

# Transparency After Sarbanes-Oxley: Beyond the Numbers

A study after the effects of the Sarbanes-Oxley Act on non-financial disclosure

D. Ligtenberg

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A study after the effects of the Sarbanes-Oxley Act on non-financial disclosure



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# Abstract

This research examines the effect of the Sarbanes-Oxley Act (SOX) of 2002 on corporate transparency. More specifically, this study focuses on transparency in non-financial reporting, i.e. the qualitative parts of corporate disclosures. To establish the effect of SOX, a difference-in-differences estimation is used to compare the changes for a set of variables between a group of European cross-listed firms, and a group of comparable European single-listed firms. Transparency is measured by a set of non-financial 21 variables, recognised by financial analysts as important in determining firm value. This study provides evidence that, relative to a single-listed control group, cross-listed firms became significantly more transparent after SOX. The second part of this research consists of a comprehensive textual content analysis, to measure variables for forward-looking information. Combining the results of the content analysis with qualitative variables on forward-looking information, this research suggest that after the implementation of SOX, European cross-listed firms became significantly more forward-looking in their non-financial information disclosures.

Keywords: *corporate governance, transparency, regulation, Sarbanes-Oxley Act, non-financial information, content analysis, forward-looking*



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# 1. Introduction

Financial markets play an important role both locally and globally in modern society. Circulation of capital between investors and companies requires an adequate information distribution to reduce agency costs. A shakedown in this information environment (e.g. by extreme asymmetry or fraud) is disastrous for the functioning of capital markets which mainly rely on trust and transparency.

As a result of the massive financial scandals at Enron, Tyco, WorldCom and others, legislators were forced to recognise the importance of good corporate governance and were eager to develop an answer to these high corporate failures. The U.S. Congress passed the Sarbanes-Oxley Act (SOX) late July 2002. In order to restore investor confidence in financial markets, SOX aims at improving financial reporting quality and reducing fraud by enhancing corporate disclosure and governance. The law, which applies to all public listed companies in the US, includes different provisions covering topics as accountability, financial transparency, corporate governance and corporate responsibilities. Reducing opacity and enhancing integrity are the corner stones of SOX (Akhigbe et al., 2008).

Ever since, there has been an ongoing debate about whether the costs of compliance with SOX outweigh the benefits it yields (Brown Jr., 2007; Coates, 2007; Singer and You, 2009; Zhang, 2007; Stephen and Apilado, 2008; Rittenberg and Miller, 2005). Compliance to specific sections of the act (e.g. section 302 and section 404) requires a serious investment in both time and money. Coates (2007, p. 92) substantiates that a qualitative approach should be chosen in determining effects as *'...costs are hard to quantify, and the benefits even harder...'*

A few previous studies tried to quantify the benefits of SOX (Singer and You, 2009; Lobo and Zhou, 2006; Skaife et al. 2008, Akhigbe and Martin; 2005; Rittenberg and Miller, 2005). However, most of these studies focus on specific elements of SOX that contribute to an enhanced quality of financial information available to financial markets. Evidence on more conservative financial reporting in the two years after the implementation of SOX is presented by Lobo and Zhou (2006), who also observe a decrease in the use of discretionary accruals. Akhigbe and

## Introduction

continued

Martin (2006) examined the positive valuation effects of SOX on firms in the financial service industry as a result of disclosure and governance characteristics. Singer and You (2009) found a positive effect of SOX Section 404 on reporting quality and conclude that Section 404 contributes to accuracy and reliability of corporate disclosure. Similar evidence is presented by Skaife et al. (2008) who argue that effective internal controls, enforced as a result of SOX Section 404, is fundamental to financial information quality.

This research debates that in capital markets investors should benefit from the promises of SOX. Financial analysts could be seen as a proxy for investors and have access to all public information (Begley et al., 2007). The implication of SOX to provide more accurate and transparent information in capital markets should be beneficial to these analysts, e.g. resulting in lower earnings forecast bias.

At this moment in time there is hardly any research available which directly links both the critical information used by analysts in forecasting earnings and the impact of SOX on the quantity and quality of this type of information. A study by Stephen and Apilado (2008) showed a decrease in forecast accuracy and also indicated more pessimistic earnings forecasts in the post-SOX era. This is partially supported by Begley et al. (2007) who found only a positive effect on the short term regarding public information quality, but a decrease below pre-SOX levels in the long term. Most of the studies take a quantitative approach, based on financials, which are objective, easy to compare and available for a large time-frame. The downside of such an approach is that all data is backward looking.

In order to contribute to the ongoing debate on regulation, questioning improved quality of reporting, market valuation and the costs versus benefits, this study takes a qualitative approach. According to Li (2006) non-financial information (e.g. footnotes and MD&A section) correlates with equity pricing. Moreover Li (2006) debates that where financial information is mostly backward-looking, whereas non-financial information is also forward-looking of nature.

The motivation of this research partially stems from the study of Coates (2007) who strongly states that existing studies relating to SOX fail to capture the unique effects of the Act as those are biased by the strong economic and political change during the time of implementation of the law.

The contributions of this dissertation are twofold. First, this research contributes to the literature examining the effects of SOX on transparency in information. By knowledge of the author, this study is the first in taking a qualitative approach overcoming difficulties regarding interpretation and subjectivity issues. Second, this research contributes to the growing body of content analysis in finance and accounting literature (e.g. Petersen, 2004; Engelberg, 2008, Orens and Lybaert, 2007; Li, 2006; Barron et al. 1999). This research complements the research of Loughran and McDonald (2009) and Tetlock et al. (2008) in their quest for a dictionary to study on financial concepts by means of content analysis.

The findings of this research have significant implications suggesting that regulation can enhance corporate disclosure, moreover, result in more transparent non-financial information. This dissertation provides evidence that an increase in both transparency and in forward-looking tone of the non-financial information disclosed by cross-listed firms is caused by the legislation of SOX.

The remainder of this paper is organised as follows. Section 2 discusses the literature on the topic of transparency in non-financial reporting. In Section 3, the methodological framework and empirical measures are presented. Section 4 discusses the findings and statistics. Section 5 concludes.





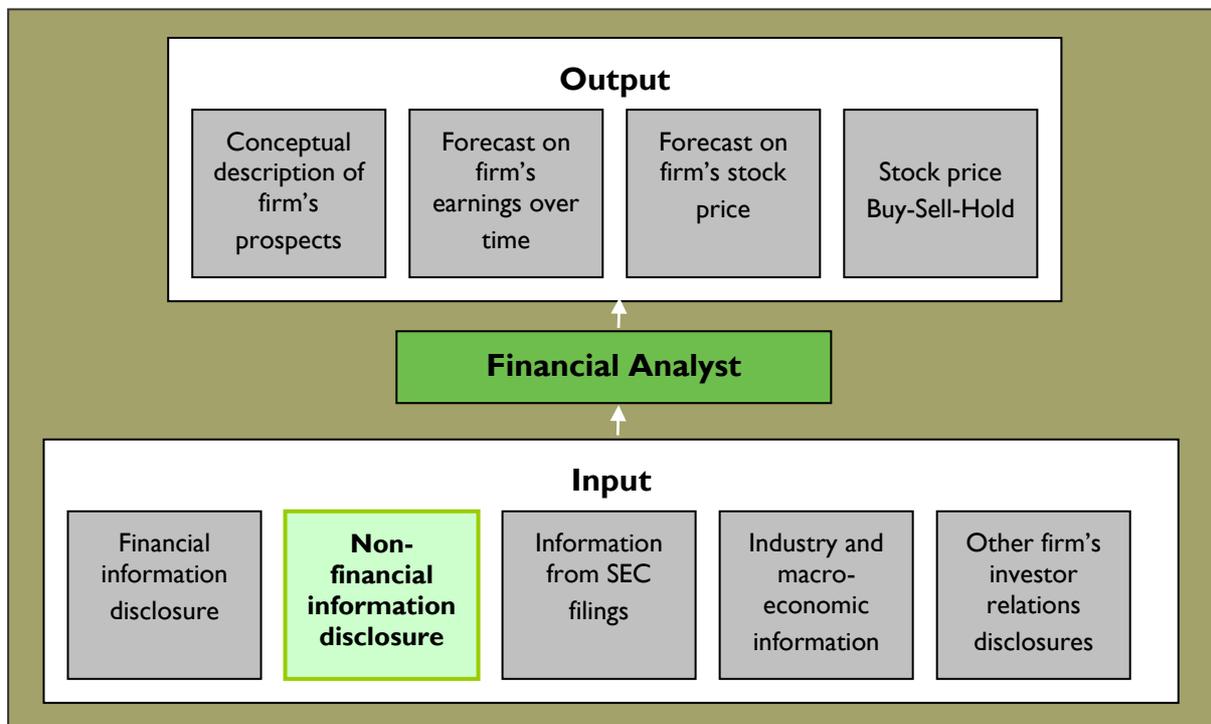


## 2. Literature Review

In this research the information environment of financial analysts is used as a proxy for the information environment of efficient capital markets. An adapted version of a framework presented by Ramnath et al. (2008) is presented in figure 2.1, which shows both the input and output for the work of a financial analyst. This research mainly focuses on the input, as transparency of information is the topic under study.

In this chapter first the information environment of capital markets will be examined. Second, the research available on the users of this information (i.e. financial analysts, will be reviewed. Lastly the impact of Sarbanes-Oxley (SOX), and its relation to the information environment will be reviewed. The chapter will be closed with the research question and the development of the hypotheses tested in the research.

Figure 2.1: The information environment of financial analysts in capital markets



# Literature Review

continued

## 2.1 Related literature

This literature review is based on three streams of the extant literature: (1) research on corporate disclosure and the information environment, (2) research on the interpretation of this information, (3) research on the Sarbanes-Oxley Act.

### 2.1.1 Information in capital markets

Corporate disclosure and transparency are crucial for the functioning of efficient capital markets (e.g. Lang and Lundholm, 1996; Healy and Palepu, 2001; Schipper, 1991). A major purpose of these markets is to collect and process pieces of information, to finally incorporate these into stock prices. This efficiency is related to the validity and accuracy of the information available in the markets as provided by both firms as certain governance systems (Stephen and Apilado, 2008). In light of this, the quality of information is of such importance that different official bodies like the Securities and Exchange Commission (SEC) and Public Company Accounting Oversight Board (PCOAB) monitor the markets and the reporting mechanisms.

In the heart of corporate governance research two main problems relating to disclosure are identified namely the *information asymmetry problem* and the *agency problem* (Roe, 2004). The information asymmetry problem refers to the imperfect information to the different stakeholders available, i.e. the extent to which managers have more insights about the firm and its value, than other external stakeholders such as investors (Cai et al., 2008). Full disclosure of all private information, regulation, board composition, incentive alignment are widely studied in the literature as possible solutions to this problem (Healy and Palepu, 2001; Cai et al., 2008; Raheja, 2005; Harris and Raviv, 2008).

The agency problem stems from the separation of ownership and control, and lies at the core of corporate governance issues within organisations. The agency theory describes the alignment of the goals of both 'principals' (stakeholders) and 'agents' (managers). Due to the separation of ownership and control, and as a result, the different (conflicting) interests of both parties, costs can arise referred to as agency costs (Healy and Palepu, 2001; Roe, 2004). The reduction of these agency costs is of interest of both principal and agent. These costs can arise by both managerial diversion and incompetence (Roe, 2004). Diversion refers to diverting firm value in different ways (e.g. fraud, excessive bonus schemes), whereas competence alludes to incumbent management. Separation of ownership and control can lead to costs, denoted as agency costs,

which should be minimised by mechanisms of governance such as a board of directors or information intermediaries like financial analysts (Healy and Palepu, 2001).

