THESIS ON ECONOMICS H15

Public Announcements' Relevance, Quality and Determinants on Tallinn, Riga and Vilnius Stock Exchanges

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Declaration:
Hereby I declare that this doctoral thesis, my original investigation and achievement, submitted for the doctoral degree at Tallinn University of Technology has not been submitted for any academic degree.

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INTRODUCTION

Listed companies can communicate with the public using different mediums and types of disclosures. This thesis focuses on public announcements defined as news items compiled by the listed company to fulfil disclosure requirements set in Stock Exchange Rules and published under the company news section on the stock exchange's web-page. Public announcements are different from the financial reports and ordinary press releases because of their timeliness, the ease of simultaneous access to investors, and the regulative framework behind them. Because of these distinguishing features, higher quality public announcements could be expected to lead to lower information asymmetries more quickly than in case with other types of disclosures, and, therefore, they deserve more attention.

So far, disclosure research has been pre-occupied with financial disclosures (mainly annual reports) and other mediums (including public announcements) have received considerably less attention as noted by Verrecchia (2001). This thesis aims at extending the empirical disclosure research in the context of public announcements. The focus will be on three developing capital markets in the Baltic states: Tallinn, Riga, and Vilnius Stock Exchanges. There has been no previous study on disclosure policies of companies listed on these three markets known to the author. It means that better comprehension of the companies' disclosure decisions and disclosure quality levels may be of help in understanding the companies' disclosure policies and in improving the regulative enforcement needed for decreasing the potential information asymmetries. Considering the multiplicity of possible research topics within the context of public announcements, this thesis focuses on three issues: the relevance, the quality, and the determinants of public announcement disclosures. Accordingly, this thesis has four chapters focusing on three main objectives. First, to determine the relevance (relative importance) of different types of public announcement disclosures to investors by concentrating on the economic significance of market reactions around the announcement. Second, to propose a public announcements' disclosure quality measure that could be used in empirical research. Third, to determine the impact of listed companies' ownership structures and company characteristics on the quality of their public announcement disclosures.

Chapter 1 defines public announcement disclosures and describes the institutional setting of the markets in question. Additional attention will be paid to the theoretical and empirical background of disclosure research previously discussed in a paper Laidroo (2006).

Chapter 2 attempts to provide some indication of the relevance of public announcements to investors operating in the three markets. Relevance is defined in terms of economic significance of market reactions to different types of public announcements and two hypotheses are tested:

H1: Financial news generates economically significant market reactions more often than other news.

H2: Financial news generates larger market reactions than other news.

Event study methodology using the approach employed by Ryan and Taffler (2004) is used to measure the relative importance of different types of announcements to investors. This approach differs from traditional event-study as the procedure is reversed – economically significant reactions are identified and then these are matched with announcements (in traditional event study the focus is on the size of the reaction to the specific news). The differences in reactions to news are investigated by employing difference-in-means tests. This chapter is based on the findings of Laidroo (2008b) and the results are used as input in the following chapter of the thesis dealing with disclosure quality measurement.

Chapter 3 concentrates on developing a methodology for public announcements' disclosure quality measurement. This is the first attempt at solving this issue in the context of public announcements, as the measurement approaches based on financial reports used in previous literature are not entirely suited for other mediums. Previously used methodologies are used as a starting point and the theoretical justification for the proposed public announcements' quality measurement methodology is based on information theory. The latter theory is operationalised into empirically measurable attributes by using finance and accounting theories to define content attributes and cognitive psychology theory to define timing attributes. Special attention is paid to the indirect validity tests of the developed disclosure quality score by testing the following hypotheses:

H3: Average public announcements' disclosure quality is statistically significantly different across years.

H4: Average public announcements' disclosure quality is statistically significantly different across company size groups.

H5: Average public announcements' disclosure quality is statistically significantly different across themes.

H6: Average public announcements' disclosure quality is statistically significantly different across stock exchanges.

In addition to testing the validity, the results of these tests also shed some light on the differences in disclosure policies on the markets in question. This chapter is based on two published papers Laidroo (2008a) and Laidroo (2009).

Chapter 4 looks at the determinants of public announcement disclosures with special attention on the ownership structure. This is one of the main corporate governance mechanisms for which the data can be easily obtained and could be expected to affect the level of disclosure quality. The following hypotheses are tested:

H7: There is a negative association between disclosure quality and ownership concentration.

H8: There is a positive association between disclosure quality and managerial ownership.

H9: There is a positive association between disclosure quality and government ownership.

H10: There is a positive association between disclosure quality and institutional ownership.

H11: There is a negative association between disclosure quality and foreign ownership.
The methodological approach employed includes linear individual and time fixed effects regressions run on the pooled sample. This chapter is based on a published paper Laidroo (2009).

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1. PUBLIC ANNOUNCEMENT DISCLOSURES

Public announcements are defined as news items compiled by the listed company to fulfil disclosure requirements set in Stock Exchange Rules and published under the company news section on the stock exchange's web-page. The aim of these disclosures is to inform investors of important events that are not known to the public, but because of their potential impact on the listed company's assets, liabilities, activity, or reputation may have a significant effect on the share price. These disclosures are regulated by the Stock Exchange Rules. Information disclosed through such announcements must be accurate and complete and their first medium must be the stock exchange system. This means that if the Rules are followed, new information disclosed is freely available to all interested parties simultaneously through the web. In case the Rules are violated by the listed company, the stock exchange authorities have the right to warn or fine the company. It should be kept in mind that public announcements are only a small part of the companies' overall disclosure which also includes financial reports, press releases, company web-pages, meetings with analysts, etc.

1.1. Institutional context and the sample

Disclosure practices depend heavily on the countries in focus. This thesis focuses on three European developing stock exchanges in the Baltic States: Estonia, Latvia, and Lithuania. These three countries parted from Soviet Union and became independent in the early 1990s. This event was followed by extensive development of legislation and privatization of property (land, real estate, and state-owned companies).

The stock exchanges in the three countries are named Tallinn Stock Exchange (hereafter TSE), Riga Stock Exchange (hereafter RSE), and Vilnius Stock Exchange (hereafter VSE). They have been operating since 1995. The first objective of these markets was to provide for the possibility of transactions with shares of newly privatized companies. As a result of privatizations, the ownership structures of the listed companies became quite versatile by end of 2005. Of these companies, 31% were in the hands of foreign companies specializing in the same field of activity (average holdings 68%). 17% of the companies had partly remained in the hands of the governments (average holdings 52%). Institutional shareholders had obtained holdings in 46% of the listed companies (average holdings 25%). Managerial holdings existed in 15% of the companies (average holdings 19%). Due to historical reasons, there were no family firms listed. All listed companies had block holders (shareholders with holdings over 5%) at the end of 2005, with average holdings of 76%, indicating quite concentrated ownership structures.

The number of listed companies on the three markets is low. The sample used in this thesis consists of all firms listed on the TSE, RSE, and VSE, either in the Main or I-list, during the entire period from 2000 to 2005. This means that no additional

sampling is used and the final sample includes 52 companies: 12 from TSE (23%), 9 from RSE (17%), and 31 from VSE (60%). The list of companies along with their main activity is listed in Appendix 3.

Table 1: Categorization of public announcements

Main category	Description	Sub-categories
Business-related (28 sub-cats.)	News concerning company's business activities, excluding financial news	Changes in type of activity; business negotiations; agreements; approvals acquired from government agencies; disputes with government agencies; business legislation; *certifications*; comments to business news; court proceedings; sale of assets; products; change in price of goods; *price of raw materials*; investments; joint-ventures; logo or trademarks; markets; market share; *moving*; patents; business problems; recognition; *strategy*; buy-out; changes in holdings in other companies; merger; reorganisation; *subsidiary*
Business-financials (5 sub-cats.)	Financial news of the company	Annual report; periodical report; financing; financial costs /revenues; forecasts of financial results
Company-related (9 sub-cats.)	News concerning company as a legal person excluding the business-related news	Address; company name; articles of association; listing; delisting; financial distress; paying agent; changes in registries; publicity
Management-related (6 sub-cats.)	News related to the persons having direct influence over the company's well-being	Insider transactions; changes in auditors; changes in procurators; changes in Management Board; changes in Supervisory Council; options granted to employees
Owner-related (16 sub-cats.)	News important to the owners of company's shares or other securities	Shareholders' agreements; news related to bonds; determination of dividends; payment of dividends; annual general meeting (AGM) agenda; extraordinary general meeting (EGM) agenda; AGM decisions; EGM decisions; proposal to call EGM; *investor calendar*; investor rights; increase share capital; decrease share capital; majority-owner related news; acquisition of own shares; record date
Stock exchange related (5 sub-cats.)	News concerning trading on stock exchange or the references to information disclosed in sections other than news	*Links to reports disclosed separately (not as part of news announcement); stock exchange Rule violations; suspension of trade; resumption of trade; other trading related announcements excluding suspension and resumption*

Note: Themes in italics represent discretionary disclosures.

National accounting regulations on the three markets were set up based on international accounting standards and modified according to EU regulations. Stock Exchange Rules across the three stock exchanges differed initially, but the harmonization on TSE and RSE began in 2000, and by end of 2005 the regulations for all three of them were quite similar (as all three markets had become part of the OMX group in 2004). These Rules basically define mandatory public announcement disclosures that should be disclosed simultaneously[1] in both the local language and in English. Based on the items listed in the 2005 Rules, the themes of the announcements were put into an initial coding scheme of 40 sub-categories and these were summarized in six main categories. Then, a thematic content analysis of 2000-2005 announcements was manually conducted resulting in the 69 sub-categories presented in Table 1. The details of the coding procedure are described in Appendix 4 along with the definitions of the four types of announcements distinguished and examples of the announcements provided. Based on the 2005 Rules, the distinction is made for what constitutes mandatory items. During the pre-2005 period, there are some differences in the Rules with regard to the level of detail in the comments to the financial reports, but by the end of 2005, even the requirements on these disclosures are similar. The biggest differences in disclosure policies involve the timing of the announcements made in different languages[2] and the level of detail of the disclosures.

Corporate Governance Codes were implemented from 2006 onward, and the first year of mandatory reporting on corporate governance practices was 2006. Previous research by Berglöf and Pajuste (2005) indicates that the regulatory quality, the rule of law, and the control of corruption in the three countries were among the best in Central and Eastern Europe. In terms of more developed markets, the regulatory setting had more quickly adapted and was quite comparable to that of the US, but the rule of law and corruption had considerable room for improvement. The same study showed that although the regulative framework had developed quickly, the enforcement had lagged behind, indicating that there was considerable room for improving the transparency of corporations in terms of disclosure and corporate governance arrangements. These results point to the importance of mandatory disclosure in providing investors with at least some information about companies' activities in the pre-2006 period.

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[1] In reality there are differences in the number of announcements made in different languages during 2000-2005: on TSE by 16.9%, on RSE by 13.7%, and on VSE by 0.8%. To avoid biases in the data, the announcements' database used hereafter includes announcements in both languages and in cases where there is no announcement in English next to the one made in local language, the latter is used.

[2] Announcements in English are in some instances delayed compared to announcements in the local language. A lag longer than one day occurs for 21% of announcements made on TSE, 24% on RSE, and 16% on VSE. In general, the timing differences are smaller in 2004-2005. The sample is corrected for such delays taking into account the day the announcement appears for the first time.

To the best knowledge of the author, public announcement disclosures on the three markets have not received any attention in previous literature. There have been some attempts made by the stock exchanges themselves to evaluate disclosure quality in the form of selecting the winners of Baltic Market Awards since 2006. This award is based on the evaluation of investor relations of listed companies and covers different aspects of disclosure (web-pages, public announcements, annual reports, communication with professional investors, etc.). However, the actual firm-based scores are kept secret from the public and only the winners are announced. Considering the drawbacks of the subjective evaluation methodology used, they remain more appropriate as a means for motivating listed companies to modify their disclosure behaviour to be more in line with the criteria set out on score sheets and are not as well suited for empirical research. In order to enable the measurement of public announcements' disclosure quality, a measurement methodology for creating a public announcement disclosure quality score that follows the lines of disclosure research mostly conducted in other mediums of disclosure is proposed in Chapter 3 of this thesis.

The empirical tests in this thesis are based on public announcements that were gathered from the stock exchange web-page from 2000 to 2005. Announcements included in the sample are taken from 2001 to 2005. Announcements made in 2000 are excluded because of the need to use the data from 2000 in calculating some of the variables. The final sample of announcements includes a total of 1113 (26% of total) announcements from TSE, 811 (19% of total) from RSE, and 2400 (55% of total) from VSE. The average number of announcements disclosed by companies per year is between 13.4 and 20.6. In addition to the announcements, listed companies' financial and corporate governance statistics are gathered from annual reports and trading statistics are taken from the stock exchanges' web pages.

1.2. Theoretical and empirical context

Disclosure research is closely related to the fields of economics, finance, and accounting. Economics has provided the theoretical background for it, most of the implementation has been in the field of accounting, and many research areas overlap those of finance as there are close associations between disclosure and the functioning of capital markets.

Theoretical justification for disclosure is based on information economics that relies heavily on concepts of information asymmetry (Akerlof, 1970), signalling theory (Ross, 1977), agency theory (Jensen and Meckling, 1976), and litigation costs theory (Skinner, 1994). The information or "lemons" problem arises from information differences and conflicting incentives between entrepreneurs and savers. This can lead to a breakdown in the functioning of the capital market (Akerlof, 1970). The agency problem arises because managers have the possibility of expropriating investors' funds (perquisites, excessive compensations, and the use of firm's resources to pursue their own goals) (Jensen and Meckling, 1976). Information and agency problems can be solved externally when investors sign

optimal incentive contracts with managers, supervisory boards are elected to control managers' actions, information intermediaries (analysts) are employed to uncover managers' superior private information or uncover any misuse of firm's resources, or regulations are used to induce proper information disclosure (Healy and Palepu, 2001). However, part of the information problem can be solved by the companies themselves when high quality firms wanting to distinguish themselves from their low-quality counterparts take steps to signal their superior quality through the use of signals that the low quality firms cannot afford to replicate (Ross, 1977). The managers' fear of being sued and having to pay litigation costs in the case of false or inaccurate disclosures may also improve disclosure quality (Skinner, 1994).

There are numerous possibilities for categorizing empirical disclosure studies (see Healy and Palepu, 2001; Verrecchia, 2001; Beattie, 2005; Laidroo, 2006). In the context of this thesis, two main lines of categorization are worth mentioning: studies on capital market consequences of disclosure and disclosure quality studies.

The first line of literature (studies on capital market consequences of disclosure) is part of market-based accounting research (MBAR) that has been involved in determining how accounting disclosures contribute to security-returns' behaviour since the 1960s (for detailed discussion see Lev and Ohlson, 1982). MBAR has based its information content studies on event-study methodology initiated by either Ball and Brown (1968), who concentrate on the correlation of unexpected earnings and residual stock returns, or by Beaver (1968), who focuses on residual return or volume variance during the pre- and post-announcement periods. This line of research has many features in common with studies attempting to determine the level of capital market efficiency divided into strong, semi-strong, and weak forms of market efficiency as in Fama (1970). Such studies focus mostly on the market reactions to earnings announcements (in European context, see Firth, 1981; Frost and Pownall, 1994; Hew et al., 1996; Kallunki, 1996; Schadewitz, 1996; van Huffel et al., 1996; Martikainen, 1998; Pellicer and Rees, 1999; Gajewski and Quéré, 2001; Schadewitz et al., 2002; Korczak and Tavakkol, 2004; in the context of US, see Morse, 1981; Lee, 1992; Lee et al., 1993; Joon, 2005; Bailey et al., 2006). Less popular events include dividend announcements (Foster III and Vickrey, 1978; Kwan, 1981), splits (Liljeblom, 1989), mergers, acquisitions or divisionalizations (Bühner and Müller, 1985). Public announcements or news releases in general have achieved a lot less attention in empirical market reaction literature. Still, at least eight papers have looked at market reactions to different types of news releases using an event study approach. Palmon and Schneller (1980) looked at *Wall Street Journal* news and its effect on stock returns. Morse (1982) concentrated on news releases of companies listed on the New York Stock Exchange (hereafter NYSE) and published in the *Wall Street Journal*. Thompson et al. (1987) investigated public announcement disclosures of the NYSE and the American Stock Exchange (hereafter AMEX) listed firms in the *Wall Street Journal* index, and, among other things, looked at stock return movements around different types of announcements. Their paper also attempted to analyse how

positive or negative news of different types affects stock market behaviour both in terms of return and volume. Pritamani and Singal (2001) looked at short-run stock return predictability following the release of new information proxied by large volume increases, large price changes, or public announcements of companies listed on the NYSE and the AMEX. However, most of their attention was concentrated on market under- and overreaction following an announcement. Chan (2003) focused on market anomalies (drift and reversal effects) and tried to identify how US stock prices reacted to public news and no-news. A similar approach was undertaken by Vega (2006), who investigated post-earnings announcement drift after public and private information events. Amman and Kessler (2004) selected accounting and corporate control announcements from a Swiss press release database, Hugin, and focused on insider trading and information processing issues. None of the previous studies listed attempted to determine the relative importance (relevance) of different news items. Such an issue was investigated in the study conducted by Ryan and Taffler (2004), which concentrated on economically significant stock return and volume changes to news releases made either through the London Stock Exchange Regulatory News Service; *The Financial Times*, or McCarthy Information[3]. Considering that the relative importance of news refers to higher quality disclosure, a similar study to the latter one will be conducted in the context of public announcements on TSE, RSE, and VSE in Chapter 2 to identify the themes of public announcements that could be deemed more relevant to the investor.

Empirical studies on disclosure quality can be divided into two groups. The first group of studies is based on the idea that disclosure quality is affected by many factors including regulations in the form of Stock Exchange Rules, financial reporting requirements, managers' willingness to share important information, companies' overall financial and competitive position, as well as corporate governance structures. To understand which factors influence companies' disclosure policies, these studies investigate the association between disclosure quality and different company characteristics that relate to its size, capital structure, performance, ownership, extent of international activities, risk, industry, and listing status by using regression models (for a review, see Ahmed and Courtis, 1999 and for references, see also Appendix 5). Theoretical predictions for associations between disclosure quality measures and company characteristics are made based on information economics and the expectation is that understanding the impact of these characteristics enables researchers to determine the conditions which may be associated with disclosure quality decrease which in turn may affect the quality of information available to investors. Most studies of this nature are used in accounting research to find the determinants of voluntary disclosures in annual reports (see Appendix 5 for references), interim reports (Kanto and Schadewitz, 1997), financial ratios (Watson et al., 2002), earnings disclosures (Walker and

[3] McCarthy Information is a database that gathers company, industry, and market information and news on firms from more than 40 newspapers.

Louvari, 2003), operating and financial reviews (Emmanuel and Garrod, 2004), going concern uncertainty disclosures (Martin, 2000), or segment data (McKinnon and Dalimunthe, 1993; Aitken et al., 1994). Still, some studies have focused on overall disclosure quality based on disclosure quality indexes created by professionals (McNally et al., 1982; Lang and Lundholm 1993, 1996; Brown and Hillgeist, 2006), or looked at company web-site disclosures (Aksu and Kosedag, 2006). Public announcement disclosure quality has not received much attention in these studies, and the only paper that concentrates on an analysis of disclosure in press releases in addition to the annual report management discussion is Clarkson et al. (1999). The main reason for a smaller focus on news releases lies in the lack of suitable disclosure quality proxies. Therefore, Chapter 3 develops a disclosure quality measure for public announcements and the investigation in Chapter 4 looks at public announcements' disclosure determinants, especially at the impact a of company's ownership structure which might be expected to be one of the most important disclosure determinants in the countries in focus.

The second group of disclosure quality studies focuses on whether increased disclosure leads to lower information asymmetries which in turn should reduce the cost of capital of the firm (see Greenstein and Sami, 1994; Healy et al., 1999; Leuz and Verrecchia, 2000; Botosan and Plumlee, 2002; Botosan, 2006; Zhang and Ding, 2007). This line of research is facing many problems in measuring the size of information asymmetries and because of the limited scope of this thesis, this line of literature will not be covered.

2. THE RELEVANCE OF PUBLIC ANNOUNCEMENTS

The market impact of firm-related disclosures has been well researched in previous literature (see Chapter 1) on many stock exchanges including studies looking at the efficiency of developing capital markets of Tallinn, Riga and Vilnius (for example, Rahu, 2002; Kiete and Uloza, 2005). However, a lot less attention has been paid to the relative importance of different news and to the tone of the news (positive or negative). Gaining an understanding as to how a capital market reacts to different news enables to understand how the market and investors value it. Such a focus would be of interest to market regulators as it clearly indicates what aspects of public announcement disclosures have achieved more attention on different stock exchanges. It would also be useful for entrepreneurs, who could get an indication about which news should receive greater attention in the announcement preparation process. Previous studies done on the three stock exchanges have only looked at a few distinct types of announcements (earnings announcements, stock dividends, and stock splits) and have not considered all three markets simultaneously. Therefore, the objective of this chapter is to determine to what extent economically significant stock return and volume changes on TSE, RSE, and VSE are contributable to public announcements and which types of announcements drive these significant changes.

2.1. Hypotheses development

Cutler et al. (1989), Mitchell and Mulherin (1994) and Berry and Howe (1994) provide evidence that stories reported in the financial press have little impact on stock returns and trading volume activity[4]. Notwithstanding with this apparently weak relationship between capital market information flows and price and/or trading volume activity, substantial literature exists which explores the link between specific news events and stock price and trading volume movements. The main reason why information is assumed to be valuable is that asset price changes are expected to be attributable to changes in fundamental values and that share price movements and trading volume activity are attributable to the arrival of new information. Following these lines of reasoning, considerable attention has been paid to the perceived importance of financial statements by looking at the market reaction following financial disclosures (see Chapter 1 for references). The main expectation is that significant stock price and trading volume changes after financial disclosures refer to its importance for investors (Beaver, 1968). A review

[4] The results of these studies are influenced by the focus and methodology used: Cutler et al. (1989) focus on the market index changes to economic news; Mitchell and Mulherin (1994) look at the relation between the news announcements reported daily by Dow Jones & Company and the aggregate measures of securities market activity; Berry and Howe (1994) consider the association between news releases by Reuter's News Service and aggregate measures of intraday market activity.

study by Dumontier and Raffournier (2002) based on European evidence supports significant stock price changes and volume increases surrounding financial disclosure dates. Several studies conducted on specific news items have also supported their importance in leading to changes in market expectations, including directors' trades (Seyhun and Bradley, 1997), takeover bid activity (Jensen and Ruback, 1983), seasoned equity offerings (Jegadeesh, 2000), institutional trading activity (Chan and Lakonishok, 1995), and management earnings forecasts (Bamber and Cheon, 1998). Firth (1981) also shows evidence that the reactions to financial data are greater than the reactions to annual general meetings. Still, the research on the reactions to different types of news items simultaneously is scarce. Only Ryan and Taffler (2004) have shown that analyst recommendations and issuance of financial results explains 34% of all economically significant price and volume reactions followed by 30 other types of press releases. At the same time, the magnitude of reactions to the explained economically significant price and volume reactions are dominated by financial disclosures and the magnitude of these reactions differs at a statistically significant level from other types of news releases.

