressed through the media are shown to be effective means to create awareness among investors, and to some extent to alter companies reporting behaviour. U.S. studies suggest that specific regulation has successfully restrained opportunistic non-GAAP reporting practices. On the other hand, there is evidence that the SEC regulation leads to suboptimal reporting decisions (Kolev et al., 2008, Heflin and Hsu, 2008). Our results cast doubt on the attribution of changes in investor and company behaviour to the effect of regulation and suggest that investor perceptions can change without regulation. This potentially has important implications for regulation effectiveness studies that evaluate the effect of new regulations on the behaviour of market participants.

The current study indicates the need to expand our understanding of the effect of regulation. In order to evaluate the effectiveness and necessity of the regulation of financial markets, we need to understand the effect of concurrent changes in the environment that may influence behaviour of financial markets participants. For example, media attention can induce reputation effects that discipline reporting behaviour or create awareness among the users of financial information. We report evidence that suggests that investors base their decisions on different earnings metrics after negative attention from media and regulators. Such effects may decrease the necessity of additional regulation. In order to disentangle the effects of regulation and reporting environment, more research in an international setting may be fruitful.

Chapter 3

The Diffusion of IFRS around the World[29]

3.1 Introduction

One of the most striking phenomena of the globalization of financial markets is the move to one worldwide accounting language. Over the past ten years, there has been a shift towards international comparability and harmonization of accounting standards through the adoption of International Financial Reporting Standards (IFRS)[30]. This shift has a pervasive impact on firms' financial reports throughout the world and consequently on their shareholders and stakeholders. More than 120 countries currently use IFRS, which effectively means that for the first time in history more than 15,000 firms across different countries use corresponding accounting standards (IFRS Foundation, 2013). Considering the rapidity and geographic reach of the shift, it is appropriate to ask how the diffusion of these international accounting standards can be explained.

Historically, financial reporting standards have developed over time on a national level, reflecting the country-specific environments they served. As a consequence, financial reporting has been characterized by large variations across countries, according to the relative influence of environmental factors (such as the nature of national legal systems). Most notably, there were important differences between the accounting policies of Anglo-American countries and European continental countries. Financial reporting in many European countries can be traced back to tax law and regulations with respect to dividend payments and creditor protection (Zeff, 2012). In contrast, the Anglo-American accounting model evolved in a context with dominant securities markets, where the primary function of

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[29] This chapter is based on a working paper by Koning, M., Roosenboom, P.G. J. and Mertens, G.M.H., (2013a, unpublished).

[30] For convenience, we consistently use the term IFRS to refer to standards issued by the International Accounting Standards Board (IASB) and the International Accounting Standards that were issued by the IASB's predecessor, the International Accounting Standards Committee (IASC) and that are still recognized by the IASB.

financial statements is to provide information to investors (Nobes, 1998). Variation in accounting policies causes different outcomes, which impedes meaningful comparisons between companies from different countries (Nobes, 1983). When international trade became more important, the demand for internationally comparable financial information increased. Since then, the harmonization of accounting standards has made considerable progress within a relatively short period of time. An important role in this development was played by the International Accounting Standards Board (IASB), a privately funded non-governmental organization located in London. Its objective is to develop high quality, understandable and enforceable global accounting standards (IFRS Foundation, 2013). During the past decade, many countries across the world have replaced their domestic financial reporting standards with the IASB's international financial reporting standards (IFRS) while others are converging their national standards to IFRS.

The arguments offered to support the adoption of IFRS are mainly economic ones and focus on improving the functioning of financial markets. In this view, the economic globalization leads to a convergence of traditionally national accounting standards in order to facilitate cross-border financing. Standard setters as well as adopting countries emphasize the economic advantages of global accounting standards. The IFRS Foundation explicitly refers to facilitating economic decision-making for investors and other capital market participants as the main goal for global accounting standards (IFRS Foundation, 2012). Similar views are expressed by adopting jurisdictions, when they announce their decision to adopt IFRS and list the benefits they expect from the adoption, such as the reduction of cost of capital and improving competitiveness of companies (see Brown (2011) for some examples). In academic research, substantial effort has been expended on studying the economic reasons for the move to international accounting standards. In a review paper, Tarca (2012) concludes that there is evidence that capital market efficiency improves and cross-border investment is promoted when countries require companies to use IFRS.

Although the economic benefits of international accounting standards may seem self-evident in today's globalized world, the rapid spread of IFRS does raise some questions. Adopting countries are very different in terms of levels of economic development and financing infrastructure. So why would such dissimilar countries all decide to adopt IFRS? Is it reasonable to assume that the decision to adopt IFRS was driven by similar economic, functional needs? It is not obvious that expected benefits are the same for adopting countries. So what is driving the quick spread of IFRS? To enhance our understanding, we look beyond the economic forces, and include the international, political and social dimension (Chua and Taylor, 2008). On a fundamental level, regulation of any domain of economic life is essentially a political affair since it involves the (re-)distribution of wealth (Moran, 2010). Accounting standards are designed to facilitate the allocation of capital (e.g. IFRS Foundation, 2012), and are therefore shaped by economic and political forces (Watts and

Zimmerman, 1986; Ball, 2006). The push for international accounting standards is driven by the globalization of the economy and the globalization of politics (Ball, 2006). Currently, the political dimension is mostly overlooked, which has led some academics to call for more research that addresses accounting standard setting as a political process (e.g. Chua and Taylor, 2008; Kothari et al. 2010; Leuz, 2010).

This study focuses directly on international political influences on countries' decisions to adopt IFRS or not. Our main unit of analysis is the interaction between countries, while we observe characteristics at the country level. We offer a new perspective using insights from the policy diffusion literature in political science. Diffusion theories attempt to explain the pattern of diffusion of specific policies across countries, rather than explain the policy adoption itself (Dobbin et al., 2007). The policy diffusion literature argues that countries' regulatory decisions are driven not only by domestic incentives and circumstances, but also by the choices made by other countries. The extent to which choices by other countries influence the domestic adoption decision differs depending on the country's ties with the adopting countries. The policy diffusion literature distinguishes between four diffusion mechanisms, depending on what motivates the actor (the government or regulatory authority) and the change that triggers the policy adoption (Dobbin et al., 2007; Drezner, 2008): competition, learning, coercion and emulation. We apply the insights from the policy diffusion theory on the global adoption of international accounting standards in order to identify the mechanisms that drive the diffusion of IFRS. Identifying the dominant mechanisms will help explain why many diverse countries adopted the same accounting standards.

Understanding countries' adoption strategies and their potential responses to IFRS is crucial when designing and evaluating international standard setting. Moreover, identifying the mechanism that drives the policy switch to IFRS for any country may help evaluate or potentially predict the "performance" of the international reporting standards for that particular country (Elkins and Simmons, 2005). A few studies have examined the determinants of IFRS adoption on a country level. Hope et al. (2006) examine the effect of domestic institutional characteristics on the voluntary adoption decision of 38 countries before 2004 and find that countries with relatively weak investor protection are more likely to adopt IFRS. More recently, Ramanna and Sletten (2010) apply a network perspective to analyse adoption of IFRS across countries based on the trade with IFRS-adopting countries. They find that the IFRS adoption status of a country increases if it perceives that it has higher network benefits from IFRS adoption. These country-level papers are both primarily focused on the competitive forces driving international IFRS adoption and find evidence to support the economic perspective.

With this study, we join the effort to explain IFRS adoption on a country-level and contribute by applying a perspective that allows for a broader set of explanations. We introduce insights from recent empirical work on policy diffusion in political science. This allows us to not only examine competitive forces, but other drivers of diffusion as well (learning, coercion and emulation). The first challenge is to empirically disentangle the concepts. We use various international data sources to measure the diffusion mechanisms. Then we apply logistic regressions to analyse how the probability of adopting IFRS is affected by other countries' choices. We use ordinal logistic regressions to investigate the scope of the IFRS adoptions across countries, using a definition of the dependent variable that reflects different levels of adoption (permitted, required for some companies or required for all companies). Then, in order to analyse the sequence of the adoptions we apply hazard regression analysis.

The results clearly indicate that the pace and pattern of IFRS adoption across the globe is influenced by diffusion processes. Our findings suggest that domestic factors do not explain the probability of IFRS adoptions. Instead, we do find that other countries' IFRS adoption affects the probability that the country of interest will adopt IFRS, depending on the nature and the weight of the connection between countries. We find some evidence for each of the four diffusion mechanisms, but some are more robust across model specifications than others. We find that adoption decisions of competing countries do influence each other's choices, depending on the nature and the weight of the connection between countries. But even more pronounced than the influence of competition, it is evident that emulation increases the probability of IFRS adoption. Countries are more likely to switch to IFRS if they are involved in the international development of norms via expert communities or if close neighbours (geographical or cultural) adopt IFRS. In summary, the evidence suggests that emulation may be an alternative explanation for the diffusion of IFRS. At least, our findings offer a more complete understanding of the diffusion of IFRS around the world; a diffusion that may not be attributed to capital market incentives alone.

3.2 Policy diffusion mechanisms

In political science, the occurrence that countries choose similar policies within a fairly limited period of time has been studied extensively. Diffusion research within political science studies identifies temporal and spatial clusters of policy reform and studies why they occur. Central to the diffusion literature is the notion of interdependence of countries' policy decisions. The term "diffusion" in this line of research is defined as the process by which "prior adoption of a trait or practice in a population alters the probability of adoption for the remaining non-adopters" (Strang, 1991, 325). Within the diffusion literature, the term is applied loosely, covering research on the internationalization of policies that takes into

account the possibility that policy choices in one country affect the policy choices in other countries (Gilardi, 2011)[31]. During the past few decades, political scientists have identified several diffusion mechanisms that explain how policies spread across countries. Although there is some variation in the labels, the diffusion mechanisms are generally classified as competition, learning, coercion and emulation, (Simmons et al., 2007; Lee and Strang, 2006; Gilardi, 2011). We describe each of these perspectives briefly below.

3.2.1 Competition

Diffusion resulting from economic competition occurs when governments that compete for the same resources adopt the policy of their competitors for fear of an economic loss if they deviate (Meseguer and Gilardi, 2009). The classic example is the tax system, where countries may compete with each other by imposing low tax rates, although individually they may be better off with higher tax rates. The process where competition between countries ultimately leads to the laxest tax system is known as 'the race to the bottom'. It is important to note, however, that competition does not necessarily lead to the lowest standards. The opposite is also true: in some cases regulatory competition creates incentives for higher standards. In the diffusion literature this has been documented as the "California effect", namely the idea that important export markets can push countries to more stringent environmental standards by making access to the market conditional on achieving those standards (Gilardi, 2011).
The competition perspective has been predominantly driving the literature on the globalization of the economy. The argument is that the growing international flows of capital explain why more and more countries have come to adopt broadly similar investor-friendly policies (Marsh and Sharman, 2009). The adoption of IFRS can also be seen in this light. The IASB consistently emphasizes its conviction that the transparency provided by IFRS as high-quality financial reporting standards contributes significantly to the effective functioning of capital markets and sound economic growth. This line of reasoning is shared by many governments that adopted IFRS, as reflected in the press releases in which the reasons for the adoption are explained (Brown, 2011). Competition-driven diffusion assumes that it is the decision by competing countries to adopt the policy that alters the

[31] Some policy diffusion researchers argue that the definition should be interpreted more strictly, reserving the term "diffusion" for uncoordinated, interdependent policy decisions, that is: decisions made independently by governments (uncoordinated) but where governments do take decisions of other governments into account (interdependent) (Gilardi, 2011; Elkins and Simmons, 2005). From this point of view, the coordinated spread of policies would not be regarded as policy diffusion. Specifically, this would imply that one of the diffusion mechanisms that we discuss, coercion, would not meet the definition of policy diffusion.

opportunities and hence the probability of adoption for the country of interest. For IFRS adoption, following the competitive diffusion hypothesis, we would expect the probability of a country's IFRS adoption to increase when more competitors have adopted IFRS. This assumes that governments know who their competitors are and that governments understand how policy choices connect to competitive advantages. In order to test competition theory, it is important to identify which countries are salient competitors and this may be different depending on what the countries are competing for (Dobbin et al., 2007). In the case of IFRS adoption, countries expect that the competitive position of the national capital market and of the domestic companies will improve (Brown, 2011). From the perspective of domestic companies, competing countries will most likely be those countries that are competing for trade in the product market of a third country (Dobbin et al., 2007). Alternatively, from the perspective of competition for capital, competing countries are more likely to be the countries with a similar risk profile (Simmons and Elkins, 2004).

3.2.2 Learning

Diffusion may also be caused by learning from the experience of others. If a policy is successful in a country, it is more likely that the policy will be adopted by others. The consequences of a policy adoption in one country may supply relevant information for others that consider a policy change (Meseguer and Gilardi, 2009). Berry and Bayeck (2005, 505) describe the learning mechanism as follows: "When confronted with a problem, decision makers simplify the task of finding a solution by choosing an alternative that has proven successful elsewhere". According to this definition, learning occurs in response to an identified problem, a process that has been described as "problem pressure" (Holzinger and Knill, 2005). Another aspect of this definition is that policy adoption decisions are influenced by the success of similar policies elsewhere (Gilardi, 2010). Although, in most of the literature, learning implies a form of rational decisions by governments (Marsh and Sharman, 2009), the limitations of the rationality assumption are acknowledged. Most studies employ a concept of bounded rationality (Weyland, 2007). When learning is assumed to be limited in its rationality, policy decisions will not be based on all available experience but on cognitive shortcuts (Weyland, 2004; 2007). For example, policymakers will more likely be influenced by success from countries that are close neighbours (Meseguer, 2006). In any case, learning assumes that information about policy success abroad will increase the probability of adoption of the policy in the home country. When applied to IFRS, the decision to adopt IFRS is driven by learning when it is based on evidence that adoption of IFRS contributes to the economic success of countries.

3.2.3 Coercion

Coercion essentially involves "the imposition of policies on national governments by powerful international organizations or powerful countries" (Meseguer and Gilardi, 2009, 530). Coercion is most likely to explain diffusion patterns to the developing world, such as when international organizations like the International Monetary Fund (IMF) attach conditions to their lending (Marsh and Sharman, 2009). The anti-money laundering regulations are an example of a policy that was forced upon developing countries. When governments of developing countries were reluctant to implement international policies, the European Commission pushed for international countermeasures of which the most serious was 'conditioning, restricting, targeting, or even prohibiting financial transactions with non-cooperative jurisdictions' (Drezner, 2005). But softer, more indirect manifestations of international coercion where countries try to exercise some pressure without actually threatening to take measures have also been documented.

Coercion would not be classified as a diffusion mechanism under more stringent definitions, which include only uncoordinated, interdependent policy adoptions (Gilardi, 2012). When a country is coerced to adopt a specific policy, it is clearly not a decision that is taken interdependently (Elkins and Simmons, 2005). However, the broader interpretation of diffusion includes coercion as a diffusion mechanism, in the sense that the policy adoption decision is shaped by international influences (Dobbin et al., 2007).

In the case of IFRS adoption, influential non-governmental organizations such as the IMF and the World Bank can be identified as sources of influence since they actively promote IFRS. Both institutions perform country audits where one of the items assessed is the level of IFRS compliance[32]. In addition to advocating IFRS, the World Bank or the IMF may include the requirement to adopt IFRS in their loan-granting policies (Botzem and Dobusch, 2012). This form of coercion is also known as conditionality (Dobbin et al., 2007). Diffusion driven by coercion would predict a higher rate of IFRS adoption among countries that are subject to the influence of these international organizations, most notably the World Bank and the IMF.

[32] In 1999, the World Bank and the IMF launched the standards and codes initiative to promote international financial stability through the "development, dissemination, adoption and implementation of international standards and codes" (IMF, 2005). One of the identified set of international standards is IFRS.

3.2.4 Emulation

Emulation occurs when actors model their behaviour on the examples of others, in other words when appropriate behaviour is socially constructed (Lee and Strang, 2006). So, contrary to learning, the objective functions of a policy do not matter for emulation (Gilardi, 2011). Instead, it is motivated by a country's desire to acquire legitimacy and status or to be perceived by others as advanced and up-to-date; even if it is fully aware that the policy change is ineffective (Marsh and Sharman, 2009; Meseguer and Gilardi, 2009). The benefit of adopting highly accepted policies is reputational (Elkins and Simmons, 2005), even if they do not work.

Emulation in its most typical form involves the automatic, unreflective copying of foreign policies as a result of deeply shared norms. This type of emulation is also known as imitation or mimicry. Characteristic of copying policies is that adopters do not fully comprehend the objective of the policy (Dobbin et al. 2007). Examples have been documented that illustrate the occurrence of copying mechanisms, even in the most literal sense[33], although downright copying of policies without adapting them to local circumstances is exceptional[34].

In any case, for emulation to be the driving force of adopting a policy, the ideas represented by the policy should be accepted. Ideas and norms can be influenced by participation in international organizations and professional communities (Simmons et al., 2006). For example, expert groups may provide arguments for adopting a policy and thereby increase its social acceptance (Dobbin et al. 2007). Also, shared cultural values, historical ties or a common language may facilitate the spread of ideas. Countries will be more likely to adopt a policy that is accepted by their peers, even if they cannot ascertain that adoption will be in their best interest (Simmons et al., 2006).

When we apply this diffusion theory to IFRS adoption, we expect the probability of IFRS adoption to be higher for countries participating in organizations that actively promote IFRS and for countries that are culturally close to the other IFRS-adopting countries.

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[33] For example, Venezuela copied and pasted Mexico's legislation without removing references to the Mexican constitution. Even worse, Venezuela ended up blacklisting itself when it copied Mexico's national tax blacklist that included Venezuela (Sharman, 2010).

[34] In the case of IFRS, however, full adoption would effectively mean literally incorporating the standards which is in most cases the adoption mode promoted by the IASB.