Information appears to be a crucial element for both problems, and the quality of the governance mechanisms in place does appear to have a positive effect on the information available, which thrives efficient capital markets. Byard et al. (2006) found an increase in analyst forecast accuracy positively correlating with board independence and negatively correlating with board size. Lang and Lundholm (1996) examined the analyst behaviour in relation to corporate disclosure and indirectly concluded that there is a positive relationship between firms' disclosure policies and factors relating to a reduced cost of capital. This is consistent with the view of Chung and Jo (1996) who find evidence that the monitoring of a firm by financial analysts motivates corporate managers, and thus reducing agency costs and enhancing market value. Healy et al. (1999) describe that firms with an increase in disclosure ratings, experience a positive effect in both stock performance and stock liquidity. Furthermore, as discussed by Botosan and Harris (2000, p. 331) '*...an enhanced disclosure increases liquidity and reduces cost of equity capital...*'.

Assumed is that information is a core driver for efficient capital markets, and that good corporate governance enhances the information environment. Moreover, the efficient market hypothesis is based on the premise that all information is incorporated in stock market prices. Tetlock et al. (2008) provide evidence that, information included in negative words is processed by stock markets into prices with only a slight delay, although with a tendency of markets to underreact to negative disclosure.

Information, however, is not homogeneous in type and, as a result, not equally costly to process. In finance literature information is classified in hard and soft information (e.g. Petersen 2004), also referred to as quantitative and qualitative (Engelberg, 2008) or financial and non-financial (Orens and Lybaert, 2007). In the definition of both terms Petersen (2004) provides a solid foundation by referring to soft information as often communicated with text and hard information often communicated with numbers. Numbers are better comparable, more objective and easier to process, resulting in a lower cost of information processing. The sample of annual reports filed by public U.S. companies contain on average 70,279 words, which explains the problem for systematic analysis by an investor.

Although it appears that markets do include non-financial information into stock prices, academic research have heavily relied on financial information as accounting numbers, and thus

# Literature Review

continued

found difficulty replicating this process. This is a remarkable observation as the efficient market hypothesis is based that markets incorporate all publicly, both quantitative as qualitative, information available immediately (e.g. Engelberg, 2008). The following paragraph will zoom in on, what is considered to be, the most important group of users of the information available.

## 2.1.2 Use of information by financial analysts

Financial analysts are considered to represent a large part of the financial intermediaries. Financial analysts evaluate firm performance by gathering information, from both public as private sources, in order to make recommendations about the stock (Healy and Palepu, 2001; Lang and Lundholm, 1996; Chung and Jo, 1996). The role of financial analysts in capital markets is widely studied and recognised in finance and accounting literature (e.g. Schipper, 1991; Amir et al., 1999; Ramnath et al. 2008; Hunton and McEwen, 1997).

Among questions addressed in this field, earnings forecasts and stock recommendations are considered as a primary stream of research (e.g. Brown and Rozeff, 1978; Brown et al., 1987; Brown, 1996; Lang and Lundholm, 1996; Bhat et al., 2006; Hope, 2003; Stephen and Apilado, 2008). The important role of this group is underlined by Barth and Hutton (2004) who find empirical evidence that the stock price of stocks followed by a larger group of analysts are more likely to adjust instantly by incorporating information on cash flows. In their literature study, Healy and Palepu (2001) conclude that, despite the gaps in knowledge about the credibility, the role of financial analysts is valued by the investor community. Moreover, it appears that financial analyst have a superior performance over time-series forecasting methods. Brown et al. (1987) contribute this superiority, correlating with firm size, to the information interpretation capability of financial analysts.

In their literature study Ramnath et al. (2008) examine seven broad areas of which two have a direct link to transparency and the use of disclosed information namely the analysts' decision processes and the information content of analyst research.

That a higher quantity of available information is not always providing better insights is shown by Francis et al. (1997) who report a significant increase in analysts following a firm, after providing analyst presentations. However, the material benefits can be questioned as no significant improvement in dispersion and forecast bias was found. Hope (2003) debates that forecast accuracy is positively associated with disclosure level, elaborating on prescribed and forced rules of accounting.

Another input source for financial analysts, as shown in figure 2.1 are the other investor relations disclosures by the firm. Among these are conference calls, which have become more commonly accessible to all investors instead of solely to large investors and financial analysts. Tasker (1998) discusses that conference calls are more likely to be used by those firms with weaker disclosure in their financial statements, to provide additional information. Bushee et al. (2004) discuss the market reaction to the information disclosed in these calls and conclude that price volatility is one of the accompanying effects. Due to concerns of the SEC, Regulation Fair Disclosure (Reg FD), was issued in August 2000, aimed at driving back selective disclosure to certain groups of investors or analysts. The potential advantageous effects of these calls were studied by Bowen et al. (2002), who showed that restricted access to such calls does indeed present selective disclosure problems resulting in an information gap between the analyst community and the other investors.

But how exactly is information interpreted and translated to the value of a firm? Already suggested by Ramnath et al. (2008) is that current research heavily relies on quantitative information. Quality of earnings are often the point of departure in studying the work of financial analysts which is conceptualised in terms of earnings management (Lang and Lundholm, 1996; Botosan & Harris, 2000) and accounting methodology (Hirst et al., 2004; Hunton and McEwen, 1997). There appears to be little empirical research available regarding the use and quality of non-financial information by financial analysts.

Engelberg (2008) suggests that qualitative information is more costly to process, and therefore not incorporated into valuations by analysts. In contrast this interpretation problem is recognised by Barker and Imam (2008) who combine a survey research and content analysis to determine the perceptions of earnings quality by analysts. It is striking that although, as discussed, analysts appear to rely on financial information, Barker and Imam (2008) show that perceptions of earnings quality are more often based on non-financial information. According to Block (1999), growth potential ranks first among 205 of 297 interviewed financial analysts. How this potential is measured by analysts remains unclear. Previts et al. (1994) conduct a more comprehensive study in analysing the content of financial analyst reports, showing also non-financial informative elements being of importance in their analysis. A parallel assessment of accounting information used is conducted more recently by Hope (2003) who uses a disclosure index from the Centre for International Financial Analysis and Research (CIFAR) as a proxy for

# Literature Review

continued

disclosure. This study, however, provides no insight in what specific items are of crucial importance in firms' analysis by analysts e.g. by reporting a weighted average of different categories used. Barron et al. (1999) linked the quality of the Management Discussion and Analysis (MD&A) in annual reports to earnings forecasts by financial analysts and show that high MD&A ratings are associated with less error and dispersion in earnings forecasts. This specific narrative section of an annual report (which has to be included in the SEC filings) aims to provide stakeholders with both a historical and a prospective analysis from a management's perspective. That disclosure on firm-level is beneficial for the information environment, is documented by Hope (2003), who finds a positive relation between disclosure levels and forecast accuracy.

Current studies present, on the use of non-financial information, are the studies of Orens and Lybaert (2007) and Nielsen (2004). The first study provides insights in the use of non-financial information and the accuracy of analysts' forecasts which tends to enhance with the use of more information regarding internal-structure and forward-looking. The study of Nielsen (2004) illustrates that, besides segmental information and risks and opportunities, background information (e.g. product and market information) and analysts' analysis on financial and operating data account for over 50% of the total disclosure in analysts' reports.

## 2.1.2 The Sarbanes-Oxley Act

Reviewing literature on the Sarbanes-Oxley Act (SOX) of 2002 shows a wide variety of research conducted in this field. SOX addresses different typical corporate governance issues as board composition, independency of boards and auditors, review of internal control systems (§ 404) and certification of financial statements by CEO and CFO (§ 302). Furthermore SOX aims to improve disclosure of e.g. reporting on off-balance-sheet transactions (§ 401) and obliges to disclose current accurate information on material changes in the firms financial position (§ 409). The main purpose of these provisions is to reduce the likelihood of fraud and to positively affect the alignment of incentives of management with those of other stakeholders (mainly investors), recapitulated enhancing corporate governance and disclosure. A summary of the provisions of SOX concerning disclosure and internal control systems are presented in table 2.1, which is adapted from Coates (2007, p. 97)

Table 2.1: Summary of disclosure and control provisions of the Sarbanes-Oxley Act

Sections	Topics
302, 401-406, 408-409, 906	New disclosure rules, including control systems and officer certifications
301-304-306-407	Corporate governance for listed firms (Audit committee rules, ban on officer loans)

Despite the vast literature on the effects of SOX, there is no consensus as to whether the Act has a positive or negative effect on firms. Qian et al. (2009) show a mitigating tendency for the agency problem for SOX compliant firms, corroborated by an improved condition of public debt markets. Akhigbe et al. (2008) evaluated capital market risk measures in pre- and post SOX era, and found significant positive shifts in the variance of market and idiosyncratic risk. Skaife et al. (2008) show similar positive results on risk features as firm betas, idiosyncratic risk and cost of equity. It appears that better governed firms have less information risk as a result of better accruals (Strydom et al. 2009). High-quality financial information systems rely on effective internal control systems and appear to be, from a risk-perspective, influenced positively by the legislation.

Economic consequences of SOX are investigated by Zhang (2007) who examined market reactions around the legislative event dates and found significant negative abnormal returns around key SOX events. Bris et al. (2007) argue that, although cross-listing might be beneficial in terms of monitoring and disclosure, the valuation effects are negative as there is no premium for these effects incorporated in the stock price. Pinello and Skaife (2008) disagree with this view by examining earnings predictability (as an attribute of earnings quality) in relation to Section 404 of SOX, and demonstrating an improvement in earnings quality as a result of a remediation of internal control problems. This positive effect of Internal Control Quality (ICQ) is supported by Kim et al. (2009) and Xu and Tang (2008). They provide evidence that ICQ is both an important determinant in the decision making process of financial analysts and ICQ is positively associated with analyst' forecast errors. Singer and You (2009) add that firms complying to Section 404, and hence assess their effectiveness of internal controls over financial reporting, improve their financial reporting quality in the Post-SOX period. Iliev (2009) argues that Section 404 compliance costs do not outweigh the financial benefits for small firms, showing heightened costs and lower discretionary earnings.

## Literature Review

continued

Begley et al. (2007) explored the impact of SOX on the financial information quality (both public and private) in capital markets and found a decline in information quality after an initial incline in the first year after the implementation of SOX. Suggested is that due to severe penalties associated with violations under SOX, firms started to disclosing less. Looking into their conceptualisation of information quality, they follow an approach developed by Barron et al. (1998, cited by Begley et al, 2007) which are functions of analyst forecast error and dispersion. This method highly relies on the assumption of identical precision across the field of all analysts and does, in fact not directly assess the features of information available. The suggested rise of conservatism in financial reporting is supported by Lobo and Zhou (2006), who record lower discretionary accruals after SOX and also found a more prudent approach to incorporate losses. Bartov and Cohen (2008) make a similar point, when providing evidence that there is a decline in meeting/beating (i.e. at least match or surpass the expectation) of analyst earnings forecasts in the Post-SOX period. In other words, the analyst forecast bias appears to be declining.

Although according to the literature discussed, effects of SOX are recognised in the area of financial reporting, the exact drivers of potential beneficial effects of the enhanced information environment remain blurry. Explanations range from conservative reporting to a reduction in earning management. Zhou (2007) tries to reconcile these conflicting findings on the integrity of financial reporting by means of earnings management and discretionary accruals. From an accounting perspective Zhou (2007) debates that there is both an increase in conservative financial reporting *and* a decrease in earnings management.

Overall it appears that the implementation of SOX had an impact on the information environment in financial reporting, but what impact has the Act on non-financial information? At present, published research dealing with the effects of SOX on transparency of (non-financial) reporting is limited. Only one similar study tried to quantify the potential benefits of SOX, demonstrating a positive impact on cost of equity (Stephen and Apilado, 2008). A positive impact on financial analyst performance, however, was not recorded in this study.

This leads to the central research question: *Did the passage of SOX led to a more transparent form of non-financial reporting, as measured by a set of non-financial reporting criteria used by financial analysts?*

## 2.2 Hypotheses

This research will focus on two aspects of non-financial reporting – (1) characteristics of transparency, measured as the availability of specific types of information and (2) forward-looking information, measured by the availability of specific types of information and forward-looking statements.