An alternative possibility for determining the importance of different news items is survey evidence. There have been several studies on the importance of different information sources to analysts. These tend to support the view that financial disclosures are more important than other news releases (newspapers), but as important as meetings with company's management. (Pike et al., 1993; Vergoossen, 1993).

Based on the empirical results of these two lines of research, two hypotheses are tested:

H1: Financial news generates economically significant market reactions more often than other news.

H2: Financial news generates larger market reactions than other news.

2.2. Methodology

Traditional event study is based on determining the event of interest and then concentrating on the stock return and volume changes around the event date. In most cases, the focus is on earnings announcements. In this chapter, the methodology proposed by Ryan and Taffler (2004) is used. First, economically significant stock return and volume changes (two standard deviations from the mean) are determined and then news releases are matched with these events. The major benefit of this approach is that only the extreme return and trading volume changes are looked at, and, therefore, the potential for picking up a significant amount of random market activity not related to news releases is avoided. This set-up also enables to identify information items that are the most relevant to capital market participants and not be confined to pre-determined types of information releases. The importance of firm-specific news events is measured by the frequency with which different announcement categories lead to economically

significant changes in stock returns and volumes and the magnitude of return and volume movements triggered by these events. Frequency enables to determine the relative economic importance of announcement categories and the magnitude shows how the market values different types of announcements.

Most event studies concentrate on returns. However, looking at returns and volumes together enables to capture a wider spectrum of factors associated with announcements. According to Beaver (1968), price movements reflect changes in the market's consensus expectations generated by the news release. Volume activity, on the other hand, reflects the changes in expectations of investors as a consequence of the news. Therefore, looking at both of them simultaneously, we see how quickly the market adjusts to new information and how quickly different individuals' expectations adjust to new information. The rational expectation model constructed by Holthausen and Verrecchia (1990)[5] challenged this approach, but the model constructed by Jang and Byung (1989)[6] supports the need for looking at both volume and price changes. Lokman and Abdulnasser (2005) also provide empirical evidence that price-volume relationships are lagged in developing capital markets like Hungary and Poland. If this applies to TSE, RSE, and VSE, it means that for a more accurate determination of event dates, both measures should be used. Therefore, in this chapter both measures are considered.

Security returns can be biased in cases where there is a thin-trading problem. If we consider stocks to be thinly traded when the stocks are traded less than 40% of trading days, as defined by Bartholdy et al. (2007), RSE exhibits no thinly traded stocks across years. On TSE, one to two stocks per year were thinly traded during 2001-2002, but on VSE this number ranges from 6 to 18 during 2001-2005, with the thin trading problem decreasing over time. This indicates a serious thin-trading problem on VSE. Usually, when samples are big, it is possible to exclude thinly traded securities from the analysis (for example see Pritamani and Singal, 2001). However, the objective of this chapter is to evaluate the relative importance of themes which may vary across companies exhibiting different trading frequencies. Therefore, no companies are eliminated from the sample. Several other possibilities to overcome the thin-trading problem mentioned in the literature include: using lumped returns (Heinkel and Kraus, 1988); trade-to-trade returns (Dimson and Marsh, 1983; Maynes and Rumsay, 1993); fill-in-returns (Heinkel and Kraus, 1988); or uniform returns (Maynes and Rumsay, 1993). The first two of these have generally been considered the best alternatives. In the case of the lumped returns approach, the closing prices for the days on which no trades took place are set equal to the closing price of the previous day when trading did occur. The trade-to-trade returns model excludes the days with no trades. Most papers using thinly-traded stocks usually use the lumped returns model. Only a few studies have

[5] Their rational expectations model claims that consensus and informedness are attributes of both price and volume changes.

[6] If essentially homogeneous information structures on the market exist, then volume reaction will follow an announcement. If these structures do not exist, there will be only price reaction.

investigated the lumped returns model along with the trade-to-trade returns model. The empirical results on the efficiency of these two approaches are mixed: Wulff (2002) shows no significant differences between lumped and trade-to-trade return effects over short event windows (-10;+10); on the other hand, Bartholdy et al. (2007) conclude that trade-to-trade returns are the best technique, but to save computational efforts and time, the lumped returns method could be used as well without a significant loss in accuracy of the results. Considering the bigger computational efforts needed to calculate trade-to-trade returns, the similarities of the results calculated under both methods in the case of TSE[7], and also taking into account the research design concentrating only on significant return changes that put little emphasis on return values themselves, for time-saving purposes, only lumped returns are calculated for all three markets using Formula 1.

$$R_{i,t} = \ln\left(\frac{(P_{i,t} + D_{i,t}) - P_{i,t-1}}{P_{i,t-1}}\right) \quad (1)$$

where:
$P_{i,t}$ – stock price of firm i on day t
$P_{i,t-1}$ – stock price of firm i on day t-1
$D_{i,t}$ – dividend of firm i on day t

The following discussion will concentrate only on lumped returns corrected for dividends and stock splits.

Usually, statistical methods (constant mean return or market model) are used for determining abnormal returns as the economic models based on CAPM (capital asset pricing model) are based on assumptions that may not hold in reality and models based on APT (arbitrage pricing theory) add relatively little explanatory power compared to the market model (for discussion, see MacKinlay, 1997). Ryan and Taffler (2004) employ the market model. As on TSE, RSE, and VSE the concern is that the market model coefficient could be inaccurate because of non-normal security returns, outliers, infrequent trading[8], and the small number of observations[9], the emphasis is put on more simple statistical procedures. Expected returns are calculated for all three stock exchanges using the constant mean return model, the market adjusted return model, and the market model (see Appendix 6 for calculation details). Three different estimation periods are used: (-180;-6),

[7] In the case of TSE, the number of economically significant events defined hereafter differed less than 5% in cases where trade-to-trade returns were used instead of lumped returns.

[8] Bartholdy and Riding (1994) test several market model modifications and compare the beta estimates calculated based on an ordinary least squares approach for thinly and thickly traded securities. The modifications do not alter the results considerably and the ordinary least squares (OLS) estimates prove to be more accurate for thickly traded securities.

[9] Draper and Paudyal (1995) suggest that to obtain accurate beta estimates, the estimation window should cover 400 or more trading days. They also suggest that the betas could be influenced by the day of the week and month of the year effects.

(-120;-6) and (-90;-6)[10]. Considering the fact that the constant mean and the market model provide similar results which differ from the market adjusted return model, the latter model is excluded from further calculations. As there are no reasonable grounds to prefer the results of the constant mean return model to the market model results and the length of the estimation window is also disputable, a compromise is made by calculating the average expected returns from both models across all three estimation windows. This approach ensures that when the two models exhibit similar results, this will receive greater importance than in cases where the models give contradicting expected return values. This enables to filter out return movements that are most likely of greater significance. Hereafter, abnormal returns are calculated as follows:

$$AR_{i,t} = R_{i,t} - \overline{E(R_{i,t})} \tag{2}$$

where:
$AR_{i,t}$ - abnormal return of firm i on day t
$R_{i,t}$ – actual return of firm i on day t
$\overline{E(R_{i,t})}$ – average expected return for firm i on day t across three estimation windows (-180;-6), (-120;-6) and (-90;-6) across constant mean and market models

Once the abnormal returns have been calculated, the average annual abnormal return for each firm, i, along with its standard deviation is calculated for each year. Abnormal returns that are two standard deviations above or below the average annual abnormal return are then identified as economically significant return changes.

As there is some question as to or not trading volumes can capture some of the movements not revealed by return movements, trading volumes are calculated as follows:

$$V_{i,t} = \ln\left(\frac{Q_{i,t}}{TQ_{i,t}}\right) \tag{3}$$

where:
$Q_{i,t}$ – number of firm i shares traded on day t
$TQ_{i,t}$ – total number of firm i shares outstanding on day t

One possibility for calculating the expected trading volumes, is to use the constant mean volume (similar to an approach used by Joon, 2005) calculated as follows:

[10] In case the estimation window is longer than 174 days, the number of economically significant events (defined hereafter) begins to decrease and in cases where it is shorter than 84 days, the number of events begins to increase dramatically.

$$E\left(V_{i,t}\right) = \frac{1}{T_1 - T_0} \sum_{t=T_0+1}^{T_1} V_{i,t} \quad (4)$$

where:
T_0 – is the first day of the estimation window
T_1 – is the last day of the estimation window
$V_{i,t}$ - is the trading volume of firm i on estimation window day t

An alternative to this method is to use the market model of trading volume (used by Ryan and Taffler, 2004), but as the total market traded volumes are not easily obtainable, no other models are estimated.

The abnormal trading volume is calculated as follows:

$$AV_{i,t} = V_{i,t} - \overline{E\left(V_{i,t}\right)} \quad (5)$$

where:
$AV_{i,t}$ – abnormal trading volume of firm i on day t
$V_{i,t}$ – actual trading volume of firm i on day t
$\overline{E\left(V_{i,t}\right)}$ – expected trading volume of firm i shares on day t across three estimation windows (-180;-6), (-120;-6) and (-90;-6)

To determine economically significant trading volume changes, the biggest trading volumes are taken from each year's results and their number is set equal to the number of economically significant return events identified. All economically significant events are then matched with news using an event window (-5; +5)[11]. A longer event window is selected than the one used by Ryan and Taffler (2004) (-1; +5) because the leakage effects after the announcement are expected to be larger considering the lower informational efficiency of the developing capital markets in question. If an announcement is matched with return or volume movement, the type of news is identified based on the main theme of the announcement and following the categorization scheme: business-related (news concerning the company's business activities, excluding financial news); business-financials (financial news of the company); company-related (news concerning the company as a legal person, excluding the business-related news); management-related (news related to the persons having direct influence over the company's well-being); owner-related (news important to the owners of company's shares or other securities); stock-exchange-related (news concerning trading on the stock exchange or the references to information disclosed in other stock exchange web-page sections other than news). For a detailed coding scheme, see Table 1. If different types of news are released on the same date, the precedence is given to the

[11] The event date is the date of abnormal return or volume movement (i.e., if the announcement appears five days before the abnormal return or volume movement, it is matched with news on day -5, and if the announcement appears five days after the abnormal return of volume movement, it is matched with news on day +5).

news that is assumed to be the trigger of the return or volume change[12]. If different news items are disclosed in the event window, the event is matched with the announcement disclosed nearer to day 0.

Greater frequency of economically significant reactions to news implies that investors value these announcements. To analyze the differences in the frequency of reactions, the theme frequencies are ranked for each company from the biggest (1) to the smallest (r). Similarly, the larger the return or volume movement induced by the news, the greater the expected information content (relevance) of that news category. To analyze the differences in the magnitude of reaction, absolute abnormal returns and volumes are ranked by firm from the biggest (1) to the smallest (r), and the differences in mean ranks are analyzed. In both cases, the reason for using ranks lies in the non-normal distribution of the events selected. The differences in mean ranks are investigated using the usual ANOVA (analysis of variances) procedure on ranks (including Bonferroni correction to analyse pair-wise relationships) and by employing the Kruskal-Wallis procedure.[13]

There is some evidence in the literature of a differential price reaction to good and bad news events (for an example, see Barber and Loeffler, 1993). According to Atiase (1985), this is due to differences in the pre-disclosure environment that lead to different price reactions following the news announcement. As the reaction to the news may be dependent on the tone of the news, the announcements are also divided into good news and bad news announcements. Good news announcements are defined as the kind of public announcements that induce positive abnormal return on the event date and bad news announcements as the ones inducing negative abnormal return on the event date.

2.3. Results

2.3.1. Economically significant events

According to the methodology discussed in Sub-chapter 2.2., economically significant return and volume events were determined for the years 2001 to 2005. Numbers for 2000 were eliminated from the study results because the use of estimation windows required security returns from a previous year and no data about RSE and VSE companies for 1999 were available. In total, 4299 return events and 4234 volume events were identified (for details see Table 2). The

[12] On TSE, 17% of economically significant events on average have more than one announcement issued on the same date; however, based on the main theme of the announcement, only on 7% of these dates does the main theme of these announcements differ. On VSE, the same numbers are 4% and 3% respectively, and on RSE, there are no such events. This indicates that the subjective determination of themes is rarely used. In case several themes emerge, precedence is given to financial news.

[13] Both statistics are calculated as a robustness check because although Conover and Iman (1981) suggest the use of ranked transform of ANOVA, the Kruskal-Wallis procedure is designed for nonparametric data unlike ANOVA.

proportion of overlapping events is quite low (around 14%), which indicates that return and volume movements seem to capture different aspects of investor behaviour as stated by Beaver (1968). As could be expected, due to the definition of economic significance used, the average absolute abnormal returns and volumes on days of economically significant return or volume movement exhibit 4 to 6 times greater reactions for return events and 1.5 to 4 times greater reactions for volume events.

Table 2: Descriptive statistics of economically significant events

	Return and/or volume events	% of overlapping return and volume events from total events	No. of public announcements	Average of absolute abnormal return		Average of absolute abnormal volume	
				of all trading days	on return event dates	of all trading days	on volume event dates
TSE							
2001	418	18%	182	1.6%	8.5%	83%	249%
2002	354	16%	212	1.5%	7.3%	78%	242%
2003	456	15%	243	1.5%	8.4%	86%	252%
2004	402	14%	247	1.3%	7.7%	83%	300%
2005	350	16%	229	1.9%	9.1%	103%	287%
2001-2005	**1980**	**16%**	**1113**	**1.6%**	**8.2%**	**87%**	**265%**
RSE							
2001	412	20%	147	1.9%	10.4%	109%	289%
2002	338	16%	136	1.7%	8.6%	105%	278%
2003	246	12%	129	2.0%	12.1%	127%	459%
2004	278	12%	183	1.3%	6.1%	116%	322%
2005	282	10%	216	1.3%	5.5%	108%	263%
2001-2005	**1556**	**15%**	**811**	**1.6%**	**8.0%**	**113%**	**306%**
VSE							
2001	932	16%	460	1.0%	8.0%	53%	269%
2002	1004	12%	432	1.1%	7.9%	59%	258%
2003	1133	13%	414	1.5%	7.2%	77%	228%
2004	923	12%	494	1.2%	6.6%	86%	250%
2005	1005	15%	600	1.5%	7.5%	97%	242%
2001-2005	**4997**	**13%**	**2400**	**1.3%**	**7.4%**	**74%**	**248%**

Table 3 presents the portion of events associated with public announcements. The results show that the greatest portion of return and/or volume events can be matched with news in the case of TSE announcements (28-38%), followed by RSE (19-42%), and then VSE (18-31%). The results are not biased by the possibility of counting the abnormal return or volume event explained by the same news more than once since only 14 such events were identified (representing 0.05% of all

explained events). As in the case of Ryan and Taffler (2004), the proportions of explained return and volume events taken separately are quite similar. Still, these percentages are almost two times smaller than the ones reported by Ryan and Taffler (2004), who showed that 65% of return movements and 63% of volume movements could be traced to news announcements. One factor influencing the smaller number is the concentration only on public announcements, which means that other news published in the press has not been taken into account. Still, considering the requirements of the Rules, the news having an impact on prices should have been disclosed, which means that either the Rules have not been sufficient enough to induce greater disclosure or the companies' disclosure policies have not followed the Rules. The fact that the portion of explained events has increased in time can be attributed to changes in the efficiency of the stock exchanges through years (especially on RSE and VSE) or changes in investor behaviour; however, the limited scope of this chapter does not allow for further investigation into this issue.

Table 3: Portions of economically significant return and volume events explained

	% of return events explained		% of volume events explained		% of volume and/or return events explained	
	in window (-5;+5)	on day 0	in window (-5;+5)	on day 0	in window (-5;+5)	on day 0
TSE						
2001	29%	8%	29%	13%	28%	10%
2002	40%	11%	36%	10%	38%	10%
2003	37%	11%	32%	11%	34%	10%
2004	38%	11%	33%	9%	36%	10%
2005	42%	6%	29%	10%	36%	8%
2001-2005	**37%**	**9%**	**32%**	**11%**	**34%**	**10%**
RSE						
2001	30%	5%	28%	5%	29%	5%
2002	28%	9%	23%	7%	25%	7%
2003	20%	8%	19%	6%	19%	7%
2004	42%	16%	36%	12%	38%	13%
2005	47%	9%	38%	12%	42%	10%
2001-2005	**33%**	**9%**	**29%**	**8%**	**31%**	**8%**
VSE						
2001	18%	4%	19%	5%	18%	4%
2002	21%	5%	19%	6%	20%	5%
2003	22%	5%	19%	7%	21%	6%
2004	25%	4%	20%	5%	22%	4%
2005	30%	6%	32%	10%	31%	8%
2001-2005	**23%**	**5%**	**22%**	**7%**	**22%**	**6%**

To test whether the results were influenced by the definition of economic significance, three randomly selected companies listed on TSE, RSE, and VSE were selected. Then, explained events were determined at intervals of +/- 1.5 standard deviations from the mean, +/- 1.75 standard deviations from the mean, +/- 2.25 standard deviations from the mean, and +/- 2.5 standard deviations from the mean. As could be expected, the number of economically significant events increased in the first two alternatives and mostly decreased in the latter two alternatives. The increase in explained events in the first two alternatives was, in absolute value bigger than the decrease in the latter two. However, it must be considered that as the value multiplied with standard deviation was reduced, the number of double-counted explained events increased, indicating that lowering the value below two would yield a more contaminated dataset. Once the duplications were eliminated, the explained events percentages revealed that if the multiplied value was below two, the percentage of explained events tended to remain similar to the level within two standard deviations of the mean. This indicates that the selected definition was appropriate and alternative definitions would have not yielded higher quality results in terms of higher explanatory power.

Table 4: Probabilities of detecting return and volume events

	Return events			Volume events		
	TSE	RSE	VSE	TSE	RSE	VSE
Unconditional probability[(a)]						
Event window (-5;+5)	41%	41%	40%	44%	44%	40%
Event window (-1;+1)	16%	17%	16%	16%	17%	16%
Event date	6%	7%	6%	6%	7%	6%
Conditional probability[(b)]						
Event window (-5;+5)	47%	43%	46%	50%	47%	41%
Event window (-1;+1)	23%	20%	19%	22%	20%	19%
Event date	9%	8%	6%	11%	8%	8%
Noise-to-signal ratio[(c)]						
Event window (-5;+5)	79%	92%	81%	79%	89%	93%
Event window (-1;+1)	67%	80%	80%	68%	79%	81%
Event date	73%	80%	109%	57%	80%	76%

Note: (a) Unconditional probability – number of economically significant reactions divided by the number of trading days. (b) Conditional probability – number of economically significant reactions in the event window of an announcement divided by the total number of announcements. (c) Noise-to-signal ratio - portion of days with public announcements that induce no economically significant reaction in an event window from all days with no economically significant reaction divided by the portion of public announcements that induce economically significant reaction in an event window from all days with economically significant reaction.

The second robustness check concerns the appropriateness of event-study methodology used to capture the effects of public announcements. To test this, the approach employed in financial crisis literature by Kaminsky and Reinhart (1999) is used. This approach compares unconditional and conditional probabilities. Unconditional probability shows the probability that an economically significant return/volume event occurs (regardless of whether there was a public announcement or not) on any given trading day. Conditional probability shows the probability that an economically significant event occurs in cases where there is a public announcement in the event window. The expectation is that the conditional probability should be higher than unconditional probability to support the strength of the methodology used. This applies for all event windows presented in Table 4 and for all stock exchanges (i.e., economically significant events closer to public announcements have a higher probability of occurrence). The difference is, however, quite small and the conditional probability itself quite low (the biggest explanatory power would be a case where the conditional probability would be 100%). This is supported by the noise-to-signal ratio that is in most cases below 100% and primarily remains between 70-90%. This shows that public announcements influence the occurrence of economically significant events, but it is only one factor of many. Considering the scope of this chapter, the following discussion will not concentrate on these other factors, but it should be kept in mind that other omitted variables may have a significant effect on the explanatory power of events.

The third robustness check concerns the selected length of the event window. Economically significant events were grouped by the day of occurrence with respect to the abnormal movement date (not reported here). The greatest portion of economically significant reactions on all three stock exchanges occurred on the day the news was released (26-27%), followed by those occurring on the day following the news announcement (18-23%). Therefore, the day of the news announcement and the first day following the news accounted for 47-50% of all market reactions explained by the news. Of those occurring outside this range, 31-36% of economically significant market reactions occurred 2 to 5 days after the news had been released, and 9-14% of economically significant reactions occurred prior to the news release with the most reaction occurring the day before the announcement. The shortest market adjustment periods after the news release occurred in cases of company-related news and management-related news, and the longest market adjustment periods occurred in cases of financial, business, and owner-related news. This result is in accordance with what could be expected as the latter three news types include more complicated signals that take a longer time period for interpretation before resulting in economically significant reactions compared to other news. For example, management-related news about replacement of a management board member leads to economically significant reactions closer to the announcement date if the investors have some opinion about the person's capabilities. If no opinion exists, the correction of expectations will

take a longer time period, but then it is unlikely to lead to economically significant reactions. In all three stock exchanges, volume events captured less information leakage effect prior to news releases and adjustments after the news had been announced took a shorter time period. This shows that information releases around volume events are more concentrated around the volume event (i.e., individual investors correct their expectations more quickly than does the market as a whole). Overall, these results indicate that the windows were not too long before the abnormal return/volume event. These windows could have been shorter after the abnormal return/volume event, but as the selection of window length is arbitrary and five day window after abnormal return/volume event was also used in a comparative study, no adjustments to the window lengths were made.

Overall, the portion of return and volume events explained by public announcements were 22%-37%, which was twice as low as reported on a developed stock exchange by Ryan and Taffler (2004). The results were quite robust to the definition of economic significance and the event window length. Still, the conditional probability of economically significant events occurring due to public announcements was only slightly higher than the unconditional probability, indicating that public announcements are quite noisy forecasters of economically significant events.

2.3.2. Frequency of themes driving economically significant events

Table 5 summarizes the main categories that describe the theme of announcements that could be associated with economically significant return and/or volume movements. In addition, the differences in ranked mean frequencies are provided at the bottom of the table.

The results are in line with H1, that financial disclosures lead to economically significant events more often than other news. The difference is also statistically significant as the pair-wise differences (not reported in Table 5) show that the business-financials category has higher average ranking in terms of frequency than all other themes. This result applies on each stock exchange separately as well as on the pooled sample. The most frequently occurring economically significant financial disclosures are interim financial announcements including full interim reports (balance sheet, income statement, cash flow, and management report) or very short comments to monthly profits and sales (mostly encountered on RSE and VSE). The other main categories play a less important role and their importance varies by stock exchange. Still, the pair-wise differences between ranked scores show that owner- and business-related disclosures dominate the frequency of economically significant company- and management-related disclosures on all three stock exchanges. With respect to these sub-categories, the most frequent economically significant owner-related disclosures are the annual general meeting, extraordinary general meeting agendas and decisions, as well as bond issue details. For business-related news the most economically significant disclosures are about business restructuring details and news about business contracts signed. The most

frequent management-related disclosures deal with the changes in the company's management boards, and the most frequent company-related news items are about the registration of important legal changes in the companies' names, share capital, bond issues, etc. Overall, the results are quite similar to those reported by Ryan and Taffler (2004) who also reported higher frequency of explained financial news events. The main difference is that Ryan and Taffler (2004) reported the biggest explanatory power in analysts' recommendations; however, unlike ordinary press releases, public announcements do not contain such data.