3.3 Empirical approach

3.3.1 Dependent variable

The dependent variable concerns country-level IFRS adoption decisions. Data on the timing and the extent of the adoption are drawn from surveys and reports from international organizations. In particular, we combine and triangulate multiple sources to code the IFRS adoption history for as many countries as possible and to improve the accuracy of the adoption classification. We start the coding procedure with the information from the IAS Plus websites[35], the only source for which the historical data can be traced. Since we want to analyse the pattern of IFRS adoption across countries over time, we need historical data on IFRS adoption decisions. We code the data per country year and corroborate initial coding and expand the data by carefully reading and combining the rest of the sources as described in more detail in Appendix 1. Most importantly, we use surveys that two Big 4 audit firms have performed over the past decade in order to take stock of the global use of IFRS[36]. In addition, we use the World Bank reports[37], with respect to the compliance of several jurisdictions to international standards including IFRS.

For most of our analyses, we are primarily interested in whether and when a country adopts IFRS. However, there is variation in the degree to which countries require or permit IFRS. Therefore, we distinguish 5 categories of IFRS (non-) adoption, based on classifications used in the IASPlus data. This classification is straightforward in the sense that it distinguishes countries that either mandate or allow IFRS and whether IFRS applied to all companies or some. It does not take into account more qualitative aspects, such as the rigor of the implementation or the enforcement of the standards. Other studies show that there are several ways in which countries can implement IFRS and that the method of implementation

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[35] We use the IAS plus survey from Deloitte (history from 2002-2012, based on older versions of the website and yearly editions of the "IFRS in your pocket publications" by Deloitte, that publish the same tables) and updates on the use of IFRS per jurisdiction on the IAS plus website.

[36] We use the results from a survey by EY (2010) and PWC (2011) to corroborate the findings. In addition, we check the reconcile the findings form the Big4 with the information on a IFRS adoption website by the Simon Fraser University (www.adoptifrs.org).

[37] These Reports on Standards and Codes (ROSC) are written for several countries by the IMF and the World Bank for jurisdictions at the request of the jurisdiction. The focus of the reports varies. For the purpose of our research, the reports with respect to Audit are the most relevant, since they specifically consider the adoption of (and compliance with) IFRS.

Figure 3.1
Policy diffusion mechanisms

The Figure charts the theoretical constructs of the four diffusion mechanisms in a 2x2 schema. We distinguish the diffusion mechanisms based on the source of the policy change (changing incentives or changing ideas) and the intention of the policy change (higher utility or legitimacy).

	Changing incentives	Changing ideas
Utility driven	Competition	Learning
Legitimacy driven	Coercion	Emulation

determines the likelihood that companies' financial statements will actually comply with IFRS (e.g. Zeff and Nobes, 2010). Instead, we are interested in the factors that drive diffusion of IFRS across countries. When studying the diffusion of IFRS, the primary focus is on the adoption decision itself rather than the outcome of the adoption.

3.3.2 Diffusion variables

The four policy diffusion mechanisms that were discussed in Section 2 can be distinguished along two dimensions: the ideas/incentives axis and the functional properties axis.

First, each of the perspectives either traces policy diffusion to changing ideas or changing incentives (Dobbin et al., 2007). The second dimension of our framework, distinguishes diffusion mechanisms based on their source: is the diffusion driven by the functional characteristics of a policy (utility driven) or by its social acceptance (legitimacy driven). Emulation and learning perspectives both assume that changes in ideas lead to changes in policy. However, emulation and learning have different sources for the change in ideas. For emulation, norms and rhetoric are the origin of the changing ideas. In case of learning on the

other hand, ideas change through rational, observational deduction. The other two policy diffusion mechanisms can be categorized along the same lines. In case of coercion or competition, policy changes are triggered by changing incentives. However, the source of the change in incentives is different. In case of competition, the properties of the adopted policy are expected to improve the country's competitive position. Coercion on the other hand leads to the adoption of policies regardless of its functional properties.

The theoretical distinction of the four diffusion mechanisms (as depicted in Figure 3.1) is the foundation for disentangling the concepts empirically. We will address this issue in the remainder of this paragraph.

Although the policy diffusion mechanisms may be distinct from a theoretical point of view, distinguishing the four mechanisms with distinctive observable variables is difficult. The same holds for our study, in the sense that disentangling the four diffusion mechanisms for IFRS empirically is a challenge. Our goal is to identify the relative importance of each of the mechanisms for IFRS diffusion. The mechanisms are not mutually exclusive and identifying the driving force will always be a matter of degree. Policy diffusion assumes that a country's policy choices are affected by other countries' choices and that the influence of another country will be stronger if it is more closely tied to the country of interest. In other words, the impact of another country's policy choice increases relative to the country's proximity. We measure the effect of the policy choices abroad on the country of interest as the weighted average of the dependent variable (a measure of IFRS adoption) across the country's neighbours[38]. The weight is a measure of proximity. Important is that we identify neighbours not only in the conventional sense based on geographic distances, but relative to the specific dimension that we are interested in. For example, the United Kingdom and Australia may be neighbours in the sense that they share cultural characteristics. Based on

38 In line with the policy diffusion literature, we treat the diffusion process as a spatial lag model, by including spatial terms as regressors in the model. The dependent variable is 'lagged in space', where space is the neighborhood of the country. For the respective diffusion mechanisms we are interested in, we construct a matrix W of weights that specifies the diffusion effects as the influence of the IFRS adoption of each country j on country i. By identifying specific weights for a diffusion mechanism, we are able to analyze how other countries decisions affect each other. Such a model can be expressed as:

$$Y_{it} = \rho(WY)_{it-1} + X\beta_{it} + \varepsilon_{it} \quad (1)$$

where ρ is a spatial autoregressive coefficient, W is the NxNxT spatial weight matrix, X is a vector of non-diffusion variables with coefficients β, and ε is a vector of error terms (Simmons and Elkins, 2004; Brooks and Kurtz, 2012). In addition to the spatial lag, we lag each diffusion variable in time.

the theoretical discussion in the previous section, the definition of proximity will differ depending on the diffusion mechanism. Next we describe the measurement for each of the four mechanisms.

First we investigate the notion that competition is driving the diffusion of IFRS adoption. If the widely spread use of IFRS is mainly driven by the integration of global markets (economic globalization), then the main motivation to adopt these standards would be to maintain the country's competitive position in the global markets. In order to test this assumption, we identify which countries compete with each other. Countries are in competition with other countries to the extent to which they trade with the same trade partners. We measure the effect of trade competitors' policy decisions similarly to other policy diffusion studies (e.g. Simmons and Elkins, 2004). Based on the IMF Directions of Trade Statistics database we retrieve the value of trade between country pairs. With this information, the international trade pattern of countries can be compared on a country-by-country base. First we calculate the proportion of export for a country with all N other countries. This results in an NxNxT matrix with the distribution of total trade across all foreign N-1 countries for the N countries of interest per year (t). Next we calculate the correlation between pairs of countries to determine the extent to which the trade pattern of two countries is similar. If two countries have exactly the same relative export to the same countries, there will be a perfect correlation. We use these correlation coefficients for each country pair as a proximity measure (from a competition perspective) to weigh the expected influence of IFRS adoption decisions across close/remote competitors.

An alternative interpretation of competition is that countries are competitors when they compete with each other for capital. Arguably, investors have a specific risk preference and will choose between countries that represent the same risk level when deciding where invest their money. In that case, a country would be in competition with foreign countries in the same risk class. Therefore, we calculate a measure for capital market competitors based on country risk measures as provided by The Economist Intelligence Unit (EIU)[39]. We define the alternative measure for competition driven diffusion as the fraction of IFRS adopters among countries in the same risk class. In an alternative model specification reported as robustness check (Section 5) we discuss and employ this alternative measure.

The second diffusion mechanism we investigate is learning. Like competition, this mechanism assumes diffusion is driven by perceived improvements in utility, but instead of

[39] The Economist Intelligence Unit (EIU) is part of The Economist Group and provides analysis of country-level date (as well as industry and management analysis). The overall country risk measure can be used as a proxy for general risk of a specific country or as financial research blog states: "These ratings can be used to decide on investing in the financial markets or for direct investments in those countries" (http://financialresearch.blog2blog.nl/Datastream)

changes in incentives learning emerges from changing ideas. The most obvious source of ideas about effective policies is the success of other countries. Governments are likely to learn from policies that seem to work in other countries. Learning from the success of others without imposing strict assumptions regarding the information processing capacities of governments, requires a highly visible measure for success. Therefore, we measure success as the growth of a country's GDP. In addition, we assume that governments are more aware of the economic performance of neighbouring countries and more likely to learn from their neighbours. In order to capture this, we take a look at the GDP growth rate among ten the nearest countries (geographically). We compare median GDP growth of the IFRS-adopters among the ten nearest countries (geographically) and compare this to the median growth GDP growth rate of the countries that did not adopt IFRS among the ten nearest countries (geographically). The learning diffusion variable is 1 if GDP growth is higher for the top 5 neighbouring IFRS adopters and 0 otherwise.

The third diffusion mechanism assumes that policy decisions are driven by international pressures, or coercion. The most obvious source for such pressure with respect to IFRS is the IMF and the World Bank. These institutions actively promote and monitor the use of IFRS internationally. Since 1999, the support for IFRS is formalized in the standard and codes initiative, a joint project by the World Bank and the IMF "designed to promote greater financial stability, at both the domestic and international levels, through the development, dissemination, adoption, and implementation of international standards and codes" (IMF and World Bank, 2005, p.5). The initiative covers twelve areas and related standards, one of which is accounting standards/IFRS. Countries that are depending on finance provided by these institutions ("clients" of the IMF or World Bank) are more susceptible to comply with the policies advocated by the institutions. Compliance will enhance their reputation with the IMF and World Bank (legitimacy) and may therefore improve their access to loans and credits (incentives). The operationalization of this concept is straightforward: we use a dichotomous variable of whether or not a country has drawn on IMF or World Bank resources.

The final diffusion mechanism that we are interested in is emulation. Similar to policy adoption driven by coercion, emulation involves a countries desire to increase international legitimacy. But in this case, it is the emergence of new ideas that induce the acceptance of a new policy. When international expert communities promote new policies norms, the policy may spread across countries (Dobbin et al., 2007). Ideas about accounting standards are most prominently advocated by the profession that is accountable for financial reporting: the accountants (or auditors). If the accountants of a country are convinced of the advantages of IFRS, they can influence public opinion and even government's adoption decision. The International Federation of Accountants (IFAC) is the international body of accountancy

organizations. According to the organizations website[40], professional accountancy organizations recognized by law or general consensus within their countries as substantial national organizations may apply to become associate and full member. Primarily, the IFAC is concerned with the quality of audit profession and develops international standards on auditing (ISAs). The IFAC decided to actively promote IFRS and to cooperate with the IASB already in 2002. Members are required to support IFAC's mission and programs, including the requirement that "member bodies shall identify and undertake actions to have IFRSs issued by the IASB adopted and implemented for at least public interest entities in their jurisdictions"[41]. If a country has a national body of professional accountants that is affiliated with the IFAC, there is an identifiable advocacy group that has the obligation to actively promote the norms embodied by IFRS. We therefore operationalize the emulation driven diffusion by means of an indicator variable for IFAC membership. Based on IFAC's annual reports we handcollect the membership status for every country in the years 2002-2012. The IFAC membership status for a specific country year can take on a value of 0-3, depending on whether there is no professional accountancy organization in the country registered (0), or whether at least one accountancy organization for that particular country-year is either an affiliate (1), associate (20) or full member (3).

Arguably, accountants' organizations may be more likely to join the IFAC if it is likely that its country of origin will adopt IFRS in the near future. In that case, the relation would in the reverse direction. However, we argue that this is not likely to be case; since IFAC's primary concern is to support the development of the accounting profession. Accountancy organizations are likely to join the IFAC as a signal of their professionalism and commitment to quality. The commitment to IFRS that IFAC requires is part of the membership, but not the main goal. For example, the largest member organization (in terms of individual accountants, experts and financial support) of the IFAC is the U.S. accountancy organization, the AICPA (Bunting, 2009). As an IFAC member, the AICPA actively promotes the adoption of IFRS in the U.S., but the U.S. is still using its national accounting standards. At least for the AICPA, it seems clear that their membership is not driven by the commitment by U.S. regulators to adopt IFRS.

However, we are sensitive to the concern that our measure for emulation may be endogenous. To alleviate this concern, we lag the emulation with one unit (similar to the other diffusion measures). In addition, we define two alternative measures for emulation: (1) fraction IFRS adoption among 10 closest countries by geographic proximity and (2) fraction IFRS adoption among 10 closest countries by administrative proximity. The alternative

[40] www.ifac.org/about-ifac/membership; accessed on 18 November 2012.

[41] Statement of Membership Obligations (SMOs) 1-7 (Revised) as published by the IFAC 20 November 2012; SMO 7 art. 11.

measures are applied in the alternative model specifications that are further discussed in the Robustness Checks section (in Section 5).

3.3.3 Domestic factors

Several domestic factors can be assumed to influence if not determine a country's decision to adopt IFRS. The policy diffusion mechanisms that we investigate can be seen as potential alternative explanations to the more broadly used domestic explanations. In most of our tests, we use country fixed effects to control for domestic factors. However, we also include a model where domestic variables are included as separate variables.

A known problem in empirical policy research is the lack of variation of country specific variables over time. We try to find measures for the concepts that we would like to control for that vary over time, in order for the measures to be distinct from country fixed effects. We include GDP growth as a time varying country measure that captures economic strength. A plausible alternative explanation for IFRS adoption driven by diffusion mechanisms is the domestic demand by domestic companies that are listed on a European stock exchange. We control for this by means of a dichotomous variable indicating whether there are companies established in the country that are listed on a European securities market or not. In addition, we control for a country's international openness as measured by the ratio of imports of goods and services to GDP and the ratio of FDI inflows to GDP. It can be argued that the quality of government affects the probability of IFRS adoption. A commonly used measure to proxy for government quality is the number of days it takes to enforce a contract, so we include it as one of the domestic factors. Finally, a government's attitude towards IFRS is likely to be influenced by the party orientation with respect to economic policy. For example, parties that are defined as left-wing may be less prone to adopt IFRS compared to right wing, liberal parties In order to control for these political preferences, we include a measure for government partisanship (from the Database of Political Institutions).

Variables definitions and sources are summarized in Table 3.1.

Table 3.1 Summary statistics and sources for variables included in the analysis

The sample consists of country-level observations for 155 countries in the years 2002-2012(the182 countries from the World Bank Universe minus 27 members of the EU/EEA). For two of the four Diffusion Mechanisms (Competition and Emulation), we define more than one measure. The first measure defined in the Table is used in the main analysis. The alternative measures are applied in the robustness section. Several sources have been used to collect the data. The right column in the Table indicates which sources have been used to collect and construct the variables. The numbers refer to the following sources: (1) IASPlus; (2) PWC Surveys; (3) EY Surveys; (4) Adoptifrs.org; (5) IMF Directions of Trade database; (6) The Economist Intelligence Unit (EIU); (7) World Bank, World Development Indicators; (8) Berry et al. (2010), geographic distance measure; (9) IFAC annual reports; (10) Berry et al. (2010), administrative distance measure; (11) Orbis; (12) Datastream; (13) World Bank Database of Political Institutions 2012

	Variable	Description	Obs	Mean	Std. Dev.	Min	Max	Source
Dependent variable	IFRS Status	Dummy variable; indicates whether a country has adopted IFRS or not.	1749	0.324	0.468	0	1	(1), (2), (3), (4)
Explanatory variables								
Diffusion mechanisms								
Competition: 1	IFRS policies among trade competitors	Percentage of IFRS adopters (among top 5 nearby countries). Proximity of countries is measured based on correlation of international trade pattern.	1379	0.332	0.275	0	1	(1), (2), (3), (4), (5)
2.	IFRS policies among capital market competitors	The fraction of IFRS adopters among countries that are in the same risk class as the country of interest. Risk class as reported by the Economics Intelligence Unit.	931	0.446	0.189	0	1	(1), (2), (3), (4), (6)

Table 3.1 (continued) Summary statistics and sources for variables included in the analysis

		Variable	Description	Obs	Mean	Std. Dev.	Min	Max	Source
Learning		IFRS policies of close, successful countries	Dummy variable; 1 if the IFRS adopters (among top 10 nearby countries) outperform non-adopters in terms of GDP growth; looking at median values. Also 0 when none of top 10 is IFRS adopter. In case all of top 10 are IFRS adopters, 1 if the IFRS adopters outperform country GDP growth of country of interest.	1311	0.413	0.493	0	1	(1), (2), (3), (4), (7), (8)
Coercion		IMF credits or foreign aid receiver	Dummy variable; 1 if the country is a receiver of IMF or World Bank credits, 0 otherwise.	1579	0.635	0.482	0	1	(7)
Emulation	1	Pro IFRS auditor body	IFAC-membership status of country's professional accountancy organization; proxy for advocacy of policy norms by international expert community. 0 if not listed, 1 if affiliated, 2 if associate member and 3 if full member.	1519	1.720	1.438	0	3	(9)
	2	IFRS policies among geographic neighbours	Fraction of top 10 nearby countries that adopted IFRS	1310	0.331	0.296	0	1	(1), (2), (3), (4), (9)
	3	IFRS policies among countries with administrative similarities	Fraction of IFRS adoption among the top 10 countries that are most nearby from an administrative perspective, as defined by Berry et al. (2010)	1470	0.387	0.236	0	0.9	(1), (2), (3), (4),(10)

Table 3.1. (Continued) Summary statistics and sources for variables included in the analysis

Variable	Description	Obs	Mean	Std. Dev.	Min	Max	Source
Domestic factors							
GDP Growth	GDP growth percentage as provided by the WB WDI database	1307	4.670	5.151	-41.3	46.5	(7)
Crosslisting in EU	Dummy to identify countries that have at least one domestic firm with a cross listing at an EU stock market	1291	0.449	0.498	0	1	(11), (12)
FDI inflows/GDP	Foreign Direct Investments as % of GDP	1276	4.923	6.352	-14.36905	90.7411	(7)
Imports/ GDP	Imports of goods and services as % of GDP	1338	47.468	26.322	0.125	219.0691	(7)
Quality of Government	Number of days to enforce a contract	1334	608.618	292.344	120	1715	(7)
Partisanship Government	Partisanship of government, 3-point measure right- left-centrist	1354	1.143	1.298	0	3	(13)

3.3.4 Sampling and estimation

We test our hypotheses using a cross-national panel dataset on the adoption of IFRS in 182 countries (World Bank universe) between 2002 and 2012. We focus on this period due to data availability and because very few IFRS adoptions were effective prior to this time. The unit of analysis is the country-year. Country is a natural choice for the cross-sectional unit in this study because the decision to adopt IFRS is typically made at the national level, and in most countries around the world national governments either directly govern or monitor/regulate capital markets. In our analysis, we drop all member countries of the European Union or EEA. These countries adopted IFRS collectively in 2005 (or later for the countries that joined the EU after 2005), as this decision was taken at the EU level and not on an individual country level. Consequently, the maximum number of countries in our sample diminishes with 27. In addition, depending on model specifications, additional countries may drop out due to data constraints.