### 2.2.1 Transparency in non-financial reporting

Only a few previous studies conducted a qualitative approach towards disclosure by assessing the non-financial information. Orens and Lybaert (2007) positively test the hypothesis that the disclosure of voluntary non-financial information by listed firms is increasing over time. Since the passage of SOX involves several mandatory disclosures on different topics, imposing a more prudent and transparent form of reporting, it is expected that for SOX compliant firms a stronger enhancement in disclosure will be observed than for non-SOX compliant firms. Orens and Lybaert (2007) also find a rise in the use of non-financial information on internal structure, which is conceptualised as transparency by financial analysts.

Since previous literature studies point in the direction of more transparent reporting, the following hypothesis is tested (stated in the alternative form):

**H1:** The passage of SOX is associated with an increase in transparency of non-financial information for SOX compliant firms relative to a control group of non-SOX compliant firms.

### 2.2.2 Forward-looking information in non-financial reporting

Growth potential, earnings quality, expectations and forecasts on firms' performance are all topics previously discussed. The use of voluntary non-financial information in corporate disclosure practices by financial analysts are tested by Orens and Lybaert (2007). They only partially find a confirmation for this hypothesis. They report an accumulation in transparency on different non-financial information variables, including forward-looking information variables, for Belgian firms. Engelberg (2008) finds evidence that of all categories of qualitative information, information about positive fundamentals and the future seem to be most important for predicting future returns. Only on variables of forward-looking information and internal

## Literature Review

continued

structure. Li (2006) finds a link between future returns, by means of the Fama French variables, to the risk sentiment of annual reports, measured through a content analysis. It appears that risk sentiment correlates with predictability of future returns. One of the implications of SOX is the disclosure of forward-looking information and this leads to the following hypothesis (stated in alternative form):

**H2:** The passage of SOX is associated with an increase in the level of forward-looking non-financial information for SOX compliant firms relative to a control group of non-SOX compliant firms.





# 3. Data and Methods

## 3.1 Sample selection and matching procedure

The final sample used in this study includes 50 firms cross-listed in EU-15 countries and US security markets and 50 firms single-listed in European security markets. The choice of firms was based on the matched pairs comparison method. This method implies drawing a random sample of firms and pair those to a control group based on different criteria. First out of a population of listed firms, all EU-15 cross-listed firms were selected which led to an initial sample of 76 non-paired firms. For the pairing progress the criteria for setting up the cross-listed and single-listed firms under study are respectively ordered: country, industry and market capitalisation (COMPUSTAT codes 06026, 06010, 08001). By means of these criteria, the firms under study are paired with an equally representative control firm and governance, country or firm size bias is nearly eliminated. The use of these criteria allow for controlling the information environment.

Since the financial services industry is highly supervised and regulated (e.g. Federal Reserve, Securities and Exchange Commission), including these firms is expected to have a negative impact on the validity of the results. Combining this with the complex nature and opacity of the financial service industry (Akhigbe and Martin, 2006; Oldfield and Santomero, 1997) and high level of intangible assets (Agrawal et al., 2006), these firms (industry code between 6000-6999) were excluded from the sample, which led to an initial sample of 61 pairs. Due to the fact that the sample was drawn during a timeframe from 2002 until 2007, some firms delisted, merged or had, for other reasons, no annual reports available for the timeframe. Exclusion of these firms led to a final sample of 50 cross-listed and 50 non cross-listed European firms (see appendix I).

Because of the fact that not all changes brought about by Sarbanes Oxley Act (SOX, or the Act) took effect on July 30, 2002 the impact on transparency in non-financial reporting (i.e. narrative sections) of the Act is assessed on a cross-sectional basis for the years 2002 and 2007. To draw inferences on the impact of SOX, this study focuses on the period before SOX was passed, i.e. 2002, and after all cross-listed firms had to be fully compliant, the financial year 2007. SOX signed into law on June 2002, and prior to December 2002, foreign filers did not have to comply

## Data and Methods

continued

with the Act. During years following, different sections were put in to place and made effective for foreign filers as well. This study considers 2007 the year in which all sections of the Act are effective for foreign filers, such that this year can be defined as post-SOX era.

As described in the literature review, different sources of information are available to stakeholders and, for financial analysts in particular, annual reports are considered as one of the most important (Ramnath et al., 2008; Byard et al., 2006; Orens and Lybaert, 2007; Previts et al., 1994). According to Knutson (1993, cited by Barron et al. 1999) the annual report ranks first on analysts' information sources. Previts et al. (1994) support this finding by presenting a study from the Financial Executives Research Foundation (FERF) in which the annual report ranks above respectively SEC filings and other management disclosures. In this study the information available to financial analysts, by means of the annual reports and SEC filings, is used as a proxy for the quality of information in the capital markets. The sample is thus formed by taking the intersection of the annual reports available for the selected firms of the fiscal years 2002 and 2007 which led to a sample of 199 cases (for 1 case Elmu RT. no annual report over the year 2002 was available). In addition to the annual reports, for the cross-listed firms the 20-F forms filed at the SEC were used on the variables on non-financial information, when not available in the annual report. This study focuses on the entire narrative part of the reports assuming that specific sections of the report are similar among the sample, and hence do not provide discernable information on transparency. This approach is supported by Loughran and McDonald (2009), who find that the Management Discussion and Analysis (MD&A) section does not provide additional tone measures differencing from the entire report in relation to excess returns.

There are different approaches to evaluate the transparency of the annual reports and SEC-filings. One can choose a quantitative approach e.g. by analysing cash flow and earnings disclosure (see Govindarajan, 1980; Amir et al., 1999) or a more qualitative approach (e.g. content analysis on the narrative sections; among others Loughran and McDonald, 2009; Orens and Lybaert, 2007; Tetlock, 2007; Li, 2006). Like already pointed out in the literature review, the focus of this research will be the transparency of disclosure of non-financial items and hence, a classical content analysis approach to the study is taken. Many different disciplines use content analysis, including psychology, political science and sociology and although a limited statistical analysis is possible as a result of this methodology, it is extremely suited for context specific data which are textual in nature and rich in substance (Weber, 1990). The concepts defined in the

literature review are therefore formally translated to variables for the content analysis. This is done by following the steps described for ensuring reliability on the data by Weber (1990, p. 21-24) which are summarised and applied to the study in the table below. Following the approach of Loughran and McDonald (2009) tables and pictures are excluded from the analysis, as those might contain less meaningful information regarding to the tone, or in this case the forward-looking nature of the disclosure.

Table 3.1: Structure of a content analysis approach

Step	Description	Inclusion supported by
1	Define recording units	Word and word sense;
2	Define the categories	Management analysis, Forward-looking information, Background information, Forward-looking statements
3	Test coding on sample of text	Management Discussion and Analysis paragraph of one of the reports was used to test
4	Assess accuracy	Other, unrelated, sentences appeared in the results in forward-looking statements
5	Revise coding rules	On forward-looking statements, sentences were excluded on basis of words referring to other topics(see Appendix III)
6	Return to step 3	Results on sample text are accurate
7	Code all the text	All 199 reports were examined both manually as automated
8	Assess achieved accuracy	Achieved accuracy is perceived to be satisfactory

## 3.2 Variables

### 3.2.1 Measuring non-financial information

The first set of variables relies on an adapted set of criteria described by Orens & Lybaert (2007) which rely on an extended set of AICPA (American Institute of Certified Public Accountants) and FASB (Financial Accounting Standards Board) items. Referring to the literature review, this study examined those criteria relevant to financial analysts. Those items used in more than 50% of the cases (for the year 2005) are the metrics for measuring non-financial information. Of those variables which are used by less than 50% of the analysts, 4 additional metrics on Management’s Analysis of financial and non-financial data (ANA) are added as both Barron et al. (1999) and Previts et al. (1994) underline the importance of these variables. This led to a set of 21 variables in three categories:

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- Management's analysis of financial and non-financial data (ANA.): 6 items
- Forward-looking information (FWL.): 5 items
- Background Information (BI.): 10 items

If an annual report or 20-F filing discloses information on the variables a value of one will be assigned, and otherwise be zero. This binary coding scheme can be criticised as it does not provide any insights on the amount of disclosure on a variable, nor does it show the importance of the information available. However, as discussed by Cooke (1989) and Meek et al. (1995) cited by Orens and Lybaert (2007) similar results were presented in prior studies encompassing a more extensive and weighted coding scheme. Although a qualitative assessment on the variables is desirable it is difficult to assess and heavily liable to bias (Botosan, 1997).

This set of variables is completed with the variable for sensitivity analysis on market risk SENS.AN. (equal to one if available, otherwise zero), which provides whether the company disclosed a sensitivity analysis on the exposure to market rates fluctuations. This variable should provide some insights in the effects of the risks on future cash flows.

The data collection for all non-financial information variables above is done manually by reading all 199 annual reports entirely. In examining the information disclosure on the variables, assessed is whether there is disclosure of an item, or not (yes equals value one, no equals value zero). Although this methodology has a certain level of subjectivity it is argued by Yin (1994) and Weber (1990) that validity can be achieved via methodological coherence which is ensured by the methodological approach of Weber (1990). The benefits, on the other hand, of collecting the data on all ANA., FWL. and BI. variables manually is the comprehensive ability of the observer, which enables to interpret the data on the variables. As the FWL. variables are of a more subjective nature, and of crucial importance to Hypothesis 2 than the ANA. and BI. variables, for reproducibility causes these specifically are tested triangularly. After the process of reading, the FWL. variables are tested by digitally searching the reports by using a simple search algorithm on synonyms related to the variable. This action was performed using the basic search function included in the software programme Adobe Acrobat Reader. An overview of these strings can be found in appendix II.

Table 3.2: Definition of variables for non-financial information

Description	Inclusion supported by
<b>ANA.</b>	<b>Management’s analysis of financial and non-financial data</b>
ANA.1	Reasons identified by management for changes in volume of units sold or in revenues Orens & Lybaert (2007), Barron et al. (1999)
ANA.2	Reasons identified by management for changes in innovation Orens & Lybaert (2007), Barker and Imam (2008), Previts et al. (1994), Amir et al. (1999)
ANA.3	Reasons identified by management for changes in profitability Orens & Lybaert (2007), Barron et al. (1999)
ANA.4	Reasons identified by management for changes in long-term financial position Orens & Lybaert (2007), Barron et al. (1999)
ANA.5	Reasons identified by management for changes in short-term liquidity and financial flexibility Orens & Lybaert (2007), Barron et al. (1999)
ANA.6	Unusual or nonrecurring events and their past effect on the company Orens & Lybaert (2007), Barron et al. (1999), Previts et al. (1994), Barker and Imam (2008)
<b>FWL.</b>	<b>Forward-looking information</b>
FWL.1	The future risks of the company Orens & Lybaert (2007), Previts et al. (1994)
FWL.2	The future opportunities of the company Orens & Lybaert (2007), Previts et al. (1994)
FWL.4	The activities and plans to meet the broad objectives and business strategy Orens & Lybaert (2007), Previts et al. (1994)
FWL.7	The comparison of actual business performance to previously disclosed opportunities, risks and plans of the company Orens & Lybaert (2007),
FWL.9	The expectations about the future growth of the company Orens & Lybaert (2007), Barker and Imam (2008)
<b>BI.</b>	<b>Background information</b>
BI.1	The broad objectives of the company Orens & Lybaert (2007), Barker and Imam (2008), Previts et al. (1994)
BI.2	The broad strategies of the company Orens & Lybaert (2007), Barker and Imam (2008), Previts et al. (1994)
BI.4	The industry in which the business participates Orens & Lybaert (2007), Barker and Imam (2008), Previts et al. (1994)
BI.5	The general development of the business Orens & Lybaert (2007), Barker and Imam (2008)
BI.6	The principal products and services Orens & Lybaert (2007), Barker and Imam (2008), Previts et al. (1994)
BI.7	The principal markets and market segments Orens & Lybaert (2007), Barker and Imam (2008), Previts et al. (1994)
BI.13	The location and productive capacity of the company’s principle plants Orens & Lybaert (2007),
BI.20	The major competitors of a company Orens & Lybaert (2007), Barker and Imam (2008), Asquith (2005), Previts et al. (1994)
BI.21	The intensity of the competition Orens & Lybaert (2007), Barker and Imam (2008), Asquith (2005), Previts et al. (1994)
BI.22	The competitive position (market share) Orens & Lybaert (2007), Barker and Imam (2008), Asquith (2005), Previts et al. (1994)

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### 3.2.2 Measuring forward-looking statements

Although included in the metrics on non-financial information, a specific metric on forward-looking statements in the annual report is defined. In this study the variable for forward-looking sentences disclosure (FWLD.) is based on a content analysis approach which is described by Weber (1990, p. 9) as ‘...a research method that uses a set of procedures to make valid inferences from text...’. Key concept of this approach is to classify many words of text into categories with similar meanings. Already described by Weber (1990) there is no *right way* in doing content analysis and this variable is subject to judgement of the researcher. The concept of ‘forward-looking information’ is combined with a lists of words associated with this concept. Whereas many studies use a version of the Harvard IV-4 psychological dictionary (e.g. Engelberg, 2008; Loughran and McDonald, 2009; Tetlock et al. 2008) to determine which words are associated with a certain category, this study uses a different approach. Mainly because the Harvard IV-4 dictionary contains simple categories as ‘vehicles’, ‘negative words’ or ‘positive words’, the more complex concept of forward-looking statements is not defined in this dictionary. Moreover, there is no available dictionary which encompasses categories for a setting of financial disclosure, which makes statistical inferences rely on a custom approach.