Table 5: Frequency of announcements associated with economically significant reactions by main theme

	TSE		**RSE**		**VSE**		**TSE, RSE & VSE**	
Event window (-5;+5)	No[(a)]	%[(b)]	No[(a)]	%[(b)]	No[(a)]	%[(b)]	No[(a)]	%[(b)]
Business-related	149	8%	47	3%	103	2%	299	4%
Business-financials	340	19%	264	18%	575	12%	1,179	15%
Company-related	2	0%	11	1%	17	0%	30	0%
Management-related	20	1%	13	1%	29	1%	62	1%
Owner-related	108	6%	108	7%	319	7%	535	7%
Stock Exchange related	1	0%	0	0%	0	0%	1	0%
All themes	**620**	**34%**	**443**	**31%**	**1,043**	**22%**	**2,106**	**27%**
F-statistic for themes	54.22 ***		59.08 ***		104.34 ***		187.82 ***	
Chi-statistic for themes	46.73 ***		37.49 ***		114.07 ***		194.61 ***	

Note: (a) No - Number of economically significant return and volume events in which the main theme fell under one of the six main categories. (b) % - percent of news-associated events from total return and volume events. F-statistic measures the statistical significance of differences in means and is calculated using ANOVA on ranked frequency of themes. Chi-statistic measures the statistical significance of differences in mean ranks using Kruskal-Wallis procedure. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10.

Although Table 5 presents only the results for economically significant return and/or volume events, similar calculations made on return and volume events separately (not reported here) give a similar outcome – the highest frequency of events is induced by financial disclosures. Frequencies calculated for all public announcements irrespective of their economic significance (not reported here) reveal that the ordering of themes by frequency remains the same across all three stock exchanges, and the portion of financial news from all news considered increases almost two times when economic significance is taken into account. In other theme categories, the consideration of economic significance does not create such considerable changes. This also indicates that investors tend to value financial news more when compared to other types of public announcements (i.e., public announcements concerning financial news has a higher likelihood of bringing an economically significant reaction).

To see, whether or not the results depend on the tone of the news, economically significant return and/or volume events in the positive (generating positive returns) and negative news (generating negative returns) context were calculated (see Appendix 7). The results show that the importance of themes in terms of frequency remains the same regardless of the tone of the news. The biggest difference was in the reaction to the news on VSE, where negative news is almost twice as frequent as positive news driving economically significant abnormal return and/or volume changes. In the context of all announcements issued on VSE such phenomenon is not observed. Considering that such differences did not exist on TSE and RSE, this seems to indicate that the greater reaction to negative economically significant news on VSE maybe due to investor profiles (overreaction to negative news). This phenomenon deserves attention in future studies.

Overall, the results showed support for the expectation of H1 that financial news generates economically significant reactions more frequently than other types of news. Other themes played less important roles and their frequencies varied by stock exchange. This result was robust as it held for all public announcements irrespective of their economic significance, did not depend on whether the event was determined by return or volume and did not depend on the tone of the news. Differential price reaction to good and bad news existed only on VSE where economically significant negative news was twice as frequent as positive news.

2.3.3. Magnitude of reaction to news

Based on the rankings given to each volume and return value in the sample covering 2001-2005, it is possible to calculate the average rankings. It is important to note that the smaller the ranking is, the greater the abnormal price or volume reaction to the news. The average rankings by theme and stock exchanges are summarized in Table 6.

The average rankings of different themes vary at a 95% level of significance only in the case of RSE volume events. The results are robust to the tone of the news, and when the average rankings for each theme are calculated across the year span studied (not reported here), the average theme rankings varied at a statistically significant level across all themes only in two instances (2003 for TSE and 2005 for VSE). The average rankings for business-financials in the majority of the cases generated smaller reactions than company and management-related news, which is contrary to H2 that financial news generates larger market reactions than other news. This is a quite surprising result contrary to the findings of many previous empirical studies, including the study by Ryan and Taffler (2004) which showed that financial disclosures created lower average rankings (greater reaction). One reasonable explanation as to why the magnitude of financial news was lower than anticipated could be the type of other news included in this study. The previous study by Ryan and Taffler (2004) also looked at other company press releases that had not been disclosed in the stock exchange system. The Rules require that only major other news having impact on the prices be disclosed, which means that the

expected reaction to these non-financial news releases is expected to be higher than in case of ordinary press releases having small value to the investor.

Table 6 Differences in mean abnormal return and volume rankings across themes for economically significant news

	Mean abnormal return rankings			Mean abnormal volume rankings		
All news	TSE	RSE	VSE	TSE	RSE	VSE
Business-related	21.0	14.3	12.5	15.6	13.6	10.6
Business-financial	17.1	17.5	12.4	15.3	15.8	10.8
Company-related	11.0	14.0	11.4	12.0	5.0	12.0
Management-related	10.3	15.2	13.0	10.5	18.0	9.6
Owner-related	18.2	15.1	10.1	13.2	12.5	10.2
All themes	**18.1**	**16.4**	**11.7**	**14.7**	**14.8**	**10.6**
F-statistic for themes	2.06*	1.10	1.48	1.46	2.43**	0.35
Chi-statistic for themes	8.38	2.96	5.63	6.01	9.41**	1.54

Note: F-statistic measures the statistical significance of differences in means and is calculated using ANOVA on ranked abnormal returns and volumes. Chi-statistic measures the statistical significance of differences in mean ranks using Kruskal-Wallis procedure. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10.

To test whether or not the same results are obtained for all public announcements irrespective of their economic significance, rankings were calculated in a similar manner (see Table 7).

The results show that the differences between average theme rankings on all three stock exchanges become statistically significant (except for RSE returns), and the importance of the financial news category remains on average in the 2nd and 3rd position (4th and 5th in the case of economically significant events). This does seem to indicate that the consideration of economically significant events filters out some of the no-news public announcements, reducing the differences in the magnitudes of reactions between themes, and, therefore, reducing the relative importance of financial news in terms of the reaction's magnitude. It does not explain the contrary findings of Ryan and Taffler (2004) because if all other news behave in the same way public announcements do, the differences in magnitude of economically significant events should remain at a statistically insignificant level. One possible explanation could be that either the concentration on public announcements creates a situation where some of the unexplained events were actually caused by some other news besides public announcements that were not accounted for or the concentration on all news creates a possibility of picking up too many news items that actually have no connection with the economically significant reaction in the event window. The answer could be provided by some

future study that would investigate public announcements and other news in the same setting.

Table 7: Differences in mean abnormal return and volume rankings across themes for all news

	Mean abnormal return rankings			Mean abnormal volume rankings		
All news	TSE	RSE	VSE	TSE	RSE	VSE
Business-related	12.7	14.7	9.9	11.8	14.7	8.3
Business-financial	9.1	13.4	9.8	8.6	12.4	7.0
Company-related	7.9	14.6	7.6	6.2	16.1	7.4
Management-related	11.3	16.3	8.8	8.9	17.3	7.5
Owner-related	9.9	12.4	13.9	9.1	12.1	7.5
All themes	**10.7**	**13.7**	**8.9**	**9.9**	**9.9**	**7.5**
F-statistic for themes	8.3***	2.1*	4.1***	8.5***	13.5***	3.0***
Chi-statistic for themes	36.1***	6.8	28.8***	35.3***	22.0***	21.6***

Note: F-statistic measures the statistical significance of differences in means and is calculated using ANOVA on ranked abnormal returns and volumes. Chi-statistic measures the statistical significance of differences in mean ranks using Kruskal-Wallis procedure. Statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Overall, contrary to the expectations of H2, economically significant return and volume rankings across themes did not vary at a statistically significant level. Still, the results were influenced by the inclusion of economically significant events, because the same rankings calculated for all public announcements irrespective of their economic significance exhibited statistically significant differences across public announcements' themes. However, even in the latter case, the financial news were in the second or third position and not in the first position as could be expected based on the results from prior research.

3. MEASURING THE QUALITY OF PUBLIC ANNOUNCEMENTS

The purpose of this chapter is to introduce a methodological approach for measuring the quality of public announcements' disclosures. Most of the previous literature on this topic has concentrated on the financial reports of listed companies and some possible methods for measuring their quality have been proposed (for details, see Beattie et al., 2004). However, other types of disclosures, like press releases and public announcements, have received less attention. The reason why public announcements are distinct from the overall disclosure perspective is that while financial disclosure is generally regulated by the IFRS (International Financial Reporting Standards), public announcements' disclosures depend on the specific Stock Exchange's disclosure Rules, approved Corporate Governance Codes and companies' disclosure policies. Determining the actual public announcements' disclosure level may help in identifying areas that the Rules should govern in more detail to improve the overall level of disclosure quality of the companies listed on the stock exchange. Also, the regulation of public announcements may prove to be more efficient in reducing information asymmetries and agency conflicts as this information is disseminated in a more timely manner and covers wider variety of topics when compared to financial reports. They also remain more regulated than ordinary press releases.

3.1. Overview of disclosure quality measurement approaches

In order to measure disclosure quality, it needs to be defined. Singhvi and Desai (1971) posit that disclosure quality refers to completeness, accuracy, and reliability. Brown and Hillgeist (2006) suggest that it reflects the overall informativeness of firm's disclosures and depends on the amount, timeliness, and precision of disclosed information. Diamond and Verrecchia (1991) believe that disclosure quality is measured by the Bayesian investors' beliefs about security value after receiving disclosure. Finance and accounting literature have provided little theoretical help in defining disclosure, mostly concentrating on empirical applications. This thesis takes a step back by turning to information theory (Shannon, 1948) which equates the information's value with the unexpectedness of the message. Based on that theory, the definition of disclosure quality in this thesis is based on the element of "news" (unexpectedness) contained in it (for more detailed discussion see Sub-chapter 3.2.1.).

In order to translate a theory into an empirically usable form, previous methodological approaches used for measuring disclosure quality should be considered. In finance information asymmetry (Hefflin et al., 2002; Easley et al., 1997) and agency costs have been used (Depken et al., 2005). These approaches require data that may be difficult to obtain or that may inhibit their applicability in empirical studies using the scores. More suitable approach has been found in the information content concept which employs informational efficiency defined in

rational expectation models in finance (abnormal returns in the event window point at higher information content) and was used in Chapter 2. However, this approach does not consider other determinants of disclosure quality. Considering these drawbacks, the most promising solution seems to involve looking at accounting applications. Beattie et al. (2004) distinguished the following approaches used in accounting literature: subjective analysis and semi-objective analysis (either disclosure index study or textual analysis).

Subjective analysis is usually based on analyst ratings. The disclosure quality scores are compiled by some institution (for example the Association of Investment Management Research – AIMR) and are based on analyst evaluations of certain aspects of disclosure. In the case of the AIMR, 27 industries are covered with an average of 17 companies being evaluated by 13 analysts in each industry. The disclosure score includes separate ratings for annual reports, quarterly reports, and other published information and investor relations (Beattie et al., 2004). The problem with these ratings is that the disclosure score will measure the analysts' perceptions of disclosure rather than the actual disclosure (Lang and Lundholm, 1993). Also, the question remains as to whether or not analysts take the rating procedure seriously enough (Healy and Palepu, 2001). Despite these drawbacks and mainly because of their availability, AIMR ratings have been used in many studies, including Lang and Lundholm (1993), Healy et al. (1999), Gelb and Zarowin (2002), and Brown and Hillgeist (2006). Similar valuations to AIMR have been made in some countries by other institutions as well (e.g., in Canada by the Toronto Society of Financial Analysts and in Switzerland by the Swiss Banking Institute), but most of the developing markets are not covered with such indexes. In the case of public announcements, the use of such an approach would require the participation of many professionals, which maybe difficult to achieve. Also, due to the drawbacks of the method previously mentioned, such approach may not provide the best possible results.

A semi-objective analysis may be in the form of disclosure indexes. Indexes are based on the presence of items considered to be manifestations of disclosure quality. These items are most often drawn from the Jenkins Report (AICPA, 1994). Disclosure indexes may be calculated using a binary coding scheme (presence/absence of an item recorded as 1/0) or an ordinal coding scheme (quantified disclosure scored 2, qualitative disclosure scored 1, and no disclosure scored 0). The summed valuations may be weighted or un-weighted, nested (items grouped into categories), or un-nested. Most such disclosure index studies are based on Botosan (1997) and they assume that the amount of disclosure on specified topics proxies for the quality of the disclosure. As noted by Marston and Shrives (1991), however, the indexes measure the extent of disclosure, not necessarily the quality of the disclosure. Due to the difficulty of measuring disclosure quality directly, such an approach is considered adequate. Examples of such studies include Cooke (1989) and Robb et al. (2001). In the case of public announcements, this approach cannot be used directly as the creation of score sheets would be too complicated due to the varying nature of this communication –

the Rules are generally quite vague as to what must be disclosed in the form of public announcements.

Another semi-objective approach is textual analysis. Most often, this is conducted in the form of thematic content analysis (for a review, see Jones and Shoemaker, 1994). This type of content analysis extracts and analyzes themes covered by the message. The difference in this approach from index studies is that these themes do not have to be predefined, they can be added during the coding procedure, and the approach can be applied on narrative disclosures. Thematic content analysis has been used widely in accounting research in cases of social and environmental disclosures (e.g., Guthrie and Parker, 1990; Smith and Taffler, 2000), in financial reports (Ismail and Chandler, 2005; Lajili and Zéghal, 2005), and in other information releases (Breton and Taffler, 2001; Nielsen, 2004). This approach seems best suited for public announcements due to their narrative nature; however, the main problem with content analysis based approaches is that the quantification of disclosure does not necessarily indicate quality. Most empirical studies employing content analysis have usually assumed that company size adjusted disclosure quantity is a good enough proxy for disclosure quality. In order to improve the applicability of this approach, it should be complemented with other quality attributes, and the importance of quantity should not be overstated.

The most recent solution to the drawbacks of content analysis based disclosure quality measures is the one provided by Beattie et al. (2004). It concentrates on annual report disclosures and assumes that disclosure quality is dependent on 4 quality attributes: relative amount of disclosure (residual from a linear regression of disclosure quantity on company size and number of business segments); concentration of disclosure across main topics; concentration of disclosure across sub-categories (both measured by reversed Herfindahl indexes), and the number of non-empty categories. This approach is not entirely suitable for public announcements, as these disclosures cannot be expected to be evenly distributed across themes and the approach employed by Beattie et al. (2004) lacks sufficient theoretical background. In addition, public announcements are more complex and richer communications in the sense that they have qualities that cannot be used as attributes of disclosure quality in financial reports. Still, this approach basically merges the best qualities of index and content analysis based approaches, which if applied in a proper context, could provide a suitable solution for public announcements as suggested in Sub-chapter 3.2.

3.2. Public announcements' disclosure quality score

3.2.1. Theoretical basis for disclosure quality score

Disclosure quality in this thesis is defined in the context of information theory (Shannon, 1948). In 1948, Claude Shannon managed to formally prove that when an information source (in our context, the company) and a receiver (in our context, the investor) exists, the purpose of information transmission is to reduce

uncertainty. Thus, if no message is transmitted over the channel (in our context, the public announcement), then the receiver has no information about which state the source is in; therefore, the receiver is in a state of complete uncertainty. The less frequently the communication occurs, the more information it conveys. This notion explains why the timing of transmission, in our context, the public announcement, matters. Another important aspect of information theory is that the transmission uses codes which help the receiver make inferences about the state of the source by examining the channel. Instead of the channel having as many states as the source (a symbol or signal for every single meaning that would ever need to be conveyed), it is possible to group channel states, meaning that the channel can be smaller and the code simpler. However, messages cannot be transmitted instantly, because time is needed to space out channel states to make the groups distinguishable (partial or incomplete messages can occur). This also means that the channel only partially specifies the source state that in turn partially reduces the receiver's uncertainty. In human communication, the problem is even more complicated, as the number of potential states of the source is countless and the code used (words said) can be decoded by each receiver differently, thus causing the meaning of the message as transmitted by the source to change. This notion points at the importance of the value of the message content.

Therefore, disclosure quality of public announcements based on information theory should be considered in a human communication context[14], and as having two dimensions, both content and timing. These two dimensions are measured with six attributes. In creation of these attributes, the position is taken that theories of finance and accounting provide adequate means for defining the three content attributes (informativeness, relevance, precision) and that cognitive psychology (also based on information theory), which forms the basis for different newsworthiness theories widely used in public relations/mass communications literature[15], will be suitable for determining the three timing attributes (rarity, frequency, unexpectedness). It is possible to think of disclosures from a wider

[14] Information theory was initially applied in the context of communication systems development, considering communication a mechanical process that does not concern itself with the meaning and possible differences in meanings between different receivers of information.

[15] Newsworthiness of a press release determines whether the actual news will be published in a newspaper or covered in radio or television programs. The newsworthiness theory proposed by Galtung and Ruge (1965) distinguishes 12 factors of newsworthiness: frequency, threshold, intensity, unambiguity, meaningfulness, consonance, predictability, unexpectedness, continuity, composition, and relevance to elite nations, elite people, or something negative. A more recent model has been proposed by Shoemaker et al. (1991), which distinguishes two main concepts that draw people's attention to news: deviance and social significance. The deviance concept includes novelty, unusualness, sensationalism, and conflict. Social significance encompasses importance, impact, and consequence. In addition to these models, extant surveys have been conducted among editors to determine the characteristics of newsworthiness which mostly overlap the measures already listed in the two models.

perspective, considering, for example, the stakeholder theory, impression management theory, and strategic management theory that put great emphasis on the importance of disclosure quality from the perspective of society. However, in selection of quality attributes, this thesis remains in the finance domain and assumes that the main motivation for public announcement disclosures is the reduction of information asymmetries, and that public announcements remain one of the main timely sources of information for the investor.

3.2.2. Measurement of public announcements' content quality

The measurement of content quality requires an understanding of the meaning of announcements. To achieve that, a thematic content analysis of announcements was manually conducted as described in Chapter 1 and Appendix 4. Themes were determined based on the Rules and summarized into six main categories, with 69 sub-categories as presented in Table 1. The category "stock-exchange" is excluded in the following discussions because of the vagueness of the news and because the stock exchange's announcements are not, in most cases, issued by the firms themselves.

Based on the content of announcements, three disclosure quality attributes are introduced: informativeness, relevance, and precision. All these attributes were selected based on finance and accounting theories.

Informativeness – The objective of a public announcement is to inform investors of important events. Most disclosure theories concentrate on discretionary disclosures, because these are assumed to be of higher quality than mandatory disclosures (Dye, 2001). In the case of public announcements, most of the disclosure is mandatory in the sense that the Rules require its publication. On the other hand, the announcement that was required to be disclosed anyway may include information that exceeds the minimum required level, and, therefore, could be considered discretionary in part. Informativeness will be measured in two parts to take into account both effects. First, the announcements that contain topics that are not required to be disclosed by the Rules are considered discretionary (score of 1). Second, the relative length of the announcement is used to determine whether the announcement contains discretionary components or only fulfils the minimum mandatory disclosure requirements. The minimum mandatory disclosure level is set equal to the average length of similar announcements on the same stock exchange during the same year[16]. If the company's announcement is longer in terms of sentence count, the announcement receives a score of 1 for a higher discretionary component. In the case where an announcement contains several

[16] If the sample used contains a reasonably large quantity of companies, the numbers of sentences disclosed could be divided into groups according the size of the company. This approach was not used in this thesis, as the number of companies representing the same stock exchange was small, and the size groups would have included companies of very different sizes, meaning that results could have been even more biased than in case of using the average count of sentences.

topics (Type 2 or 4), the procedure is the same across all of them; the only difference is that the maximum informativeness score remains 1. For example, if two topics are covered, and only one of them exhibits informativeness, the total score is 0.5. Although this second approach may seem highly dependent on the length which may or may not be related to the actual informativeness, one has to consider that in the case of public announcements, the no-news component is smaller than in the case of ordinary press releases and that their content remains more regulated. Considering the possible punishment for violating the regulations, it is quite common that companies listed on developing capital markets tend to disclose only as little as required through the stock exchange system. In cases of more developed markets, the no-news component may be higher, but even in that case the consideration of company size should reduce the possibility of picking up too much "faulty" informativeness. The part of "faulty" informativeness that does get picked up, on the other hand, has a small influence on the overall disclosure quality as it provides only a maximum of one point out of six, and in the case of announcements containing several themes, the maximum remains between 0 and 1. An alternative approach for measuring informativeness could be a qualitative evaluation. This requires the distinction of voluntary news, which may turn out to be unfruitful because the main theme that listed companies make voluntary public announcements about concerns ordinary business activity; however, such disclosures make up only a small part of similar disclosures made in the press. Considering the low amount of voluntary information disclosed on the markets in question, and the importance of mandatory news in such settings, no further attempt is made to separate it from mandatory disclosure. This could be done in the context of overall disclosure or if considering all press releases of the company.

Relevance – Each investor is more interested in announcements that help them correct their expectations about the firm's future cash flow, because if the announcement adds no new information, it is less likely to cause any loss or gain for the investor and there is no reason for the investor to act on it. This is the basic idea of the market efficiency based argument used in finance and in accounting, which assumes that the change in investors' expectations will lead to investor action that will be manifested in price and trading volume changes (Beaver, 1968; Ball and Brown, 1968). The speed of such adjustments depends on the efficiency of the capital markets and the size (significance) of the reaction, and shows whether or not the news was already known and had value to the investors. Chapter 2 introduced the approach that enables to filter out announcements that induce economically significant price and trading volume changes. Based on that approach, the relevance in the stock exchange context can have two different dimensions. First, the news can be considered relevant to the market as a whole (score of 1) if its disclosure causes economically significant abnormal return in the event window. In this thesis, the announcement is considered economically significant to the market only if the abnormal return in the event window of (-5;+5) is +/- 2 standard deviations from the security's average annual abnormal return (as calculated in Chapter 2). Second, the news can be considered relevant to the

investor (score of 1) if it causes significant trading volume increase. Therefore, the trading volume increases in the event window (-5;+5) are considered economically significant if it is in the list of the biggest trading volumes of the security during the year (the number of volume events is set equal to the number of economically significant return events). All calculations are based on security, meaning that the possible differences in how different stocks incorporate new information reported by Ho and Michaely (1988) do not affect the results. The maximum relevance score is set equal to 1; thus, announcements exhibiting both relevance dimensions will not receive a higher score than announcements exhibiting only one of them. Another approach for determining the relevance could be looking at each investor or investor group separately and determining the subjective relevance of each type of announcement to that group, but that would be more complicated and may not give the most accurate picture of the value of the news to the market as a whole.

Precision – It is important to consider precision because if an announcement is vague, investors' valuations of the possible state of the company are less accurate. This increases the differences between investors' expectations. Li (2005), in his rational expectations model, showed that less precise disclosure increases risk premium and volatility of stock return. The opposite holds for more precise signals. Therefore, if the signal carried by the announcement is precise, the market reaction will be more unanimous and the stock return volatility following the announcement is expected to be smaller or equal to the volatility prior to the event (disclosure of an announcement). In this thesis, the signal is considered precise (score of 1) if the stock return volatility (dispersion of stock returns) in the event window after the event date (+1;+5) is equal to or smaller than the volatility in the estimation window (calculated across days (-135;-6)). It is possible to argue that precision and relevance give contradictory meanings to the "news" component; however, the precision complements the relevance component, giving higher value to news that induces quick and stable price movements.