We are interested in the pattern of IFRS diffusion across the globe. We study the factors that explain the occurrence of IFRS adoption, the timing of the adoption across countries and the differences in the extent to which IFRS is adopted. Therefore, we first define IFRS adoption as a binary variable and employ a logistic model to analyse which factors affect the probability of the decision to adopt IFRS. Next, we run hazard regressions to investigate the effect of time on probability (hazard) of IFRS adoption. Since we do not have strong assumptions about the baseline hazard, we use the Cox proportionate hazard model. Then, assuming that the extent of a countries' IFRS adoption varies (e.g. countries may require use of IFRS for all companies or companies that meet specific criteria), we apply ordinal logistic regression analyses in order to see if the diffusion mechanisms affect the extent of adoption. In the main analyses, presented in Section 5, the models do not include domestic control variables. Instead, we cluster on a country level to control for country fixed effects. The results for models including the domestic control variables are reported in the Robustness Checks part of Section 5. Moreover, the (ordinal) logistic models include year dummies to control for patterns over time.

3.4 Findings

What conditions lead to IFRS adoption? How are countries' IFRS adoption decisions influenced by the international environment? We start with a comparison of the four diffusion mechanisms defined according to their primary definitions discussed in Section 4. We first run a separate logistic regression for each diffusion mechanism (Model A to D) and then rerun the model with all four diffusion variables combined (Model E). For the purpose

Table 3.2
Logistic regressions of IFRS status

The table presents results from logistic regressions on the binary indicators for IFRS adoption (on a country level). Sample is based on country-year observations for the years 2002-2012, maximum sample size of 157 countries (World Bank universe excluding EU/EEA members). Diffusion variables are as defined in Table 3.1. All models include year indicators (results not reported). Estimates are exponentiated coefficients (odds ratios). Robust, clustered standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

Diffusion mechanism	Model A	Model B	Model C	Model D	Model E
Competition (IFRS policies among trade competitors)	3.153**				2.751**
	(1.429)				(1.394)
Learning (IFRS policies of close successful countries)		1.632**			1.470*
		(0.321)			(0.313)
Coercion (IMF credits or foreign aid receiver)			0.899		0.685
			(0.300)		(0.266)
Emulation (Pro IFRS auditor body)				1.761***	1.686***
				(0.199)	(0.206)
year FE	Yes	Yes	Yes	Yes	Yes
Number of observations	1379	1311	1579	1519	1194
Number of countries (clusters)	150	156	169	163	143
Log pseudo likelihood	-863.4	-807.3	-985.9	-861.3	-678.3
Wald chi	48.59	48.40	49.23	57.25	58.70
Degrees of freedom	10	9	10	10	12
Pseudo R^2	0.0397	0.0317	0.0254	0.1210	0.1183

these model specifications, we translate the dependent variable into a binary format, where countries that require IFRS for some or all domestic companies score a 1 and all other score 0. In these models year fixed effects are applied. Results are reported in Table 3.2.

The findings provide support for three of the four diffusion mechanisms, with emulation providing the most pronounced results. Based on these results, it seems that countries' decision to adopt IFRS is influenced by the ideas of the leading epistemic community, which we define as is the international professional auditor organization. The separate effect of

emulation (Model D) is about the same as the effect net of competition, learning and coercion (Model E), in terms of size and significance of the odds ratio. In addition, Table 3.2 provides evidence for diffusion driven by competition and by learning. These results are also consistent for the separate models (Model A and B respectively) and the combined model (Model E), although for learning the results are less significant in the combined model (significance drops from the 5% to the 10% level). Pressure from the IMF or World Bank does not seem to play a role in the decision to adopt IFRS. The odds ratio for the coercion mechanism is smaller than one (which is contrary to expectations) but not significant. The results from Table 3.2 strongly suggest that countries' decisions to adopt IFRS are driven by other countries' behaviour. The most pronounced effects on IFRS adoption come from competition and emulation. The odds that a country will adopt IFRS increase when IFRS is more common among the most important competitors. In addition, the decision is influenced by changing ideas, measured by the pro-IFRS ideas of professional auditors.

Another way of looking at the IFRS adoption pattern is to focus on the factors that affect the timing of countries' adoption decisions. This can be analysed by means of a survival analysis, or hazard model. In principle, every country can decide to require IFRS at any point in time. For as long as IFRS is not adopted, the possibility to do so next year remains. In other words: a country that has not adopted IFRS yet, is 'at risk' of adopting IFRS next year. Countries that do not adopt, 'survive' possible IFRS adoption. In order to apply survival analysis, we redefine the dependent variable as the number of years a country goes without adopting IFRS.

As a first step, we determine the influence of the diffusion mechanisms on the risk of adopting IFRS over the years. To isolate the effect of each of the diffusion mechanisms, we determine the survival curves per diffusion variable using the non-parametric Kaplan-Meier estimator. Visualizing the survival rate helps to diagnose the effect of each of the mechanisms. We split the sample in two groups based on binary definitions of each the diffusion mechanisms. For this purpose, we apply binary definitions for each of the four diffusion mechanism variables. For competition, we split the sample on the median of the competition variable, dividing it in the 50% with the highest percentage of IFRS adoption among the most competing countries and the 50% with the lowest percentage of IFRS adoption among the most competing countries. The variable for diffusion by learning is already defined as a binary variable (splitting the sample based on whether economic success among the nearest IFRS adopters is higher compared to the IFRS adoption among the nearest non-adopters, or not). For coercion the variable is also defined as a dummy, indicating whether a country received IMF-credit and/or development aid. Emulation is operationalized as an indicator variable, which we limit to two possible outcomes for the purpose of the

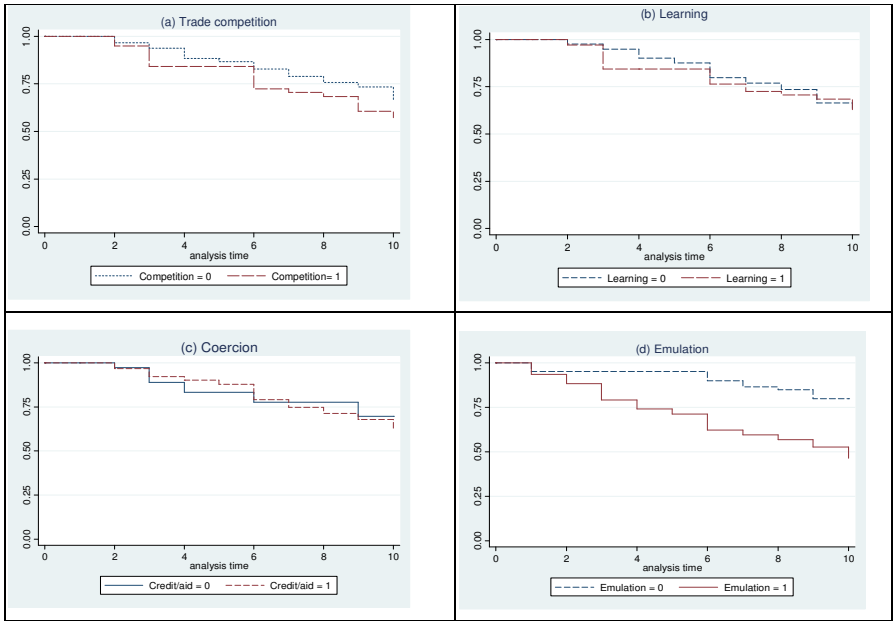
survival curve, splitting the sample in countries with a professional auditors body affiliated with the pro-IFRS IFAC and countries that do not have such an auditors organization. Figure 3.2 plots the survival function curves (Kaplan-Meier estimates) conditioned on each of the diffusion variables consecutively.

Figure 3.2
Survival curves conditioned on separate Diffusion Mechanisms

The Figure plots Kaplan-Meier survival estimates, comparing survival curves when we split the sample in two based on a diffusion mechanism. For this purpose, the diffusion variables that have been defined in Table 3.1 are transformed into binary variables as follows: :

- for the competition mechanism, we distinguish countries based on whether their main competitors in terms of export markets and geographic proximity, have adopted IFRS or not,
- for learning, we split the sample based on whether IFRS adopters among neighbouring countries are more successful (in terms of gdp growth and geographic proximity) than the neighbours that did not adopt IFRS;
- for coercion we compare countries that receive IMF credits and/or foreign aid from those that do not; and
- for emulation we compare countries that have a professional auditors organization that has joined the IFAC from those that do not have such an auditors organization.

Horizontal axes indicates the number of years passed. Vertical axes indicate the cumulative proportion that did not adopt IFRS (that is, the proportion that "survived").



The plots provide a first impression of the time to adoption of IFRS, contrasting countries that are expected to be affected by the diffusion mechanism to those that are not. Comparing

the survival curves, it is evident that the effect of emulation (Figure 3.2d) is the most pronounced. In fact, for countries that are subject to pro-IFRS ideas almost 50% would have adopted IFRS by the end of the sample period, while this is only 20% for the rest of the countries. Competition (Figure 3.2a) also has some effect, but learning and coercion do not seem to influence the pattern of IFRS adoption decisions. These results are in line with the results of the logistic regressions (Table 3.2).

Next, we extend the survival analysis by modelling the data in a hazard model, allowing us to include several variables simultaneously. The definition of the dependent for the purpose of survival analysis is the number of years that a specific country does not adopt IFRS. The variables for the diffusion mechanisms are back to their original definition (specified in Table 3.1). Table 3.3 reports the hazard ratios for Cox proportional hazard regressions with similar specifications as the logistic regressions in Table 3.2. The hazard ratios can be interpreted as the effect on the odds of IFRS adoption associated with a one unit move on the dependent variable.. The hazard ratios are proportionate to the baseline hazard rate, which represents the risk of IFRS adoption when the values of the covariates are zero (relevant for Model E). Hazard ratios greater than one imply that a change in the variable raises the hazard of IFRS adoption or decreases the "time at risk" prior to adoption. When the estimated hazard ratio is less than one, it indicates that a change in the variable will negatively affect the hazard of IFRS adoption, or increase the "time at risk" prior to adoption. The regressions confirm the impressions from the survival curves. None of the hazard ratios are significant, except the hazard ratio for emulation. Countries are more at risk to adopt IFRS when the ideas about IFRS are positive, as measured by the pro-IFRS attitude of auditors. Potentially, our measurement of emulation based on expert groups promoting the idea of IFRS is in fact endogenous. Although this concern may be alleviated by the fact that the emulation variable is lagged by one unit, we are sensitive to these concerns and employ alternative definitions and measurements for emulation in the robustness checks section.

Table 3.3
Hazard regressions of IFRS status

The table presents results from Cox proportional hazard regressions. Dependent variable is the number of years that a country goes by without adopting IFRS (i.e. the country "survives" the risk of IFRS adoption). Sample is based on country-year observations for the years 2002-2012, maximum sample size of 157 countries (World Bank universe excluding EU/EEA members). Diffusion variables are as defined in Table 3.1. All models include year indicators (results not reported). Estimates are exponentiated coefficients (hazard ratios). Robust, clustered standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

Diffusion mechanism	Model A	Model B	Model C	Model D	Model E
Competition (IFRS policies among trade competitors)	2.467				2.200
	(1.462)				(1.351)
Learning (IFRS policies of close successful countries)		1.039			0.942
		(0.316)			(0.293)
Coercion (IMF credits or foreign aid receiver)			1.251		0.949
			(0.433)		(0.362)
Emulation (Pro IFRS auditor body)				1.591***	1.652***
				(0.183)	(0.216)
Number of observations	814	871	957	912	778
Number of countries (clusters)	109	116	127	122	104
Time at risk	815	872	958	913	779
Log pseudo likelihood	-183.2	-196.2	-209.6	-198.6	-168.5
Wald chi	2.32	0.02	0.42	16.33	17.71
Degrees of freedom	1	1	1	1	4

The results presented thus far all employ a binary definition of IFRS adoption, distinguishing countries that have adopted IFRS from those that have not. In reality, there is a wider variation in the way that jurisdictions relate to IFRS. Instead of either requiring IFRS or not, countries may also allow IFRS or require IFRS only for certain companies. In order to take this variation into account, we redefine the IFRS variable, allowing it to take on a value of 0-4. For each country-year we code the IFRS implementation status based on the classifications used in the IASPlus database. IFRS status is 0 when a country has no policy

Table 3.4
Ordinal logistic regressions of IFRS status

The table presents results from ordinal logistic regressions on the multi-level indicators for IFRS adoption (on a country level). The dependent variable can take on values from 0-4 depending on the IFRS adoption status, where 0 is the lowest status (the country has no policy with respect to IFRS) and 4 is the highest (IFRS is required for all firms). The construction of the dependent variable is further explained in Appendix 1. Sample is based on country-year observations for the years 2002-2012, maximum sample size of 157 countries (World Bank universe excluding EU/EEA members). Diffusion variables are as defined in Table 3.1. All models include year indicators (results not reported). Estimates are exponentiated coefficients (odds ratios). Robust, clustered standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

Diffusion mechanism	Model A	Model B	Model C	Model D	Model E
Competition (IFRS policies among trade competitors)	3.530***				2.912**
	(1.406)				(1.282)
Learning (IFRS policies of close successful countries)		1.441**			1.362*
		(0.259)			(0.253)
Coercion (IMF credits or foreign aid receiver)			0.640*		0.553*
			(0.169)		(0.172)
Emulation (Pro IFRS auditor body)				1.364***	1.291***
				(0.117)	(0.119)
year FE	Yes	Yes	Yes	Yes	Yes
Number of observations	1379	1311	1579	1519	1194
Number of countries (clusters)	150	156	169	163	143
Log pseudo likelihood	-1510.7	-1504.4	-1836.0	-1698.0	-1255.2
Wald chi	60.98	55.55	60.13	62.92	65.09
Degrees of freedom	10	9	10	10	12
Pseudo R2	0.0319	0.0186	0.0220	0.0423	0.0544

with respect to IFRS in a specific year. When IFRS is required for all firms in a country year, the IFRS status is 4. Appendix 1 provides more detailed information about the construction of the IFRS implementation status variable. Using the multi-level IFRS variable as dependent, we employ ordinary logistic regression in order to take the variation in the scope of IFRS adoption into account. Results are reported in Table 3.4.

In this specification, the results are very similar to the logistic regressions reported in Table 3.2. The results are stronger, in the sense that Table 3.4 reports significant results for all four diffusion mechanisms. The odds ratios are significant in the separate Models A-D and in the combined Model E. The odds ratio for coercion however, is smaller than 1, suggesting that the odds of adopting IFRS decrease when countries are dependent on the World Bank/IMF. This is in line with the results from the logistic analysis, although the odds ratio for coercion in the logistic models is not significant. Model E in Table 3.4 confirms that the emulation has the strongest positive influence on the odds of adopting IFRS.

Robustness checks

Throughout our models, we use one empirical definition for each diffusion mechanism. This may raise concerns with respect to the sensitivity of our results to these particular definitions. Specifically, we check whether the results for competition and emulation are robust to other operationalizations of the concept. For competition we construct an alternative measure based on a different type of competition. Arguably, in the case of IFRS, countries are competing for capital from investors rather than for trade and that our measure should reflect this. To address this concern, we identify an alternative measure for competition driven diffusion based more directly on capital market competition. From an investor perspective countries compete for capital based on the country's risk profile. Investors with a certain risk preference will compare countries within the same risk class. Hence, when deciding to adopt IFRS driven by competition-based arguments, a country will compare itself to countries with the same risk rating. To capture this, we use the overall country risk measure from the Economist Intelligence Unit. This risk measure is determined annually for 119 countries and is calculated as the average of the ratings for sovereign risk, currency risk and banking sector risk. For each country, we determine the average IFRS adoption within its risk class, per year.

Also for emulation, we operationalize the concept differently. In this case, we construct two alternative measures: a measure for emulation based on geographic proximity and a measure based on administrative proximity. Both proximity measures are based on the distance measures from Berry et al. (2010), where geographic distance is defined as the great circle distance between two countries and administrative distance combines measures for colonial ties, common religion and legal system. For both measures, we calculate emulation as the fraction of IFRS adoption across the most nearby countries. We run logistic models including the alternatively defined diffusion variables. The results in Table 3.5 are in line with our original estimates.