Therefore an adapted version of the list on forward-looking words used by Hussainey et al. (2003) is used. The adaptations to the list were made as a result of the limitations in software, which was not able to search pairs of words. The list is partially corrected for inflections, or different forms of the word. For instance, if the query contains the word *plan*, one would also include words as *planning* and *plans*. Furthermore, the simplifying assumption is made that all forward-looking words are equally informative. While one could suggest a more sophisticated approach of estimating informational value of the individual words, this would bring a subjective judgement into the study, besides from the estimation of different likelihood ratios. The results on this variable will therefore be replicable and objective. The complete modified list of the search algorithm can be found in appendix III

The data gathering on the FWLD. variable was automated by a software data mining programme of Provalis Research; “QDA Miner” including the “WordStat” plug-in. The criteria for this variable were imported into the content analysis programme and in order to determine the sentences containing information on this variable a 3-step Key-word-in-context (KWIC) approach was taken. This approach enables to determine if the meaning of particular words is

related to the FWLD. variable. First, a query on the annual reports was run on the ‘forward-looking words’, which resulted in an output of sentences containing these words. Second, the output was imported in Microsoft Office Excel. Third, the output was cleared on sentences containing words on the FWLD. variable, but relating to other topics such as remuneration and pension plans. For the clearing query used in step 3 see appendix III. For an example of the output as described above, see appendix IV.

In line with the methodology of Hussainey and Aljifri (2007) a disclosure score (FLWDS.) is computed as a ratio of the value of forward-looking sentences divided by the total of sentences in the annual report (LINE.). The score can be presented as a formula:

$$FWLDS. = FLWD. / LINE$$

Table 3.3: Definition of variables for forward-looking statements

	Description	Inclusion supported by
	Forward-looking statements	
LINE	Number of lines in the Annual Report (N/A: error no line count possible)	Hussainey and Aljifri (2007)
FWLD.	Number of sentences of forward-looking information (see FWL sheet N/A: no FWL count possible))	Hussainey and Aljifri (2007), Asquith (2005)
FWLDS.	Forward-looking Score: FWLD divided by LINE, indicates the amount of FWLD relative to AR size	Hussainey and Aljifri (2007)

### 3.2.3 Control Variables

In addition to the criteria used to determine the sample (market capitalisation, country and industry) three dummy variables are included: PREP. (describes the basis of preparation of the financial statements), AUD. (equal to one if the firm is audited by a Big4<sup>1</sup>, auditor), FIN.EX. (equal to one if the firm has an independent financial expert in the audit committee). If analysis on the annual report did not provide a decisive answer for FIN.EX a value of zero was assigned. No control variable is included for the number of analysts following a firm as there has already been controlled for as a result of the matched pairs methodology. The last two dummy variables

<sup>1</sup> Price Waterhouse Coopers, Ernst & Young, KPMG, Deloitte and Touche

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added are number of pages of the annual report (PAGE.) and number of words in the annual report (WORDS.). These two variables were collected with the software programme “Practicount and Invoice”. For 6 cases no word count was available, due to the fact that the programme was unable to process these files as a result of security reasons.

Table 3.4: Definition of control variables

	Description	Inclusion supported by
Control variables		
FIN.EX.	Is there an independent financial expert in the audit committee?	Akhigbe et al. (2008)
PREP.	Accounting standards or reporting standards used	Kim et al. (2009)
AUD.	Is the firm audited by BIG4 (PwC, E&Y, KPMG, Deloitte) auditor (1=yes, 0=no)	Previts et al. (1994), Hope (2003), Hammersley et al. (2008)
PAGE	Number of pages of the Annual Report	n/a
WORDS	Number of words of the Annual Report	n/a
SENS.AN.	Does the AR contain a market risk analysis by means of a sensitivity analysis on rates	Not examined in prior literature

### 3.3 Endogeneity issues

Coates (2007) describes the difficulties in examining the effects of the Act by stressing the fact that SOX was presented in a time of significant economic and political change. The most ideal setting to study the effects of SOX would be an exogenous experiment containing a sample of firms separated in two groups by randomly assigning these firms with the SOX rules. This would bring up a situation in which one can perfectly assess the unique effects and differences between the two groups and assign these findings to the effects of SOX. Qian et al. (2009) suggest that by building a control group not affected by the specific regulation, in this case SOX, one can draw valid inferences. To overcome this issue, a quasi-natural approach is used, simulating this effect by selecting data of the firms in a pre-SOX era (2002) and a post-SOX era (2007). Another endogeneity problem, relating to content analysis of the FWLS. variable could arise from the possibility that if managers know there is a list of words that, for example, might be perceived as more forward-looking, and thus valued by investors, they will systematically include those words. This problem is recognised by Loughran and McDonald (2009) and in this research both limited by combining the FWLS. variable, with the FWL. variables, and by the custom approach in defining the list of forward-looking words.

### 3.4 Sample data and descriptive statistics

As discussed above the data collection is based on a sample of 199 annual reports of paired firms for the years 2002 and 2007. Table 3.5 and table 3.6 provide the summary descriptive statistics for the sample on average values for the variables that were collected from each annual report. For the binary coded data only the mean and the number of observations are available, for the data on ratio level also the mean and standard deviation are included. PREP. is a text variable so no descriptive statistics are available for this variable. The variables ANA., FWL. and BI. are averages of their underlying equivalents.

Table 3.5 shows that, as expected, for Panel A (2002), on average, cross-listed firms score higher on the variables for non-financial information disclosure. Some of the variables are available in the 2002 annual reports for all cross-listed firms (ANA.1, BI.2, BI.4, and BI.6) and disclosure on FWL. items is for both cross-listed (66%) and non cross-listed (51%) lower than on the ANA. and BI. variables.

On the variable for forward-looking statements for Panel A (2002), a smaller number of observations was made as a result of the limitations on the software programme to process all documents properly. The average value on the FWLDS. variable is materially higher for the cross-listed firms (.0083) than for the non cross-listed firms (.0061). Looking at the data in Panel B (2007), the values on this variable for cross-listed and non cross-listed have respectively increased to .0094 and .0068.

The control variables show that a large percentage of both cross-listed and non cross-listed firms is audited by one of the big 4 accounting firms (respectively 96% and 88% for 2002; 100% and 94% for 2007). The variable SENS.AN, which firms under SOX have to comply, differs significantly for cross-listed (2002: 94% and 2007: 100%) and non cross-listed firms (2002: 35% and 2007: 60%). A similar observation is made for FIN.EX, which is also one of the rules implied by SOX. Looking at the size of the annual reports (WORDS and PAGE) cross-listed firms tend to report more extensively than non cross-listed firms and an improvement can be observed for the time period 2002-2007. The size of the annual reports is contrasting to the findings of Li (2006), who found an average number of words for US filed reports of 70,279 during a time-series from 1993 to 2003. This is probably caused as a result of the fact that the study of Li (2006) is based on annual reports in 10-K form lay-out as filed by the SEC.

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Table 3.5: Descriptive statistics for Panel A (2002)

Variable	Cross-listed				Non cross-listed			
	Mean	Median	STD	OBS	Mean	Median	STD	OBS
<b>ANA. (6)</b>	<b>72%</b>		<b>,206</b>		<b>68%</b>		<b>,244</b>	
ANA.1	100%		,000	50	92%		,277	49
ANA.2	46%		,503	50	31%		,466	49
ANA.3	92%		,274	50	80%		,407	49
ANA.4	74%		,443	50	57%		,500	49
ANA.5	68%		,471	50	61%		,492	49
ANA.6	52%		,505	50	86%		,354	49
<b>FWL. (5)</b>	<b>66%</b>		<b>,211</b>		<b>51%</b>		<b>,306</b>	
FWL.1	90%		,303	50	51%		,505	49
FWL.2	68%		,471	50	71%		,456	49
FWL.4	70%		,463	50	47%		,504	49
FWL.7	28%		,454	50	12%		,331	49
FWL.9	74%		,443	50	71%		,456	49
<b>BI. (10)</b>	<b>86%</b>		<b>,126</b>		<b>66%</b>		<b>,224</b>	
BI.1	88%		,328	50	67%		,474	49
BI.2	100%		,000	50	90%		,306	49
BI.4	100%		,000	50	96%		,200	49
BI.5	82%		,388	50	69%		,466	49
BI.6	100%		,000	50	96%		,200	49
BI.7	96%		,198	50	84%		,373	49
BI.13	76%		,431	50	33%		,474	49
BI.20	68%		,471	50	16%		,373	49
BI.21	96%		,198	50	61%		,492	49
BI.22	56%		,501	50	45%		,503	49
PAGE	118	110	53,4	50	101,59	92	47,3	49
WORDS	55.236	44.540	29.098	49	37.771	29.950	24.893	46
LINE	5.937	5.539	2.743	49	4.388	3.601	2.773	46
PREP.								
AUD.	96%			50	88%			49
FIN.EX.	74%			50	63%			49
FWLD.	47,2	38,5	27,2	48	25,9	20	18,8	42
FWLDS.	0,0083	0,0073	0,0040	48	0,0061	0,0037	0,0030	42
SENS.AN.	94%			50	35%			49

Notes: Variables as defined in tables 3.2, 3.3. and 3.4. Variables ANA., FWL. and BI. are categories of disclosure of non-financial information, with ANA.=average of items on 'management analysis on of financial and non-financial information', FWL.=average of items on 'forward-looking information', BI.= average of items on 'background information'; between parentheses is the number of items belonging to each information category.