3.2.3. Measurement of public announcements' timing quality

Timing refers to the effect of news timing on its value to the investor. All three attributes in this category relate to concepts borrowed from cognitive psychology theory that deals with human perception and selective attention. Most research in this area, including informativeness theories of public relations literature, are based on Broadbent's model (Broadbent, 1958). The basic idea is that the less attention is paid to the news, the less likely it would be to help to correct investors' expectations, (i.e., the less valuable the news).

Rarity – According to cognitive psychology theory, people tend to put greater emphasis on and pay more attention to rare events. In this thesis, an announcement is considered rare (score of 1) if the theme has not appeared in the announcements of the preceding year. This period was selected as many public announcements occur in at least at one-year intervals, and the announcements occurring more frequently should not be considered rare. In the case of an announcement

containing several topics (Type 2 or Type 4), the procedure is the same across all of them; the only difference is that the maximum rarity score remains 1 (for example if two topics are covered and only one of them exhibits rarity, the total score is 0.5).

Frequency – If announcements are made at small intervals, less attention would be paid to them than to less frequently occurring announcements. Therefore, in this thesis, announcements are considered infrequent (score of 1) if the time period from the company's previous announcement was above the annual average of the frequencies of the same company. Concentration on the average frequency of the same company ensures that companies pursuing less frequent disclosure strategies are not punished for differences in their disclosure policy.

Unexpectedness – Some public announcements' dates are set in advance and disclosed to all investors through an investor calendar or using previous announcements. These mostly include quarterly and annual report disclosure dates along with annual general meeting and extraordinary general meeting dates. Due to the element of surprise, unplanned announcements are considered more valuable to investors, so they receive a score of 1.

It can be claimed that stable, expected disclosure also has value, but this assumption coincides more with other theories which could explain disclosure, like impression management for example, and contradicts the disclosure quality definition used in this thesis. Also, the definitions presented above do not necessarily imply the lack of importance of frequent disclosures. For example, unexpectedness and rarity are defined in terms of the announcement's theme, which means that an announcement on a rare theme, or disclosed in addition to the news mentioned in the investor calendar (hence, unexpected), is likely to increase the number of announcements disclosed during the year. The frequency definition in this thesis is not the direct opposite of the number of announcements issued, because it measures the distance from the previous announcement, meaning that if there are two or three longer time periods in a year without news, the actual number of announcements disclosed during the year maybe the same, bigger, or smaller than for the company with the same number of announcements disclosed at more even intervals.

3.2.4. Calculation of the disclosure quality score

The attributes can be aggregated first on the announcement level, as the sum of attributes' scores similarly to 1/0 rankings used in index studies:

$$Dq = I + Re + P + Ra + F + U \tag{6}$$

where

I – The informativeness score is equal to 1 if announcement is of discretionary type, or the average length of the announcement exceeds the average length of companies' announcements made on the same stock exchange during the same year. The score may be between 0 and 1 if the announcement is of Type 2 or

Type 4 (in that case 0/1 coding is given to each sub-category and the average of the categories is then used as the score).
Re – The relevance score is equal to 1 if an announcement creates abnormal return in the event window below or above two standard deviations of the average abnormal returns of the same firm on the same year. Is equal to 1 if the announcement creates abnormal volume in the event window that is in the top abnormal volumes of the same firm on the same year. The maximum score per announcement is 1.
P – The precision score is equal to 1 if the dispersion of returns during the event window after event decreases or remains at the same level, compared to dispersion of returns in the estimation window.
Ra – The rarity score is equal to 1 if the topic had not appeared in the announcements of the company during the preceding one-year period. The score may be between 0 and 1 if an announcement is of Type 2 or Type 4 (in that case 0/1 coding is given to each sub-category and the average of the categories is then used as a score).
F – The frequency score is equal to 1 if the time period from company's previous announcement was above the annual average of the frequencies of the same company.
U – The unexpectedness score is equal to 1 if the announcement's disclosure date was not set in advance.

Calculated in this manner, the maximum score per announcement is 6, and the greater the score of an announcement, the greater is its disclosure quality. The use of un-weighted scores is more appropriate as the use of weights may not improve the results (see Spero, 1979 for discussion) and as it is also difficult to determine the weights best suited for measurement as these could differ across investors[17]. Annual firm-based scores can be calculated as the sum of individual announcements' scores:

$$DQ_{in} = \sum_{T=1}^{N_{in}} Dq_{T,in} \tag{7}$$

where N_{in} is the total number of announcements of firm *i* on year *n*

Content analysis enables to calculate theme-based quality scores based on the first coded term of an announcement[18] as follows:

[17] The validity of the un-weighted score was also investigated based on the empirical data by running the principal components on the sample. The results showed that the regression coefficients of the first principal component for all six attributes were in the range of 0.34-0.43, indicating the appropriateness of the un-weighted score.
[18] Some announcements may include more than one main theme (Type 2), but the number of such announcements containing more than one main theme are rare (0.8% of announcements on TSE, 0.4% on RSE, and 0.3% on VSE) and do not bias the results.

$$DQsub_{in} = \sum_{T=1}^{Nsub_{in}} Dq_{T,in} \quad (8)$$

where $Nsub_{in}$ is the total number of announcements of firm i on year n from main category sub (business-related, business-financials, company-related, management-related or owner-related)

Measures calculated using Formulas 7 or 8 can be summed across all years and in that case term n is skipped. Total disclosure quality can also be partitioned into disclosure quality six attributes and two main dimensions (content and timing). In that case, Dq is set equal to the quality attribute (I, Re, P, Ra, F or U)/dimension score.

Descriptive statistics of the firm-based disclosure quality/attribute scores calculated according to Formula 7 are presented in Table 8.

Table 8: Descriptive statistics of total disclosure scores per firm in a year

	Maximum of total disclosure/attribute scores per firm a year				Minimum of total disclosure/attribute scores per firm a year			
	TSE	RSE	VSE	All	TSE	RSE	VSE	All
Total informativeness score (*I*)	32.1	34.1	23.2	34.1	1.0	0.0	0.0	0.0
Total relevance score (*Re*)	10.0	9.0	14.0	14.0	0.0	0.0	0.0	0.0
Total precision score (*P*)	29.0	29.0	37.0	37.0	2.0	1.0	0.0	0.0
Total rarity score (*Ra*)	15.7	11.0	8.5	15.7	0.0	0.0	0.0	0.0
Total frequency score (*F*)	22.0	18.0	23.0	23.0	3.0	1.0	2.0	1.0
Total unexpectedness score (*U*)	43.0	35.0	34.0	43.0	1.0	1.0	1.0	1.0
Total content score (*C*)	65.1	72.1	70.7	72.1	10.0	2.2	4.2	2.2
Total timing score (*T*)	72.7	56.0	57.8	72.7	6.5	2.2	4.0	2.2
Total disclosure score (*DQ*)	**137.8**	**128.1**	**128.5**	**137.8**	**17.5**	**4.4**	**9.0**	**4.4**

	Average of total disclosure/attribute scores per firm a year				Standard deviation of total disclosure/attribute scores per firm a year			
	TSE	RSE	VSE	All	TSE	RSE	VSE	All
Total informativeness score (*I*)	11.2	10.2	5.3	7.5	6.9	8.4	4.6	6.5
Total relevance score (*Re*)	3.4	2.8	2.0	2.5	2.2	2.1	2.0	2.2
Total precision score (*P*)	10.7	11.5	9.8	10.3	6.0	8.0	5.2	6.0
Total rarity score (*Ra*)	4.4	3.6	2.1	2.9	3.0	2.6	1.8	2.5
Total frequency score (*F*)	7.7	6.4	6.0	6.5	3.7	4.2	3.0	3.5
Total unexpectedness score (*U*)	12.1	12.7	7.8	9.6	8.9	9.1	5.3	7.4
Total content score (*C*)	25.2	24.5	17.1	20.3	13.6	17.3	10.0	12.9
Total timing score (*T*)	24.2	22.7	15.9	19.0	14.7	14.0	8.8	12.0
Total disclosure score (*DQ*)	**49.4**	**47.2**	**33.0**	**39.2**	**27.7**	**30.9**	**18.3**	**24.4**

The results show that informativeness, precision, and unexpectedness have the greatest effect on total disclosure quality. The maximum and minimum scores across stock exchanges exhibit great differences, while the variability of scores on a stock exchange basis is the smallest on VSE. This result indicates that disclosure quality of companies listed on VSE is more homogenous than those listed on TSE and RSE. Similarly, theme-based disclosure scores can be calculated using Formula 8, but these will be used in the validity tests and will be presented in the following Sub-chapter 3.3.

It can be claimed that the disclosure quality score calculated according to Formula 7 is dependent on the number of announcements disclosed, meaning that the quality maybe influenced by the number of announcements issued. Such direct association does not exist as the announcement exhibiting no quality attribute will receive a score of 0. As a robustness check, the disclosure quality can be calculated as an average announcement based score with a minimum value 0 and a maximum value 6 for each firm (see Formula 9).

$$\overline{DQ}_{in} = \frac{1}{N_{in}} \sum_{T=1}^{N_{in}} Dq_{T,in} \tag{9}$$

where N_{in} is the total number of announcements of firm i on year n

If the firm's total disclosure quality is high and the average disclosure quality per announcement is low relative to other companies, this would indicate that the company issues more announcements that provide more information to the investors, but the average quality of an announcement is lower (the portion of no-news component in announcements is higher). To test the association between the two scores, firm-based scores were calculated according to Formula 7 and Formula 9 across all three markets. The pair-wise correlation coefficient of the total scores was 0.6. Most of the attributes exhibited correlation coefficients between 0.6 and 0.8. The lowest correlations were for frequency (F) at 0.3 and precision (P) at 0.5. These results show a strong statistically significant positive association between the two measures providing support to the claim that the summed score is not heavily driven by the number of announcements disclosed and it is not a poorer quality measure than the announcement-based score. On the other hand, the drawbacks of the announcement-based score should be considered. First, it will punish firms with more frequent no-news disclosures more severely than firms with fewer disclosures. Considering that most companies listed on the three markets prefer to make infrequent disclosures to fulfil only the mandatory requirements, the punishment of companies pursuing more open disclosure policies seems unreasonable. Second, the increase of a no-news component in announcements means that it is more difficult to make news (as defined in this thesis) than in the context of no disclosures, and, therefore, it does not seem reasonable to assume that an increase of no-news disclosures should reduce the perceived overall disclosure quality. Considering these factors, Formula 7 seems better suited as a disclosure quality measure in the quality definition context provided and the results of the

following validity tests will be presented only for that measure. The tests were also made using Formula 9, but their results mostly copied the ones of the total score.

3.3. Testing the validity of the disclosure quality score

The best possibility for testing the validity of a disclosure quality score would be its comparison with an already existing analyst evaluations based score. This is not possible for the sample at hand. Another possibility is to compare the score with quantitative disclosure scores. It is believed that if the quantity of voluntary disclosure correlates with disclosure quality, it can be used as its proxy in empirical research (as shown by Botosan, 1997; Hussainey et al., 2003). In the case of public announcements, these will also include mandatory elements, which are difficult to entangle from voluntary elements, but assuming that public announcements contain timely information that should be important to each investor, then the distinction between the two should matter less than in the case of financial reports. Considering this reasoning, the quality of public announcement disclosures could be proxied with announcement length (measured as the total number of sentences disclosed by the company per year - *Sent*)[19] and frequency of announcements (measured as the total number of announcements issued by the company per year – *NoAnn*) assuming that the quantity based measures are well-correlated with qualitative measures. The pair-wise correlation coefficients between disclosure quality score (*DQ*) and length of announcements (*Sent*) was 0.64 and between disclosure quality score (*DQ*) and number of announcements (*NoAnn*) was 0.96. Also, for disclosure quality attributes, all pair-wise correlation coefficients between attributes, disclosure quality score, and quantitative scores exhibited statistically significant positive associations at $p<0.01$ (see Appendix 9 for details).

These results seem to support the validity of the disclosure quality score. Additional indirect tests of validity are provided in the following sub-chapters considering the expected behaviour of disclosure quality score. These tests will be based on differences in ranked mean scores (using ANOVA on ranks and by employing Kruskal-Wallis procedure) that are analyzed across years, company size groups, themes, and stock exchanges. Some results will also be presented by partitioning the samples into low, medium, and high quality disclosure companies. In order to provide some means for understanding the possible sources of differences the frequency (number of announcements per year) and length of announcements (number of sentences disclosed) will also be presented in some of the tables.

[19] Some content analysis based studies correct disclosure quantity for size, due to expected positive association; however, considering the regression model approach employed afterwards the use of a non-corrected score makes the results more easily interpretable and enables checking for positive association with size through regression models.

3.3.1. Disclosure quality across years

Public announcements are highly regulated disclosures which means that it is reasonable to assume that if stock exchange regulations have improved gradually over time and listed companies have followed these properly, disclosure quality should also have increased across years. Previous investigation of the Rules of the three stock exchanges reveals that considerable amendments were made prior to 2005. Assuming that these changes were made to increase disclosure quality, and assuming that the enforcement has improved over time, the third hypothesis is:
H3: Average public announcements' disclosure quality is statistically significantly different across years.

To test the variation of disclosure quality across years, the scores are calculated using Formula 7. The results are summarized in Table 9 (Formula 7 term *i* skipped and score divided by the number of listed companies).

Table 9: Disclosure quality score per firm per year from 2001 to 2005

	Annual average of total disclosure/attribute score per firm					Difference in ranked scores' means	
	2001	2002	2003	2004	2005	F-statistic	Chi-statistic
Total informativeness score (*I*)	6.1	6.8	7.0	8.3	9.4	2.64**	9.96**
Total relevance score (*Re*)	2.2	2.3	2.6	2.4	2.8	0.46	1.87
Total precision score (*P*)	9.7	9.8	9.0	11.5	11.5	2.66**	10.16**
Total rarity score (*Ra*)	2.1	2.6	2.7	3.5	3.6	4.33***	15.70***
Total frequency score (*F*)	6.1	6.0	6.1	6.7	7.4	1.17	4.71
Total unexpectedness score (*U*)	8.2	8.7	8.9	10.7	11.6	3.10**	12.16**
Total content score (*C*)	18.0	18.8	18.6	22.2	23.6	2.39*	9.24*
Total timing score (*T*)	16.4	17.4	17.7	20.8	22.6	3.26**	12.38**
Total disclosure score (*DQ*)	**34.4**	**36.2**	**36.4**	**43.0**	**46.2**	**3.00****	**11.62****

Note: F-statistic measures the statistical significance of differences in means and is calculated using ANOVA on ranked disclosure quality scores. Chi-statistic measures the statistical significance of differences in mean ranks using Kruskal-Wallis procedure. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10.

As can be seen, most disclosure quality components show an increasing trend in time implying that improvement of the Rules and/or the disclosure policies of the listed companies have increased the quality of disclosure. In terms of economic significance, the increase of a company's annual score from 34.4 to 46.2 means an 11.8 point increase, which is equal to issuing at least five average quality announcements (this represents on average nearly 25% of announcements issued in 2005 by a company on average). This is an economically significant change.

Statistical tests on ranked means[20] also show that quality attributes' mean rankings are statistically significantly different in all cases except for relevance and frequency. This is primarily due to the number of economically significant events that can be expected to be a quite stable number and the stability of frequency scores relates to a quite small change in the number of announcements issued. On a yearly basis, Bonferroni tests (not reported here) confirm that the strongest statistical difference is between the 2001 and 2005 results and between the 2001 and 2004 results. For the remaining years, the pair-wise differences do not appear statistically significant.

Another approach for analyzing the differences is to consider the changes in the level of disclosure quality, frequency, and length of announcements across years (see Table 10)[21].

Table 10: Grouped disclosure scores per year from 2001 to 2005

	Annual average of total disclosure score (*DQ*) per firm			Average frequency of announcements per firm a year			Average number of sentences in announcements per firm a year		
Disclosure quality group	High	Medium	Low	High	Medium	Low	High	Medium	Low
2001	48.1	28.8	25.5	21.6	13.1	11.8	170.4	72.8	80.1
2002	53.6	32.0	21.9	23.9	12.9	10.1	261.6	98.3	80.2
2003	57.1	29.2	21.5	25.0	13.2	9.8	270.7	113.1	91.7
2004	63.3	39.5	25.1	29.8	15.6	11.4	377.7	156.1	96.4
2005	65.5	43.8	28.2	29.2	19.7	13.7	404.3	183.3	115.1
Average 2001-2005	**57.5**	**34.7**	**24.5**	**25.9**	**14.9**	**11.4**	**296.9**	**124.7**	**92.7**

The average companies' scores tend to increase over time, especially in companies with high and medium quality disclosure. In firms with low quality disclosure, the results are more mixed. In terms of announcement frequency, it is noteworthy that the high quality disclosure group has more than twice as many announcements as the low quality disclosure firms. The same trend applies for announcement length. This indicates that higher frequency and greater length are associated with an

[20] Disclosure quality scores based on Formula 7 were ranked across all years and all three stock exchanges from the biggest (1) to the smallest (*r*).

[21] Quality groups are formed by ordering each company's summed score from Formula 7 across 2001-2005 on a stock exchange basis, and by dividing the companies into three groups (upper third, medium third and bottom third). Each group forms a sample that contains equal number of companies from each stock exchange. Disclosure quality is calculated based on Formula 7 for each year as an average of annual company-based scores across the sample. Average frequency is calculated as an average of annual company-based number of announcements across the sample. Average number of sentences is calculated as an average of annual company-based number of sentences across the sample.

increase in overall quality of announcements. Although not reported here, the same calculations made on a stock exchange basis confirm the tendencies reported in Table 10.

Overall, the results support H3, indicating that the disclosure quality score seems to capture the increase in disclosure quality across years we expected it to encompass.

3.3.2. Disclosure quality across company size groups

One of the main company characteristics assumed to have a strong impact on disclosure quality is the size of the firm. Positive association between size and disclosure was first hypothesized by Singhvi and Desai (1971). He argued that a larger company has lower information generation costs, greater interest in easier marketability of its securities, easier access to external financing, and lower adverse effects of disclosure, which should lead to greater disclosure. This line of reasoning is supported by agency theory, according to which disclosure is related to the amount of outside financing (Jensen and Meckling, 1976) and as a larger firm uses more outside capital, its incentive to disclose more should be bigger (Leftwich et al., 1981). Also, bigger firms have an incentive to disclose more, because potential litigation costs and net disclosure-related costs are an increasing function of firm size (Skinner, 1994; Ali et al., 1994). Empirical support for these arguments is very strong (see Appendix 5). Based on this reasoning, the fourth hypothesis is:

H4: Average public announcements' disclosure quality is statistically significantly different across company size groups.

To test the differences in disclosure quality according to size, three size groups are formed[22]. Then, total disclosure scores are calculated using Formula 7 (term *i* and *n* skipped and score divided by five times the number of listed companies in each size group). The results are presented in Table 11. As can be seen, the total scores as well as the disclosure quality components tend to increase with company size - the total score of small firms is 14 points smaller than in big firms. This difference corresponds to at least six average quality announcements per year (30% of announcements issued on average per year by the end of 2005). That is an economically significant difference. In all attribute levels except for relevance and rarity, the differences in mean scores are also statistically significant. What is also noteworthy is that the announcements of the big firms tend to be more precise, more informative, and more unexpected. Although not reported here, similar calculations made across years confirm that the differences between the scores across size groups have decreased in time. While in 2001, big firms exhibit total disclosure scores that exceed the small-sized firm group by 20.2 points and the

[22] Companies are ordered according to the average market value of equity during 2001-2005 by each stock exchange and divided into three groups (i.e. group "big" includes the upper third of companies from each stock exchange).

medium-sized firm group by 9.8 points, in 2005 the differences are 11.1 and 0.9 respectively. This means that by 2005, the medium-sized firms' announcements have quality levels almost equal to the quality of announcements of big firms, and although small firms have increased the quality of their announcements, their quality still remains below that of medium-sized and big companies. This does seem to imply that big firms are able to reach higher disclosure quality levels more quickly than medium-sized firms, and the benefits of increased disclosure quality for small firms tends not to exceed potential information generation costs. Overall, H4 is supported, but in an annual context, the more recent years rebuff it.

Table 11: Disclosure quality score per firm per year by company size groups

	Annual average of total disclosure/attribute score per firm			Difference in ranked scores' means	
	Big	Medium	Small	F-statistic	Chi-statistic
Total informativeness score (*I*)	8.7	7.8	6.4	2.64*	5.15*
Total relevance score (*Re*)	2.6	2.5	2.3	0.32	0.63
Total precision score (*P*)	12.7	10.1	8.7	10.23***	18.57***
Total rarity score (*Ra*)	3.0	2.8	2.9	0.76	1.39
Total frequency score (*F*)	7.7	6.7	5.4	9.58***	18.27***
Total unexpectedness score (*U*)	12.8	9.0	7.9	11.45***	21.30***
Total content score (*C*)	24.1	20.3	17.4	6.24***	11.93***
Total timing score (*T*)	23.5	18.5	16.2	9.71***	18.14***
Total disclosure score (*DQ*)	**47.6**	**38.8**	**33.6**	**8.05*** **	**15.24*** **

Note: F-statistic measures the statistical significance of differences in means and is calculated using ANOVA on ranked disclosure quality scores. Chi-statistic measures the statistical significance of differences in mean ranks using Kruskal-Wallis procedure. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10.

The results in Table 12 show the numbers for size and disclosure characteristics' groups[23]. Only big firms in high quality disclosure group have considerably higher quality levels than in smaller firms. For the low disclosure quality group, the size of the company has almost no impact on its disclosure quality. Still, as noted previously, from 2004 forward, even in the big firms' group with high quality disclosures, the disclosure scores tend to remain slightly below these of medium-sized companies. In terms of announcement frequency and length, only big firms with high disclosure quality exhibit higher values than smaller

[23] The sample is defined according to two criteria set in note 21 and note 22. Disclosure quality is calculated based on Formula 7 as an average of annual company-based scores across the sample. Average frequency is calculated as an average of annual company-based number of announcements across the sample. Average number of sentences is calculated as an average of annual company-based number of sentences across the sample.

companies. The differences between the remaining companies' groups are dispersing.

Table 12: Grouped disclosure scores across company size groups

	Annual average of total disclosure score (*DQ*) per firm			Average frequency of announcements per firm a year			Average number of sentences in announcements		
Disclosure quality group	High	Medium	Low	High	Medium	Low	High	Medium	Low
Big company	64.9	36.9	24.8	31.1	18.1	7.7	602.6	111.1	56.7
Medium company	55.0	35.0	24.2	22.7	10.0	9.8	160.1	82.6	78.9
Small company	52.0	32.0	24.2	22.2	14.0	11.7	224.0	133.0	98.3
All companies	**57.5**	**34.7**	**24.5**	**25.9**	**14.9**	**11.4**	**296.9**	**124.7**	**92.7**

Overall, the validity test supports some size-related pressure on the constructed disclosure quality score amongst high and medium disclosure quality firms, as expected. In the case of low disclosure quality firms, the size has no effect on disclosure quality. This may be an indication of the fact that once the company chooses its disclosure level, it sticks to it, and only some bigger firms may wish to invest in additional information disclosure. Therefore, this result does not directly question the suitability of the disclosure quality score.