Table 3.5
Logistic regressions of IFRS status, alternative measurement of main diffusion mechanisms

The table presents results from logistic regressions on the binary indicators for IFRS adoption (on a country level). Sample is based on country-year observations for the years 2002-2012, maximum sample size of 157 countries (World Bank universe excluding EU/EEA members). Diffusion variables are as defined in Table 3.1, specifically we use the alternative definitions for the diffusion mechanisms Competition and Emulation. All models include year indicators (results not reported). Estimates are exponentiated coefficients (odds ratios). Robust, clustered standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

Diffusion mechanism	Model A	Model B	Model C	Model D	Model E
Competition					
IFRS policies among capital market competitors	8.881 *			10.18 **	5.305
	(10.62)			(11.27)	(5.945)
Emulation					
IFRS policies among geographic neighbours		5.057 ***		6.716 ***	
		(2.574)		(4.878)	
IFRS policies among countries with administrative similarities			6.499 ***		6.061 *
			(4.442)		(5.985)
Learning					
IFRS policies of close, successful countries				1.272	1.624 *
				(0.292)	(0.406)
Coercion					
IMF credits or foreign aid receiver				0.969	0.959
				(0.404)	(0.409)
year FE	Yes	Yes	Yes	Yes	Yes
Number of observations	931	1310	1470	808	799
Number of countries (clusters)	102	156	158	98	97
Log pseudo likelihood	-606.5	-784.8	-898.2	-494.3	-504.1
Wald chi	44.83	44.12	52.97	40.93	42.75
Degrees of freedom	10	9	10	12	12
Pseudo R^2	0.0493	0.0574	0.0496	0.0990	0.0687

Model A introduces the alternative definition for competition, based on countries' perceived risk. We see that the results are similar to the effect of trade competition that we reported in our original model specifications. Higher IFRS adoption rates among countries with a

similar risk profile (that therefore compete for investors with the same risk preferences), increase the probability of IFRS adoption.
For alternative definitions of emulation, the results remain roughly the same. Emulation based on geographic or administrative proximity seems to positively affect the probability of IFRS adoption. Both definitions of emulation remain significant when included in a model with the other diffusion mechanisms (Model D and E).

Next we expand the model from Table 3.2 by including domestic factors. We start with a stripped down model, which tries to explain the probability of IFRS adoptions with domestic factors only. This represents the most fundamental alternative explanation to policy diffusion, namely that policy decisions are driven by domestic characteristics only. We include six proxies for country characteristics that may influence the probability of adopting IFRS, as discussed in Section 4. Model A in Table 3.6 reports the results for the logistic regression with domestic factors only. In Model B we expand the model by first introducing competition, since this is the most often cited motivation to adopt IFRS. In Model C-E we add the alternative diffusion mechanisms one by one; hence Model E includes all diffusion variables.

Table 3.6
Logistic regressions of IFRS status, including domestic factors

The table presents results from logistic regressions on the binary indicators for IFRS adoption (on a country level). Sample is based on country-year observations for the years 2002-2012, maximum sample size of 157 countries (World Bank universe excluding EU/EEA members). Diffusion variables and domestic variables are as defined in Table 3.1. All models include year indicators (results not reported). Estimates are exponentiated coefficients (odds ratios). Robust, clustered standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

Diffusion mechanism/ Domestic factors	Model A	Model B	Model C	Model D	Model E
Competition		3.919 **	3.668 **	3.656 **	3.520 **
(IFRS policies among trade competitors)		(2.152)	(1.999)	(2.013)	(2.120)
Learning			1.327	1.266	1.248
(IFRS policies of close successful countries)			(0.333)	(0.309)	(0.315)
Coercion				0.602	0.612
(IMF credits or foreign aid receiver)				(0.282)	(0.319)
Emulation					1.500 ***
(Pro IFRS auditor body)					(0.207)
Domestic factors					
GDP Growth	1.002	0.999	0.998	1.004	1.008
	(0.0257)	(0.0259)	(0.0251)	(0.0251)	(0.0278)
Crosslisting in EU	0.960	1.028	0.992	0.992	1.010
	(0.326)	(0.364)	(0.358)	(0.358)	(0.372)
FDI inflows/GDP	1.038	1.034	1.032	1.034	1.037
	(0.0300)	(0.0310)	(0.0305)	(0.0307)	(0.0309)

Table 3.6 (continued)
Logistic regressions of IFRS status, including domestic factors

Diffusion mechanism/ Domestic factors	Model A	Model B	Model C	Model D	Model E
Imports/ GDP	0.995	0.998	0.999	1.000	1.000
	(0.00734)	(0.00783)	(0.00798)	(0.00858)	(0.0103)
Quality of Government	0.581	0.654	0.660	0.706	0.646
	(0.222)	(0.275)	(0.283)	(0.305)	(0.278)
Partisanship Government	0.931	0.956	0.941	0.955	0.921
	(0.107)	(0.113)	(0.113)	(0.115)	(0.115)
year FE	Yes	Yes	Yes	Yes	Yes
Number observations	888	786	782	782	782
Number of countries (clusters)	134	128	127	127	127
Log pseudo likelihood	-547.6	-486.6	-480.4	-477.4	-456.1
Wald chi	31.72	28.66	30.71	31.66	34.97
Degrees of freedom	14	14	15	16	17
Pseudo R^2	0.0403	0.0505	0.0549	0.0609	0.1028

The results reported in Table 3.6 suggest that none of the domestic factors significantly influences the odds of a country's decision to adopt IFRS. This is consistent across Models A-E. This finding supports the notion that countries' policy decisions are not taken based on domestic affairs only. The behaviour of competing countries is influential, with consistent significant results across model specifications. More importantly, the results from the analysis of the model specifications excluding domestic factors (Table 3.2) are unaffected, in the sense that Table 3.6 also reports significant odds ratio's for two diffusion mechanisms: competition and emulation. When the adoption rate among competitors increases (by one unit), the odds of IFRS adoption increase by a factor 3. Incremental to the inclusion of other diffusion variables, the effect of emulation is most evident. The size of the effect is smaller than for competition (with an increase in the odds by a factor 1.5), although comparing the size of the effects is complicated because of the different scales of the underlying variables. Although the results for competition and emulation are robust, the results for learning

disappear upon the inclusion of the domestic factors. For the fourth diffusion mechanism, coercion, we find no significant results in this model specification, which is similar to the findings for models without domestic factors (reported in Table 3.2).
As a final robustness check, to alleviate concerns that results are biased by the effect that one diffusion variable may have on another diffusion variable when include in the same model, we run logistic regressions for interactions of all pairs of diffusion variables. The (not tabulated) results are very similar to the reported results.

3.5 Conclusions

Within the international relations literature, evidence has been building that international diffusion plays an important role in the timing and spread of financial liberalization policies. Within the international financial reporting literature however, this class of explanations has been overlooked. The adoption of IFRS by the majority of countries during the past decade has been explained by the economic benefits individual countries expect to gain. This paper shows that the economic, domestic explanation is incomplete. There are good reasons to believe that countries are sensitive to adoption decisions by neighbouring countries. Countries may be neighbours from distinct perspectives, and depending on the nature of the ties we measure proximity differently. Countries may be close competitors, close geographic neighbours or they may share cultural roots or norms. Based on whether the policy change is induced by changing ideas or changing incentives and whether countries strive for legitimacy or utility, we identify four diffusion mechanisms: competition, learning, coercion and emulation. Across all model specifications and variable definitions, we find evidence of emulation as a driving force behind the adoption of IFRS. The changing ideas of a government about IFRS increase the odds that IFRS will be adopted. Ideas may change influenced by the national accountancy organizations, who are committed by the international accountants organization to actively promote IFRS. Alternatively, governments may accept IFRS as the norm because neighbouring countries (geographically or culturally) already adopted IFRS. These mechanisms of diffusion appear incrementally to the effect of competition (defined as the average IFRS adoption across close trade competitors). In addition, we found some evidence that governments learn from the success of others. In these cases, odds of IFRS adoption are higher when IFRS adopting neighbours are more successful. We found no evidence for coercion to be a driving force behind IFRS adoption, in the sense that the odds that a country adopts IFRS are not significantly affected by pressure from powerful international institutions (IMF and World Bank).
Domestic factors performed weakly. This is contrary to widely held beliefs that governments take the decision to adopt IFRS primarily based on specific national circumstances. Again,

this emphasizes that we need to broaden our perspective on IFRS adoption. Policy decisions cannot be explained by domestic country characteristics alone.

Essentially, this study adds two main points to our understanding of the worldwide adoption of IFRS. First, we cannot understand the pace and pattern of IFRS adoption without a conjoint model of domestic and international influences. Second, the diffusion of IFRS is not simply induced by the globalization of markets. Adoption decisions are clearly influenced by the acceptance of IFRS as the norm. This influence is consistent and incremental to the effect of competition. As such, the worldwide adoption of IFRS reflects the global spread of an idea.

Appendix 3.1 Collection and construction of the dependent variable IFRS status

This appendix describes the construction and coding of the dependent variable in some more detail. We collect data on the adoption per jurisdiction over the period 2002 till 2012. This period is chosen for 2 reasons:

1. Before 2002, only few IFRS (or IAS as they were named at that time) took place. This is probably related to the changes that took place with respect to the IASB. The status of the IASB and IFRS changed dramatically during 2001. The IASB in its current form was constituted during 2001. The new organizational structure was changed in order to increase its independence and hence it legitimacy as an international standard setter. In the same period, the IASB increased the intensity with which it was working to improve its accounting standards. Also, in 2002 the European Union announced its intention to adopt IFRS in 2005, augmenting the legitimacy of IFRS considerably.
2. Most of the data with respect to IFRS/IAS adoptions start in 2002, most likely for reasons similar to the ones stated under point 1.

We base our IFRS variable on several data sources. We do so in order to augment the reliability of the data and in order to increase coverage and include as many countries as possible. In social sciences, the convergence of multiple data sources in order to corroborate the data is known as triangulation[42] (Denzin, 1978).

Below, the sources (including websites, as visited for our data collection) are listed.

1. IAS plus (Deloitte) history from 2002-2012: http://www.iasplus.com/country/useias.htm
2. EY IFRS implementation (based on a 2010 survey): http://www.ey.com/GL/en/Issues/IFRS/IFRS-Status-of-implementation-by-country
3. PWC IFRS per country (based on a 2011 survey) http://www.pwc.com/us/en/issues/ifrs-reporting/country-adoption

[42] This definition is consistent with The Encyclopedia of research design (Salkind, 2010, p.1510). Like most researchers, the encyclopedia refers to Norman Denzin, the author of the book "The act of research" from 1978, who defined the concept of triangulation.

4. Reconstruction of IFRS adoption per country, produced by the IFRS Adoption Research Group at Simon Fraser University, Canada: http://www.adoptifrs.org/
5. IAS plus (Deloitte) updates per country:
   http://www.iasplus.com/en/jurisdictions
   http://www.iasplus.com/en/resources/use-of-ifrs
6. IMF/World Bank Reports on the Observance of Standards and Codes (ROSCs):
   http://www.worldbank.org/ifa/rosc.html
   http://www.imf.org/external/NP/rosc/rosc.aspx

We start off with the historical data from the IASPlus websites (source 1) (based on older versions of the website and yearly editions of the "IFRS in your pocket publications" by Deloitte, that publish the same tables) and code the data per jurisdiction year. Although the information on the IASPLus website is presented in a table format, it is accompanied by many footnotes. So coding the IASPlus information includes the interpretation of the additional information presented in the extensive footnotes. Then we check the initial coding, corroborating it with the other data sources, and expand the data by carefully reading and combining the rest of the sources.

To construct the IFRS variable, we code the information about the IFRS adoption per jurisdiction per year, for domestic companies (listed and unlisted companies separately) and for the IFRS implementation status. We distinguish 5 categories of IFRS (non) adoption, based on classifications used in the IASplus data. The categories are:

Code	IFRS adoption
0	No policy with respect to IFRS
1	IFRS not permitted
2	IFRS permitted
3	IFRS required for some firms
4	IFRS required for all firms

We apply this coding scheme as straightforward as possible, applying a very broad understanding of IFRS adoption. Since we are interested in the decisions governments make with respect to the acceptance of the standards produced by the IASB, we include many different types of IFRS adoption. When a country explicitly refers to its accounting standards as IFRS's, it is coded as IFRS adoption. Although we do acknowledge that there is variety in the rigor with and the extent to which countries adopt IFRS, we do not try to distinguish between countries that have adapted the standards, countries that do not update the standards in a timely manner and countries that incorporate the standards as issued by the IASB immediately. The primary focus of our study is on the process (the flow of adoption decisions across countries) rather than on the outcome (the quality of the IFRS adoption). For this purpose, the IFRS adoption measure should reflect a country's decision to use IFRS as its accounting standards, regardless of the quality of the implementation of the adoption decision. Moreover, the interpretation and coding of the type of adoption would require substantial interpretation. Hence, we choose to code the IFRS variable as clean as possible.

Chapter 4

Auditor selection and IPO underpricing[43]

4.1 Introduction

In this paper we examine the factors that affect the demand for auditing at the time of an initial public offering (IPO). The audit of financial information plays an important role in the functioning of financial markets. Audited financial reports are perceived as more credible and hence help to alleviate information asymmetry problems. At the time of an IPO, information asymmetry problems are particularly present and therefore the demand for external assurance of financial reporting information is more pronounced. Moreover, the change in the ownership structure of the issuing firm affects the demand for monitoring. In this setting, it is important for the issuing firm to select an auditor that will provide the appropriate quality level of audit services. The high incidence of auditor switches prior to an IPO illustrates the notion that the selection of an appropriate auditor is taken seriously by issuing firms. We exploit these circumstances to study the drivers of auditor selection.

The literature on the demand for differential audit quality draws on signalling and agency theories, and on the insurance role of auditors. Several theories suggest that the demand for auditing is driven by incentives to reduce information asymmetry and, hence, potential adverse selection and moral hazard problems. Reputable auditors help to mitigate these problems by credibly certifying the information (e.g. financial statements, prospectuses) that allows stakeholders to estimate future prospects of the firm and to monitor the actions of managers. Based on these theories, we expect issuing firms with higher ex-ante uncertainty to have an increased demand for high-quality auditors. In addition, the degree of the issuing firms' agency conflicts will affect the demand for audit services. Related to the certification role is the insurance role of auditors. Auditors are liable for irregularities in the audited reports and may be required to indemnify the losses of stakeholders resulting from these

[43] This chapter is based on a working paper by Koning, M., Roosenboom, P.G. J. and Mertens, G.M.H. (2013b, unpublished).

irregularities. The insurance role of auditors would lead to a demand for higher audit quality in case of more risky offers.

We examine the demand for audit services in a sample of 728 U.K. firms that went public on the London Stock Exchange in the years 1995-2003. The study is set in the U.K. because of the principal institutional features in two areas: the audit market and the financial reporting requirements. First, the market for audit services in the U.K. is relatively dynamic and competitive as compared to other countries. While in many countries the audit market is dominated by the large international audit firms, the U.K. audit market is characterized by a more dispersed market share across audit firms of different sizes. Second, in the U.K. both public and private companies are required to file audited annual reports. This means that firms that go public already have a history of disclosing financial information, while in other countries the prospectus is the first publicly available financial report. Moreover, since all financial statements must be audited, firms already have an auditor before they decide to go public. This affects the level of information asymmetry at the time of an IPO. In addition, it affects auditor selection dynamics at the time of an IPO since breaking a longer term auditor-client engagement is costly. The combination of these features of the audit market and financial reporting requirements provides the opportunity to increase our understanding of auditor selection and the role of audit quality in the IPO process.

Since our sample period includes the years in which the dotcom bubble took place (1999 and 2000), we analyse the dynamics of this period separately. Ritter & Welch (2002) argue that despite the large list of theoretical reasons to go public, evidence supports only two: favourable market conditions or the stage of the firm's life cycle. We expect different auditor choices depending on what motivated the decisions to go public. In case of an optimistic market, we expect incentives to be different. As a consequence, the determinants of auditor choices may be different and the subsequent effect on underpricing is potentially altered.

Turning to our results, we find that auditor selection is affected by the issuing firms' demand for certification (driven by signalling or monitoring) and insurance. Loss making firms are more likely to have a larger audit firm at the time of an IPO, or to switch to a larger audit firm if they did not already have one. This is in line with higher demand for certification when the uncertainty of future prospects is higher. The choice for a higher quality auditor at the time of an IPO is also associated with the firm's ownership structure. In line with lower monitoring costs, firms are less likely to appoint a Big 4 auditor when insider ownership stakes are larger. Instead, issuing firms are more likely to choose a mid-tier audit firm when insiders hold a larger part of the shares prior to going public. For the insurance role of auditors, we find that more risky offers are associated with lower quality auditors. This result may be driven by the supply of high quality audits instead of the demand. More specifically, IPO's with higher litigation risk may not be eligible for more reputable audit firms. In that sense, the finding is consistent with the insurance role of auditors.

In addition to the auditor selection analysis, we analyse the effect of the auditor selection of the IPO firm on the first day returns (underpricing). Since underpricing is commonly seen as a performance measure for IPOs, this allows us to evaluate auditor selection in relation to the IPO. Contrary to expectations based on the certification hypothesis, we find that choosing a big or mid-size auditor to audit the prospectus increases underpricing. When an IPO firm has a higher quality audit firm after a recent upward switch, the increasing effect on initial returns is mitigated. This suggests that switching to higher quality auditor prior to the IPO is perceived as a stronger certification signal than the quality of the incumbent auditor. Moreover, this finding is driven by the bubble years (1999-2000) in our sample and may therefore be distorted by the behaviour of overoptimistic investors (who may cause higher than expected initial returns). In addition, it is consistent with the insurance role of auditors. During the hot market period, lower quality firms go public and seek higher quality auditors. Reputable audit firms are more willing to accept risky clients in bubble years. In the no-bubble years, the auditor selection doesn't seem to matter for underpricing.
The remainder of the paper is organized as follows. Section 2 discusses related literature on auditor selection and underpricing. Section 3 describes the sample and provides some results from univariate tests, while section 4 presents the main results from multivariate tests. Section 5 discusses some sensitivities of the main analyses and offers some robustness checks. Finally, section 6 concludes.