Table 3.6: Descriptive statistics for Panel B (2007)

Variable	Cross-listed				Non cross-listed			
	Mean	Median	STD	OBS	Mean	Median	STD	OBS
<b>ANA. (6)</b>	<b>85%</b>		<b>,141</b>		<b>76%</b>		<b>,197</b>	
ANA.1	100%		,000	50	100%		,000	50
ANA.2	70%		,463	50	46%		,503	50
ANA.3	100%		,000	50	94%		,240	50
ANA.4	88%		,328	50	66%		,479	50
ANA.5	90%		,303	50	66%		,479	50
ANA.6	64%		,485	50	84%		,370	50
<b>FWL. (5)</b>	<b>84%</b>		<b>,182</b>		<b>72%</b>		<b>,232</b>	
FWL.1	98%		,141	50	88%		,328	50
FWL.2	94%		,240	50	82%		,388	50
FWL.4	92%		,274	50	78%		,418	50
FWL.7	48%		,505	50	28%		,454	50
FWL.9	90%		,303	50	84%		,370	50
<b>BI. (10)</b>	<b>92%</b>		<b>,087</b>		<b>75%</b>		<b>,140</b>	
BI.1	98%		,141	50	80%		,404	50
BI.2	100%		,000	50	98%		,141	50
BI.4	100%		,000	50	100%		,000	50
BI.5	94%		,240	50	86%		,351	50
BI.6	100%		,000	50	100%		,000	50
BI.7	100%		,000	50	98%		,141	50
BI.13	92%		,274	50	48%		,505	50
BI.20	74%		,443	50	16%		,370	50
BI.21	98%		,141	50	82%		,388	50
BI.22	60%		,495	50	40%		,495	50
PAGE	177	167	58,0	50	148	142	58,0	50
WORDS	92.130	91.456	36.259	50	64.533	55.476	33.565	48
LINE	9.045	8.879	3.464	49	7.456	6.248	3.692	48
PREP.								
AUD.	100%			50	94%			50
FIN.EX.	98%			50	78%			50
FWLD.	83,1	73,0	43,8	48	50,6	41,5	34,6	44
FWLDS.	0,0094	0,0084	0,0041	48	0,0068	0,00489	0,0028	44
						2		
SENS.AN.	100%			50	60%			50

Notes: Variables as defined in tables 3.2, 3.3. and 3.4. Variables ANA., FWL. and BI. are categories of disclosure of non-financial information, with ANA.=average of items on ‘management analysis on of financial and non-financial information’, FWL.=average of items on ‘forward-looking information’, BI.= average of items on ‘background information’; between parentheses is the number of items belonging to each information category.







# 4. Results

## 4.1 Data description

The effect of SOX on non-financial reporting is measured along variables pertaining transparency and forward-looking information. This is done for a treatment group, cross-listed (CL) firms, and a control group, non cross-listed (NCL) firms. In this section the data for these variables are described to a more detailed extent than in chapter 3. Section 4.2 elaborates the results obtained from the data and discusses the statistical tests in relation to the hypotheses.

### 4.1.1 Data description Transparency

Table 3.5 and table 3.6 show the degree in which non-financial information is disclosed in the annual reports for both the treatment and control group. Columns 2 and 6 show the percentage of disclosure on each item for the years 2002 (table 3.5) and 2007 (table 3.6) for respectively the CL and NCL firms. For the transparency variables, the findings reveal that all variables are disclosed in at least one of the reports for the CL and the NCL companies for both years. Comparing both groups, the level of disclosure on the ANA., FWL. and BI. categories are all higher for CL firms for the year 2002. For the category on background information (BI.) this difference totals 20%. Analysing the ANA. category these differences can be partially explained by the tendency of firms to implement uniformity in their annual reports and other filings. Concerning financial reporting, the SEC had already extensive requirements in place, before the implementation of SOX, for the CL firms. A good example of such requirements is that the SEC requires firms to disclose the location and production capacity of the firms primary plants. The variable for this type of disclosure, BI.13, scores 76% for CL firms in 2002 compared to 33% for their NCL equivalents. The variable for average words and average number of pages in the annual report confirms afore mentioned, showing more sizeable reports for the CL firms in both words and pages.

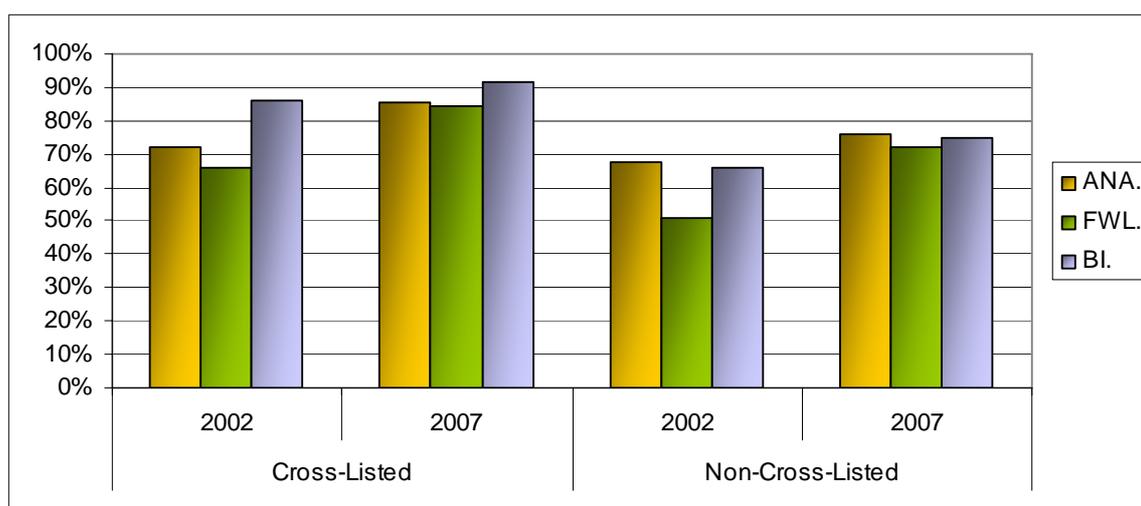
For the year 2007 the CL firms report an increase in all variables, with the FWL. category accumulating the most, up to a level of 18% more disclosure on the non-financial information

## Results

continued

items. Although the NCL companies also report an increase, for two variables a decrease is observed. The analysis of non-recurring events (ANA.6.: -2%) and disclosure on the competitive position of the firm (BI.22.: -5%) decrease, and the variable for the description of the major competitors stagnates (BI.20: 0%). However, all other categories show an enhancement, with the FWL. growing strongest by 21%. Looking at the size of the annual reports in 2007, an increase is noted for both groups, whereas the CL firms tend to have a much bigger increase producing even more sizeable reports than in 2002. The median strongly confirms this difference for both 2002 and 2007. Chart 4.1 shows the means for each category, showing an improvement in disclosure from years 2002 to 2007 for both the treatment as the control group, with the treatment group having a higher initial level of disclosure in 2002.

Chart 4.1 Disclosure level on a categorical level for Panel A and Panel B



### 4.1.2 Data description forward-looking information

Summary statistics on the variable for forward-looking information, FWLD. can be retrieved from table 3.5 and table 3.6. Comparing the data of the two groups for 2002, a difference is noted, whereas the CL firms report, on average, more forward-looking statements in their reports. This observation is confirmed by the median numbers for both groups. The findings are in line with expectations, as the reports for the CL group are more sizeable in both pages and number of words.

Looking at the data on the FWLD. variable for 2007 an increase is noted for both CL (+ 76%) and NCL firms (+ 95%), where the latter almost doubles. The level of forward-looking sentences in the annual reports for both groups tends to develop upwards during the time-frame, along with the growth in size of the annual reports.

A more in-depth analysis of the forward-looking nature of these sentences is provided in table 4.1 and table 4.2. The second and fourth column note the fractional percentage for each word in column relative to the total amount of words. The first 5 words in table 4.1 for 2002 (*expect, estimate, next, remain, likely*) account for over half (54%) of the forward-looking words for CL firms and for almost half (48%) of the forward-looking words for NCL firms. It is interesting to note that words which are mentioned most in forward-looking sentences differ for CL and NCL firms. The frequencies of the word ‘estimate’ (CL: 11,79%; NCL: 5,59%) and ‘expect’ (CL: 15,41%; NCL: 10,90%) differ considerably. For the year 2002 CL firms tend to use these words much more often than NCL firms. One of the drawbacks of working with a custom word-list, in this case on the concept of forward-looking words, is that the results are not directly comparable to similar research. However, one can easily assume that the words ‘estimate’ and ‘expect’ have a stronger forward-looking tone than e.g. ‘next’ and ‘remain’. Given that there is no empirical evidence on this assumption, differences in word-counts cannot be analysed separately for the FWLD. variable.

The descriptive statistics for 2007 show a similar distribution compared to the data of 2002 where for 2007, in contrast, the upper 5 words (*expect, estimate, next, likely, remain*) account for over half of the total forward-looking words. The top of the table remains similar for the CL firms (only changing places for the words ‘remain’ and ‘likely’), for the NCL firms, on the other hand an intriguing observation is made with a sudden shift in the use of the word ‘estimate’ (+5%). Overall a gradual upward trend in the upper region of the frequency table is noted for the use of forward-looking words.

Both panels presented in table 4.1 and table 4.2 show a common phenomenon in content analysis known as Zipf’s Law, which explains the distributional shape of word counts by observing that word frequencies often consist of a small fraction of high frequency words, and a large number of low frequency words (Loughran and McDonald, 2009). Future research can use this as a starting point for weighting of words in determining the forward-looking nature of annual reports.

# Results

continued

Table 4.1: Frequency table on word counts Panel A (2002)

Word	Cross-listed		Non cross-listed	
	% of Total FWL. Word Count	Cumulative %	% of Total FWL. Word Count	Cumulative %
Expect	15,41%	15,41%	10,90%	10,90%
Estimate	11,79%	27,20%	5,59%	16,50%
Next	10,88%	38,08%	12,02%	28,52%
Remain	9,02%	47,10%	11,18%	39,70%
Likely	6,44%	53,54%	7,83%	47,53%
Intend	4,58%	58,11%	3,91%	51,44%
Forecast	4,53%	62,65%	2,33%	53,77%
Planned	3,76%	66,41%	5,96%	59,74%
Outlook	3,63%	70,04%	6,90%	66,64%
Ahead	3,58%	73,62%	5,78%	72,41%
Anticipate	3,45%	77,06%	3,26%	75,68%
Confidence	3,04%	80,10%	4,01%	79,68%
Predict	2,49%	82,59%	0,84%	80,52%
Confident	2,31%	84,90%	1,86%	82,39%
Intention	2,09%	86,99%	2,98%	85,37%
Soon	2,09%	89,08%	2,70%	88,07%
Accelerate	1,63%	90,71%	0,65%	88,72%
Prospect	1,50%	92,20%	1,49%	90,21%
Renew	1,09%	93,29%	1,12%	91,33%
Novel	1,04%	94,33%	0,09%	91,43%
Hope	0,82%	95,15%	0,93%	92,36%
Unlikely	0,82%	95,97%	1,12%	93,48%
Estimating	0,77%	96,74%	0,75%	94,22%
Eventual	0,73%	97,46%	0,56%	94,78%
Convinced	0,54%	98,01%	1,49%	96,27%
Forthcoming	0,54%	98,55%	1,77%	98,04%
Shortly	0,50%	99,05%	0,28%	98,32%
Optimistic	0,45%	99,50%	1,03%	99,35%
Await	0,27%	99,77%	0,37%	99,72%
Envisage	0,23%	100,00%	0,28%	100,00%

Notes: For 2002 the word count for CL firms (N=48) sums up to 2.206, the word count for NCL firms (N=42) sums up to 1.073.

Table 4.2: Frequency table on word counts for Panel B (2007)

Word	Cross-listed		Non cross-listed	
	% of Total FWL. Word Count	Cumulative %	% of Total FWL. Word Count	Cumulative %
Expect	16,11%	16,11%	10,15%	10,15%
Estimate	15,53%	31,63%	10,63%	20,78%
Next	10,00%	41,63%	14,31%	35,09%
Likely	7,39%	49,02%	7,93%	43,02%
Remain	7,16%	56,18%	9,18%	52,20%
Forecast	5,68%	61,86%	4,88%	57,08%
Planned	5,53%	67,39%	7,59%	64,67%
Outlook	3,89%	71,28%	3,04%	67,71%
Intend	3,52%	74,80%	2,61%	70,32%
Anticipate	2,86%	77,66%	2,90%	73,22%
Accelerate	2,81%	80,48%	2,61%	75,83%
Ahead	2,41%	82,89%	4,64%	80,47%
Predict	2,14%	85,03%	1,40%	81,88%
Intention	2,06%	87,09%	2,85%	84,73%
Confidence	2,04%	89,12%	1,55%	86,27%
Prospect	1,53%	90,65%	1,21%	87,48%
Renew	1,23%	91,88%	2,27%	89,75%
Novel	1,08%	92,96%	1,21%	90,96%
Estimating	1,03%	93,99%	0,58%	91,54%
Unlikely	0,90%	94,90%	1,06%	92,61%
Confident	0,88%	95,78%	1,45%	94,06%
Eventual	0,85%	96,63%	1,01%	95,07%
Hope	0,80%	97,44%	0,48%	95,55%
Soon	0,80%	98,24%	1,88%	97,44%
Shortly	0,53%	98,77%	0,58%	98,02%
Forthcoming	0,38%	99,15%	1,11%	99,13%
Convinced	0,30%	99,45%	0,58%	99,71%
Optimistic	0,28%	99,72%	0,29%	100,00%
Envisage	0,18%	99,90%	0,00%	100,00%
Await	0,10%	100,00%	0,00%	100,00%

Notes: For 2007 the word count for CL firms (N=48) sums up to 3.980, the word count for NCL firms (N=44) sums up to 2.069.