3.3.3. Disclosure quality across themes and stock exchanges

Most of the event-study based research generally assumes that information content of financial reports is higher than is the case with other information. Previous tests on economic significance of market reactions to public announcements on the three stock exchanges presented in Chapter 2 revealed that business-financial disclosures coincided with around 27%, owner-related around 12%, and business-related disclosures around 7% of total economically significant return and volume movements. This indicates that these three categories are more closely monitored by investors in terms of frequency, which means that their quality should be higher than is the case with of other types of announcements. Also, the differences in quality levels should be noteworthy. Therefore, the fifth hypothesis is:
H5: Average public announcements' disclosure quality is statistically significantly different across themes.

Disclosure quality can be sub-divided into themes according to Formula 8 (term *i* and *n* skipped and score divided by five times the number of listed companies). This calculation shows how disclosure quality is formed from different types of news across disclosure quality attributes. Difference-in-means tests are based on ranked disclosure quality scores.[24] The results for total disclosure quality scores

[24] Company based scores by each theme were ranked across all years and all three stock exchanges from the biggest (1) to the smallest (*r*).

across the three stock exchanges is presented in Table 13, which shows both economically and statistically significant differences across the themes, supporting H5. Business-financials, business-related, and owner-related disclosures exhibit the highest quality. The same results apply on the attribute level (not reported here); the only difference is that business-financial disclosures have lower quality in terms of rarity and unexpectedness. This is due to their more frequent disclosure because of planned release dates. More detailed discussion on the theme-based differences across stock exchanges will follow.

Table 13: Disclosure quality score per firm per year by themes

	Annual average of total disclosure score (*DQ*) per firm			Portion of total disclosure quality			Difference in ranked scores' means across stock exchanges	
	TSE	RSE	VSE	TSE	RSE	VSE	F-statistic	Chi-statistic
Business-related	20.7	11.4	5.9	42%	24%	18%	15.51***	27.72***
Business financials	13.0	16.8	9.6	26%	36%	29%	19.98***	35.71***
Company-related	0.8	2.4	1.9	2%	5%	6%	1.31	2.01
Management-related	4.4	3.3	2.6	9%	7%	8%	5.18***	8.79**
Owner-related	10.6	13.2	13.0	21%	28%	40%	1.88	3.71
All themes	**49.4**	**47.2**	**33.0**	**100%**	**100%**	**100%**	**14.05*** **	**25.50*** **
F-statistic for themes	27.08 ***	7.11 ***	38.19 ***					
Chi-statistic for themes	56.36 ***	21.98 ***	121.54 ***					

Note: F-statistic measures the statistical significance of differences in means and is calculated using ANOVA on ranked disclosure quality scores. Chi-statistic measures the statistical significance of differences in mean ranks using Kruskal-Wallis procedure. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10.

Investigation of the Rules of the three stock exchanges reveals that while by the end of 2005 the texts of TSE and RSE Rules were quite similar, the VSE wording differed considerably. Previous empirical investigations of differences in disclosure behaviour based on content analysis (for details see Laidroo, 2007) reveal that there seems to be differences in the content and quantity of information disclosed. As two quantitative measures showed a high correlation with quality scores, we could expect to see differences in disclosure quality scores across stock exchanges. Based on this notion the sixth hypothesis is:

H6: Average public announcements' disclosure quality is statistically significantly different across stock exchanges.

In terms of stock exchange based differences, it is clear that in terms of total disclosure the TSE and RSE average scores exceed those of VSE, but the differences between the first two are very small, indicating more similar disclosure quality levels. Theme-based results show that the TSE disclosures' quality is higher

in business and business-financials and for on RSE and VSE in business-financials and owner-related disclosures. Regardless of disclosure quality levels, these three themes remain the most important as shown in Table 14. What is noteworthy is that the frequency and length do not automatically lead to higher quality. Especially good examples are the RSE and VSE owner-related disclosures in medium and low quality groups. This means that these announcements are made relatively more often than other announcements, and they tend to be longer but provide less significant information to the investor. Some of the differences in the importance of different themes across stock exchanges relates to the subjects covered.

Table 14: Portion of disclosure quality by disclosure quality groups and themes

	% of total disclosure quality			% of total number of announcements			% of total sentences of announcements		
Disclosure quality group	High	Medium	Low	High	Medium	Low	High	Medium	Low
TSE									
Business-related	43%	34%	31%	44%	30%	21%	27%	15%	4%
Business-financials	21%	25%	26%	24%	35%	45%	49%	66%	89%
Company-related	6%	10%	12%	2%	1%	1%	1%	2%	0%
Management-related	11%	12%	12%	9%	8%	4%	4%	3%	1%
Owner-related	19%	19%	19%	21%	26%	29%	19%	14%	6%
All themes	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
RSE									
Business-related	18%	28%	33%	17%	26%	21%	16%	23%	15%
Business-financials	44%	18%	18%	44%	24%	24%	29%	26%	29%
Company-related	7%	17%	7%	5%	3%	2%	12%	7%	0%
Management-related	12%	9%	8%	9%	7%	4%	6%	4%	1%
Owner-related	19%	28%	34%	25%	40%	49%	37%	40%	55%
All themes	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
VSE									
Business-related	23%	23%	22%	14%	9%	8%	9%	4%	4%
Business-financials	22%	20%	23%	40%	32%	40%	31%	11%	15%
Company-related	9%	12%	12%	5%	2%	5%	3%	1%	2%
Management-related	13%	13%	10%	6%	9%	7%	4%	5%	3%
Owner-related	33%	32%	33%	35%	48%	40%	53%	79%	76%
All themes	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

First, there is an overwhelming disclosure quality in business-related disclosures of firms with high disclosure quality on TSE that corresponds to the frequency of these announcements, but is less important in terms of length. Most of these announcements concern business agreements, company restructurings, or comments to court cases. Although business-financials are important from the quality perspective and their length captures over half of the sentences disclosed, its quality makes up less than 26% of total disclosure. The high proportion of length relates to very thorough comments to quarterly reports disclosed in the

announcements' system. Company, management, and owner-related disclosures exhibit the same disclosure characteristics regardless of the quality group.

Second, on RSE, different themes add considerably different amounts to disclosure quality in terms of disclosure quality groupings. Firms with high disclosure quality receive higher scores for business-financials, while medium and low disclosure quality groups for business-related and owner-related disclosures. This relates to the latter's smaller attention to these themes, which is mainly based on less frequent disclosures. On RSE, many bigger companies issue monthly announcements concerning the previous month's sales and net profit numbers in addition to quarterly reports. Compared to TSE, the proportion of owner-related disclosures is higher, especially in the low-quality group. This is mainly due to the disclosure of very detailed annual general meeting and extraordinary general meeting agendas and resolutions, unlike in TSE where only very short main points are listed.

Third, on VSE, the differences between the themes' proportions affecting disclosure quality do not vary considerably by disclosure quality groups, unlike on and RSE. Although the frequency of business-financial disclosures is high, the announcements add little to the quality ratings. This may relate to the fact that VSE companies did not disclose longer comments to quarterly reports and the standard quarterly financial disclosure was based on sales and net profit numbers. About a third of disclosure quality originates from owner-related disclosures, as in the case of RSE, and the length of such announcements in low and medium disclosure quality groups makes up most of the disclosed sentences (exhibiting a tendency to disclose very detailed annual general meeting and extraordinary general meeting agendas and resolutions).

Overall, the results support significant differences across themes (H5) as well as differences across stock exchanges (H6). Both effects seem to be in line with differences in regulative enforcement as well as differences in disclosure practices of firms listed on different stock exchanges, and, therefore, support the quality score's validity. With regard to the potential improvement areas of disclosure quality, the results also showed that for the pre-2005 period, the TSE disclosure levels were quite similar across disclosure quality groupings, and the only area for potential improvement concerned the annual general meeting and extraordinary general meeting agendas and resolutions' disclosures in owner-related group. On, the disclosure policies of companies at different disclosure quality levels differed more. Firms with a high disclosure quality were more prone to business-financials disclosures, while medium and low disclosure quality groups tended to prefer business- and owner-related disclosures. The potential area for improvement concerned business-financials disclosures of medium and low disclosure quality groups. On VSE, the disclosure policy across quality groupings did not differ considerably, but business-related disclosure quality received considerably lower scores than on TSE and RSE, indicating a potential area for improvement.

4. PUBLIC ANNOUNCEMENTS' DISCLOSURE QUALITY AND OWNERSHIP STRUCTURE

The actual disclosure of information depends heavily on the company's disclosure policy, which is strongly affected by several company characteristics including corporate governance mechanisms like the managers elected, management structure, remuneration principles, and ownership structure. One of these variables that has received considerable attention in previous research (Schadewitz and Blevins, 1998; Chen and Jaggi, 2000; Eng and Mak, 2003; Makhija and Patton, 2004; Huafang and Jianguo, 2007; Lakhal, 2007) is the ownership structure for which the data is also the easiest to obtain. This chapter investigates the impact of company characteristics on public announcements' disclosures in the context of TSE, RSE, and VSE with special attention on the impact of ownership structure. It extends existing disclosure quality literature dealing with associations between disclosure quality and company characteristics (see Chapter 1) in several respects. First, although corporate governance literature has paid considerable attention to the impact of governance mechanisms on the disclosure quality of financial reports (mostly annual reports), public announcements have remained unexplored. One of the possible reasons for this is the lack of suitable disclosure quality proxies for this medium. This chapter uses the disclosure quality score introduced in Chapter 3 along with two quantitative disclosure measures (length of announcements and number of announcements). Second, the association between company characteristics including corporate governance mechanisms and disclosure has received some attention in other emerging markets, but on the three markets in question no similar study exists (at least to knowledge of the author). Therefore, this chapter presents an attempt to investigate disclosure in such a setting.

4.1. Theoretical and empirical background

Ownership structure has received considerable attention in previous literature investigating associations between disclosure and corporate governance mechanisms (for details, see Appendix 8). In addition to ownership structure, a great deal of attention has been paid to management structure (McKinnon and Dalimunthe, 1993), remuneration of managers (Forker, 1992; Arcay and Vàzquez, 2005; Lakhal, 2007), and the existence of an audit committee (Forker, 1992; Ho and Wong, 2001; Arcay and Vàzquez, 2005), but as the former is the most reliably attainable, only this governance mechanism will be considered hereafter.

One possible way to link disclosure with ownership concentration is to consider that companies with more shareholders (more diffused ownership) tend to be bigger, and as bigger companies are expected to have greater disclosure, positive associations between the number of shareholders and disclosure could be expected (Singhvi and Desai, 1971). Another possibility is to think in lines of agency theory (Jensen and Meckling 1976), which suggests that as the number of owners increases, ownership concentration decreases, and information asymmetries

between shareholders and managers increase. One of the reasons for this is that the existence of many small investors creates a free-rider problem; they are too small and poorly informed to exercise their control rights. In such situations, more efficient monitoring could be achieved through the existence of several block holders (shareholders who hold more than 5% of share capital), because they have incentive to collect information, monitor management, and have enough control over the assets of the firm to have their interests respected (Shleifer and Vishny, 1997). This would mean that the existence of block holders could increase disclosure quality. Still, the positive effect of large block holders could be eliminated by their own self-interests, which may not coincide with smaller shareholders' interests. This means that they could begin to treat themselves preferentially at the expense of other investors, which could lead to severe expropriation of minority shareholders. In such circumstances, having access to all the information they need, block holders could put pressure on the management to keep public disclosures to the minimum. Hence, the association between ownership concentration and disclosure could be negative.

Previous empirical studies have used several ownership concentration proxies, and the results have mostly supported negative association with ownership concentration (Fan and Wong, 2002; Arcay and Vàzquez, 2005; Lakhal, 2007; for others, see Appendix 8). The ownership concentration of the listed companies on these three markets is high, as large block holders' holdings are nearly 70%. This indicates that the negative effect of diffused ownership and block holders on disclosure should override the positive effect. Therefore, the seventh hypothesis is:
H7: There is a negative association between disclosure quality and ownership concentration.

If senior directors have shareholdings in the company, managers' interests are more in line with those of other shareholders (Jensen and Meckling, 1976). This would mean that they also have long-term interests in the company, benefits from dividends, and have fewer reasons to expropriate company's resources for their own personal benefit. This leads to owner-managers' smaller interest in hiding information from investors, which in turn could lead to an increase in the level of disclosure quality. However, the opposite may happen if managers' shareholdings become large and the entrenchment effect emerges (Morck et al., 1988). Therefore, managers could begin to use the power they have for expropriating company funds in the form of consumption of perquisites, pursuing pet projects, staying on the job longer than they are qualified to, etc. (Shleifer and Vishny, 1997).

Considering that the association between managerial ownership and disclosure could depend on the size of managerial holdings, previous empirical findings have also given contradictory results: Arcay and Vàzquez (2005) support positive associations, while Ruland et al. (1990), and Eng and Mak (2003) support negative associations. Of the three markets in question, the levels of managerial ownership have been historically low, which means the incentive effect is expected to override the entrenchment effect, leading to a positive association with disclosure. Therefore, hypothesis eight is:

H8: There is a positive association between disclosure quality and managerial ownership.

Government ownership is common if companies have not yet been fully privatized. Such companies have a lower need for outside financing, and assuming that the more the company uses outside capital the greater its incentive to disclose information (Leftwich et al., 1981), government ownership is expected to decrease disclosure. Similar results could be expected, due to the political control exercised over such companies because this may not be as effective as private control in monitoring the management (Shleifer and Vishny, 1997) and in improving the transparency of the company's activities through higher quality disclosure. At the same time, government ownership could increase disclosure if the intention is to acquire additional resources from capital markets. Once the company is listed on a stock exchange, government ownership may draw more public attention to the company because of the potential of a lower market for corporate control that may in turn lead to disclose more.

Previous empirical studies (Eng and Mak, 2003; Makhija and Patton, 2004) have supported positive associations between disclosure and government ownership regardless of the size of government holdings. Considering that government stakes in the companies listed on the three stock exchanges are mostly majority holdings with a tendency toward decrease, this means that greater disclosure may be needed to improve the possibilities of selling the remaining shares at maximum prices, and that one of the objectives of listing state-owned companies following the privatization has been the expected increase in transparency, the ninth hypothesis is:

H9: There is a positive association between disclosure quality and government ownership.

Healy et al. (1999) argue that firms with more outside financing need to make more frequent disclosures, which would attract institutional investors. These agents are considered to be more information demanding in a timely manner. Therefore, higher institutional ownership could be expected to be positively associated with disclosure. On the other hand, high long-term institutional ownership may lead to a situation where the institutional owner has direct access to the information it needs, and the company's interest for other potential capital providers decreases, which may lead to a decrease in the company's need for higher quality public disclosures. Similarly to the mixed theoretical predictions, previous empirical findings have been mainly inconclusive (Schadewitz and Blevins, 1998; Makhija and Patton, 2004; Lakhal, 2007). Considering that institutional ownerships on the three markets are quite new and their holdings remain below 25%, indicating that their control over listed companies is small, and increasing disclosure could be necessary for maintaining good opportunities for acquiring capital from other sources, the tenth hypothesis is:

H10: There is a positive association between disclosure quality and institutional ownership.

Previous discussion has shown that one of the main factors in determining the association between disclosure and ownership structure is its level of concentration. Considering that of the three markets in question, the majority holdings of many companies belong to foreign companies operating in the same field of activity, this may be expected to have a significant impact on the companies' disclosure decisions. Although previous empirical studies listed in Appendix 8 have not investigated such shareholders, the setting in question requires its consideration. The theoretical arguments previously discussed have shown that if the holdings of one shareholder become significant, disclosure is likely to decrease. This should also apply for foreign owners as the local companies are small and foreign owners are big international companies operating in several countries, meaning that parent companies are expected to have significant control over the subsidiaries' disclosure decisions and have a low need for acquiring outside financing locally (financing can be acquired from the parent). Therefore, the eleventh hypothesis is as follows:

H11: There is a negative association between disclosure quality and foreign ownership.

There are many other company characteristics, in addition to ownership variables, which have proven to be associated with disclosure quality (for an overview of variables, see Appendix 5 and Ahmed and Courtis, 1999). These are used as control variables in the following regression models.

Control 1 – Size: Singhvi and Desai (1971) expected positive association between size and disclosure, because of lower information generation costs of larger companies, the greater interest of larger companies in easier marketability of their securities, easier access to external financing, and lower adverse effects of disclosure. These expectations have been supported by agency theory, which assumes that disclosure is related to the amount of outside financing (Jensen and Meckling, 1976), and as larger firms use more outside capital, their incentive to disclose more should be greater (Leftwich et al., 1981). Also, bigger firms have the incentive to disclose more, because potential litigation costs and net disclosure-related costs are an increasing function of firm size (Skinner, 1994; Ali et al., 1994). Empirical support for positive association has been overwhelming (McNally et al., 1982; Lang and Lundholm, 1993; Clarkson et al., 1999; for others see Appendix 5).

Control 2 – Leverage: According to agency theory, higher monitoring costs would be incurred by firms that are highly leveraged. To reduce these costs, firms are expected to disclose more information, (i.e., the relationship between leverage and the extent of disclosure is expected to be positive) (Jensen and Meckling, 1976). Signalling theory, on the other hand, provides contradicting explanations for the direction of relationship between disclosure and leverage: Ross (1977) suggests that markets interpret increased leverage as a signal of the firm's superior quality, but Myers and Majluf (1984) argue that increased leverage is a signal of below-expected cash flow. Most empirical studies have found inconclusive results, and only a few annual report studies have supported positive association (including

Malone et al., 1993; Prencipe, 2004; Ismail and Chandler, 2005; Barako et al., 2006).

Control 3 – Liquidity: According to Altman (1968), low liquidity ratios predict bankruptcies. Based on this notion, companies having high liquidity ratios should disclose more, as they have nothing to fear. On the other hand, firms with weak liquidity ratios may wish to disclose more information to explain the reasons for such situations and to assure investors of the short-term nature of the situation. This is in line with agency theory, according to which higher leverage is associated with higher agency costs. The probability of lower liquidity measures in case of higher leverage would then require a higher level of disclosure. Thus, liquidity may have either effect on disclosure. Empirical results have shown no significant association with disclosure, except for negative associations reported by Wallace et al. (1994).

Control 4 – Performance: Akerlof (1970) stated that a well-run firm, with higher profitability and higher growth rates, would want to distinguish itself from the "lemons". This means that if the company is performing well, increased disclosure can be used to signal its superiority (Ross, 1977), to reduce information asymmetry between investors and managers, and to reduce agency costs (Jensen and Meckling, 1976). Alternatively, the association could be negative if a poorly performing firm wants to explain the reasons for its below-expected performance. Accordingly, different profitability and growth measures have given contradicting results: positive association has been supported by Watson et al. (2002), Archambault and Archambault (2003), Prencipe (2004) and negative association by Schadewitz and Blevins (1998), Chen and Jaggi (2000), Brown and Hillgeist (2006), Birt et al. (2006).

Control 5 – Internationality of operations: It has been suggested that as the firm becomes more international in its operations, the proportion of foreign stakeholders increases, leading to an increase in information asymmetry that in turn increases the demand for additional information leading to a higher level of disclosure (Meek et al., 1995). Several studies employing internationality variables have supported a significant positive association (Depoers, 2000; Robb et al., 2001; Archambault and Archambault, 2003; Cahan et al., 2005).

Control 6 – Risk: Risk affects the firm's supply as well as outside parties' demand for information. As the uncertainty about the firm's cash flows increases, the greater the information asymmetry between investors and managers. A low market-to-book ratio is associated with low growth potential and high free cash flows under the discretion of insiders. Such firms have little need for external financing and for voluntary disclosure (Core, 2001); therefore, one would expect a positive relationship between market-to-book value and disclosure quality. At the same time, a low market-to-book ratio may be an indication of undervaluation by the market, which means that the expected relationship could be negative. Empirical evidence (Aksu and Kosedag, 2006) has favoured negative association.

Control 7 – Industry: Industry variables in the form of industry dummies have reported their effect on disclosure. However, a viable alternative to dummies is the use of market entry barriers as an indirect industry related variable. Theoretical

argument based on Myers (1977) implies that wealth transfers are more difficult, hence agency costs are lower with assets that are already owned compared with assets that are yet to be acquired. This means that disclosure would be inversely related to a firm's proportion of assets in place. However, a controversial argument can be provided by agency theory. If a company operates in an industry with high market entry barriers, a quite inexpensive way to reduce agency costs and information asymmetry is to disclose more, because higher quality disclosures cannot be used by possible new competitors due to the difficulty of entering the market. Empirical support has been provided for the latter argument by Depoers (2000).

Other factors that have been tested in previous research include: listing status (Singhvi and Desai, 1971; Wallace et al., 1994), auditor type (Archambault and Archambault, 2003), analyst following (Clarkson et al., 1999; Cahan et al., 2005; Brown and Hillgeist, 2006), number of distinct press releases (Clarkson et al., 1999), and labour pressures (Depoers, 2000). Considering that some of these variables, such as listing status and auditor type are not important disclosure quality determinants in the context of public announcements, and that for others, such as analyst following, the data is difficult to obtain, these will not be considered as control variables in this chapter.

4.2. Analysis and results

Summary statistics on public announcements' disclosure quality proxies along with definitions of explanatory and control variables are presented in Table 15.

Table 15: Descriptive statistics of dependent and explanatory variables

Variable	Proxy	TSE, RSE & VSE			
		Mean	Max	Min	St.dev.
Dependent variables					
Disclosure quality attributes as in Formula 7 on attribute basis	*I* - Total informativeness score	7.51	34.10	0.00	6.51
	Re - Total relevance score	2.46	14.00	0.00	2.17
	P - Total precision score	10.30	37.00	0.00	5.98
	Ra - Total rarity score	2.89	15.70	0.00	2.47
	F - Total frequency score	6.47	23.00	1.00	3.45
	U - Total unexpectedness score	9.62	43.00	1.00	7.36
	C - Total content score	20.26	72.10	2.20	12.94
	T - Total timing score	18.98	72.70	2.20	11.96
Total disclosure score	*DQ* - Total disclosure score as in Formula 7	39.24	137.80	4.40	24.38
Announcement length	*Sent* - Total sentences disclosed per year	132.94	1939.00	14.00	227.09
Announcement frequency	*NoAnn* – No. of public announcements disclosed per year	16.63	60.00	2.00	8.57

Table 15 (continued): Descriptive statistics of dependent and explanatory variables

Variable	Proxy	TSE, RSE & VSE			
		Mean	Max	Min	St.dev.
Explanatory variables					
Ownership concentration	*TOP1* - shares held by the biggest shareholder/ total share capital	0.54	0.99	0.09	0.25
	Block% - shares held by shareholders over 5%/ total share capital	0.77	1.00	0.23	0.16
Managerial ownership	*O_Man* - share capital held by persons on top positions in the company/ total share capital	0.02	0.43	0.00	0.07
	d_Man - dummy variable equal to 1 if managers have holdings over 0% and 0 otherwise	0.18	1.00	0.00	0.38
Government ownership	*O_Gov* - shares held by the government/ total share capital	0.12	0.97	0.00	0.27
	d_Gov - dummy variable equal to 1 if government has holdings over 5% and 0 otherwise	0.21	1.00	0.00	0.41
Institutional ownership	*O_Inst* - shares held by institutional shareholders/ total share capital	0.13	0.99	0.00	0.22
	d_Inst - dummy variable equal to 1 if institutional shareholders have holdings over 5% and 0 otherwise	0.43	1.00	0.00	0.50
Foreign ownership	*O_For*- shares held by foreign companies operating in the same field of activity/ total share capital	0.19	0.96	0.00	0.32
	d_For - dummy variable equal to 1 if foreign investor operating in the same field of activity has holding over 5% and 0 otherwise	0.32	1.00	0.00	0.47
Control variables					
Size	*MV* - log of average daily market value during the year	7.38	9.24	6.05	0.66
Leverage	*D/A* - total liabilities to total assets	0.42	0.94	0.01	0.24
Liquidity	*CA/CL* - current assets/ current liabilities	2.53	78.51	0.11	5.29
Performance	*PAT/S* – net profit/ sales	0.10	9.44	-0.56	0.59
	ROE - net profit/ total equity	0.06	0.63	-1.29	0.21
	Sgr - sales growth	0.10	1.54	-0.93	0.26
	PATgr - net profit growth	-0.85	52.48	-232.61	15.47
	Agr – asset growth	0.13	1.96	-0.56	0.30
Internationality	*EXP/S* - exports to total sales	0.39	1.00	0.00	0.37
Risk	*M/B* - market value of equity / book value of equity as at end of year	1.49	16.05	0.07	1.66
Industry	*EntryB* – gross fixed assets / total assets	0.53	0.98	0.00	0.23

Considering the small number of companies included from TSE, RSE, and VSE only the pooled sample statistics will be presented and used hereafter.