4.2 Literature review: of auditor selection and underpricing

Firms' demand for audit quality arises from incentives to reduce information asymmetries. IPOs can give rise to particularly severe information asymmetry problems. First, since an IPO leads to more dispersed ownership it will aggravate agency problems (Jensen and Meckling, 1976). Second, information asymmetries between current owners and uninformed investors lead to the risk of adverse selection (Rock, 1986). Audit quality can play a role reducing these problems. Several studies suggest that reputable auditors have incentives to supply high-quality information about the issuing firm, thereby helping resolve information asymmetries of IPO firms (e.g. De Angelo, 1981; Titman and Trueman, 1986). According to this certification function, the reputational capital of audit firms serves as a bonding mechanism, committing them to provide high quality information[44]. In addition, auditors

[44] High quality audit may reduce information asymmetry by providing 1) more accurate information (Beatty, 1989); or 2) more information, either private information from the owners or the information content of the auditor report itself.

play an insurance role since they are at risk for litigation and substantial fines in case of audit failure.

Analysing auditor selection at the time of an IPO places our study against the back drop of the vast underpricing literature. Underpricing is the difference between the closing price of the shares on the first trading day and the price at which the IPO's shares were initially offered[45]. A common assumption in the underpricing literature is that issuing firms try to maximize the gross proceeds of the IPO (Chambers and Dimson, 2009). From the perspective of the issuing firm, underpricing is an opportunity cost in the sense that the market was apparently willing to pay more for the shares than the firm actually raised (the firm 'left money on the table'). Underpricing is a very common phenomenon for IPOs internationally, although the differences across countries are substantial (Ritter, 2003; Ljungqvist et al., 2003). Average underpricing in the U.K. over the period 1959-2001 is 17.4 % (Ritter, 2003), but there are substantial fluctuations over the years. Most notably during the dotcom bubble (during 1999 and 2000) considerably higher average underpricing is reported (Loughran and Ritter, 2004; Ljunqvist and Wilhelm, 2003)[46].

Although the concept of underpricing is straightforward, the explanation as to what determines the extent of underpricing is more ambiguous. Several review papers provide an overview of the explanations for underpricing (e.g. Ritter and Welch, 2002; Ljunqvist, 2007; Ritter, 2011) and describe the developments in this literature over time. Traditionally, many explanations focus on information asymmetries that arise when a firm goes public. In order to compensate the uninformed investors for their adverse selection risk, issuers decide to underprice the offered shares (Rock, 1986; Beatty and Ritter, 1986). In general, the greater the ex-ante risk related to the IPO (firm risk or specific characteristics of the deal), the higher the IPO underpricing. The extent to which an IPO firm should underprice the offer can be reduced if the firm can signal its higher quality. For instance, firms can seek high quality advisers (underwriter, auditor, legal advisers) that will serve as a signal of firm value. The involvement of prestigious intermediaries in the IPO process serves as a certification of the quality of the issue. The role of the auditor in IPOs has been studied from the certification perspective. Datar et al. (1991) formally show that IPOs can signal quality by setting the optimal auditor choice and level of retained ownership. Copley and Douthett (2002) provide

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[45] The terms 'underpricing' and 'initial returns' are used interchangeably in the literature.

[46] Average underpricing percentage for the U.K. as reported by Ritter (2003). The U.K. average is close to the U.S average reported over the same period of 16.8%. In our sample, as reported later in the paper, the overall average underpricing is 22.7%, which is higher than the 17.4% reported by Ritter (2003) due to the relative impact of the dotcom years. In our sample, the mean underpricing for 1999 is 40.5% and for 2000 42.7%. For the dotcom bubble years, Loughran and Ritter (2004) find an average underpricing in the U.S. of 65%. International comparatives available on http://bear.warrington.ufl.edu/ritter/ipodata.htm

empirical evidence for the jointly chosen auditor and retained ownership. In an early paper, Beatty (1989) reports evidence that higher auditor reputation is associated with lower underpricing levels. That does not imply that the highest quality auditor is always the best choice in case of an IPO. A lower level auditor may be optimal if that is what the market expects (Willenborg, 1999) or if that optimizes total IPO costs (Hogan, 1997).

For underwriters, this certification role has been studied extensively. The findings are however sensitive to the period studied. Until the 1980s, more prestigious underwriters were associated with lower underpricing, but since then the sign has flipped (Beatty and Welch, 1996). The debate as to what explains this change has sparked new perspectives on underpricing. More recent models explicitly take into account the incentives of the owners to explain the level of underpricing. These models assume that owners care for underpricing only to the extent that they potentially lose from it, or as Habib and Ljungqvist (2001, p.434) put it: "Some IPOs are more underpriced than others because their owners have less reason to care about underpricing." The issuers can affect the level of underpricing by the choices they make in the IPO process with respect to hiring a more reputable the investment bank, law firm or auditor. Top tier advisers will increase direct cost of the issue because of higher fees[47] but will lower expected underpricing. Habib and Ljungqvist (2001) argue that the net effect of the owners' incentives is affected by the extent to which the owners will participate in the secondary market and the fraction of new shares that will be issued (the dilutive effect of the issue). In a formal model, they demonstrate that promotion cost of an IPO will increase with the participation ratio and the dilution factor. For underpricing they show negative relation with the participation ratio and an inconclusive relation with the dilution factor. Ljungqvist and Wilhelm (2003) analyse the extremely high underpricing in the bubble years 1999 and 2000 from an ownership incentive perspective and find that the underpricing in the dotcom bubble was at least partially explained by changes in ownership. Their prediction that initial returns will be larger when ownership is more dispersed and insider hold smaller stakes is known as the realignment of incentives hypothesis. A group of pre-IPO owners that has been subject to several researches is the venture capitalists (VC). Previous studies find evidence suggesting that backing by venture capitalists reduces underpricing (e.g. Megginson and Weiss, 1991; Chang et al., 2009), consistent with the expectation that ex-ante uncertainty is reduced when an IPO is backed by a VC (Kaplan and Stromberg, 2003).

The more recent literature on what determines underpricing potentially shed more light on the role of the auditor at the time of an IPO. We distinguish three main classes of determinants of auditor selection and underpricing as follows: 1. Firm risk characteristics,

[47] Habib and Ljungqvist (2001) call these costs the promotion costs of going public. Total promotion costs include not only the fees paid but also the cost of road shows, listing fees and so on.

2. Ownership characteristics; and 3. IPO deal characteristics. A more detailed discussion of the variables that we identify in each class is provided in section 3.

4.3 Sample and Data, descriptive evidence

4.3.1 IPO firms

The dataset consists of 728 U.K. IPO firms during the period from January 1995 to December 2003. The IPO firms are identified from Thomson Financial and the London Stock Exchange New Issue file. We exclude transfers between market segments, and introductions without raising capital, financial companies, investment funds and foreign-incorporated firms. For each IPO firm we collect financial statement information (as published in the prospectuses) and the name of audit firm that audited financial statements prior to the IPO from the FAME database (Bureau Van Dijk) and IPO prospectuses obtained from Thomson Research. For 728 firms we obtain the IPO prospectuses and hand-collect the names of the audit firm that signed off the prospectus and that acted as reporting accountant for the IPO. The pre and post IPO shares held by several board members, CEOs and venture capitalists are collected from the IPO prospectuses. First-day trading prices, FTSE market returns are taken from Datastream.

Table 4.1 provides descriptive statistics for our sample by year. Panel 1 summarizes the characteristics of the IPO firms across the sample years. Similarly to Ljungqvist and Wilhelm (2003) we test whether the changes over the years reveal a significant time trend. For most characteristics, the time trend is significant. The number of IPOs per year varies, with three years of over a 100 IPOs. IPO frequency peaked in 2000, with 168 IPOs accounting for 23% of our sample. The median age of the IPO firms at the year of the introduction is 7 years. Again the year 2000 stands out with the youngest IPO firms with median (average) age of four (five) years. Overall, IPO firms have become younger and smaller over the sample period. The average (median) age at issue (significantly) declines over our sample period from 37 (14) years in 1995 to 9 (5) years in 2003. This is consistent with U.K. data documented by Ljungqvist (2003) and similar to the pattern in the U.S. (Ljungqvist and Wilhelm, 2003; Loughran and Ritter, 2004). Median book values of assets dropped from $21.7 million in 1995 to $2.4 million in 2003. In line with this, the median proceeds declined from $14.3 to $5.4 million. Median underpricing does not change significantly on an annual time trend. The year 2000 has highest average underpricing of 42.7%, compared to an average of 22.7% over the entire sample. The statistics for that year

are heavily influenced by one extreme observation, with an underpricing of 1,166.7%[48]. Excluding this observation, the average underpricing for 2000 is 36.0%. The years 1999 and 2000 stand out in terms of average underpricing, which is in line with the so-called dotcom bubble during those years.

[48] The extreme observation is Forbidden Technologies plc, an introduction on the Alternative Investment Market early 2000 at an offer price of 22.5 pence and a price of 285 pence by the end of the first trading day, resulting in 1166.7% underpricing. The price rose even more during the days thereafter, reaching 925 pence closing price at day five.

Table 4.1
Descriptive Statistics

The sample consists of 728 IPO firms in the U.K. in the years 1995-2003. Included in the sample are all equity introductions for companies that did not have a listing before on the London Stock Exchange's Official List (OL) and Alternative Investment Market (AIM). All currencies are translated into U.S. dollar ($) exchange rates on the IPO date. Panel 1 depicts the frequency and the mean and median (p50) of the characteristics of the IPO firms and the issue itself. Age at IPO in years is the IPO year minus the year operations commenced, as identified in the prospectus. Assets are book values as reported in the financial statements in the prospectus. Proceeds are the gross proceeds and equal the offer price times the number of shares sold. Underpricing is defined as the first-day closing price divided by the offer price, minus one. Panel 2 reports the auditors that are appointed at the time of the IPO by the issuer. We partition the audit sector in three different segments (Big, Mid and Small audit firms) based on their relative sizes. The identities of reporting accountants (auditor at IPO) are hand-collected from the prospectuses. Frequencies are the number of times (percentage) that an audit firm is identified as the reporting accountant for an IPO, calculated within sample. Upward switches occur if the reporting accountant at the IPO is from a higher segment than the auditor that audited the financial statements of the firm before the IPO. For each of the characteristics in Panel A and B, we test if the year by year changes are significant. We regress each characteristic separately on the annual year time trend *t* and report significance level for the estimated coefficient for *t* at the bottom row of the Table (using OLS and median regressions for trends in means and medians respectively and logit regressions for trends in binary variables). We use ***,** and * to denote significance at the 1%, 5% and 10% level (two-sided) respectively and – to indicate lack of significance

Panel A. IPO firms and Deal characteristics

		IPO Firm characteristics				**Deal characteristics**			
Year	**IPO**	**Age at IPO (years)**		**Assets (in $mln)**		**Proceeds (in $mln)**		**Underprcing %**	
	N	mean	median	mean	median	mean	median	mean	median
1995	57	37	14	74.4	21.7	55.6	14.3	14.7	8.0
1996	145	23	10	200.2	9.8	79.5	10.6	14.6	12.5
1997	112	26	12	115.8	8.7	50.3	11.1	12.8	10.9
1998	61	22	10	93.7	15.4	82.8	12.1	17.6	12.4
1999	49	16	7	68.9	7.7	94.5	9.7	40.5	20.3
2000	168	5	4	26.3	2.1	55.7	13.6	42.7	11.6
2001	59	11	5	13.4	1.7	24.3	3.3	16.6	10.0
2002	42	21	5	157.3	4.2	88.8	6.7	10.9	6.7
2003	35	9	5	67.0	2.4	61.0	5.4	13.0	8.6
All years	**728**	**18**	**7**	**95.5**	**5.4**	**64.1**	**10.0**	**22.7**	**11.0**
Trend		**Neg*** **	**Neg*** **	**Neg***	**Neg****	**_**	**Neg*** **	**Pos****	**_**

Panel B. Auditor Selection

		Audit firm selection at IPO							
Year	**IPO**	**Big audit firm**		**Mid-size audit firm**		**Small audit firm**		**Upward switches**	
	N	N	% IPO	N	% IPO	N	% IPO	#	% IPO
1995	57	41	71.9	7	12.3	9	15.8	11	19.3
1996	145	92	63.4	35	24.1	18	12.4	36	24.8
1997	112	69	61.6	30	26.8	13	11.6	34	30.4
1998	61	43	70.5	14	23.0		6.6	8	13.1
1999	49	22	44.9	22	44.9	5	10.2	13	26.5
2000	168	92	54.8	57	33.9	19	11.3	27	16.1
2001	59	23	39.0	26	44.1	10	16.9	7	11.9
2002	42	22	52.4	13	31.0	7	16.7	5	11.9
2003	35	14	40.0	13	37.1	8	22.9	3	8.6
All years	**728**	**418**	**57.4**	**217**	**29.8**	**93**	**12.8**	**144**	**19.8**
Trend		**Neg*** **		**Pos*** **				**Neg*** **	

4.3.2 Audit firm selection

The literature on audit services during IPOs is based on the demand for certification, which will vary depending on IPO characteristics. But preceding the certification theory is the presumption that there is variation in audit quality. Although actual quality of the performed audit is unobservable, there is a large body of theoretical and empirical evidence that suggests that the level of audit quality is higher for larger audit firms. Several theories have been proposed to explain the association between the size of an audit firm and audit quality. DeAngelo (1981) argues that larger audit firms have more technical capabilities and more resources to detect misstatements and that larger audit firms will be able to operate more independently from their clients (and independent auditors are assumed to perform better audits). Moreover, larger audit firms have more reputational capital that they want to protect, which provides an incentive to perform high quality audits. A vast body of empirical research on audit quality supports the theory that audit quality is related to the size of the audit firm. Most importantly, the 4 largest audit firms (the Big 4) are often regarded as the highest quality segment. Assuming that audit firms can be divided in different quality segments, we can distinguish switches to another firm within the segment and switches to a firm in another segment. Switches within a segment do not affect the audit quality level and

are therefore more likely to be driven by the auditor-client relation. In contrast, switches to another segment change the quality of the auditor and can be explained by signalling theory and the information role of the auditor.

The outcome of the audit firm selection process is disclosed in the IPO prospectus, which includes a signed auditor's report. In any case, this reveals the auditor choice of the IPO firm. It may be though that the auditor of the prospectus is different form the auditor of the preceding financial statements of the issuing firm. In these cases, the IPO firm apparently switched to another audit firm prior to the introduction. We collect the names of the audit firms that audited the prospectus and the names of the auditors of the financial statements of the two years prior to the IPO (which are also disclosed in the prospectus). Using the information in the FAME database and the historical information on the ICAEW website[49], we track the mergers and name changes that occurred during our sample period. Most notably, two big audit firms (Arthur Andersen and Deloitte) merged in August 2002 as a consequence of the Enron scandal. The combined firm operates under the name Deloitte. Our sample includes 2 switches from Arthur Andersen, which took place in 1995 and 1996 and where therefore not influenced by the merger. We did not remove the Arthur Andersen clients from the sample; instead these observations are included under the Deloitte header. This way, the big audit firms in our sample are identical to the current Big 4 in the U.K. audit market. The classification does not affect the results, since both firms are in the same audit firm tier (big audit firms). Panel B of Table 4.1 provides a summary for the audit firms that the issuing firms in our sample selected. Issuing firms select a big audit firm less frequently over the years. In 1995, 71.9% of the IPOs were audited by a big firm, compared to 40.0% in 2003. In contrast, mid-size audit firms are increasingly popular. The fraction of issuing firms with a mid-tier auditor increased from 12.3% to 37.1%. In both cases, the trend is significant. The fraction of small audit firms varies over the years, but there is no significant trend in our sample. In total we observe 144 upward switches in our sample, which means that 19.8% of the issuing firms either switch to a mid-size or big audit firm. Another 18 IPO firms switch downwards and 40 firms switch within the same tier, bringing the total number of switches to 202 (or 27.7% of our sample). This is remarkably high compared to the overall switching rate of 4.2% for U.K. listed companies during 1996-2004 (Oxera, 2006)[50]. Issuing firms are less inclined to switch to an audit firm in a higher tier in

[49] The ICAEW provides the history of mergers and demergers of accounting firms on its website. The so-called family trees have been compiled by Peter Boys and updated in 2005. http://www.icaew.com/en/library/subject-gateways/accounting-history/resources/whats-in-a-name

[50] In a report on the U.K. audit market, Oxera (2006) reports an overall auditor switching rate of 4.2 % over the years 1996-2004, for firms that were listed in 2004. Of this percentage, approximately 20% is driven by mergers between audit firms.

Table 4.2

Audit Firms' Presence in the IPO Market

The audit sector is partitioned in three different (segments Big, Mid and Small firms) based on their relative sizes. Frequencies are the number of times (percentage) that an audit firm is identified as the reporting accountant for an IPO, calculated within sample. The identities of reporting accountants (auditor at IPO) are hand-collected from the prospectuses. Market share is calculated as within sample fraction of gross proceeds. Proceeds are gross proceeds in U.S. $ millions Underpricing is defined as first-day closing price divided by the offer price, minus one. Univariate significance tests are based on the two tailed Wilcoxon rank-sum (Mann Whitney) test of the null hypothesis that the distribution of gross proceeds (underpricing) is identical across audit firm segments. ***, ** and * denote significance at the 1%, 5% and 10% (for two-sided tests) respectively.