### 4.1.3 Data description on control variables

When comparing the data on the control variables for the year 2002, table 3.5 and table 3.6 on average a difference in size of reports is noted for CL and NCL groups in both pages and words. The mean for the page variable shows that the reports of CL firms in the sample contain 18 more pages than the NCL firms, a number which rises to 25 in 2007. Furthermore the average report size for CL firms enhances 5,0% over the years, whereas the report size of NCL increases

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4,6% (based on mean data). An interesting observation is made when looking at the variable for big 4 Auditor (AUD.). For 2002 almost all CL firms were already audited by a big 4 auditor, a number increasing to 100% in 2007, while NCL firms were audited in 88% of the cases by a big 4 auditor (increasing to 94% in 2007). This is probably caused by the fact that cross-listing requires certain extra expertise above single-listing, with which the bigger firms are more familiar. The specific requirement of SOX to have an independent financial expert in the audit committee is confirmed by the corresponding metric (FIN.EX.) showing an improvement for CL firms from 74% to 98%, whereas the NCL firms only report a development from 63% to 78%.

## 4.2 Results

### 4.2.1 Results on transparency

The transparency variables ANA., FWL., BI. are measured along a binary coding scheme (yes=1, no=0) and are therefore dichotomous. Although nominal, the dichotomous nature of these variables offers the possibility to treat these as ordinal in specific contexts. Along the equilibrium of no disclosure towards disclosure, one could speak of 'more disclosure' when a variable measures 1. Combined with the fact that a dichotomous variable can only be arranged in two possible ways, the chosen order does not make a difference. Given that the context of this research studies the spectrum of disclosure, the variables are treated as ordinal and a non-parametric Friedman *F*-test is applied to test the statistical significance of the potential increase in disclosure. The findings of this test are presented in table 4.3. During the time-frame of the study all CL firms note a significant enhancement for all disclosure variables. The increasing rank figures suggest that the disclosure of non-financial information by CL firms is developing positively over time. In the subset of TOT., the information category on forward-looking information (FWL.) reports the strongest accumulation. Similar to the results for CL firms, NCL firms report a rise in disclosure of non-financial information. Although a significant overall increase is observed, the information category of management's analysis of financial and non-financial data (ANA.), only shows a significant improvement on the 10% level. Comparing the results for CL and NCL, a significantly stronger advancement in disclosure of non-financial information is noted for the treatment group. These results are consistent with those of Orens and Lybaert (2007) who report a significant increase in voluntary non-financial information over

time. For the purpose of this study, still, these growing figures do neither fully support, nor fully reject Hypothesis 1. In fact these results are the point of departure for further analysis, to determine what the treatment effect is embodied by the legislation of Sarbanes Oxley.

Table 4.3: Non-parametric Friedman F-test on disclosure of non-financial information

Category	Cross-listed				Non cross-listed			
	Year	Rank	Chi square	Sig.	Year	Rank	Chi square	Sig.
TOT.	2002	1,17	24,200	,000	2002	1,30	9,524	,002
	2007	1,83			2007	1,70		
ANA.	2002	1,29	14,226	,000	2002	1,41	2,793	,095
	2007	1,71			2007	1,59		
FWL.	2002	1,23	22,091	,000	2002	1,24	16,026	,000
	2007	1,77			2007	1,76		
BI.	2002	1,36	8,909	,003	2002	1,36	6,533	,011
	2007	1,64			2007	1,64		

Notes: Variables ANA., FWL. and BI. are categories of disclosure of non-financial information, with ANA.=average of items on ‘management analysis on of financial and non-financial information’, FWL.=average of items on ‘forward-looking information’, BI.= average of items; TOT. = category variable for total disclosure of non-financial information encompassing the averages of ANA., FWL. and BI. N=50 for Cross-Listed, N=49 for Non cross-Listed

To establish the effect of Sarbanes-Oxley on the treatment group a basic two-way fixed effects econometric model is used. This difference-in-differences (diff-in-diffs) panel regression is conducted to isolate the effect SOX had on transparency in non-financial reporting for the cross-listed firms. The time series of the control group is used to establish what the development would have been in absence of SOX. The basic assumption here is that the control group follows a similar time-path of events that would have happened during the absence of the Act. The data is based on the following regression:

$$Y_{it} = \beta_0 + \beta_1 T_{it} + \beta_2 A_{it} + \beta_3 T_{it}A_{it} + \epsilon_{it}$$

Where  $T_{it}$  is 1 if the firm belongs to CL treatment group,  $A_{it}$  is 1 in for the year 2007,  $T_{it}A_{it}$  is the interaction term, measuring the values of CL in 2007. State (i) indicates if the firm is CL (1) or NCL (0) and time (t) indicates 2002 (0) or 2007 (1). The method basically boils down to a comparison of the deltas in the mean of both the treatment and the control group and is

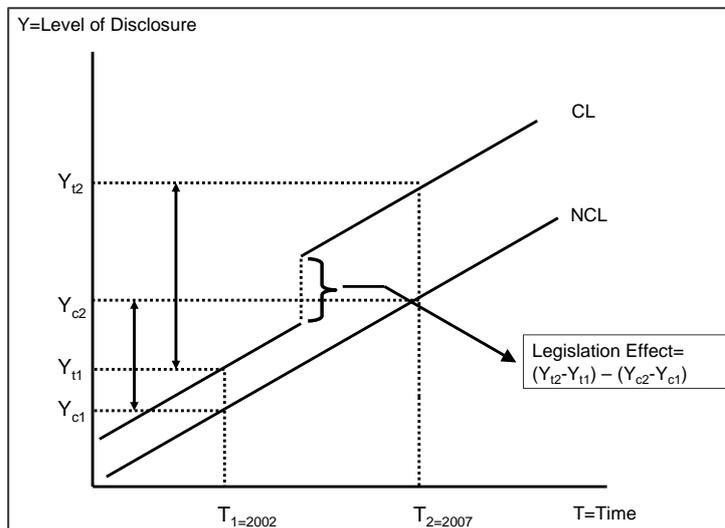
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visualized in picture 4.1 To ensure the robustness of the results, the fact that the differences are based on a finite scale, ranging from 0% to 100%, needs to be taken in consideration. Therefore not only the mean averages are used as a metric, also a relative mean average measure is used. This metric is determines the level of realization of the potential available for enhanced disclosure and is calculated as follows:

$$\text{Rel. } \Delta \text{ Mean} = \frac{\overline{\Delta x}_{2002-2007}}{(1 - \overline{x}_{2002})}$$

Picture 4.1: Methodological framework diff-in-diff regression



The input data for the diff-in-diff regression are presented in table 4.4 reporting the changes in means for the variables underlying the disclosure categories ANA., FWL. and BI. for the years 2002 and 2007. The comparison of the mean of the outcomes for the variables ANA., FWL. and BI. ('differences' estimator) is justified as the setup of

the research is based on pair-matching, which guarantees both treatment and control group should not differ systematically on these variables. In this way the study controls for observable differences. As described in paragraph 4.1 an overall increase for all deltas on the variables is reported, except for the data on ANA.6, BI.20 and BI.22 for the NCL firms. Interpreting the data on the adjusted mean measure (Rel.  $\Delta$  Mean) a similar inclination is observed, except for those variables already reporting a 100% score for both years. The combined data on both variables brings understanding of the movement of the disclosure variables over the years. The added value of a combined interpretation, instead of a separate analysis of the mean measures as a differences estimator results in the calculation of the diff-in-diff regression which is presented in table 4.5.

Table 4.4 Descriptive statistics: changes in means for Panel A and Panel B

Variable	Cross-listed				Non cross-listed			
	Mean 2002	Mean 2007	Δ Mean	Rel. Δ Mean	Mean 2002	Mean 2007	Δ Mean	Rel. Δ Mean
<b>ANA.</b>								
<b>(6)</b>	<b>72%</b>	<b>85%</b>	<b>13%</b>	<b>48%</b>	<b>68%</b>	<b>76%</b>	<b>8%</b>	<b>26%</b>
ANA.1	100%	100%	0%	100%	92%	100%	8%	100%
ANA.2	46%	70%	24%	44%	31%	46%	15%	22%
ANA.3	92%	100%	8%	100%	80%	94%	14%	71%
ANA.4	74%	88%	14%	54%	57%	66%	9%	21%
ANA.5	68%	90%	22%	69%	61%	66%	5%	12%
ANA.6	52%	64%	12%	25%	86%	84%	-2%	-12%
<b>FWL.</b>								
<b>(5)</b>	<b>66%</b>	<b>84%</b>	<b>18%</b>	<b>54%</b>	<b>51%</b>	<b>72%</b>	<b>21%</b>	<b>43%</b>
FWL.1	90%	98%	8%	80%	51%	88%	37%	76%
FWL.2	68%	94%	26%	81%	71%	82%	11%	37%
FWL.4	70%	92%	22%	73%	47%	78%	31%	59%
FWL.7	28%	48%	20%	28%	12%	28%	16%	18%
FWL.9	74%	90%	16%	62%	71%	84%	13%	44%
<b>BI. (10)</b>	<b>86%</b>	<b>92%</b>	<b>5%</b>	<b>39%</b>	<b>66%</b>	<b>75%</b>	<b>9%</b>	<b>27%</b>
BI.1	88%	98%	10%	83%	67%	80%	13%	39%
BI.2	100%	100%	0%	100%	90%	98%	8%	80%
BI.4	100%	100%	0%	100%	96%	100%	4%	100%
BI.5	82%	94%	12%	67%	69%	86%	17%	54%
BI.6	100%	100%	0%	100%	96%	100%	4%	100%
BI.7	96%	100%	4%	100%	84%	98%	14%	88%
BI.13	76%	92%	16%	67%	33%	48%	15%	23%
BI.20	68%	74%	6%	19%	16%	16%	0%	0%
BI.21	96%	98%	2%	50%	61%	82%	21%	54%
BI.22	56%	60%	4%	9%	45%	40%	-5%	-9%

Notes: Variables as defined in tables 3.2, 3.3. and 3.4. Variables ANA., FWL. and BI. are categories of disclosure of non-financial information, with ANA.=average of items on ‘management analysis on of financial and non-financial information’, FWL.=average of items on ‘forward-looking information’, BI.= average of items on ‘background information’; between parentheses is the number of items belonging to each information category. Rel. Δ Mean is

the level of increase compared to the potential available compared to the year 2002 in mean value (i.e.  $\frac{\overline{\Delta x_{2002-2007}}}{(1 - x_{2002})}$ )

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continued

Table 4.5 Results on the Difference-in-Difference estimation for transparency variables