The association between disclosure quality and explanatory variables was first investigated by using pair-wise correlations[25] (see Appendix 9). The results show that both ownership concentration measures (*TOP1* and *Block%*) are highly correlated with each other (correlation coefficient 0.69, $p<0.01$) and have several correlation coefficients above 0.23 ($p<0.10$) with other ownership variables (excluding *d_For* and *O_Inst*). Statistically significant pair-wise correlation coefficients between control variables are not very frequent, but size (*M/V*), leverage (*D/A*), and return on equity (*ROE*) do seem to be more correlated with other control variables. As could be expected, the correlations between disclosure quality attributes are strong with correlation coefficients between 0.44 and 0.96 ($p<0.01$). In terms of disclosure determinants, the total disclosure (*DQ*) score shows statistically significant positive correlation with managerial ownership dummy (*d_Man* coefficient 0.26, $p<0.10$) and with size (*MV* coefficient 0.42, $p<0.01$), as expected. In terms of quality attributes, the size variable exhibits statistically significant positive correlations in all cases, excluding relevance and rarity. The attribute that has the most statistically significant associations with explanatory variables is rarity, but taken together on an attribute basis, there is support for a negative correlation with ownership concentration (H7) in terms of rarity, a positive correlation with managerial ownership (H8) in terms of relevance and rarity, and a positive correlation with institutional ownership (H10) in terms of relevance and rarity. The findings regarding the association with government ownership give varying signs with different attributes providing inconclusive results for H9.

The correlations of calculated disclosure scores (as well as attributes) with announcement length (*Sent*) and announcement frequency (*NoAnn*) are statistically significant (coefficients between 0.5 and 0.96, $p<0.01$), meaning that assuming the validity of the quality score, these could be used as proxies for disclosure quality in hypothesis testing. Still, the correlations between quantitative scores and explanatory variables exhibit some differences: number of sentences has a positive correlation with market-to-book ratio (*M/B* coefficient 0.36, $p<0.01$) and a positive correlation with the institutional ownership dummy (*d_Inst* coefficient 0.29, $p<0.05$), and number of announcements has a positive correlation with government ownership dummy (*d_Gov* coefficient 0.27, $p<0.10$). Similarly, disclosure quality score's statistically significant positive correlation with size maintains (*MV* coefficients 0.34, $p<0.05$ and 0.43, $p<0.01$ respectively).

To understand how different ownership variables affect disclosure quality simultaneously, linear individual and time fixed effects regressions[26] are run on the

[25] Pair-wise correlation coefficients were calculated based on the variables' averages of firm-based measures across 2001-2005.

[26] Individual and time (or two-way) fixed effects models assume that the dependent variable is expected to be different both for each cross-section unit and each year (dummies created both for each year and each firm).

whole sample. The dependent variable in these regressions is the total disclosure quality score (*DQ*). See Table 16.

Table 16: Regression results for total disclosure score with all control variables

	Model 1		**Model 2**		**Model 3**	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Constant	-31.02	-0.29	3.33	0.04	4.67	0.06
TOP1	-22.74	-1.59				
Block%			-61.89 *	-1.94	-68.25 **	-2.19
O_Man			73.13	1.27		
d_Man					-1.52	-0.43
O_Gov			11.94	0.86		
d_Gov					7.95	1.02
O_Inst			23.75 *	1.93		
d_Inst					5.69	1.64
O_For			-1.98	-0.49		
d_For					-13.89 ***	-4.00
MV	7.98	0.66	7.21	0.63	8.59	0.68
D/A	9.27	0.71	10.91	0.92	10.52	1.00
CA/CL	0.15	0.54	0.11	0.52	0.00	-0.01
PAT/S	1.78 **	1.99	1.40	1.57	1.39	1.52
ROE	2.78	0.59	3.42	0.92	2.98	0.81
Sgr	12.46 ***	5.55	11.35 ***	4.67	11.54 ***	5.72
PATgr	0.00	0.05	0.02	0.46	0.03	0.71
Agr	0.12	0.10	0.21	0.11	-0.56	-0.30
EXP/S	2.17	0.35	8.72	0.92	11.12	1.22
M/B	-0.57	-0.54	-0.84	-0.74	-1.15	-0.92
EntryB	33.26	1.31	29.64 *	1.72	29.46 *	1.77

Observations	260	260	260
R-squared	0.67	0.69	0.69
Adjusted R-squared	0.56	0.57	0.57
Durbin-Watson statistic	2.20	2.29	2.31
Akaike info criterion	8.63	8.60	8.60
Schwarz criterion	9.56	9.59	9.59
F-statistic	5.85 ***	5.93 ***	5.93 ***
Jarque Bera statistic	29.64 ***	31.75 ***	36.04 ***

Note: For definitions of variables, see Table 15. Statistical significance: * p<0.10; ** p<0.05; *** p<0.01.

Regression Model 1 includes only one ownership variable (*TOP1*) and all control variables. The results show that when *TOP1* holdings are included, this variable does not appear statistically significant, but since its p-value is 0.89, it is quite close to having statistically significant negative association with the disclosure quality as hypothesised (H7). Profitability (*PAT/S*) and sales growth (*Sgr*) appear to have statistically significant positive association with the total disclosure score, as expected.

In order to determine the effect of different ownership characteristics, Model 2 copies Model 1, but the *TOP1* ownership variable is replaced with all other percentage holdings based variables. Similarly to Model 1, the sales growth maintains a statistically significant positive association with disclosure quality. Unlike in Model 1, the block holder ownership has a statistically significant negative association as expected under H7 ($t = -1.94$, $p<0.10$) and institutional holdings has a statistically significant positive association supporting H10 ($t = 1.93$, $p<0.10$). In addition, industry (*EntryB*) becomes statistically significant, and although profitability (*PAT/S*) looses its statistical significance, its p-value is quite high 0.89. As a robustness check, the block holder ownership variable was removed from the regression (not reported here) to see whether its correlation with other percentage based ownership variables affected the results. This step lead to adjusted R-squared 0.56, and an increase of statistical significance of institutional ownership (*O_Inst*, coefficient 17.75, $t = 2.18$, $p<0.05$), supporting H10. In terms of control variables, the sales growth (*Sgr*) maintained statistically significant positive association, and size (*MV*) began to show a statistically significant positive association ($p<0.01$) not reported before.

As the question of how accurate the percentage based values are remains, Model 3 extends Model 2 by replacing the last four ownership variables with alternative dummy variables. The Model 2 results are maintained, the only difference is that the foreign ownership dummy (*d_For*, $t = -4.00$, $p<0.01$) shows a negative statistically significant association with disclosure quality supporting H11. Due to high correlations between block holder ownership (*Block%*) and ownership dummies, Model 3 was also calculated without this variable (not reported here). Even in that case, Model 3 results were maintained - adjusted R-squared remained at 0.56 and coefficient values of statistically significant variables were similar - but unlike in the case of percentage based holdings, the coefficient of size (*MV*) remained statistically insignificant.

Economic significance of the coefficients of the three models was compared using standardized coefficients[27]. The hypothesis is that if the standardized regression coefficient is above or below 0.18, an arbitrarily set limit, it could be considered economically significant. In this case, the change of explanatory variable by one standard deviation would cause a 4.4 increase in disclosure quality score equal to the effect of issuing two average quality announcements per year,

[27] Standardized coefficient = estimated coefficient * (standard deviation of explanatory variable/ standard deviation of dependent variable).

which corresponds to 15% of announcements issued by the company per year on average. The three models presented previously show the highest economic significance for block holder ownership (*Block%* standardized coefficients from -0.4 to -0.44), followed by entry barriers (*EntryB* standardized coefficients 0.28 to 0.32), foreign ownership (*d_For* standardized coefficient -0.27), and institutional ownership (*O_Inst* standardized coefficient 0.21). For sales growth (*Sgr*), the standardized coefficients are at 0.12, which is not economically significant but still quite considerable. In terms of variables that did not exhibit statistical significance in the three models, the *TOP1* ownership, managerial ownership (*O_Man*), and size (*MV*) did exhibit economically significant coefficients (standardized coefficients -0.23, 0.22, and 0.19 to 0.23 respectively).

Table 17: Regression results for total disclosure score after backward elimination

	Model 1-1		**Model 2-1**		**Model 3-1**	
	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
Constant	36.97 ***	4.28	75.40 ***	2.80	76.45 ***	3.01
TOP1	-27.40 **	-2.25				
Block%			-71.93 **	-2.00	-69.82 **	-2.01
O_Inst			27.78 ***	3.05		
d_Inst					6.53 ***	2.77
d_For					-11.70 ***	-5.30
PAT/S	2.59 ***	2.68	2.21 ***	2.70	2.31 ***	2.93
Sgr	14.54 ***	3.84	14.19 ***	3.55	13.99 ***	3.64
EntryB	28.85 **	2.11	25.75 ***	2.64	29.38 ***	2.61

Observations	260	260	260
R-squared	0.67	0.68	0.68
Adjusted R-squared	0.57	0.59	0.59
Durbin-Watson statistic	2.17	2.22	2.25
Akaike info criterion	8.58	8.54	8.54
Schwarz criterion	9.40	9.38	9.39
F-statistic	6.81 ***	7.15 ***	7.05 ***
Jarque Bera statistic	31.38 ***	29.66 ***	28.78 ***

Note: For definitions of variables see Table 15. Statistical significance: * p<0.10; ** p<0.05; *** p<0.01.

There is one concern with Model 1, 2 and 3 results - some control variables can be used as replacements for each other and may have higher correlations with each other. To determine the effect of the number of variables used, a backward elimination procedure is conducted. This means that from these three regression models, with each step the explanatory variable with the highest p-value (lowest t-

value) was excluded. The elimination of variables was repeated until all explanatory and control variables became statistically significant at a 90% level of significance. Regression results are reported as Models 1-1, 2-1, and 3-1 in Table 17.

The results show that the reduction of explanatory and control variables does not alter the adjusted R-squared value, and the regression coefficients are quite similar to the ones reported earlier in Table 16. The greatest changes in Model 1 concern ownership concentration (*TOP1*, t = -2.25, p<0.05) and entry barriers (*EntryB*, t = 2.11, p<0.05), such that both exhibit positive statistically significant associations with the total disclosure score not reported earlier. In Models 2 and 3, the elimination procedure increases the statistical significance of profitability (*PAT/S* to p<0.01), and institutional ownership (*d_Inst* to p<0.01) along with slight changes in the coefficient values.

The results of models 1-1 to 3-1 were also economically significant for all explanatory and control variables, excluding profitability (*PAT/S* standardized coefficient 0.06). Although the standardized coefficients of institutional ownership dummy (*d_Inst*) and sales growth (*Sgr*) could be termed economically insignificant, their values were 0.13 and 0.15 respectively (close to set limit 0.18). Compared to Models 1, 2, and 3 the standardized coefficients of the remaining variables tended to increase between 0.30 and 0.50 points.

In order to understand whether the results differed in cases where the disclosure quality attributes had been used instead of a total disclosure quality score, Models 1, 2, and 3 were estimated with all six attributes and with quantitative disclosure proxies. The detailed results are not reported here, but the summary findings are presented in Table 18.

Adjusted R-squared values across models vary, but in most cases are above 0.50. An extremely high R-squared value for announcement length (*Sent*) model can be explained by the fact that disclosure quantity can be more precisely determined by the explanatory variables used, while the quality models should include some omitted variables that may not be as significant determinant of announcement length, as such like the management structure and remuneration policy of managers, for example.

The results show that ownership structure has strong associations with the public announcement disclosures of the listed companies. Still, on the basis of different disclosure proxies, some differences do exist. In accordance with H7, ownership concentration reduces overall disclosure quality (*DQ*), informativeness (*I*), relevance (*R*), and precision (*P*) of announcements, and decreases uneven distribution of announcements across the year (*F*), decreases number of unexpected announcements (*U*), and decreases the number of announcements disclosed (*NoAnn*). Managerial ownership increases the relevance of announcements (*Re*), increases uneven distribution of announcements across the year (*F*), and may have either effect on the length of announcements (*Sent*). The first two results support H8, while the latter points at inconclusiveness. Government ownership increases the informativeness (*I*), relevance (*Re*), disclosure of infrequent topics (*Ra*), and

length of announcements (*NoSent*) as hypothesized in H9. In accordance with H10, institutional ownership increases overall disclosure quality (*DQ*), informativeness of announcements (*I*), disclosure of unexpected topics (*U*), and length of announcements (*NoSent*). Foreign ownership decreases overall disclosure quality (*DQ*), reduces precision of announcements (*P*), decreases uneven distribution of announcements across the year (*F*), decreases unexpected announcements (*U*), and the number of announcements issued (*NoAnn*) as hypothesized in H11. Compared to previous research (see Appendix 8), the ownership variables show some agreement and also some disagreement with previous findings. However, considering that the direction of association with ownership variables is dependent on the actual ownership structures of listed companies, these were to be expected.

Table 18: Summary of regression results with disclosure quality attributes' scores

	Expected sign	*I*	*Re*	*P*	*Ra*	*F*	*U*	*C*	*T*	*DQ*	*Sent*	*NoAnn*
TOP1	-	--				--				-		--
Block%	-	--	-	--		--	-	--	-	--		--
O_Man	+		+			+					+	
d_Man	+										-	
O_Gov	+	+	+								+	
d_Gov	+	+	+		+			+			+	
O_Inst	+	+					+		+	+	+	
d_Inst	+	+					+		+		+	
O_For	-	+				-						-
d_For	-	-		-		-	-	-	-	-		-
MV	+										--	
D/A	+		+									
CA/CL	-											
PAT/S	+	++			++		++		++	+		
ROE	+		++			+					--	
Sgr	+	++		++	++	++	++	++	++	++	++	++
PATgr	+											
Agr	+											++
EXP/S	+	+				+						
M/B	+			--							++	
EntryB	+	++	++		++	++			++	++		++
Adjusted R-squared		0.64	0.28	0.43	0.35	0.56	0.55	0.56	0.67	0.56	0.84	0.53

Note: For definitions of variables, see Table 15. ++ or -- means that there is strong and robust positive/negative association between disclosure quality and the explanatory variable (i.e., at least two models out of three have coefficients with $p<0.10$, or 1 model has coefficient with $p<0.01$). + or – present positive/negative associations that are less robust (i.e., one model out of three has a coefficient with $p<0.10$).

The results also show that in line with previous findings (see Appendix 5), the most important company characteristics associated with disclosure quality increases, as well as increases in the length and the number of announcements are the industry in terms of entry barriers (*EntryB*, $p<0.05$) and sales growth (*Sgr*, $p<0.01$). Profitability (*PAT/S*, $p<0.10$) also has a weak positive association with disclosure quality, as expected. However, contrary to previous results, there is no statistically significant positive association with size. Instead, there is a strong negative association between length of announcements and company size (*MV*, $p<0.01$). This seems to be a property of the sample because some big VSE firms (having low disclosure scores) used to have short announcements during 2001-2003, which has a strong effect on the results of the pooled sample, due to the large number of VSE firms included. Although not supported in other models, there is an indication of a negative association between length of announcements and return on equity (*ROE,* $p<0.01$), and of negative association between frequency of announcements and asset growth (*Agr*, $p<0.01$). The positive association between length of announcements and market-to-book ratio (*M/B*, $p<0.01$) should be interpreted with caution as it disappears once the size is excluded as an explanatory variable (although the R-squared remains at 0.84).

Overall, a public announcements' disclosure quality showed a statistically significant negative association with ownership concentration and foreign ownership, and a positive association with institutional ownership as expected under H7, H11, and H10. A positive association with managerial and government ownership (H8 and H9) was also confirmed with a slightly lower level of confidence. Block holder, foreign, and institutional ownership were also economically significant determinants of disclosure on these three markets. In terms of other company characteristics, there was strong support for a positive association for public announcements' quality with sales growth, with the size of entry barriers, and lower support for a positive association with profit after tax to sales. These results confirmed the findings in previous literature. Unlike in previous empirical disclosure studies, no significant positive association with size was supported; instead, the announcement length had a negative statistically significant association with size. The latter result was partly because of very short announcements issued on VSE during 2001-2003, which had strong impact on the results of the pooled sample.

These results indicate that ownership structure is a significant determinant of a company's disclosure policy and a concentrated ownership structure is likely to decrease the quality of disclosure. This, in turn, would lead to a situation where minority shareholders are poorly informed. To avoid such a situation, the mandatory disclosure level should be enough to fulfil the information needs of smaller shareholders and the enforcement should be strong enough to force the companies to follow the existing standards.

CONCLUSIONS

Considering the shortage of disclosure research conducted in the context of public announcements, the main aim of this thesis has been to extend empirical disclosure literature in the context of these disclosures and in the context of three markets: Tallinn, Riga, and Vilnius Stock Exchanges. The objective was to focus on three issues: the relevance, the quality and the determinants of public announcement disclosures. These were looked at in Chapters 2, 3 and 4 respectively.

The objective of the Chapter 2 was to determine the relevance (relative importance) of different types of public announcement disclosures to investors by concentrating on the economic significance of market reactions around the announcement. Employment of the methodology previously used by Ryan and Taffler (2004) showed that the portions of return and volume events explained by public announcements were 22%-37% of the total, which was twice as low as reported on a developed stock exchange by Ryan and Taffler (2004). The results were quite robust to the definition of economic significance and the event window length. Still, the conditional probability of economically significant events occurring due to public announcements was only slightly higher than the unconditional probability, indicating that public announcements are quite noisy forecasters of economically significant events.

The greatest frequency of return and/or volume events related to news was attributable to financial disclosures as hypothesized based on prior research (H1). Other themes played less important roles and their frequencies varied by stock exchange. This result was robust as it held for all public announcements irrespective of their economic significance, did not depend on whether the event was determined by return or volume, and did not depend on the tone of the news. Differential price reaction to good and bad news existed only on VSE, where economically significant negative news was twice as frequent as positive news.

Contrary to the expectations of H2, economically significant return and volume rankings across themes did not vary at a statistically significant level. Still, the results were influenced by the inclusion of economically significant events, because the same rankings calculated for all public announcements irrespective of their economic significance exhibited statistically significant differences across public announcements' themes. However, even in the latter case, the financial news were in the second or third position and not in the first position as could be expected based on prior research.

In sum, the results obtained in Chapter 2 differ in some respects from previously reported results achieved in a more developed capital market setting. This may be partly due to the research design used that does have some limitations. First, unlike the previous study by Ryan and Taffler (2004), the focus was solely on listed companies' public announcements, which means that some important news issued through other media (conference calls, communication with analysts, and communication through press) were not included. Considering the fact that the news affecting stock prices should be announced first through the stock exchange

system, this should not bias the results considerably. Still, for determining the effect of news included in the sample, some future study could look at both public announcements and press releases or even include other non-firm news (news on macroeconomic environment, news about competitors' success or failure, etc.). Second, the trading behaviour of market participants could be influenced by many other factors besides public announcements; however, the determination of all variables is impossible and consideration of more than one of these is out of the scope of the event study methodology and difference-in-means tests employed. Therefore, the calculations presented suffer from the existence of omitted variable bias, the effect of which remains unknown. Considering these factors, some future study could look at potential drivers of unexplained return and volume events from a behavioural finance perspective. Third, the event study methodology is based on the assumption that market participants act rationally to the news disclosed and based on the correction of their expectations, market prices adjust and investors trade. This is a strong assumption that may not entirely hold in reality, but is the cornerstone of the methodology employed.

The objective of Chapter 3 was to propose a public announcements' disclosure quality measure that could be used in empirical research. The methodology proposed was based on information theory and operationalised through finance/accounting and cognitive psychology theories. The disclosure quality measure was based on six quality attributes (informativeness, relevance, precision, rarity, frequency, and unexpectedness). Disclosure quality was measured on an announcement basis as a sum of the six attributes (each measured on a 0 to 1 scale). Announcement-based scores were summed by accounting years and companies to give the final score later used in empirical tests. The validity of the score created was supported by a high correlation with the length and frequency of announcements as well as a high correlation with the average announcement-based score. Additional validity tests showed that there was strong support for H3 concerning the year-based differences in disclosure quality scores, indicating that disclosure quality had increased over time both in terms of economic and statistical significance. Tests of H4 concerning the effect of company size on disclosure quality supported economically and statistically significant differences between differently sized firms. In the case of low disclosure quality firms, the size had no effect on disclosure quality, but that may be an indication of such companies' resistance for improving their disclosure policy, not necessarily implying the inadequacy of the disclosure quality score. H5, concerning the differences between disclosure quality levels across themes, was supported at both economically and statistically significant levels. In line with expectations, there were also statistically significant differences in the quality of announcements across stock exchanges, which supported H6.

Although the public announcements' disclosure quality measurement methodology introduced in Chapter 3 seemed to capture the differences in public announcement disclosures, it had several limitations. First, no comparison with an analyst based disclosure quality score could be made. Therefore, the replication of

the methodology on a more developed market, where such scores are available, could enable a better validity test. Second, the methodology introduced is valid only in the context of public announcements. Its use for other mediums or overall disclosure would require some modifications. As the possibilities for defining disclosure quality have remained largely unexplored, a future study could investigate the possibilities of defining it in the context of overall disclosure. Third, the indirect tests of validity neglected numerous disclosure determinants that could be investigated in multivariate setting. This issue received some attention in Chapter 4.