	Frequency		Market	Gross proceeds		Underpricing	
	Total	%	Share	Mean	Median	Mean	Median
DELOITTE & TOUCHE LLP	126	17.3	24.2	90.4	19.7	15.2	8.6
ERNST & YOUNG LLP	65	8.9	11.3	81.8	14.9	19.7	9.7
KPMG AUDIT PLC	101	13.9	13.0	94.0	19.8	33.9	12.9
PRICEWATERHOUSECOOPERS LLP	126	17.3	19.7	142.7	36.1	12.3	7.5
Total Big Audit Firms	418	57.4	68.1	105.7	20.8	19.5	9.6
BAKER TILLY	21	2.9	1.4	10.5	5.1	28.0	15.6
BDO STOY HAYWARD LLP	54	7.4	1.6	11.3	4.7	26.2	15.8
GRANT THORNTON UK LLP	87	12.0	1.1	7.8	4.1	40.6	14.9
HLB KIDSONS	18	2.5	1.0	7.4	4.7	24.8	14.3
HORWATH CLARK WHITEHILL LLP	18	2.5	1.0	7.3	3.1	30.9	16.9
PKF	19	2.6	1.1	7.8	5.0	24.9	15.0
Total Mid-size Audit firms	217	29.8	7.2	8.9	4.5	32.5	15.6
Total Small Audit firms (38 firms)	93	12.8	24.7	6.1	3.6	15.2	11.5
	728	100.0	100.0				

Wilcoxon rank-sum (Mann-Whitney) test			
diff = Big-Mid=0	z	12,719 ***	3,783 ***
diff= Big-Small=0	z	-10,731 ***	0.105
diff = Mid-Small=0	z	-2,250 **	1,609

later years of the sample; the highest frequency of upward switches occurs in 1996 (36 switches), the highest relative frequency in 1997 (30.4% of IPO), both early sample years. In the final sample year only 3 IPO firms switch (8.6% of IPOs). The negative time trend is significant. After the bubble years, switches to higher quality audit firms seem less common. Taken together, the snapshot of auditor selection suggests that IPO firms in later years are more likely to choose a mid-tier audit firm before the start of the IPO process and to stick with the mid-size audit firm during the IPO.

Table 4.2 summarizes the main characteristics of the audit firms active in the U.K. IPO market and that audited at least one of the IPO prospectuses in our sample.) We identify the auditor for the two financial statements prior to the IPO and for the prospectus (the reporting auditor). In total 48 different audit firms are identified to have been appointed as reporting

accountants. We partition the audit firms in three different segments (Big, Mid and Small firms) following the convention in academic and professional literature. As a group, the 4 largest audit firms that are commonly labeled the "Big 4"[51] (Deloitte, Ernst & Young, KPMG and PWC) dominate our sample as well. The big audit firms cover 68.1% of the IPO-market in our sample, in terms of gross proceeds and audit 57.4% of the IPOs. At the individual firm level, these firms have a much larger market share (percentage of total gross proceed in the sample) compared to the firms in the mid-tier. In terms of frequency however, Grant Thornton is the number four audit firm, auditing 12% of IPOs. Among the big audit firms, mean underpricing of KPMG audited IPOs is notably high (33.9% compared to the average for big audit firms of 19.5%). This value is driven by the same extreme observation that affects the average underpricing for the year 2000 in Table 4.1, Panel 1 (see footnote 4). Excluding the extreme observation brings the mean underpricing for KPMG at 20.5%, which is in line with the other big audit firms.

The category mid-size audit firms consists of the non-Big4 audit firms that audited more than 15 of the IPO firms in our sample. We classify 6 audit firms as mid-size, covering in total 7.2% of the IPO market. The applied criterion to distinguish mid-tier from small-tier audit firms leads to a clear gap between the two segments: lowest frequency for a mid-tier firm equals 18 and the highest frequency for a small audit firm is 7. The classification is consistent with professional publications that report descriptive statistics of the U.K. audit market (e.g. FRC 2002, 2006; Oxera, 2006). Our mid-tier includes 4 of the 5 largest audit firms excluding the Big 4, measured by total fee and audit fee earned in 2003-2004[52]. Mean gross proceeds for this group is significantly lower (Mid $8.9 million, Big $105.7 million,

[51] During our sample, originally 6 big audit firms were active including Coopers & Lybrand and Arthur Andersen. In 1998, Coopers & Lybrand merged with Price Waterhouse. From 2002, since Arthur Andersen's demise, only 4 big audit firms are left (the Big 4). Arthur Andersen surrendered its CPA licenses and its right to practice before the SEC in August 2002, after being convicted of obstruction of justice related to the audit of Enron (the verdict was later reversed by the Supreme Court). Although the scandal was U.S. based, it effectively put Arthur Andersen out of business. The operations started to wind down when the Enron scandal surfaced in 2001. There are a larger number of mergers in the mid-size and small segments of the audit market.

[52] Reports before 2003 do not disclose a ranking with the individual names of audit firms. The top 4 in the reports over 2003-2004 is: 1. BDO Stoy Hayward LLP; 2. Grant Thornton LLP; 3. Baker Tilly; 4. PKF (FRC, 2005; Oxera, 2006). The number 5 of mid-tier firms, Mazars LLP, is not in our mid-size group because it has only audited one IPO in our sample. Horwath Clark Whitehill LLP is number 7 in the ranking. HLB Kidsons is not in the rankings because it merged with BDO in 2002. The IPO-audits by HLB Kidson in our sample are all before the merger (last IPO date 2 January 2002, the merger was announced on 7 January 2002, see http://www.efinancialnews.com/story/2002-01-07/baker-tilly-and-hlb-kidsons-to-merge last accessed 29 June 2013).

z=-12.719) while the initial returns are on average significantly higher compared to the Big audit firms (Mid 32.5%, Big 19.5%, z= 3.783). This suggests that the mid-tier audit firms are generally involved in lower quality IPOs than their big peers. More unexpectedly is the observation that underpricing is on average higher for IPOs audited by a mid-size firm compared to the IPOs audited by the small audit firms, with mean underpricing for IPOs audited by small firms of 15.2%. However, the difference between the distributions is not significant (z= 1.609).

4.3.3 Other determinants of auditor selection and underpricing

Several determinants of the demand for auditor choice and switches have been suggested in prior literature. Like previous auditor choice studies (e.g. Beatty, 1989; Willenborg, 1999), we control for firm characteristics age, size (assets), profitability (loss), high-tech industries (internet and tech) and market segment (AIM). As discussed in section 2, competing views are proposed in the underpricing literature with respect to owners' incentives in an IPO process. Although predictions vary, there is consensus that ownership structure of a firm prior to going public will affect auditor choice incentives. We therefore include a measure for pre-IPO insider shareholdings and holdings by venture capitalists. In addition, we include two measures that are suggested by Habib and Ljungqvist (2001) a measure for the percentage of shares sold by pre-IPO owners (participation ratio) and a measure for the dilution effect of the issue that the pre-IPO owners suffer (dilution factor). Previous studies suggest that low-priced issues exhibit higher risk and are often speculative issues (Chalk and Peavy, 1987; Ibbotson et al., 1988). Issuing firms do not choose the offer price randomly and low prices may be set in order to promote diffuse ownership and to attract retail investors (Booth and Chua, `1996). Therefore, as a proxy for potentially speculative issues, we include the reciprocal value of the offer price per share.

The underpricing model we employ is similar to the auditor selection model. We use a different measure for size. Instead of the size of the IPO firm (measured by assets in the auditor selection models), underpricing is more likely to be influenced by the deal size of the offering. Hence, we include gross proceeds in the underpricing model.

Table 4.3 Summary statistics for explanatory variables

The sample includes 728 U.K. IPO firms in the years 1995-2003. Descriptive statistics are presented for the control variables used in the auditor selection models (choice and switch) and the underpricing models. Statistics are provided for the entire sample and for the bubble years (1999 and 2000) separately. Definitions of the internet and high-tech industries are as defined in Loughran and Ritter (2002). Participation ratio and dilution ratio are as defined in Habib and Ljungqvist (2001). Financial statement data (assets, loss) and industry data (internet and tech) is taken from Thomson research and corroborated with the financial statement data from the IPO prospectuses. Proceeds are retrieved from Datastream. All other data items form prospectuses. T-test for differences in means of the sample Bubble years (1999 and 2000) versus Non-Bubble years (1996-1998 and 2001-2003). We use ***, ** and * to denote significance at the 1, 5% and 10% level respectively. All currency amounts in U.S.$ millions.

		All years					No-Bubble years					Bubble years					Bubble vs. No Bubble
Variable	Description	Obs	Mean	S.D.	Min	Max	Obs	Mean	S.D.	Min	Max	Obs	Mean	S.D.	Min	Max	t-test
Firm Characteristics																	
ln_assets	Assets in last available financial statements; natural logarithm	728	8.56	2.41	0.00	16.13	511	8.86	2.40	0.00	16.13	217	7.83	2.28	0	14.47	5.3814 ***
ln_age	Company age at IPO; natural logarithm	728	2.20	1.17	0.00	5.63	511	2.44	1.15	0.00	5.63	217	1.63	0.99	0	4.78	8.9583 ***
loss	Indicator variable: 1 if IPO firm is loss making in the last available financial year before IPO	728	0.33	0.47			511	0.26	0.44			217	0.48	0.50			-5.8344 ***
internet	Indicator variable: 1 if IPO firm is in internet industry	728	0.07	0.25			511	0.02	0.12			217	0.19	0.40			-9.1558 ***
tech	Indicator variable: 1 if IPO firm is in high-tech industry	728	0.29	0.45			511	0.21	0.41			217	0.47	0.50			-7.561 ***
aim	Indicator variable: 1 if IPO firm is issuing on the Alternative Investment Market segment	728	0.61	0.49			511	0.58	0.49			217	0.68	0.47			-2.6089 ***

Variable	Description	All years Obs	Mean	S.D.	Min	Max	No-Bubble years Obs	Mean	S.D.	Min	Max	Bubble years Obs	Mean	S.D.	Min	Max	Bubble vs. No Bubble t-test
Ownership characteristics																	
ins_pre	Pre-IPO shares held by insiders (board members and their family, including CEO), fraction	728	0.52	0.34	0.00	1.00	511	0.51	0.35	0.00	1.00	217	0.56	0.31	0	1.00	-1.6058
vc_pre	Pre-IPO shares held by venture capitalists, fraction	728	0.11	0.21	0.00	0.99	511	0.12	0.21	0.00	0.99	217	0.09	0.19	0	0.79	2.0287 **
ins_post	Post-IPO shares held by insiders (board members and their family, including CEO), fraction	728	0.37	0.24	0.00	0.97	511	0.36	0.24	0.00	0.95	217	0.37	0.23	0	0.97	-0.3807
vc_back	Indicator variable: 1 if IPO firm received VC backing before IPO	728	0.33	0.47			511	0.36	0.48			217	0.26	0.44			2.6878 ***
dilution	dilution factor: new shares/pre-IPO shares outstanding, winsorized at 5%	728	0.53	0.64	0.04	2.84	511	0.51	0.61	0.04	2.84	217	0.59	0.70	0.04	2.84	-1.5478
part	participation ratio: secondary shares sold by pre-IPO owners as part of IPO/pre-IPO shares outstanding; winsorized at 5%	728	0.10	0.14	0.00	0.48	511	0.11	0.15	0.00	0.48	217	0.06	0.10	0	0.48	4.7034 ***
Deal characteristics																	
ln_grpr	gross proceeds in , natural logarithm	728	9.36	1.72	4.71	14.90	511	9.23	1.75	4.71	14.90	217	9.65	1.62	6.16	14.65	-2.9842
1/price	reciprocal of the IPO share price	728	0.04	0.11	0.00	1.00	511	0.04	0.11	0.00	1.00	217	0.04	0.11	0.00	1.00	0.306

Table 4.3 summarizes the descriptive statistics for each of the variables included in our auditor selection and underpricing models. In light of the discussion with respect to the distinct properties of the bubble years (1999 and 2000) we specify the statistics for this period separately. Comparing the statistics for 1999 and 2000 with the 'normal' years, many differences are as expected. During the years 1999 and 2000, issuing firms were on average significantly smaller and younger, more often reported a loss in the year before IPO and were more often in the internet or high-tech industry. All these characteristics are consistent with higher risk firms going public at the peak of the dotcom bubble and higher information asymmetry for IPOs in those years. With respect to the ownership characteristics, insiders held on average approximately half of the shares before the IPO and 37% after IPO. These percentages are almost the same for the bubble years and the 'normal' years. Ljungqvist and Wilhelm (2003) also report insignificant differences in 1999-2000 and non-bubble years for the U.S., with average post-IPO insider ownership of 44.6%. One third of our sample IPO firms are backed by a venture capitalist, but the numbers are significantly different for 1999-2000 compared to the rest of the sample years. During the bubble years, VC's were less involved (26%) and held a smaller stake in the firm (9%). Also, the participation ratio is significantly lower in the bubble years. This is different from the findings reported by U.S. studies, where the fraction of VC-backed IPOs increased to over 70% in 1999 and 2000, although the stakes held by VC declined (Ljungqvist and Wilhelm, 2003). We calculate the means for each of the ownership characteristics separately for the years before and after the bubble years separately and none of these deviating results for 1999 and 2000 are explained by a continuing time trend. The third category of explanatory variables is that related to the specific risk of the IPO deal. During bubble years, firms issued more often on the Alternative Investment Market segment, but the average deal size and offer price is not significantly different during the bubble years.

4.4 Results from multivariate analysis

We turn to the results of the multivariate regression results in order to get a clearer picture of what determines auditor selection and how this in turn affects the IPO. First the analyses of the determinants of auditor selection (choice and switches) at IPO are discussed. We then continue with an underpricing regression and examine the effect of auditor selection on first-day returns.

4.4.1 Auditor selection

The results for logistic regressions on the auditor choice and upward switch indicator variables are reported in Table 4.4. We perform a separate regression for each of the three segments (*Big*, *Mid*, *Small*) to analyse the likelihood of choosing an audit firm of a particular quality level and the characteristics that are associated with this likelihood. In addition, we estimate the logistic model for the decision to switch to a higher-quality auditor at the time of the IPO. In the auditor choice models, three of the IPO firm characteristics are significant for each of the auditor quality segments. Big audit firms are more likely to be appointed by larger IPO firms and IPO firms that reported a loss in the final financial statements. The mirror image of these characteristics is reported for the mid and small segments: larger IPO firms and loss reporting IPOs are less likely to either have a mid-tier or small auditor. The finding that larger firms will more likely choose a big audit firm is consistent with previous studies (e.g. Bédard et al., 2000). For firms that are issuing shares on the Alternative Investment Market the odds are higher that they will have a small or mid-size auditor. Our measure for potentially speculative issues (1/offer price) is significantly associated with issuing firms selecting small audit firms. Of the ownership characteristics included in the choice models, only the insider share holdings are a significant determinant for auditor choice. When insiders have a higher stake in the IPO firm prior to the issue, it is more likely that a mid-tier audit firm will be appointed. This is consistent with the monitoring role of auditors, for which the demand is less when incentives are aligned. The stake of venture capitalists in pre-IPO firms is not significantly associated with auditor choices. Model 4 reports the estimates for the upward switches model. If we look at the determinants of the likelihood that an IPO firm will switch to a higher quality auditor, we see that larger and loss generating issuing firms will more likely switch to a higher quality audit firm while AIM issuers are less likely to switch to a higher segment audit firm, reflecting the findings for the choice models. When we split the upward switches into switches to big audit firms and switches to mid-size audit firms and repeat the regression (not tabulated), we see that firms issuing on the AIM segment are significantly more likely to switch upwards to a mid-size auditor. The odds that an IPO firm will switch to a big audit firm increase as the participation rate increases, while IPO firms with higher shareholdings by insiders are more likely to switch to a mid-size audit firm.