Variable	Cross-listed		Non cross-listed		Difference-in-Differences	
	Δ Mean	Rel. Δ Mean	Δ Mean	Rel. Δ Mean	Diff-in Diff	Rel. Diff-in-Diff
<b>ANA. (6)</b>	<b>13%</b>	<b>48%</b>	<b>8%</b>	<b>26%</b>	<b>5%</b>	<b>22%</b>
ANA.1	0%	100%	8%	100%	-8%	0%
ANA.2	24%	44%	15%	22%	9%	22%
ANA.3	8%	100%	14%	71%	-6%	29%
ANA.4	14%	54%	9%	21%	5%	33%
ANA.5	22%	69%	5%	12%	17%	56%
ANA.6	12%	25%	-2%	-12%	14%	37%
<b>FWL. (5)</b>	<b>18%</b>	<b>54%</b>	<b>21%</b>	<b>43%</b>	<b>-3%</b>	<b>11%</b>
FWL.1	8%	80%	37%	76%	-29%	4%
FWL.2	26%	81%	11%	37%	15%	44%
FWL.4	22%	73%	31%	59%	-9%	15%
FWL.7	20%	28%	16%	18%	4%	10%
FWL.9	16%	62%	13%	44%	3%	18%
<b>BI. (10)</b>	<b>5%</b>	<b>39%</b>	<b>9%</b>	<b>27%</b>	<b>-4%</b>	<b>13%</b>
BI.1	10%	83%	13%	39%	-3%	45%
BI.2	0%	100%	8%	80%	-8%	20%
BI.4	0%	100%	4%	100%	-4%	0%
BI.5	12%	67%	17%	54%	-5%	12%
BI.6	0%	100%	4%	100%	-4%	0%
BI.7	4%	100%	14%	88%	-10%	12%
BI.13	16%	67%	15%	23%	1%	44%
BI.20	6%	19%	0%	0%	6%	19%
BI.21	2%	50%	21%	54%	-19%	-4%
BI.22	4%	9%	-5%	-9%	9%	18%

Notes: Variables as defined in tables 3.2, 3.3. and 3.4. Variables ANA., FWL. and BI. are categories of disclosure of non-financial information, with ANA.=average of items on 'management analysis on of financial and non-financial information', FWL.=average of items on 'forward-looking information', BI.= average of items on 'background information'; between parentheses is the number of items belonging to each information category. Rel. Δ Mean is the level of increase compared to the potential available compared to the year 2002 in mean value (i.e.  $\frac{\overline{\Delta x_{2002-2007}}}{(1 - \overline{x_{2002}})}$ )

Column 6 presents the results on the diff-in-diff estimation, reporting a positive effect on the ANA. information category (5%) and a negative effect on both the FWL. (-3%) and BI. (-4%) categories. This estimation shows the effect of SOX relative by comparing the control group with the treatment group. In view of what has been discussed before, the potential increase which could be realised on a variable during the time-frame had to be taken into account, considering

the finite structure of a 0-100% scale. The fact that for the year 2002, for all variables the CL firms already reported a higher level of disclosure, raises the need for a normalisation method. To illustrate this, the development of the variable for the industry in which a firm participates (BI.4) is analysed. In 2002 and 2007 a score of 100% is observed for all CL firms. For the NCL firms an increase is observed of 4% over these years. Extracting the effect of SOX on basis of the diff-in-diffs for this variable would show a negative effect of 4%. Concluding a negative effect of SOX for this variable would be inaccurate, considering the fact that the CL firms were not able to realise any improvement in disclosure on this variable. For this reason, the diff-in-diff methodology is applied again to the Rel.  $\Delta$  Mean differences estimators. The results of this calculation show a more representative outcome. The normalised scores on the modified diff-in-diff estimation show a positive effect on all disclosure variables. The management's analysis of financial and non-financials information (ANA: +22%) shows the strongest increase with strong underlying enhancements of the variables on liquidity and financial position (ANA.4: +33%; ANA.5: +56%). It appears that the legislation effect resulted in a more extensive disclosure on reasons for the changes in both short-term and long-term financial position. This observation is in line with expectations, since one of the objectives of SOX is to provide a more transparent overview of a firm's financial position. The variable for disclosure of changes in innovation (ANA.2: +22%) also develops more strongly for the CL firms than the control group. The compulsory items on the 20-F SEC filings on both financial position (Item 5B) and innovation (Item 5C) in the operational review of a firm probably contributed to this development. The availability of these items, are in part responsible for the higher initial disclosure (for 2002) for CL relative to NCL firms. With this taken into account, the strong upward development of this information category however, can, as a result of the analysis, be contributed to the legislation of SOX. For the variable relating to management's analysis of revenue changes (ANA.1), no conclusions can be made as the CL firms fully disclosed this information during the time-frame, which causes a flawed diff-in-diff estimator. In view of the high disclosure scores of NCL firms for this variable (2002: 92%; 2007: 100%) one could easily think of this variable as a dummy, to be present in most of the cases.

For the information category relating to forward-looking information a positive effect of 11% is observed. Both treatment and control group report strong relative increases on the underlying variables of this information category, reducing the diff-in-diff effect. The increase of forward-

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continued

looking information over time, is consistent with the findings of Orens and Lybaert (2007). Future opportunities of a firm (FWL.2: +44%) and expectations about future growth (FWL.9: +18%) report the strongest changes. It is noteworthy that the NCL firms realise, in absolute quantities, a strong improvement on other variables (FWL.1: +37% and FWL.4: +31%). After the implementation of SOX for almost all FWL. variables full disclosure is observed for the CL firms (except for FWL. 7: 48%), and although disclosure has also improved significantly for the NCL firms, the relative diff-in-diff strongly expose the legislative effects of SOX. The objective of SOX for firms to give a more accurate and prudent view of their activities, appears to be translated to a more forward-looking tone in the annual reports as well. A more detailed analysis on the forward-looking trend can be found in paragraph 4.2.2.

Disclosure on background information of the company also, on the basis of the relative diff-in-diff, appears to have benefited by the Act (BI: +13%). Comparing the firms by type of listing a stronger relative increase is noted for the CL firms (+39%) than the NCL firms (+27%). However, interpreting these numbers, the continuous 100% disclosure scores for CL firms, and almost full disclosure scores for NCL firms, on BI.2, BI.4 and BI.6, have to be taken into account. These cause a flaw in the diff-in-diff estimator, and as a result no conclusions for these variables can be made as the legislative effect simply cannot be extracted. Just as for the ANA.1 variable, these can easily be considered as dummy variables, always present in the annual reports in the sample. As there is a vast amount of background information available for all firms in 2002 (considering the high initial disclosure scores) it is more interesting to analyse the anomalies. Legislative effects are high for the variable relating to broad objectives of the company (BI.1: +45%) as the CL firms realise a strong relative increase compared to the NCL firms. The same holds true for information on the principal plants (BI.13: +44%). The mandatory disclosure of this item for the 20-F filings (Item 4D) explains the high level of disclosure for CL firms. Although observing an increase of +18%, information describing the market share of a company (BI.22) does not appear to be strongly affected by the Act, as the contribution of the CL firms to this figure only rises 9%. To gain an understanding of the effect of SOX on competitor disclosure, looking at the combination of variables on competitor disclosure (BI. 20, BI.21, and BI.22) is more prudent. Reporting succeeding diff-in-diff scores for these variables of +19%, -4%, +18% the effect is noteworthy. In particular for the data on major competitors, where NCL firms show no motion at all, and CL both absolute and relative report an increase. The upward trend of

disclosure on the general development of the business (BI.5) appears to be less affected by the regulation documenting a diff-in-diff effect of only 12%.

Although as mentioned in chapter 3, the limitations of diff-in-diff estimations are recognised (e.g. endogeneity of other specific events during the time-series of the research), it is a commonly used and accepted methodology to study the effects of specific events (Meyer, 1995).

To conclude, when the results of the Friedman *F*-test and the diff-in-diffs are combined, hypothesis 1 can be confirmed. A significant improvement of the transparency variables for non-financial information is observed, but the CL firms appear to report a significantly stronger increase, than the NCL firms. The passage of SOX is therefore associated with an increase in transparency of non-financial information for SOX compliant firms relative to a control group of non-SOX compliant firms.

#### 4.2.2 Results on forward-looking Information

The analysis of the variables describing forward-looking information is the result of a calculation based on the content analysis output, resulting in the variable FWLDS. representing the fraction of forward-looking information (on basis of the total number of sentences) in the annual report. Rephrasing the formula from chapter 3:

$$\text{FWLDS.} = \text{FWLD.} / \text{LINE}$$

Where FWLDS. represents the forward-looking disclosure score dividing forward-looking disclosure sentences (FWLD.) by the number of lines (LINE.) available in the annual report narrative sections. The results for the time-series for this variable are presented in table 4.6. Comparing the differences in average, the changes over the years varies for the CL and NCL firms. The amount of lines available in the annual report tends to grow significantly at the same pace for both groups. This indicates that the legislation effects on this variable are limited. Analysing the results on the FWLD. variable, a significantly stronger increase for the CL firms is observed, which confirms the data described on forward-looking words (tables 4.1 and 4.2).

## Results

continued

Table 4.6: Changes in forward-looking tone of annual reports 2002-2007

		Year	Mean	STD.	OBS	Mean Difference (2007-2002)	t-test
CL	LINE	2002	5937,43	2742,97	49		
		2007	9045,18	3463,73	49	3107,76**	4,924
	FWLD.	2002	47,17	27,22	48		
		2007	83,10	43,77	48	35,94**	4,833
	FWLDS.	2002	,00825	,00398	48		
		2007	,00937	,00411	48	,00111	1,345
NCL	LINE	2002	4387,83	2772,91	46		
		2007	7456,04	3691,75	48	3068,22**	4,541
	FWLD.	2002	25,88	18,76	42		
		2007	50,59	34,64	44	24,71**	4,086
	FWLDS.	2002	,00613	,00309	42		
		2007	,00680	,00283	44	,00067	1,051

Note: \* and \*\* denote two-sided statistical significance at 5% and 1%, respectively. The t-test results compare means on an independent two-sided sample basis.

In estimating the difference-in-difference for the forward-looking variables, the problem of standardising the values discussed in paragraph 4.2.1 does not occur because of the ratio scale of measurement of the FWLD. and FWLDS. variable. The inconsistency of the standard errors is ignored in the diff-in-diff analysis in comparing the averages on incremental change during the time-series. The data in table 4.7 report an increase in forward-looking tone of the annual reports. The FWLD. variable indicates an isolated legislation effect of 11,228 more forward-looking sentences available in the annual report. Standardising these results through the calculation of the FWLDS. variable, the effect is still observable (FWLDS.: +.00044). Though only providing a quantitative augmentation. Combining these findings with the word count analysis in tables 4.1 and 4.2, a qualitative assessment can be made. Combining the findings of paragraph 4.1 on forward-looking statements, the forward-looking tone of the narrative sections in the annual reports tends to increase more for CL firms, than for NCL firms.

Table 4.7: Results on the Difference-in-Difference estimation for forward-looking variables

	<b>Cross-listed</b>	<b>Non cross-listed</b>	<b>Diff-in-Diff</b>
LINE	3107,76 (4,924)	3068,216 (4,541)	39,540
FWLD.	35,938 (4,833)	24,710 (4,086)	11,228
FWLDS.	,00111 (1,345)	,00067 (1,051)	,00044

Note: Robust t-statistics are reported in brackets. The FWLDS. variable is computed as  $FWLDS. = FWLD. / LINE$ .

To lay the foundation for a solid conclusion, the results for the FWL. variables are recalled. The positive development towards more disclosure relating to the FWL. variable (diff-in-diff effect: +11%) was observed for both panels. Variables showing the strongest increase (FWL.2: +44% and FWL.9: +18%) both focus on growth and opportunities of a firm rather risk and projects (FWL.1 and FWL.4) or backward looking (FWL.7). As discussed this trend differs for the NCL firms. These findings are consistent with the frequency tables on word counts for CL. firms, reporting a frequent use of strong forward-looking words as ‘expect’ and ‘estimate’. Hypothesis 2 can therefore be accepted and the passage of SOX is therefore associated with an increase in the level of forward-looking non-financial information for SOX compliant firms relative to a control group of non-SOX compliant firms.







## 5. Conclusion

Prior research demonstrates an association between the legislation of SOX and its effects on capital markets en disclosure by listed companies (e.g. Akhigbe & Martin, 2006; Coates, 2007; Zhou, 2007; Zhang, 2007; Akhigbe et al., 2008; Skaife et al., 2008; Bartov & Cohen, 2008; Iliev, 2009). Capital markets and lawmakers require firms to be more transparent in both financial as non-financial reporting. In this study, the focus lays on disclosure of non-financial information, rather than the widely studied effects of financial information (among others. Begley et al., 2007; Pinello & Skaife, 2008; Kim et al., 2009). Moreover, because a growing body of literature suggests that this type of information is of crucial importance for the participants in capital markets (e.g. Hunton & McEwen, 1997; Barron et al., 1999; Nielsen, 2004; Orens and Lybaert, 2007; Barker & Imam, 2008).