The objective of Chapter 4 was to determine the impact of listed companies' ownership structures and company characteristics on the quality of their public announcement disclosures. Linear individual and time fixed effects regressions run showed that public announcements' disclosure quality had statistically significant negative association with ownership concentration and foreign ownership, and positive association with institutional ownership as expected under H7, H11, and H10. A positive association with managerial and government ownership (H8 and H9) was also confirmed with a slightly lower level of confidence. Block holder, foreign, and institutional ownership were also economically significant determinants of disclosure on these three markets. In terms of other company characteristics, there was strong support for positive association for public announcements' quality with sales growth, with the size of entry barriers, and lower support for positive association with profit after tax to sales. These results confirmed the findings in previous literature. Unlike in previous empirical disclosure studies, no significant positive association with size was supported; instead, the announcement length had a negative statistically significant association with size. The latter result was partly because of very short announcements issued on VSE during 2001-2003, which had a strong impact on the results of the pooled sample.

Considering the selected markets, there were some limitations to the research design used in Chapter 4. First, the three markets began to use Corporate Governance Codes after 2005, which means that the companies' willingness to disclose information about board structures, board members, and managers' shareholdings was poor, and, therefore, only ownership variables could be obtained without causing significant biases in the raw data. Improvements in corporate governance practices on the markets in question should enable an investigation of the effects of other corporate governance mechanisms on a post-2005 period. Second, the results depend on the validity of the disclosure quality proxy used and it has limitations as discussed previously. Third, the focus was on public announcements, which means that only part of the total disclosure behaviour was captured. A future study in a setting where the public announcements' quality could be easily compared with the quality of other disclosures could shed some light on the question of whether or not there are significant differences in the ownership structures' effect on disclosure of public announcements and other types of disclosure. Fourth, the regression approach employed enabled a determination of

the association between variables, but not the causality or its direction. As this issue has received no attention in previous disclosure literature (probably due to the use of cross-sectional not panel data), some future study could take a look at this question. Fifth, the focus was on the effect of ownership and corporate characteristics on disclosure. This means that the evidence provided does not enable to answer to the question of whether or not the disclosure quality affects performance. Considering that this issue has received little attention in previous literature, this could be an interesting question for future research. Sixth, the sample included companies from three different markets. This is one of the potential causes for the very strange observed effect of size on disclosure measures. Although the harmonisation of Rules and historical backgrounds of the markets are similar, the small number of companies included from each of them does not enable to disentangle the potential effects of market-based characteristics from the overall results. Univariate tests on differences in means could provide some insight on the potential differences in the characteristics of the markets and the listed companies on the results reported. Some of these issues were covered in Chapter 3.

Overall, the evidence provided in this thesis supported some differences in the relevance and quality of announcements covering different themes. Ownership structure proved to be a quite important determinant of disclosure policy, which means that regulative enforcement should pay greater attention to ways to reduce its potential negative impact on the size of information asymmetries. The empirical evidence provided and the public announcements' disclosure quality measurement methodology developed enables the creation of a basis for broadening the existing disclosure research. Potential research areas identified in this thesis also provide directions for developing the field of disclosure research.

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ABSTRACT

Listed companies can communicate with the public using different mediums and types of disclosures. This thesis focused on public announcements defined as news items compiled by the listed company to fulfil disclosure requirements set in Stock Exchange Rules and published under the company news section on the stock exchange's web-page. Public announcements are different from the financial reports and ordinary press releases because of their timeliness, the ease of simultaneous access to investors, and the regulative framework behind them. Because of these distinguishing features, higher quality public announcements could be expected to lead to lower information asymmetries more quickly than in case with other types of disclosures, and, therefore, they deserve more attention.

So far, disclosure research has been pre-occupied with financial disclosures (mainly annual reports) and other mediums (including public announcements) have received considerably less attention as noted by Verrecchia (2001). This thesis aimed at extending the empirical disclosure research in the context of public announcements. The focus was on three developing capital markets in the Baltic states: Tallinn, Riga, and Vilnius Stock Exchanges. There had been no previous study on disclosure policies of companies listed on these three markets known to the author. Comprehension of the companies' disclosure decisions and disclosure quality levels was expected to help in understanding the companies' disclosure policies and in identifying areas for improving the regulative enforcement needed for decreasing the potential information asymmetries. The focus was on the years of 2001-2005 for which an announcement database was compiled and financial and trading statistics could be gathered. More detailed descriptions of the institutional setting and previous theoretical and empirical research was provided in the first chapter of the thesis that was based partly on a paper Laidroo (2006).

Considering the multiplicity of possible research topics within the context of public announcements, this thesis focused on three issues: the relevance, the quality, and the determinants of public announcement disclosures. Accordingly, this thesis had three main objectives. First, to determine the relevance (relative importance) of different types of public announcement disclosures to investors by concentrating on the economic significance of market reactions around the announcement. Second, to propose a public announcements' disclosure quality measure that could be used in empirical research. Third, to determine the impact of the listed companies' ownership structures and company characteristics on the quality of their public announcement disclosures.

The first of these objectives was covered in the second chapter of this thesis the main conclusions of which have been published in a paper Laidroo (2008b). The relevance was defined in terms of economic significance of market reactions to public announcements. Event study methodology previously used by Ryan and Taffler (2004) was employed to measure the relative importance of different types of announcements. The results showed that the portions of return and volume events explained by public announcements were 22%-37% of the total, which was

twice as low as reported on a developed stock exchange by Ryan and Taffler (2004). In connection with the first objective, two hypotheses were tested:
H1: Financial news generates economically significant market reactions more often than other news.
H2: Financial news generates larger market reactions than other news.

The greatest frequency of return and/or volume events related to news was attributable to financial disclosures as hypothesized based on prior research (H1). This result also held for all public announcements irrespective of their economic significance, did not depend on whether the event was determined by return or volume, and did not depend on the tone of the news. Differential price reaction to good and bad news existed only on VSE, where economically significant negative news was twice as frequent as positive news.

Contrary to the expectations of H2, economically significant return and volume rankings across themes did not vary at a statistically significant level. Still, the results were influenced by the inclusion of economically significant events, because the same rankings calculated for all public announcements irrespective of their economic significance exhibited statistically significant differences across public announcements' themes. However, even in the latter case, the financial news were in the second or third position and not in the first position as could be expected based on prior research.

The second of the main objectives was looked at in Chapter 3 the main conclusions of which have been published in two papers: Laidroo (2008a) and Laidroo (2009). The attempt to measure disclosure quality in the context of public announcements was made by concentrating on information theory (Shannon, 1948) and operationalised through finance/accounting and cognitive psychology theories. Disclosure quality measure proposed was based on six quality attributes (informativeness, relevance, precision, rarity, frequency, and unexpectedness). Disclosure quality was measured on an announcement basis as a sum of the six attributes (each measured on a 0 to 1 scale). Announcement-based scores were summed by accounting years and companies to give the final score later used in empirical tests. The validity of the score created was supported by a high correlation with the length and frequency of announcements as well as a high correlation with the average announcement-based score. Additional indirect tests of validity were based on the following four hypotheses:
H3: Average public announcements' disclosure quality is statistically significantly different across years.
H4: Average public announcements' disclosure quality is statistically significantly different across company size groups.
H5: Average public announcements' disclosure quality is statistically significantly different across themes.
H6: Average public announcements' disclosure quality is statistically significantly different across stock exchanges.

There was strong support for H3 and the results indicated an economically and statistically significant increase in disclosure quality scores over time. H4, H5, and

H6 were supported at economically and statistically significant levels. Overall, the indirect validity tests supported the appropriateness of the methodology.

The third of the main objectives was covered in Chapter 4 the main conclusions of which have been published in a paper Laidroo (2009). Several company characteristics were expected to affect public announcement disclosures and special attention was paid to the associations with ownership structure as this is one of the main corporate governance mechanisms for which the data was easily attainable. Linear individual and time fixed effects regressions were run on the pooled sample to test the following five hypotheses:

H7: There is a negative association between disclosure quality and ownership concentration.

H8: There is a positive association between disclosure quality and managerial ownership.

H9: There is a positive association between disclosure quality and government ownership.

H10: There is a positive association between disclosure quality and institutional ownership.

H11: There is a negative association between disclosure quality and foreign ownership.

Public announcements' disclosure quality showed a statistically significant negative association with ownership concentration and foreign ownership, and a positive association with institutional ownership as expected under H7, H11, and H10. A positive association with managerial and government ownership (H8 and H9) was also confirmed with a slightly lower level of confidence. Block holder, foreign, and institutional ownership were also economically significant determinants of disclosure on these three markets. In terms of other company characteristics, there was strong support for positive association for public announcement's quality with sales growth, with the size of entry barriers, and lower support for positive association with profit after tax to sales. These results confirmed the findings in previous literature. Unlike in previous empirical disclosure studies, no significant positive association with size was supported; instead, the announcement length had a negative statistically significant association with size. The latter result was partly because of very short announcements issued on VSE during 2001-2003, which had a strong impact on the results of the pooled sample.

Overall, the evidence provided in this thesis supported some differences in the relevance and quality of announcements covering different themes. Ownership structure proved to be a quite important determinant of disclosure policy, which means that regulative enforcement should pay greater attention to ways to reduce its potential negative impact on the size of information asymmetries. The empirical evidence provided and the public announcements' disclosure quality measurement methodology developed enables the creation of a basis for broadening the existing disclosure research. Potential research areas identified in this thesis also provide directions for developing the field of disclosure research.

KOKKUVÕTE

Börsil noteeritud ettevõtted võivad suhelda avalikkusega kasutades erinevaid infokanaleid ning teabe vorme. Väitekiri keskendus böristeadetele, mida defineeriti kui börsiettevõtte poolt koostatud uudiseid, mis täidavad börsi reglemendis sätestatud nõudeid ning on avaldatud börsi veebi-lehe ettevõtte uudiste sektsioonis. Börsiteated erinevad finantsaruannetest ja tavalistest pressiteadetest oma ajakohasuse, investoritele samaaegse ligipääsu võimaldamise ning regulatiivse taustsüsteemi poolest. Nende tegurite koosmõjus võib eeldada, et kõrgema kvaliteediga börsiteated aitavad vähendada informatsiooni asümmeetriat kiiremini kui muud teabe vormid ning väärivad seetõttu suuremat tähelepanu.

Teabe avaldamise alased uurimistööd on eelnevalt keskendunud peamiselt finantsteabele (aastaaruanded) ning ülejäänud teabe vormid (sealhulgas börsiteated) on jäänud tahaplaanile nagu on ka märkinud Verrecchia (2001). Antud väitekirjaga püüti laiendada empiirilist teabe avaldamise alast kirjandust börsiteadete kontekstis. Tähelepanu keskmes olid kolm arenevat kapitaliturgu Balti riikides: Tallinna, Riia ja Vilniuse Börs. Nimetatud riikide ettevõtete teabe avaldamise poliitikad ei ole autori andmetel eelnevates uuringutes kajastust leidnud. Samas aitaks ettevõtete teabe avaldamise otsuste ning teabe kvaliteedi tasemete tundmine paremini mõista ettevõtete teabe avaldamise poliitikaid ning määrata valdkonnad, kus regulatiivne sekkumine aitaks vähendada potentsiaalset informatsiooni asümmeetriat. Vaatluse alla võeti aastad 2001-2005, mille kohta koostati börsiteadete andmebaas ning mille kohta oli võimalik saada finantsnäitajad ning tehingustatistika. Täpsem institutsionaalse taustsüsteemi, eelneva teoreetilise ning empiirilise kirjanduse ülevaade oli esitatud töö esimeses peatükis, mis baseerus osaliselt artiklil Laidroo (2006).

Arvestades börsiteadetega seotud erinevate uurimisteemade paljusust, keskenduti väitekirjas kolmele tegurile: börsiteadete olulisus, kvaliteet ning mõjutegurid. Nende tegurite baasil formuleeriti kolm peamist töö eesmärki. Esiteks, määrata erineva teemaga börsiteadete suhteline olulisus investorite jaoks keskendudes börsiteadetele eelneval või neile järgneval perioodil toimuva turu reaktsiooni majanduslikule tähtsusele. Teiseks, luua börsiteadete teabe kvaliteedi mõõdik, mida oleks võimalik kasutada empiirilistes uurimustes. Kolmandaks, määrata omandistruktuuri ning ettevõtet iseloomustavate näitajate mõju ettevõtete börsiteadete kvaliteedile.

Esimesele eesmärgile oli pühendatud töö teine peatükk, mille põhiseisukohad olid avaldatud artiklis Laidroo (2008b). Börsiteadete olulisust defineeriti läbi börsiteadetega kaasnenud reaktsiooni majandusliku tähtsuse. Erinevat liiki börsiteadete suhtelise olulisuse hindamiseks kasutati sündmuste uuringu (*event study*) metodoloogia varianti, mida eelnevalt on rakendanud Ryan ja Taffler (2004). Selgus, et 22-37% majanduslikult olulistest tulumäära ja tehingute mahu sündmustest oli võimalik seletada börsiteadetega. Antud protsendid olid kaks korda madalamad kui Ryan'i ja Taffler'i (2004) arenenud börsil läbi viidud uuringus. Püstitatud eesmärgiga seonduvalt testiti kahte hüpoteesi:

H1: Finantsuudised kutsuvad esile majanduslikult olulisi reaktsioone sagedamini kui ülejäänud uudised.
H2: Finantsuudised kutsuvad esile suurema ulatusega tururеaktsioone.

Kooskõlas esimese hüpoteesiga põhjustasid finantsuudised (vahearuanded, kommentaarid finantstulemustele) majanduslikult olulisi reaktsioone sagedamini kui ülejäänud uudised. See tulemus kehtis kõigi börsiteadete kontekstis (olenemata nendega seonduva reaktsiooni suurusest), ei erinenud tulumäära ja tehingute mahu sündmuste lõikes ning ei sõltunud teate toonist. Positiivsetele ja negatiivsetele uudistele reageeriti erinevalt ainult Vilniuse Börsil, kus majanduslikult olulised negatiivsed uudised olid kaks korda sagedasemad kui positiivsed uudised.

Vastupidiselt teises hüpoteesis märgitule ei esinenud statistiliselt olulist erinevust majanduslikult oluliste tulumäärade ning tehingumahtude järjestatud väärtustel. Antud tulemus oli mõjutatud majanduslikult olulistele sündmustele keskendumisest, sest kui järjestuse aluseks olid kõik börsiteated, siis esines statistiline erinevus börsiteadete erinevate teemade vahel. Sellegi poolest olid ka viimatinimetatud juhul finantsuudised teisel ja kolmandal kohal, kuid mitte esimesel, nagu võiks eeldada varasemate uuringute baasil.

Väitekirja teisele peamisele eesmärgile oli pühendatud kolmas peatükk, mille põhiseisukohad on avaldatud kahes artiklis: Laidroo (2008a) ja Laidroo (2009). Börsiteadete teabe kvaliteedi mõõdiku aluseks valiti informatsiooniteooria (Shannon, 1948) ning see viidi empiiriliselt mõõdetavate atribuutide kujule rahanduse/majandusarvestuse ning kognitiivse psühholoogia teooria abil. Konstrueeritud teabe kvaliteedi mõõdik baseerus kuuel kvaliteedi atribuudil (informatiivsus, olulisus, täpsus, haruldus, sagedus ning ootamatus). Teabe kvaliteeti mõõdeti börsiteate lõikes kui kuue atribuudi summat (iga atribuuti mõõdeti skaalal 0 kuni 1). Empiirilistes testides kasutati aastate ja ettevõtete lõikes summeeritud börsiteadete skoore. Loodud skoori valiidsust toetas selle kõrge korrelatsioon börsiteadete pikkuse ning sagedusega nagu ka kõrge korrelatsioon keskmise börsiteadete skooriga. Täiendavalt testiti valiidsust kaudselt nelja hüpoteesi kaudu:
H3: Börsiteadete keskmine kvaliteedi tase erineb statistiliselt olulisel määral aastate lõikes.
H4: Börsiteadete keskmine kvaliteedi tase erineb statistiliselt olulisel määral ettevõtte suurus-gruppide lõikes.
H5: Börsiteadete keskmine kvaliteedi tase erineb statistiliselt olulisel määral teemade lõikes.
H6: Börsiteadete keskmine kvaliteedi tase erineb statistiliselt olulisel määral börside lõikes.

Tulemused näitasid tugevat toetust kolmandale hüpoteesile. Seejuures viitasid tulemused teabe kvaliteedi majanduslikult ja statistiliselt olulisele kasvule ajas. Hüpoteesid 4, 5 ja 6 leidsid samuti kinnituse majanduslikult ja statistiliselt oluliste erisuste osas. Seega kaudsed valiidsuse testid toetasid kasutatud mõõdiku sobilikkust.

Kolmanda eesmärgi täitmisele oli pühendatud väitekirja neljas peatükk, mille põhiseisukohad on avaldatud artiklis Laidroo (2009). Eeldati, et erinevad ettevõtet iseloomustavad tegurid mõjutavad börsiteadete avaldamist ning erilist tähelepanu pöörati seostele omandistruktuuriga kuna omandistruktuur on üks peamistest ühingujuhtimist mõjutavatest teguritest, mille kohta on lihtne saada andmeid. Lineaarseid individuaalselt ja ajas fikseeritud efektidega regressioonimudeleid rakendati kogu valimile järgmise viie hüpoteesi testimiseks:
H7: Teabe kvaliteedi ja omandi kontsentratsiooni vahel on negatiivne seos.
H8: Teabe kvaliteedi ja juhtkonna osaluste suuruse vahel on positiivne seos.
H9: Teabe kvaliteedi ja riigi osaluste suuruse vahel on positiivne seos.
H10: Teabe kvaliteedi ja institutsionaalsete osaluste suuruse vahel on positiivne seos.
H11: Teabe kvaliteedi ja välismaiste ettevõtete osaluste suuruse vahel on negatiivne seos.

Börsiteadete kvaliteet näitas statistiliselt olulist negatiivset seost omandi kontsentratsiooni ning välismaiste ettevõtete osaluste suurusega ning positiivset seost institutsionaalsete osaluste suurusega nagu eeldatud hüpoteeside 7, 11 ja 10 puhul. Positiivne seos juhtkonna ning riigi osaluste suurusega (H8 ja H9) leidis ka kinnitust, kuid mõnevõrra väiksema usaldusväärsusega. Omandi kontsentratsiooni, välismaiste ettevõtete ning institutsionaalsete osaluste suuruste puhul olid tulemused ka majanduslikult olulised. Ülejäänud ettevõtet iseloomustavate näitajate puhul leidis kinnitust börsiteadete kvaliteedi positiivne seos müügitulu kasvu ja turule sisenemise barjääride suurusega ning mõnevõrra vähemal määral börsiteadete kvaliteedi positiivne seos maksude järgse kasumi ja käibe suhtega. Nimetatud tulemused olid kooskõlas varasemate analoogsete uuringute tulemustega. Vastupidiselt varasemate empiiriliste uuringute tulemustele ei leidnud kinnitust oluline positiivne seos ettevõtte suurusega. Selle asemel oli börsiteadete pikkusel statistiliselt oluline negatiivne seos ettevõtte suurusega. Antud tulemus oli osaliselt seotud Vilniuse Börsil esinenud väga lühikeste teadetega perioodil 2001-2003, mis mõjutas olulisel määral kogu valimiga saadud tulemust.

Kokkuvõttes toetasid antud väitekirjas esitatud tulemused erinevatel teemadel avaldatud börsiteadete olulisust ning kvaliteedi erisust. Omandistruktuur oli oluline teabe avaldamise poliitika mõjutegur, mis tähendab, et regulatsioonidega peaks pöörama suuremat tähelepanu selle negatiivse mõju vähendamisele informatsiooni asümmeetria kontekstis. Saadud empiirilised tulemused ning välja töötatud börsiteadete kvaliteedi hindamise metodoloogia annavad võimaluse laiendada olemasolevat teabe avaldamise alast kirjandust. Antud väitekirjas märgitud potentsiaalsed uurimissuunad annavad ühtlasi suuniseid teabe avaldamise alaste uuringute edasiarendamiseks.

Appendix 1

CURRICULUM VITAE

1. Personal data

Name:	Laivi Laidroo
Date and place of birth:	05.05.1978, Tallinn.
Citizenship:	Estonian

2. Contact information

Address:	Tallinn University of Technology, Kopli 101, Tallinn 11712
Phone:	(+372)620 4057
E-mail:	laivilaidroo@hot.ee

3. Education

Educational institution	Graduation year	Education (field of study/degree)
Tallinn University of Technology	Expected 2008	PhD in Financial Economics
Tallinn University of Technology	2002	Master of Arts in Economics
Tallinn University of Technology	2000	Bachelor of Arts in Social Sciences (*cum laude*)

4. Language competence/skills (fluent, average, basic skills)

Language	Level
Estonian	Fluent
English	Fluent
Finnish	Average
German	Basic skills
Russian	Basic skills

5. Special Courses

Period	Educational or other organisation
June 2006	Empirical Corporate Finance, Graduate School of Finance in Helsinki

6. Professional Employment

Period	Organisation	Position
Since 2007	Danske Bank A/S Estonian Branch (former Sampo Pank AS)	Credit Analyst
2007-2008	Tallinn University of Technology, Centre for Economic Research	Part-time researcher
2002- 2007	Tallinna Vesi AS	Analyst
2000-2002	Data Accounting OÜ	Accountant

Appendix 1 cont.

7. Scientific work
Conference presentations and publications presented as an appendix to the CV.

8. Defended theses
2002 – Laivi Laidroo, Master thesis, "The Financial Management in the Company's Strategic Management System at Present", Tallinn University of Technology
2000 – Laivi Laidroo, Bachelor thesis, " The Use of Financial Analysis in the Process of Strategic Planning", Tallinn University of Technology

9. Main areas of scientific work /Current research topics
Disclosure, market-based accounting research.

Appendix to CV:

Conference presentations:
Laidroo, L. Public Announcement Induced Economically Significant Stock Return and Trading Volume Reactions on Tallinn, Riga and Vilnius Stock Exchanges. 31st Annual Congress of EAA, 23-25 Apr 2008, Rotterdam, Netherlands.

Laidroo, L. Content Analysis of 2000-2005 Public Announcements on Tallinn, Riga and Vilnius Stock Exchanges, 2nd annual Conference of the Estonian Economic Association, 12-13 Jan 2007, Pärnu, Estonia.

Laidroo, L. Listings, Delistings and Cross-Listings on Tallinn Stock Exchange 1996-2005, paper co-authored with Katrin Rahu, 7th International Scientific Conference "Enterpreneurial Finance and Financial Environment", 16-17 Nov 2006 Tartu, Estonia.

Laidroo, L. Review of Empirical Studies on Disclosure and MBAR in European Countries. 1st annual Conference of the Estonian Economic Association, 20-21 Jan 2006, Pärnu, Estonia.

Publications:
International Journals
Laidroo, L. 2009. Association between Ownership Structure and Public Announcements' Disclosure Quality. Corporate Governance: An International Review, forthcoming. (ETIS 1.1.) (indexed in Current Contents, Social Sciences Citation Index, Emerald Management Reviews, ABI/INFORM, SCOPUS etc.)

Appendix 1 cont.

Laidroo, L. 2008. Public Announcement Induced Market Reactions on Baltic Stock Exchanges. Baltic Journal of Management, Vol. 3, No. 2, pp. 174-192. (ETIS 1.1.) (indexed in Social Sciences Citation Index, EBSCO, Emerald Management Xtra etc)

Working Papers

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Conference Proceedings

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Laidroo, L. 2007. Content Analysis of 2000-2005 Public Announcements on Tallinn, Riga and Vilnius Stock Exchanges. Materials of 2nd Annual Conference of Estonian Economic Association, 30 p. (ISBN: 978-9949-006-9) (ETIS 3.5)

Laidroo, L., Rahu, K. 2007. Listings, Delistings and Cross-Listings on Tallinn Stock Exchange 1996-2005. Proceeding of the 7th International Scientific Conference "Entrepreneurial Finance and Financial Environment" Tartu, pp. 187-210 (ISBN: 978-9949-11-547-1) (ETIS 3.5.)