Table 4.4
Auditor Choice and Upward Switches, all years

The Table presents results from logistic regressions on the binary indicators for auditor choice and auditor upward switches. Auditor Choice variables *Big*, *Mid* and *Small* are dummy variables that take the value of 1 if the audit firm at the time of the IPO is a firm from the big or mid-size segment respectively. Classification of audit firms is explained in Table 4.2. Auditor Switch variable *upsw* is a dummy variable that takes the value of one if the IPO firm switches to an audit firm of a higher tier (from a small firm to a mid-size or big firm; or from a mid-size firm to a big firm) prior to the IPO. Explanatory variables as defined in Table 4.3. Auditor Choice models are estimated over the full sample of 728 IPO firms. The Auditor Switch model is estimated over the subsample of IPO firms that initially had a small or mid-size audit firm (and hence could potentially switch to a higher tier). All models include year indicators (results not reported). Exponentiated coefficients (odds ratios) are reported. Robust standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

	Auditor Choice			**Auditor Switches**
Variable	**Big all years (Model 1)**	**Mid all years (Model 2)**	**Small all years (Model 3)**	**Upward all years (Model 4)**
Firm Characteristics				
ln_assets	1.329 ***	0.849 ***	0.844 **	1.074
	(0.104)	(0.0536)	(0.0632)	(0.0953)
ln_age	0.895	1.035	1.168	1.393 **
	(0.0978)	(0.117)	(0.179)	(0.216)
loss	1.905 ***	0.635**	0.829	1.677*
	(0.452)	(0.144)	(0.229)	(0.468)
internet	0.905	1.073	1.008	1.511
	(0.358)	(0.409)	(0.514)	(0.640)
tech	1.237	1.200	0.493 **	1.328
	(0.266)	(0.246)	(0.156)	(0.362)
Ownership Characteristics				
ins_pre	0.404 ***	2.357 ***	1.064	1.319
	(0.128)	(0.728)	(0.374)	(0.559)
vc_pre	1.486	0.853	0.243	1.472
	(0.807)	(0.496)	(0.256)	(1.198)
dilution	1.174	1.111	0.620 **	1.056
	(0.190)	(0.164)	(0.136)	(0.191)
part	0.953	2.170	0.203	1.849
	(0.767)	(1.799)	(0.281)	(2.041)
Deal Characteristics				
aim	0.208 ***	4.468 ***	3.100 ***	0.446 **
	(0.0581)	(1.331)	(1.331)	(0.149)
1/price	0.00151 ***	3.841	9.970 ***	0.186
	(0.00277)	(3.403)	(8.044)	(0.283)

Year indicators	Yes	Yes	Yes	Yes
N	728	728	728	377
Log likelihood	-359.0	-367.2	-239.6	-216.7
Pseudo-R-squared	0.277	0.172	0.139	0.135
Chi-squared	169.3	119.9	76.72	60.78
Degrees of freedom	19	19	19	19

Because the incentives are potentially different when the IPO-market is hot, we estimate the same logistic regressions for the years of the dotcom bubble (1999 and 2000) separately. The results are presented in Table 4.5

Table 4.5
Auditor Choice and Upward Switches during Bubble Years 1999 and 2000

This Table presents results from logistic regressions on the binary indicators for auditor choice and auditor upward switches once we split the sample for the years 1999 and 2000 only. Auditor Choice variables *Big*, *Mid* and *Small* are dummy variables that take the value of 1 if the audit firm at the time of the IPO is a firm from the big or mid-size segment respectively. Classification of audit firms is explained in Table 4.2. Auditor Switch variable *upsw* is a dummy variable that takes the value of one if the IPO firm switches to an audit firm of a higher tier (from a small firm to a mid-size or big firm; or from a mid-size firm to a big firm) prior to the IPO. Explanatory variables as defined in Table 4.3. Auditor Choice models are estimated over the subsample of IPOs in the years 1999 and 2000 (217 IPOs). The Auditor Switch model is estimated over the subsample of IPO firms in the years 1999 and 2000 that initially had a small or mid-size audit firm (and hence could potentially switch to a higher tier). All models include year indicators (results not reported). Exponentiated coefficients (odds ratios) are reported. Robust standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

	Auditor Choice			**Auditor Switches**
	Big 1999-2000 (Model 5)	**Mid 1999-2000 (Model 6)**	**Small 1999-2000 (Model 7)**	**Upward switches 1999-2000 (Model 8)**
Firm Characteristics				
ln_assets	1.336 *	0.841	0.871	1.000
	(0.219)	(0.114)	(0.109)	(0.153)
ln_age	0.835	1.408	0.734	1.705 *
	(0.189)	(0.340)	(0.269)	(0.485)
loss	1.520	0.896	0.599	1.386
	(0.616)	(0.347)	(0.293)	(0.559)
internet	0.997	1.263	0.650	1.578
	(0.479)	(0.583)	(0.479)	(0.716)
tech	0.996	1.502	0.474	1.732
	(0.348)	(0.522)	(0.246)	(0.761)
Ownership Characteristics				
ins_pre	0.890	1.352	0.905	1.718
	(0.512)	(0.762)	(0.630)	(1.468)
vc_pre	1.867	0.708	0.102	1.077
	(1.841)	(0.694)	(0.220)	(1.288)
dilution	1.279	1.261	0.347 **	0.784
	(0.350)	(0.328)	(0.171)	(0.241)
part	0.253	33.52	0.00000787	5.021
	(0.525)	(75.89)	(0.0000775)	(12.37)
Deal Characteristics				
aim	0.110 ***	9.350 ***	3.996	1.495
	(0.0603)	(5.990)	(3.838)	(0.928)
1/price	0.00462	64.36 **	0.207	5.222
	(0.0189)	(109.5)	(0.323)	(11.01)

Year ind.	Yes	Yes	Yes	Yes
N	217	217	217	199
Log likelihood	-111.0	-114.9	-61.19	-89.96
Pseudo-R-squared	0.261	0.193	0.189	0.0991
Chi squared	42.17	38.59	19.16	19.87
Degrees of_freedom	12	12	12	12

Across model specifications, the size of the issuing firm and the market segment that the firm is issuing on remain relevant, although size matters to a smaller extent. There are some differences compared to the models for all sample years in Table 4.4. Speculative offers are notably more likely to choose a mid-size audit firm in the bubble years, judging by the size and significance of odds ratio for 1/offer price. This is in line with the high level of underpricing for the mid-tier auditors reported in Table 4.2. Pre-IPO ownership structure does not seem to affect the auditor choice in bubble years, whereas this is a significant characteristic across the entire sample period in Table 4.4. In addition to the tabulated results, we run the same models on the sample excluding the dotcom bubble years and find similar results to the reported findings for all sample years. With respect to auditor switches in the heated market conditions of the bubble years, we see positive but insignificant odds ratios for the indicator variable for the AIM issues and for the reciprocal offer price. When we split the upward switches into switches to big and mid-size audit firms (not tabulated), we see that the odds ratios for these two characteristics are opposite for big and mid and significant. IPOs on the AIM are much more likely to switch to a mid-size audit firm, while the odds of switching to a big audit firm are significantly lower. The reciprocal offer price that proxies for more speculative offers displays a comparable pattern: the odds that an issuer of a more speculative offer will switch upward to a mid-size firm are significantly higher, while the odds of switching to a big auditor diminish significantly when the offer share price is lower. These findings suggest that more risky IPO firms (AIM-segment, low share price) are more likely to switch to a mid-size auditor in the bubble years, which is likely to contribute to the observed higher underpricing levels in the mid-tier auditor segment in our sample.

4.4.2 Underpricing

The main focal point of the IPO literature is the underpricing phenomenon. Given its prominence, we turn to this discussion in the current section and apply our measures of auditor selection in an underpricing model. We are interested in the association between the auditor selection variables and the level of underpricing. Table 4.6 presents the results for

the underpricing OLS-regressions models that include the explanatory variables explained in section 3 and summarized in Table 4.3.

Table 4.6
Underpricing models

Cross-sectional results from OLS regressions with robust standard errors. Dependent variable is underpricing and is calculated as (first day closing price – offer price)/ offer price. Closing prices obtained from Datastream. Offer prices collected from IPO prospectuses. Auditor selection variables are dummy variables for auditor choice and for auditor switches by the IPO firm. Auditor Choice variables *Big* and *Mid* are dummy variables that take the value of 1 if the audit firm at the time of the IPO is a firm from the big or mid-size segment respectively. Classification of audit firms is explained in Table 4.2. Auditor Switch variable *upsw* is a dummy variable that takes the value of one if the IPO firm switches to an audit firm of a higher tier (from a small firm to a mid-size or big firm; or from a mid-size firm to a big firm) prior to the IPO. Other explanatory variables as defined in Table 4.3. All models include year indicators (results not reported). Robust standard errors in parentheses. Significance of correlations at the 1%, 5% and 10% levels marked with ***, ** and * respectively.

	All years			Non Bubble years	Bubble years
	Basic model (Model 9)	**Auditor Choice (Model 10)**	**Auditor Choice and Switch (Model 11)**	**Auditor Choice and Switch (Model 12)**	**Auditor Choice and Switch (Model 13)**
Auditor Selection					
Big		0.191 **	0.216 **	0.0183	0.675 *
		(0.0929)	(0.102)	(0.0342)	(0.347)
Mid		0.141 ***	0.172 ***	0.00704	0.570 ***
		(0.0444)	(0.0511)	(0.0297)	(0.178)
upsw			-0.101 **	0.00712	-0.263 **
			(0.0508)	(0.0235)	(0.118)
Firm Characteristics					
ln_age	-0.0535 ***	-0.0538 ***	-0.0506 ***	-0.0304 ***	-0.142 **
	(0.0163)	(0.0165)	(0.0162)	(0.0111)	(0.0664)
loss	-0.0449	-0.0497	-0.0435	-0.0695 ***	0.0593
	(0.0772)	(0.0723)	(0.0734)	(0.0260)	(0.205)
internet	0.126	0.128	0.135	-0.0136	0.137
	(0.166)	(0.162)	(0.161)	(0.0566)	(0.211)
tech	0.136 **	0.129 **	0.130 **	0.0275	0.284 *
	(0.0558)	(0.0553)	(0.0555)	(0.0240)	(0.162)
Ownership characteristics					
ins_post	0.205	0.220	0.232	0.0198	0.692
	(0.175)	(0.185)	(0.187)	(0.0438)	(0.554)
vc_back	0.0166	0.0139	0.00991	0.0149	0.0317
	(0.0275)	(0.0280)	(0.0287)	(0.0167)	(0.0933)
dilution	0.119 **	0.117**	0.117 **	0.0341	0.175
	(0.0557)	(0.0561)	(0.0559)	(0.0246)	(0.161)

Table 4.6 (continued)
Underpricing models

	All years			Non Bubble years	Bubble years
	Basic model (Model 9)	**Auditor Choice (Model 10)**	**Auditor Choice and Switch (Model 11)**	**Auditor Choice and Switch (Model 12)**	**Auditor Choice and Switch (Model 13)**
part	0.111	0.105	0.116	-0.00567	0.881
	(0.132)	(0.138)	(0.140)	(0.0662)	(0.819)
Deal characteristics					
aim	-0.103 *	-0.0886 **	-0.0904 **	-0.0266	-0.248
	(0.0559)	(0.0451)	(0.0454)	(0.0242)	(0.155)
ln_grpr	-0.0463*	-0.0560 *	-0.0597 *	-0.0191 *	-0.192
	(0.0262)	(0.0333)	(0.0346)	(0.0100)	(0.147)
1/price	0.517 **	0.602 ***	0.596 ***	0.388 ***	0.783
	(0.208)	(0.203)	(0.200)	(0.0923)	(0.630)
_cons	0.602 **	0.535 **	0.554 **	0.378 ***	1.549
	(0.234)	(0.237)	(0.242)	(0.110)	(1.202)
year ind.	Yes	Yes	Yes	Yes	Yes
N	722	722	722	505	217
R^2	0.109	0.117	0.121	0.125	0.158
adj. R^2	0.085	0.090	0.093	0.089	0.095
F	2.471 ***	2.481 ***	2.487 ***	3.861 ***	2.096 **

We are primarily interested in the certification effect of auditor selection on underpricing. Model 10 includes the indicator variables for auditor choice. Both the indicator for a Big 4 auditor and the indicator for a Mid-size audit firm (*Big* and *Mid*) are significantly and positively associated with underpricing, indicating that having a higher quality auditor is associated with an increase rather than a decrease of initial returns. In contrast, we see that switching to an auditor in a higher quality segment (*upsw*) reverses this effect to some extent and reduces underpricing. These findings are driven by the dotcom bubble years 1999-2000 (Model 13) and disappear once we remove the bubble years from the sample (Model 12). This is consistent with the notion that the dynamics are different in a hot market. Particularly, it is consistent with lower quality firms going public during the bubble years and trying to signal quality by appointing a reputable auditor. A switch to a higher tier audit firm may be seen as a stronger quality signal, as this means that the large audit firm has accepted the IPO firm as a client and thereby signals that the quality is adequate, reducing the increasing effect on underpricing. In addition, the findings of increased underprcing for higher quality audits in the bubble-years are consistent with the insurance role of auditors. The incentives to go

public are different in a hot market, when firms are driven by the optimistic market rather than by the life cycle of the company (Ritter and Welch, 2002). As a consequence, the type of IPO firm differs depending on the market circumstances. In a hot market, issuing firms on average are more risky and will be more inclined seek insurance from high-quality audit firms. But if big audit firms accept more risky clients, the certification effect will diminish and may even counter. Moreover, the favourable market may explain the reverse effect of high quality auditors on underpricing. The certification of a high quality auditor may in fact increase the price at which the share trades (Chang et al., 2009) and this effect may be stronger in a hot market.

Besides the auditor selection variables, we include several determinants of underpricing. For these variables we first run the basic model for underpricing (Model 9), excluding auditor selection variables. Most firm characteristics perform as predicted, although not all variables are significant. Underpricing is lower for firms that are older as they go public, although the effect is small. Firms in industries with higher ex ante uncertainty (internet and high-tech) are associated with higher underpricing, although only significant for the high-tech sector. The coefficient on the indicator variable for a reported loss is negative, although economically and statistically insignificant. This counter-intuitive effect is driven by the 'normal' years (Model 12, excluding the bubble years 1999 and 2000), during which IPOs with a reported loss had slightly higher initial returns. The variables that capture deal characteristics are all significantly associated with underpricing. Across all models, firms that list on the Alternative Market Segment have lower underpricing, which is inconsistent with the general notion that more risky forms issue on the AIM. The finding is not driven by either the specific circumstances in the dotcom bubble. The significant positive relation with the proceeds of the placing is also unexpected, although the size of the effect is small. Potentially speculative issues, indicated by small share prices, are associated with higher underpricing. In sum, the evidence for the predicted ex-ante risk characteristics is mixed.

Ownership characteristics are included for the predicted effects of realignment as suggested by Habib and Ljungqvist (2001) and Ljungqvist and Wilhelm (2003) and show weak results. We find a positive association with the dilution factor, which is significant only in the estimations including all sample years (Models 9-11). According to the proposed model of Habib and Ljungqvist (2001), this implies that the promotion cost paid by the issuer offset the negative effect on underpricing. The participation ratio however does not significantly impact underpricing. The predicted negative sign is reported only if we exclude the bubble years from our sample (Model 12), but the coefficient is small and insignificant.

4.5 Sensitivity tests

Our results may be sensitive to a selection bias and endogeneity. A selection problem potentially exists if observations are not randomly distributed across discrete groups. Specifically in the context of this study: if an issuing firm chooses its auditor in order to optimize total issuing cost (as suggested by Hogan, 1997), then the observed auditor choice would not be randomly distributed across IPO firms in the underpricing models. In that case, the estimated coefficients in the underpricing model may suffer from selection bias (Lennox et al., 2011). Selectivity is a well-documented issue in the audit fee and audit quality literature, where it is common to treat the choice of an audit firm from a specific quality level as a non-random predictor for the outcome (f.e. audit fee, audit opinion or a measure of financial reporting quality). In an IPO setting, the level of underpricing is affected by several choices made by the owner, such as which underwriter to hire or on what exchange to list (Habib and Ljungqvist, 2001). Several choice variables have been endogenized in previous literature in addition to auditor choice, such as retained ownership and earnings disclosure (Datar et al., 1991; Copley and Douthelt, 2002). Similarly, in the underpricing literature the choice of underwriter and ownership structure is often assumed to be endogenously determined in the underpricing model since these determinants are all choice variables. The common approach to these endogeneity issues is to estimate a two-stage least square or Heckman-type regression. Recently, some papers critically review the application of selection models and instrumental variables to resolve endogeneity issues and argue that these models aggravate the problems in many cases (Lennox et al. 2011, Larcker and Rusticus, 2010). Problem is that these estimation procedures rely on the validity and strength of the instrumental (or exclusion) variables. A proper instrument should be correlated with the endogenous regressor, but not to the error term (that is: it should be exogenous). Moreover, the instruments should be justifiable from a theoretical perspective. If two-stage regressions are applied using weak or invalid instruments, models are potentially more biased than OLS and results will be very fragile. As Lennox et al. (2011) demonstrate, the conditions for strong and valid instrumental variables are rarely met in auditing research.

We do not endogenize auditor choice in our underpricing models. This is partly motivated by the concerns discussed above. Next, we briefly describe why we think the U.K. institutional setting mitigates the potential endogeneity issue to some extent. In addition, we describe a robustness test and a diagnostic test.

We argue that the IPO process in the U.K. is such that auditor choice is less likely to be endogenous to the underpricing model, mainly because the auditor has been engaged before the IPO or as a first step in the IPO decision making. In the U.K., the IPO process generally takes one year and the auditor is the first adviser to be involved in the process (see for

example LSE, 2002). Moreover, in many cases the issuer already has a client-auditor relationship before the IPO decision. This is a distinctive feature for the U.K. institutional environment, which requires private companies to report audited financial statements. Since breaking a client-auditor relationship is costly, the fact that IPO firms already have an auditor raises the barrier to choosing an auditor for the IPO specifically. In addition to an early appointment of the auditor, the price for the vast majority of U.K. issues is set earlier in the process and incorporates the market demand to a lesser extent. This effectively reduces the influence of the advisers (including the auditor) on the initial returns. Taken together, the auditor choice and pricing decisions are likely to be taken consecutively rather than simultaneously and the initial returns are determined by the trading on the first day rather than the setting of the IPO price. This would imply that treating the choice for a particular audit firm as exogenous to the underpricing model is not a significant concern in a U.K. setting.

We challenge our empirical translation of the U.K. institutional setting for IPOs by identifying the situation in which the exogenous determination of auditor choice is less likely. Auditor choice is more likely to be endogenous if it takes places shortly before the IPO date. The decision to break the auditor-client relationship shortly before going public is more likely to be part of the overall IPO-process, perhaps in an attempt to optimize overall issue costs (Hogan, 1997). In other words: potential selection bias would most likely apply to auditor switches in the IPO year itself. We identify 117 auditor switches that take place in the period between the pre-IPO financial statements and the IPO-date and label these switches with a dummy variable Interim that takes the value of 1 if the issuer makes an IPO-year auditor switch. We then rerun our auditor choice model for the sample of IPO firms that did not make a last-minute switch, thereby excluding potentially endogenously determined auditor selections. Our findings are very similar with the results in the main section of the paper (not tabulated). Also our underpricing model produces very similar results for the sample excluding Interim switchers (not tabulated). This supports the argument that our findings are not driven by selection bias.

In addition to partioning our sample, we perform a Durbin-Wu-Hausman test. This test is used to diagnose endogeneity, but assumes that the instrument is valid and is therefore subject to the same concerns for two stage regressions that we discussed above. We diagnose whether the choice for a big audit firm or upward auditor switches are endogenous in the underpricing model by including the residuals of the choice (upward switch) model in the underpricing models. To identify the instruments for auditor choice and switches, we rely on previous literature. Lennox et al. (2011) survey 75 articles in accounting that apply selection models, most of which use a measure of size and a measure of profitability as

exogenous variables in the first stage[53]. In line with these studies, we use our measure for size (*ln_assets*) and our indicator variable for loss as instruments in the first stage regression[54]. We then include the residuals from the choice and upward switch model in the underpricing regression. The coefficients on the residuals are not significant, suggesting that our OLS regressions are consistent and that we do not need to use an instrumental variable. Again, this is under the assumption that the instruments (*size* and *loss*) are valid and strong. Arguably, the models for underpricing that we define are limited in the sense that we do not include all the determinants that have been suggested in existing literature. The (adjusted) R-squares are low, indicating that our models do not explain a large proportion of the total variance. Since we are primarily interested in the relation between underpricing and auditor selection (instead of predicting underpricing), the R-squares that we observe (all within the range 0.10 to 0.15) are reasonable. Moreover, they are in line with prior U.K. underpricing research (e.g. Unlu et al. 2004). The significant F-test indicates that the observed R-square is reliable, and is not a spurious result of oddities in the dataset. The proposed relation between the response variable and the set predictors is statistically reliable. As a test of the robustness of our results, we repeated our analyses with different specifications and included some of explanatory variables suggested in previous research. Including additional variables in our model improves explanatory power, but hardly affects the results for our variables of interest[55]. For example, we ran the models for the years 1995-2000 including control variables for market conditions at the time of the IPO and including an indicator variable for underwriter reputation. Although the model improved, the coefficients on the variables that we report are hardly affected (not tabulated).