The contributions of this research are twofold. First, this research is the first study, to the knowledge of the author, which takes a qualitative approach in assessing the effects of SOX on transparency in information. Previously recognised difficulties regarding interpretation and subjectivity issues are overcome by combining a triangular approach with a matched-pairs selection method. Second, this research contributes to the growing body of content analysis in finance and accounting literature.

### 5.1 Overall conclusion

The empirical results of this study show that both cross-listed (CL) as non cross-listed firms disclose more non-financial information during the time-frame. The empirical results show a stronger increase in transparency of non-financial information for CL firms over time, findings which corroborate from a financial perspective with those of Singer and You (2009). Since most of previous research focuses on financial information, and only examines the impact of particular sections of SOX, linking current findings to specific sections of SOX is only suggestive.

Looking at the major sections of SOX affecting disclosure, the effects of SOX sections 302 and 404 are perceived to be the most far-reaching and costly to implement (Singer & You, 2009;

## Conclusion

continued

Rittenberg & Miller, 2005; Iliev, 2009), and appeared to have a significant impact on financial reporting. The positive effects of legislation on internal control systems are recognised in markets world-wide, since comprehensive programmes as Solvency II and Basel II are embraced. That transparency is beneficial for information capital markets (Byard et al., 2006) and, hence, increasing liquidity (e.g. Bushee and Leuz, 2005).

On basis of the findings the initial hypothesis, i.e. the passage of SOX is associated with an increase in transparency of non-financial information for SOX compliant firms relative to a control group of non-SOX compliant firms, can be confirmed.

In examining the forward-looking tone of the annual reports for all firms in the sample, an overall increase in forward-looking statements, both relative and absolute, is observed. The analysis of both the FWL. transparency variables as the content analysis on the FWLD. variable illustrates an upward movement over the years. Comparing the data for CL and NCL firms, the findings reveal a stronger relative increase on all FWL. variables for CL firms. When isolating the legislation effects of SOX on all FWL. variables an increased disclosure is observed, unveiling for FWL.2 (+44%) and FWL.2 (+18%) the strongest impact. Combining these robust results with the content analysis on the FWLD. and FWLDS. variables, documenting an isolated increase of ,00044 on the FWLDS. variable, a significant effect on forward-looking tone of the narrative sections of the annual report can be observed. The beneficial effects of forward-looking information on analysts' earnings forecasts (Barron et al., 1999; Francis et al. 1997) and on risk uncertainty (Skaife et al. 2008) are evident.

Illative these outcomes confirm the hypothesis that the passage of SOX is associated with an increase in the level of forward-looking non-financial information for SOX compliant firms relative to a control group of non-SOX compliant firms.

As commented above on hypothesis 1, linking these results to specific sections of SOX would be speculative. From a purely theoretical point of view, one could debate that the fact that the CEO and CFO are obliged (or else liable) to prepare a statement to certify the appropriate presentation of operations and financials in all disclosures (SOX section 302), could have contributed to an overall sense of a more transparent form of disclosure by companies.

## 5.2 Limitations and future research

As with all studies examining the effect of a single event, this research is also subject to bias, as the observed effects might not be entirely attributed to SOX. Other minor events, changes in markets and economy could also have affected the results.

The main limitations of this research are threefold. First the study is limited to one source of information (i.e. annual reports), for only one proxy in the market (i.e. financial analysts). Additional information, available through e.g. quarterly earnings announcements and conference calls are not contemplated in this research. To mitigate this problem, future research should perform an additional analysis controlling for analysts' forecast revisions after earnings announcements and other releases. Second, the time-frame of this research is limited to only the data for 2002 and 2007. Though through the matched-pairs approach, the effects of the legislation are studied as an isolated event, future research could extend the time-frame to ensure that the effects are not temporary. An enlarged time-frame, of both pre- as post-SOX eras, will contribute to a better understanding of the effects. Third, to objectify the results of the study no qualitative assessment of the disclosure and forward-looking variables was made. The triangularly approach combining the variables with a 2-way content-analysis mitigates this problem partially, but does not provides the ability to make a thorough qualitative assessment of the information available in the annual reports and disentangle the effect of SOX upon reporting.

Financial analysts are considered to be one of the most important financial intermediaries in the markets. An interesting direction for future would therefore be to combine the results on transparency and forward-looking information, with analysts' forecast bias to assess whether analysts incorporate the more transparent non-financial information for CL firms into their recommendations.







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# Appendices

## Appendix I: list of firms under study

<b>Cross-Listed Firms (2002-2007)</b>	<b>Country</b>	<b>Sector ID</b>	<b>Non Cross Listed Firms (2002-2007)</b>	<b>Country</b>	<b>Sector ID</b>
Alcatel-Lucent	France	2	Bouygues	France	2
Arcadis NV	Netherlands	2	Kendrion	Netherlands	2
ARM Holdings Plc	United Kingdom	10	Dimension Data Holdings Plc	United Kingdom	10
ASM International NV	Netherlands	10	Be Semiconductor Industries Nv	Netherlands	10
ASML	Netherlands	10	OCE NV	Netherlands	10
BP Plc	United Kingdom	6	Centrica Plc	United Kingdom	6
British Sky Broadcasting	United Kingdom	5	Tesco Plc	United Kingdom	5
Cadbury Schweppes Plc	United Kingdom	4	British American Tobacco Plc	United Kingdom	4
CRH Plc	Ireland	2	Kingspan Group	Ireland	2
Crucell	Netherlands	10	Be Semiconductor Industries Nv	Netherlands	10
Daimler Ag	Germany	3	Bayerische Motoren Werke	Germany	3
Dassault Systemes	France	10	Atos Origin	France	10
Deutsche Telekom Ag	Germany	12	E.On Ag	Germany	12
Diageo Plc	United Kingdom	4	British American Tobacco Plc	United Kingdom	4
Elan Corp Plc	Ireland	8	United Drug	Ireland	8
Eni Spa	Italy	6	Enel Spa	Italy	6
France Telecom	France	12	Veolia Environnement	France	12
Glaxosmithkline Plc	United Kingdom	8	Astrazeneca Plc	United Kingdom	8
Head NV	Netherlands	4	Koninklijke Ten Cate	Netherlands	4
Ilog Sa	France	10	Linedata Services	France	10
Imperial Tobacco Group Plc	United Kingdom	4	Sabmiller Plc	United Kingdom	4
Infineon Technologies Ag	Germany	2	Linde Ag	Germany	2
Koninklijke Kpn NV	Netherlands	12	Tele2 Netherlands Holding NV	Netherlands	12
Luxottica Group Spa	Italy	4	Benetton Group Spa	Italy	4
Magyar Telekom	Hungary	12	Elmu Rt.**	Hungary	12
National Grid Plc	United Kingdom	12	Scottish Power	United Kingdom	12
Nokia Oyj	Finland	2	Metso Oyj	Finland	2
Novo Nordisk A S	Denmark	8	H. Lundbeck A/S	Denmark	8
Pearson Plc	United Kingdom	5	Tesco Plc	United Kingdom	5
Portugal Telecom Sgps Sa	Portugal	12	Edp - Energia De Portugal Sa	Portugal	12
Qiagen	Netherlands	8	Opg Groep Nv	Netherlands	8
Reed Elsevier N V	Netherlands	5	Tnt Nv	Netherlands	5
Reed Elsevier Plc	United Kingdom	5	Kingfisher Plc	United Kingdom	5
Rio Tinto Plc	United Kingdom	1	Anglo American Plc	United Kingdom	1
Royal Dutch Shell Plc	Netherlands	6	Sbm Offshore Nv	Netherlands	6
Ryanair Holdings Plc	Ireland	11	Irish Continental Group	Ireland	11
SAP Ag	Germany	10	Intershop Communications	Germany	10
SGL Carbon Ag	Germany	1	Celanese Ag	Germany	1
Smith & Nephew	United Kingdom	8	Shire Plc	United Kingdom	8
Stolt-Nielsen S.A.	Luxembourg*	11	Go-Ahead Group	United Kingdom	11
Stora Enso Oyj	Finland	1	Upm-Kymmene Oyj	Finland	1
Thomson	France	2	Schneider Electric Sa	France	2
Tomkins Plc	United Kingdom	2	Bba Aviation Plc	United Kingdom	2
Total Sa	France	6	Technip Sa	France	6
Trintech Group Plc	Germany	5	TAKKT	Germany	5
Unilever NV	Netherlands	4	Heineken Nv	Netherlands	4
Unilever Plc	United Kingdom	4	British American Tobacco Plc	United Kingdom	4
Vodafone Group Plc	United Kingdom	12	BT Group Plc	United Kingdom	12
Wavcom S A	France	10	GFI Informatique	France	10
WPP Group Plc	United Kingdom	5	Kingfisher Plc	United Kingdom	5

Notes: \*For Stolt-Nielsen no available match on all three criteria was available (fail on country), \*\*For Elmu RT only the 2007 annual report was available

## Appendix II: Search Algorithm on FWL. variables

	<b>Description</b>	<b>Search terms</b>
FWL.1	The future risks of the company	<i>risk, uncertain, , exposure</i>
FWL.2	The future opportunities of the company	<i>opportunity, plan, prospect, chance</i>
FWL.4	The activities and plans to meet the broad objectives and business strategy	<i>objective, strategy, activity, plan, target, intention, goal</i>
FWL.7	The comparison of actual business performance to previously disclosed opportunities, risks and plans of the company	<i>progress, review, compare, previous, risk, plan, objective, opportunity, plan, intention, project</i>
FWL.9	The expectations about the future growth of the company	<i>growth, expect, outlook, prospect, hope, intend</i>

## Appendix III: Search algorithm on FWLD. variable

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### **Forward-looking words**

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Accelerate  
Ahead  
Anticipate  
Await  
Confidence  
Confident  
Convinced  
Envisage  
Estimate  
Estimating  
Eventual  
Expect  
Forecast  
Forthcoming  
Hope  
Intend  
Intention  
Likely  
Next  
Novel  
Optimistic  
Outlook  
Planned  
Predict  
Prospect  
Remain  
Renew  
Shortly  
Soon  
Unlikely

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### **Words referring to context other than FWLD.**

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Accounting  
Audit  
Bonus  
Committee  
Director  
Pension  
Shareholder  
Stock

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## Appendix IV: Sample from output on content analysis

<b>Case No.</b>	<b>Output</b>	<b>Match on</b>
193	It is our INTENTION to continue to divest and, where appropriate, make selective acquisitions as part of active portfolio management.	<i>Intention</i>
193	Shell expects to be able to RENEW or increase these facilities on commercially acceptable terms.	<i>Expect, renew</i>
152	E.ON Ruhrgas also launched an open season in which market participants can declare their interest in booking capacity, ensuring that third parties will have non-discriminatory access to the PLANNED terminal's capacity.	<i>Plan</i>
145	At subsequent reporting dates, debt securities that the Group has the expressed INTENTION and ability to hold to maturity (held - to-maturity debt securities) are measured at amortised cost using the effective interest rate method, less any impairment loss recognised to reflect irrecoverable amounts.	<i>Intention</i>
101	In sawn timber OUTLOOK is cautious due to existing high inventories and slowing of the building activity in some of the main markets.	<i>Outlook</i>
1	High-speed Internet access remains a major driver of growth in data traffic, which is expected to ACCELERATE in the NEXT few years under the influence of various factors.	<i>Accelerate, next, expect, prospect</i>
89	A significant increase in the incidence of signal piracy could require the replacement of smart cards sooner than otherwise PLANNED.	<i>Planned, soon</i>
67	The risk management control systems involve the use of analytical techniques, including value-at-risk analyses, to ESTIMATE the expected impact of changes in interest rates on the Group's future cash flows.	<i>Estimate, expect</i>