4.6 Conclusion

This paper explores different explanations for auditor selection (auditor choices and upward switches to another audit firm) when a firm goes public. Depending on the dominant incentives, the auditor selection will be driven by different characteristics of the issuing firm, the ownership structure and the offer itself. Studying auditor selection at the time of an IPO

[53] The majority of the studies in reviewed by Lennox et al. (2012) use an auditor choice model in the first stage. Although none of the studies provide a theoretical or economic rationale for the independent variables used to estimate the first stage regression, we use the same measures.

[54] We perform the test manually in order to be able to include two endogenous variables simultaneously. We cannot include more, again for lack of instruments. The standard errors produced are incorrect, but this is of no concern for our purpose here. We use OLS estimation in the first stage to relax concerns about the distribution.

[55] For market conditions we include market returns (FTSE 100), number of IPOs and average underpricing for the period during a period of 90 days before the IPO date. For underwriter reputation an indicator variable that takes the value of 1 if the lead underwriter in the IPO is in the 5th quintile of the largest marketshares of the underwriters in the sample.

offers some advantages. First, studying auditor selection of IPO firms offers more variation in audit firms, since IPO firms are usually smaller firms. Second, prior literature contends that there is an increased demand for credible auditors at the time of an IPO, driven by the desire to signal firm value or to minimize monitoring costs (e.g. Menon and Williams, 1991). Related to this, an IPO marks an important change in a company's circumstances and can trigger auditor change. The increased number of auditor switches for issuing firms in itself provides an interesting setting to study auditor selection.

We analyse a sample of 728 firms that went public on the U.K market in the years 1995-2003. The U.K. provides an interesting setting to study the switches of IPO-firms to higher quality level audit firms for at least two reasons: 1) the audit market is less dominated by the Big 4 and hence firms have more to choose from; 2) the disclosure requirements for private firms are very similar to public firms and therefore switches are not driven by a change in required audit services when going public. We document that over the years 1995-2003 IPO firms are on average increasingly younger and smaller. In addition, less IPO firms choose a Big 4 audit firm or switch to a higher level audit firm prior to an IPO. Instead, mid-size audit firms are increasingly popular for IPO's. In sum, the descriptive evidence shows that as average size and age of issuing firms declines over the years, they stay with their mid-size audit firm more often. This is in line with the certification role of audit firms.

In order to study the determinants for auditor selection and switches, we employ logistic regressions for each of the audit firm tiers Big Mid and Small and for upward switches. In line with previous studies, we find that larger (smaller) firms are more likely to select a Big (Mid /Small) audit firm. Since larger firms have more agency costs (Simunic and Stein, 1987), this finding is consistent with monitoring needs driving the demand for auditors. Ex-ante uncertainty factors show mixed results, where firm risk increases the odds of selecting a big audit firm while deal risk factors decrease the odds that a big audit firm is appointed. In other words: higher risk firms will choose a more reputable audit firm but when the IPO-deal is more risky the firm will more likely appoint a small audit firm. Alternatively, this may be explained by audit firms' preferences instead of the IPO firms' selection. From the audit firms' perspective, deal risk may be reason to decline the client, while firm risk may be more acceptable. Although going public affects the ownership structure of the firm, this does not seem to drive the auditor selection. The shareholdings of insiders prior to the IPO are significantly associated with the odds of choosing a particular audit quality level. IPO firms more likely appoint a mid-size audit firm when insiders have a larger stake, but retained ownership has no effect in our analysis.

In addition to the auditor selection analysis, we study the potential effect of the auditor selection on the first day returns of the IPO based on similar theoretical explanations. In the underpricing literature, the certification hypothesis covers informational incentives and the

realignment hypothesis addresses conflicts of interests and agency problems. We find mixed results for the certification hypotheses when testing for the effect of auditor reputation on initial returns. The negative effect of upward switching on underpricing is consistent with the certification hypothesis. On the other hand, the finding that IPO firms with a big or mid-size audit firm have higher underpricing seems unexpected. When we split the sample to analyse the years of the dotcom bubble (1999 and 2000) separately, we find that the results for auditor choice and upward switching are driven by the bubble years. Therefore, this finding may be driven by the specific market circumstances in these years, causing firms with a different risk profile to go public and potentially increasing the importance of the insurance incentive to demand high quality audits. In addition, the favourable market itself may respond differently to high quality certification and increase the share price.

Overall the results indicate that IPO firms select an audit firm based on incentives that are consistent with certification and insurance motivation. Despite careful selection, a higher audit quality level does not diminish underpricing.

Chapter 5

Summary and concluding remarks

This thesis comprises of three studies that analyse the financial reporting environment. Each Chapter presents a separate study and takes a different approach. More specifically, each of the studies focuses on specific factors that together shape financial reporting. The study presented in Chapter 2 focuses on the users and preparers of financial information and information intermediaries. Chapter 3 specifically studies the choices made by regulators. In Chapter 4 the preparer and the auditor are the focal point. Each of the studies contributes to our understanding of the financial reporting environment, albeit from different perspectives.

The research presented in Chapter 2 zooms in on the role of the media as financial intermediaries. Particularly, the study in Chapter 2 analyses managers' reporting choices and investors' perception of the usefulness of the reported information at a time when a series of critical newspaper articles were published with respect to a specific reporting practice: the use of alternative earnings measures. According to the press, companies publish their own earnings metrics, stripping out expenses like interest, tax, depreciation or other items, in order to mislead investors. These non-standard (or non-GAAP) measures allow managers to report more favourable results compared to earnings as defined by accounting standards (or GAAP measures). Regulators shared these concerns, but the response varied across countries. The U.S. regulators intervened with a radical reform of regulations aimed at curtailing non-GAAP reporting practices. This contrasts with the Netherlands, where regulators did not respond with additional regulation. Hence, the research in Chapter 2 focuses on the Dutch situation, to observe what happens to a popular but widely criticized financial reporting practice if regulators do not intervene. We analyse a sample of earnings press releases published in the period 2000–2005 by companies listed at Euronext Amsterdam. Our findings indicate that Dutch companies report non-GAAP measures frequently and prominently. However, companies' reporting behaviour changes after a peak in negative media attention for non-GAAP reporting. The magnitude of the adjustments to GAAP earnings decreases and companies seem to have different reasons to report non-

GAAP measures. The effect of the media attention is stronger for companies that have been criticized specifically for their non-GAAP reporting in the press. Investors seem to have become more hesitant towards the use of non-GAAP measures for their decision-making after negative media attention. Together, these findings suggest that the negative media attention for non-GAAP measures has influenced the decisions of investors and managers. Moreover, it seems that information intermediaries influence the demand and supply of financial reporting information, in the absence of regulatory measures.

The third Chapter focuses on regulators and their role in the financial reporting environment. More specifically, this study examines why countries make different choices with respect to (the timing of) International Financial Reporting Standards (IFRS) adoption. IFRS is generally promoted from a specific, capital market perspective that may not be equally convincing to every country. Applying a framework with a broader set of forces that potentially drive IFRS adoption decisions, the pattern of IFRS diffusion across the countries of the World Bank universe is analysed. Building on the international relations literature, we analyse the role that decisions by other countries have on the IFRS adoption decision of a specific country. We distinguish diffusion mechanisms based on the motivation of the decision and the response. A decision to adopt a new policy may be motivated by changing incentives or by changing ideas. The response to the change may either be driven by expected utility of the new policy or by the legitimation that adoption would provide. The results of this analysis suggest that the decision to adopt IFRS is not simply driven by perceived competitive benefits, but by adoption decisions that peer-countries have made. Countries can be peers or neighbours from different perspectives: geographically, economically or culturally. Especially the choices of culturally closely related countries seem to matter. These adoption decisions seem to be motivated by a change in ideas and driven by the desire for legitimacy. In our research design, this motivation is distinct from a competition driven decision, which is how the success of IFRS is commonly explained. It seems that adopting IFRS can also be influenced simply by the desire to emulate others, just because it seems the right thing to do.

Chapter 4 examines the relation between the preparers and auditors of financial reports. This study takes a closer look at the selection of an audit firm at the time when credibility of financial reports is especially important for a company, namely when a company goes public and offers (part of) its shares at the stock market. Arguably, assurance is particularly important to outsiders of the company when it makes an entrance to the stock market. In a setting of U.K. IPO firms in the years 1995-2003 it seems that the selection of an audit firm matters. We observe increased number of companies decide to switch to an audit firm of a different size when they face an IPO. Applying the insights from the finance literature, more

specifically the findings in the underpricing literature, we explore whether the selection of an auditor by IPO firms is driven by the demand for certification or insurance. We find evidence that IPO firms are more likely to choose a high quality auditor when the uncertainty of the future prospects is higher and the IPO firm wants to signal quality (certification driven by signalling). In addition, the demand for higher quality auditors can be driven by the demand for monitoring issues, as reflected by the IPO ownership structure (certification driven by monitoring), although the evidence is mixed. The finding that more risky IPO firms select higher quality audit firms is in line with the insurance hypothesis. Given the descriptive evidence that IPO firms are actively selecting an audit firm (as reflected in the high switching rate), it seems that IPO firms make an effort to select the desired level of audit quality. In order to evaluate whether these efforts are successful, we take the study a step further and analyse auditor selection in light of the performance of the offer. Since the IPO literature is particularly concerned with underpricing as an indication of IPO quality, we attempt to place the audit firm selection in the perspective of the pricing of the offer. IPO firms that switch to a higher quality level audit firm experience lower underpricing, which is in line with the certification hypothesis. On the other hand, IPO firms with a big or mid-size audit firm have higher underpricing, which contradicts certification. However, the findings are affected by the market circumstances during the bubble years (1999 and 2000), in which high underpricing may be driven by investors' enthusiasm. In other words: the difference between the offer price and the market price may not be caused by underpricing of the offer by the issuer, but rather by 'overpricing' by the market. Overall, although there is notable effort to select an appropriate auditor at the time of an IPO, the effectiveness of the selection as reflected in underpricing deserves further attention.

The studies presented in this dissertation share the notion that financial reporting information emerges from the interplay of groups in society that all have an interest in this information; users of the information, preparers of the information, regulators (including standard setters), intermediaries and auditors. In that sense, the studies advocate a broader view on financial reporting issues in order to enhance our understanding of its function in financial markets and society at large. The dominant perspective, both in research and standard setting is an informational view, where the main purpose of financial accounting is to provide information that is useful for decision making. Investors are considered to be the most important user. Within the information perspective, the focus is on the valuation role. Financial reporting facilitates the optimal allocation of financial resources and this can only be achieved if the information is relevant for the prediction of future cash flows. Recently, the IASB decided to focus solely on decision usefulness for capital allocation purposes in its

revised Conceptual Framework[56]. This was a big step, in the sense that it was the first time in the history of the writings of objectives of financial reporting that the stewardship role was deprived of its status as a separate goal next to the valuation role (Zeff, 2013). It led to some debate (mostly among practioners), where critics argued that the decision usefulness approach has been taken too far (Whittington, 2008). In this debate the stewardship role is defined as a form of information provision that serves contracting purposes for the labour market of managers. Both the valuation role and the stewardship role fit into a strict economic view. In any case, financial information is regarded as a commodity that facilitates efficient transactions among individual investors and managers, whether on capital markets or managerial labour markets. Since this perspective was embraced by accounting academics, research has improved in terms of scientific rigor and objectiveness and progress has been made in terms of our understanding of accounting information in capital market context. At the same time, it has been argued that the accounting research became less relevant for 'the real world' when it became more scientific (Granof and Zeff, 2008). Moreover, the dominance of the economic, information perspective came at the expense of the diversity in accounting research. The tendency of researchers to restrict themselves to conversant areas may cause fundamental questions and promising research methods to be overlooked (Brown, 2013). For example, the historical, institutional and political context of financial reporting is mostly overlooked on current research agendas. A more expansive view would contribute to a richer understanding of financial reporting. At a Strategy Retreat of the American Accounting Association, one of the participants used the following words to describe the issue: "If accounting researches do not tackle the fundamental issues in accounting, we collectively face obsolescence, irrelevance and oblivion" (Basu, 2012, 855). It seems one can hardly disagree.

[56] The IASB is updating the Conceptual Framework in separate stages. Chapter 1 Objectives of general purpose financial reporting was completed in September 2010. It states the following: "The objective of general purpose financial reporting[1] is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity. Those decisions involve buying, selling or holding equity and debt instruments, and providing or settling loans and other forms of credit." (F OB2)

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Nederlandse samenvatting

(Summary in Dutch)

Financiële verslaggeving van ondernemingen komt tot stand in een omgeving waarin allerlei, soms tegengestelde, belangen bestaan bij financiële informatie. Behalve de opstellers van de informatie (de onderneming) en de gebruikers van de informatie, spelen ook andere partijen zoals accountants, regelgevers en media een rol. De studies in dit proefschrift betrekken verschillende aspecten van dit speelveld in het onderzoek, waarbij in elk hoofdstuk andere belanghebbenden centraal staan.

In Hoofdstuk 2 staan de opstellers, gebruikers en de pers centraal. Het onderzoek richt zich op alternatieve winstmaatstaven (non-GAAP maatstaven). Dit soort maatstaven, dat niet gedefinieerd is door regelgevers, biedt de mogelijkheid om bepaalde posten niet mee te tellen bij het bepalen van de winst, waardoor veelal een gunstiger resultaat kan worden gerapporteerd. Het onderzoek in dit hoofdstuk laat zien dat de keuzes van zowel de opstellers als gebruikers van financiële informatie veranderen in een periode waarin de media zich kritisch uitlaten over bepaalde winstmaatstaven, ook al is er geen specifieke regelgeving ingevoerd om de rapportage van alternatieve winstmaatstaven in te perken.

In Hoofdstuk 3 staan de keuzes van internationale regelgevers centraal. De wereldwijde verspreiding van IFRS wordt vaak verklaard op grond van het bevorderen van een efficiënt functioneren van internationale kapitaalsmarkten. Als we de (timing van de) keuze van landen wereldwijd om IFRS in te voeren analyseren vanuit het perspectief van internationale betrekkingen, dan blijkt dat di keuze wordt beïnvloed door de keuzes van verwante landen. Het gaat daarbij niet alleen om economische verwantschap tussen landen; ook culturele verwantschap met IFRS-landen vergroot de kans dat een land IFRS zal invoeren.

Tenslotte wordt in Hoofdstuk 4 de rol van de controlerend accountant onderzocht, ten tijde van beursintroducties. Bedrijven wisselen vaker van accountant voorafgaand aan een beursgang, wat suggereert dat ondernemingen in dit proces belang hechten aan de selectie van een geschikt accountantskantoor. Het onderzoek laat zien dat ondernemingen proberen kwaliteitssignaal af te geven door te switchen naar een groter accountantskantoor. De resultaten suggereren dat ondanks dat beursintroducees belang hechten aan de selectie van een accountantskantoor, de keuze zich niet altijd vertaalt in een betere introductieprijs (lagere *underpricing*).

De studies in dit proefschrift onderstrepen het belang van een breed perspectief in het onderzoek naar financiële verslaggeving, met aandacht voor de diversiteit van de omgeving waarin de informatie tot stand komt

About the author

Miriam Koning holds an MSc in Economics from the Erasmus School of Economics, Erasmus University Rotterdam. Following graduation, she worked several years in the international audit practice at Ernst and Young (EY). Currently, she is Assistant Professor in Finance and Accounting at the Rotterdam School of Management, Erasmus University.

Miriam teaches several courses in financial accounting. Her research is focused primarily on economic and political aspects of financial reporting and disclosure regulation. Furthermore, her research interests include the origins and evolution of financial accounting thought and practice. She has published in *Abacus* and the *International Review of Financial Analysis*

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THE FINANCIAL REPORTING ENVIRONMENT

THE ROLE OF THE MEDIA, REGULATORS AND AUDITORS

Financial reporting is the process of disclosing financial information about a company to external users. This dissertation investigates three different parties involved in the environment of financial reporting: the media, regulators and auditors. The media, or more specifically the financial press, are central to the first study. This study shows that reporting practices are sensitive to critique in the financial press. Both reporting choices and investor decisions can be affected by negative press. The second study in this dissertation examines a remarkable change in the regulation of financial reporting that took place during the past decade: the diffusion of International Financial Reporting Standards (IFRS) across the globe. The competitive benefits of IFRS that are commonly put forward are not equally important for every country. The study explores alternative motivations that may have been driving the widespread acceptance of IFRS and finds that changing ideas and the desire for legitimacy also play a role. The third study explores auditor selection in a time when credible financial reporting is particularly salient, namely when a company goes public. Many firms switch to another audit firm when they go public. Different audit quality levels are selected depending on characteristics of the firm, ownership or the offering. But despite the careful selection of an auditor, audit quality does not seem to reduce underpricing. Overall, the studies in this dissertation emphasize that in order to enrich our understanding of financial reporting we need to examine its environment.

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Design & layout: B&T Ontwerp en advies (www.b-en-t.nl) Print: Haveka (www.haveka.nl)

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