Appendix 2

ELULOOKIRJELDUS

1. Isikuandmed
   Nimi: Laivi Laidroo
   Sünniaeg ja -koht: 05.05.1978, Tallinn
   Kodakondsus: Eesti

2. Kontaktandmed
   Aadress: Tallinna Tehnikaülikool, Kopli 101, Tallinn 11712
   Telefon: (+372) 620 4057
   E-posti aadress: laivilaidroo@hot.ee

3. Haridus

Õppeasutus (nimetus lõpetamise ajal)	Lõpetamise aeg	Haridus (eriala/kraad)
Tallinna Tehnikaülikool	Oodatav 2008	Filosoofiadoktor finantsökonoomika erialal
Tallinna Tehnikaülikool	2002	Majandusteaduste magistri kraad, ärikorralduse erialal
Tallinna Tehnikaülikool	2000	Sotsiaalteaduste bakalaureuse kraad ärkorralduse erialal

4. Keelteoskus (alg-, kesk- või kõrgtase)

Keel	Tase
Eesti	Kõrgtase
Inglise	Kõrgtase
Soome	Kesktase
Saksa	Algtase
Vene	Algtase

5. Täiendusõpe

Õppimise aeg	Täiendusõppe läbiviija nimetus
Juuni 2006	Empiiriline ettevõtte rahandus, Rahanduse doktorikool Helsingis

6. Teenistuskäik

Töötamise aeg	Tööandja nimetus	Ametikoht
Alates 2007	Danske Bank A/S Eesti filiaal (endine Sampo Pank AS)	Krediidianalüütik
2007-2008	Tallinna Tehnikaülikool	Erakorraline teadur osalise koormusega
2002-2007	Tallinna Vesi AS	Analüütik
2000-2002	Data Accounting OÜ	Raamatupidaja

Appendix 2 cont.

7. Teadustegevus

Presentatsioonid konverentsidel ning publikatsioonid on esitatud eraldi inglise keelse elulookirjelduse lisana.

8. Kaitstud lõputööd

2002 – Laivi Laidroo, magistritöö, "Finantsjuhtimine ettevõtte juhtimise süsteemis kaasajal", Tallinna Tehnikaülikool.

2000 – Laivi Laidroo, bakalaureusetöö, "Finantsanalüüsi kasutamine ettevõtte strateegilise planeerimise protsessis", Tallinna Tehnikaülikool

9. Teadustöö põhisuunad

Teabe avaldamine, turu-põhised majandusarvestuse uuringud

Appendix 3

Description of companies included in the sample

Company Name	Core business	Average of annual *DQ* 2001-2005
TSE		
Baltika	Clothing retail	64.35
Eesti Telekom	Telecommunications	97.70
Harju Elekter	Design, production and marketing of electrical engineering and telecommunication systems	38.97
Klementi	Production and sale of apparel	38.10
Kalev	Production and sales of confectionery products, real estate management, production of food products	83.23
Merko Ehitus	Construction	45.88
Norma	Production of safety belts and car accessories	33.35
Rakvere Lihakombinaat	Purveyance, processing and sale of meat	22.70
Saku Õlletehas	Production of alcoholic beverages and soft drinks, retail and wholesale	40.13
Tallinna Farmaat-siatehas	Production of medications	35.95
Tallinna Kaubamaja	Wholesale and resale of goods	58.16
Viisnurk	Wood processing	34.30
RSE		
Latvijas balzams	Production of alcoholic beverages	38.05
Ditton pievadķēžu rūpnīca	Manufacturing of vehicle components	27.01
Grindeks	Pharmaceuticals	59.22
Latvijas Gāze	Sale of natural gas	43.86
Liepājas metalurgs	Ferrous metallurgy	24.33
Olainfarm	Pharmaceuticals	39.01
Rīgas kuģu būvētava	Engineering, construction and shipbuilding	21.54
Ventspils nafta	Central company of a diversified concern	100.88
Valmieras stikla šķiedra	Production of glass fibre	70.80
VSE		
Alita	Manufacture of sparkling grape wine and other alcoholic drinks	18.84
Anykščių vynas	Manufacture and bottling of wine	27.37
Apranga	Wholesale and retail trade	30.61
Alytaus tekstilė	Manufacture of cotton and cotton-polyester fabrics	33.57
Dvarčionių keramika	Manufacture of ceramic products	23.05

Note: *DQ* is calculated as in Formula 7 on a firm basis as an average across 2001 and 2005.

Appendix 3 cont.

Description of companies included in the sample

Company Name	Core business	Average of annual *DQ* 2001-2005
VSE (continued)		
Grigiškės	Production of paper, cardboard, fibre board and their products	48.28
Invalda	Investment	25.93
Klaipėdos baldai	Manufacture of furniture	17.08
Klaipėdos jūrų krovinių kompanija	Stevedoring at Klaipeda port and aquatory	21.08
Klaipėdos nafta	Export and import of oil products	19.81
Kauno energija	Manufacture and sale of electricity and thermal energy	27.52
Lietuvos dujos	Import and sale of natural gas	30.05
Lietuvos energija	Manufacture and distribution of electricity	46.60
Lifosa	Manufacture of inorganic fertilizers	34.02
Limarko laivinin-kystės kompanija	Shipping of cargo	25.58
Linas	Investment activities	21.85
Lietuvos telekomas	Telecommunications	65.10
Mažeikių nafta	Refining and transportation	51.95
NORD/LB Lietuva	Banking	34.93
Panevėžio statybos trestas	Construction and design	22.97
Pieno žvaigždės	Manufacture of milk and dairy products	32.50
Rokiškio sūris	Dairy products	32.88
Šiaulių bankas	Banking	32.13
Sanitas	Manufacture of pharmaceutical preparations	62.60
Snaigė	Manufacturing of refrigerators, freezers and their spare parts	30.77
Snoras	Banking	37.05
Stumbras	Production of alcoholic and soft drinks	29.78
Ūkio bankas	Banking activities	35.06
Utenos trikotažas	Production of knitwear	20.60
Vilniaus Vingis	Manufacture of electronic equipment	51.91
Žemaitijos pienas	Manufacture of various dairy products	31.75

Note: *DQ* is calculated as in Formula 7 on a firm basis as an average across 2001 and 2005.

Appendix 4

Overview of the content analysis procedure employed

Thematic content analysis extracts and analyzes themes covered by the message. To ensure the reliability of content analysis procedure, the steps defined by Weber (1985) were addressed as listed below.

Step	Weber's steps	Mobilization of the step
1	Define the recording units (e.g. word, word sense, sentence, or theme)	Text was coded according to themes in each announcement separately (some announcements include several themes)
2	Define the categories (e.g. through literature review)	The categories were defined in 2 steps. First, a set of themes were based on the disclosure requirements arising from TSE, VSE, and RSE Rules. If the author felt that the existing categories did not match the theme of the announcement, they were put in the category Other. After coding all the announcements of this stock exchange items with Other index were re-read and a decision was made as to whether or not some new themes should be added or some themes divided.
3	Test coding on sample of text	As the author was familiar with the general setup of the announcements, and most announcements made are obligatory, the test coding was done on all TSE announcements.
4	Assess accuracy or reliability	After the TSE announcements had been coded, accuracy was tested using a re-coding procedure (i.e. each theme was filtered one at a time and the short descriptions of the announcements were used to determine whether the coding was consistent and correct). If necessary, the whole announcement was re-read and coding corrected.
5	Revise coding rules (e.g. develop rules)	Step 4 procedures lead to the harmonisation of the coding rules used and for the development of new ones.
6	Return to Step 3 until accuracy or reliability is satisfactory	Due to the detailed analysis in Step 3, no modifications were made after Step 5 unless some additional rules were created during the coding procedure of RSE and VSE announcements.
7	Code all the text	After TSE announcements had been coded, the coding of RSE and VSE announcements followed
8	Assess achieved reliability or accuracy	The reliability and accuracy of RSE and VSE announcements was checked the same way as described in Step 4. In addition, in the cases of RSE and VSE, the consistency with TSE coding was also constantly monitored.

Appendix 4 cont.

Subjectivity, validity, and replicability were also considered.

Subjectivity - Content analysis leads to quantification that may be based on a sentence, word, or percentage of page. As both Milne and Adler (1999) and Unerman (2000) persuasively argue, understanding the meaning of each disclosure is best achieved by the consideration of whole sentences, thus in this thesis sentences under a theme were counted taking into account the type of announcement discussed below[28].

Validity – ensured by following the formal procedure described above.

Replicability – ensured by re-coding of announcements. The better alternative would have been the use of multiple coders for coding the same announcements. However, due to the manual procedure to be used, the large number of announcements to be read, and to ensure the consistency of coding, a one-person coding method was preferred. As noted by Milne and Adler (1999): well-specified decision categories, with well-specified decision rules, may produce few discrepancies and reduce the need for the costly use of multiple coders.

As announcements may include several themes simultaneously, four types of announcements were distinguished.

Type 1 - the announcement concerns only one sub-category; for example, an ordinary announcement about replacing a Management Board member. The announcements' sentences were counted.

Type 2 – the announcement concerns several sub-categories that are equally important and independent from one another. For example, a company announced its quarterly results simultaneously with its investor calendar for next year. Sentences describing each theme were counted separately.

Type 3 – the announcement concerns several sub-categories from which one presents the main theme that can be explained by other sub-categories. For example, a firm signs a contract that concerned an investment into equipment (coded as agreement + investment), or a company announced quarterly results of its subsidiary (coded as periodical report + subsidiary). Only the count of sentences in an announcement was taken as an indicator of length.

Type 4 – the announcement is a mix of Type 2 and Type 3 announcements. For example, a firm announces its annual report and adds a link to the full report (coded as annual report + link to annual report) or a company discloses the results of its AGM (annual general meeting) and decisions concerning the election of the auditor and new Management Board member (coded as AGM decision + auditor + Management Board). Both the length of independent themes and the length of the entire announcement were recorded.

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[28] Sentences were counted based on the periods marking the end of sentences. Periods marking abbreviations, numbering, etc. were eliminated from the total count. The sentences were counted in the same manner irrespective of the language they were written in. There may be slight differences in the count of sentences due to the use of local language announcements, but based on test-counts these differences were below 5%.

Appendix 5

Overview of disclosure determinants' studies

Variable	Measures	Statistically significant positive (+) or negative (-) empirical results reported
Size	Assets, sales, equity, employees	**McNally et al. (1982) /+** **Lang and Lundholm (1993) /+** **Clarkson et al. (1999)* /+** **Aksu and Kosedag (2006) /+** Depoers (2000) /+ Ho and Wong (2001) /+ Gray et al. (2001) /+ Robb et al. (2001) /+ Ferguson et al. (2002) /+ Watson et al. (2002) /+ Archambault and Archambault (2003) /+ Vanstraelen et al. (2003) /+ Cahan et al. (2005) /+ Alsaeed (2006) /+ Barako et al. (2006) /+ Birt et al. (2006) /+ Brown and Hillgeist (2006) /+ Lopes and Rodrigues (2007) /+
Leverage	Debt to equity, debt or equity to total assets,	Malone et al. (1993) /+ Prencipe (2004) /+ Ismail and Chandler (2005) /+ Barako et al. (2006) /+
Liquidity	Current ratio	Olusegun Wallace et al. (1994) /-
Perfor-mance	Profitability, growth, difference between estimated and actual earnings per share, dividend per share, stock return	**Brown and Hillgeist (2006) /-** Schadewitz and Blevins (1998) /- Chen and Jaggi (2000) /- Watson et al. (2002) /+ Archambault and Archambault (2003) /+ Prencipe (2004) /+ Birt et al. (2006) /-
Internatio-nality of operations	Exports, exports from sales, number of geographical segments, number of foreign subsidiaries	Depoers (2000) /+ Robb et al. (2001) /+ Archambault and Archambault (2003) /+ Cahan et al. (2005) /+

Note: The studies that focused on other information releases besides or in addition to annual reports are in bold. * - the results on news releases.

Appendix 5 cont.

Overview of disclosure determinants' studies

Variable	Measures	Statistically significant positive (+) or negative (-) empirical results reported
Risk	Standard deviation of earnings, sales; market-to-book ratios; correlation between annual stock returns and earnings per share, bid-ask spread	**Lang and Lundholm (1993) /+** **Aksu and Kosedag (2006) /-** **Brown and Hillgeist (2006) /+** Schadewitz and Blevins (1998) /+
Industry	Industry type, gross fixed assets	Cooke (1992) /+ McKinnon and Dalimunthe (1993) /+ Aitken et al. (1994) /+ Entwistle (1999) /+ Depoers (2000) /+

Note: The studies that focused on other information releases besides or in addition to annual reports are in bold. * - the results on news releases.

Appendix 6

Calculation of expected returns

First, the expected returns based on the constant mean return model for the lumped return is calculated as follows:

$$E\left(R_{i,t}\right)=\frac{1}{T_1-T_0}\sum_{t=T_0+1}^{T_1}R_{i,t}$$

where:
T_0 – is the first day of the estimation window
T_1 – is the last day of the estimation window
$R_{i,t}$ - is the return of firm i on estimation window day t

Second, the expected return based on the market adjusted return model for the lumped return is calculated as follows:

$$E\left(R_{i,t}\right)=R_{m,t}$$

where:
R_{mt} – is the market return for day t calculated based on the respective stock exchange market index change.

Third, the expected return based on the market model for the lumped return model is calculated as follows:

$$E\left(R_{i,t}\right)=\alpha_i+\beta_i R_{m,t}$$

where:
α_i – is the constant term of security i from market model regression during estimation period calculated as $\alpha_i=\frac{1}{T_1-T_0}\sum_{t=T_0+1}^{T_1}R_{i,t}-\beta_i\frac{1}{T_1-T_0}\sum_{t=T_0+1}^{T_1}R_{m,t}$

β_i – is the coefficient term of security i from market model regression during estimation period calculates as

$$\beta_i=\frac{\sum_{t=T_0+1}^{T_1}\left(R_{i,t}-\frac{1}{T_1-T_0}\sum_{t=T_0+1}^{T_1}R_{i,t}\right)\left(R_{m,t}-\frac{1}{T_1-T_0}\sum_{t=T_0+1}^{T_1}R_{m,t}\right)}{\left(R_{m,t}-\frac{1}{T_1-T_0}\sum_{t=T_0+1}^{T_1}R_{m,t}\right)^2}$$

$R_{m,t}$ – is the market return for day t calculated based on the respective stock exchange market index change

Appendix 7

Announcements associated with economically significant reactions by themes and tone of news

Positive news in event window (-5;+5)	TSE					RSE					VSE				
	No[(a)]	%[(b)]	E(n)	No-E(n)	%[(c)]	No[(a)]	%[(b)]	E(n)	No-E(n)	%[(c)]	No[(a)]	%[(b)]	E(n)	No-E(n)	%[(c)]
Business -related	71	4%	78	-7	-9%	24	2%	26	-2	-7%	34	1%	54	-20	-37%
Business-financials	179	10%	179	0	0%	99	7%	145	-46	-32%	161	3%	301	-140	-46%
Company-related	2	0%	1	1	90%	6	0%	6	0	-1%	7	0%	9	-2	-21%
Management-related	11	1%	11	0	5%	5	0%	7	-2	-30%	10	0%	15	-5	-34%
Owner-related	55	3%	57	-2	-3%	48	3%	59	-11	-19%	97	2%	167	-70	-42%
Stock Exchange related	1	0%	1	0	90%		0%	0	0		0	0%	0	0	
All themes	**319**	**18%**	**326**	**-7**	**-2%**	**182**	**13%**	**243**	**-61**	**-25%**	**309**	**7%**	**546**	**-237**	**-43%**

Negative news in event window (-5;+5)	TSE					RSE					VSE				
	No[(a)]	%[(b)]	E(n)	No-E(n)	%[(c)]	No[(a)]	%[(b)]	E(n)	No-E(n)	%[(c)]	No[(a)]	%[(b)]	E(n)	No-E(n)	%[(c)]
Business -related	66	4%	71	-5	-7%	14	1%	21	-7	-34%	55	1%	49	6	12%
Business-financials	143	8%	161	-18	-11%	83	6%	119	-36	-30%	305	7%	274	31	11%
Company-related	0	0%	1	-1	-100%	3	0%	5	-2	-40%	7	0%	8	-1	-14%
Management-related	9	0%	9	0	-5%	5	0%	6	-1	-15%	17	0%	14	3	23%
Owner-related	50	3%	51	-1	-2%	44	3%	49	-5	-10%	168	4%	152	16	10%
Stock Exchange related	0	0%	0	0	0%	0	0%	0	0	0%	0	0%	0	0	0%
All themes	**268**	**15%**	**294**	**-26**	**-9%**	**149**	**10%**	**200**	**-51**	**-25%**	**552**	**12%**	**497**	**55**	**11%**

Note: (a) No - Number of economically significant return and/or volume events in which the main theme was under one of the six main categories. (b) % - percent of news associated events from total return and volume events. E(n) – expected number of announcements derived by multiplying the actual number of announcements in the same theme category by the total number of positive/negative price movements divided by the total number of price movements. (c) % - shows the percent difference in the expected and observed number of announcements.

Appendix 8

Overview of empirical studies on associations between ownership structure and disclosure

Ownership structure variable	Study	Type of disclosure	Country	Hypot-hesis	Actual sign
Ownership diffusion	McKinnon and Dalimunthe (1993)	Segment information	Australia	+	+
	Raffournier (1995)	Annual reports	Switzerland	+	?
Ownership concentration	Arcay and Vàzquez (2005)	AEI	Spain	-	-
	Lakhal (2007)	Earnings disclosures	France	-	-
	Fan and Wong (2002)	Earnings informativeness	East Asia	-	-
Block holder ownership	Eng and Mak (2003)	Management discussion	Singapore	-	?
	Huafang and Jianguo (2007)	Annual reports	China	+	+
No. of shareholders	Malone et al. (1993)	Annual reports	US	+	+
Managerial ownership	Arcay and Vàzquez (2005)	AEI	Spain	+	+
	Eng and Mak (2003)	Management discussion	Singapore	-	-
	Forker (1992)	Annual reports	UK	?	?
	Huafang and Jianguo (2007)	Annual reports	China	+	?
	Makhija and Patton (2004)	Annual reports	Czech	-/+	?
	Nagar et al. (2003)	AIMR rankings	US	-	?
	Ruland et al. (1990)	Earnings forecasts	US	-	-
Outside ownership	Chau and Gray (2002)	Annual report	Hong Kong /Singapore	+	+
Government ownership	Eng and Mak (2003)	Management discussion	Singapore	+	+
	Huafang and Jianguo (2007)	Annual reports	China	-	?
	Makhija and Patton (2004)	Annual reports	Czech	+	+

Note: AEI - Actualidad Económica Index

Appendix 8 cont.

Overview of empirical studies on associations between ownership structure and disclosure

Ownership structure variable	Study	Type of disclosure	Country	Hypot-hesis	Actual sign
Institutional ownership	Lakhal (2007)	Earnings disclosures	France	+	?
	Makhija and Patton (2004)	Annual reports	Czech	+/-	+/-
	Schadewitz and Blevins (1998)	Financial reports	Finland	-	?
Family control	Chen and Jaggi (2000)	Financial reports	Hong Kong		+
Household ownership	Schadewitz and Blevins (1998)	Financial reports	Finland	+	?
Legal-persons' ownership	Huafang and Jianguo (2007)	Annual reports	China	+	?
	Schadewitz and Blevins (1998)	Financial reports	Finland	-	-
Ownership of insurance companies	Schadewitz and Blevins (1998)	Financial reports	Finland	-	?
Ownership of foreign investors	Lakhal (2007)	Earnings disclosures	France	?	+

Note: AEI - Actualidad Económica Index

Appendix 9

Pair-wise correlations between variables

	TOP1	*Block%*	*O_Man*	*d_Man*	*O_Gov*	*d_Gov*	*O_Inst*
TOP1	1.00						
Block%	0.69***	1.00					
O_Man	-0.34**	-0.28**	1.00				
d_Man	-0.30**	-0.27*	0.66***	1.00			
O_Gov	0.34**	0.34**	-0.15	-0.17	1.00		
d_Gov	0.24*	0.33**	-0.16	-0.15	0.90***	1.00	
O_Inst	-0.04	-0.09	-0.01	0.12	-0.25*	-0.26*	1.00
d_Inst	-0.37***	-0.35**	0.23	0.34**	-0.29**	-0.26*	0.72***
O_For	0.33**	0.38***	-0.19	-0.31**	-0.14	-0.01	0.01
d_For	0.15	0.19	-0.22	-0.36***	-0.04	0.12	-0.09
MV	0.13	0.28**	-0.16	-0.06	0.22	0.42***	-0.13
D/A	-0.10	-0.05	0.03	0.02	-0.13	-0.18	0.36***
CA/CL	-0.13	-0.09	-0.07	-0.05	-0.15	-0.10	-0.23
PAT/S	-0.23	-0.13	-0.05	-0.07	-0.07	-0.06	-0.14
ROE	-0.01	-0.07	0.03	0.13	-0.13	-0.11	-0.17
Sgr	-0.27*	-0.15	0.23	0.13	-0.32**	-0.31**	-0.05
PATgr	0.09	0.01	0.05	0.07	0.06	0.07	-0.09
Agr	-0.26*	-0.01	0.06	0.08	-0.29**	-0.30**	-0.09
EXP/S	-0.24*	-0.26*	0.07	0.13	-0.29**	-0.31**	0.10
M/B	0.00	0.10	-0.09	0.03	-0.30**	-0.18	0.20
EntryB	0.17	0.21	-0.06	-0.12	0.47***	0.50***	-0.19
I	-0.14	0.02	0.16	0.24*	-0.08	0.11	0.05
Re	-0.13	-0.08	0.28**	0.34**	-0.29**	-0.15	0.07
P	-0.14	0.01	0.10	0.15	0.17	0.37***	-0.03
Ra	-0.30**	-0.15	0.40***	0.33**	-0.34**	-0.21	0.10
F	-0.18	-0.06	0.09	0.23	0.04	0.24*	0.06
U	-0.17	0.07	0.18	0.24*	0.05	0.27*	-0.14
C	-0.15	0.01	0.17	0.24*	-0.01	0.20	0.02
T	-0.21	0.00	0.21	0.27**	-0.02	0.20	-0.05
DQ	-0.18	0.00	0.19	0.26*	-0.01	0.20	-0.01
Sent	-0.12	0.01	0.15	0.15	-0.02	0.18	0.04
NoAnn	-0.18	0.03	0.17	0.20	0.06	0.27*	-0.04

Note: For definitions of variables see Table 15. Statistical significance: * p<0.10; ** p<0.05; *** p<0.01.

Appendix 9 cont.

Pair-wise correlations between variables

	d_Inst	*O_For*	*d_For*	*MV*	*D/A*	*CA/CL*	*PAT/S*
d_Inst	1.00						
O_For	-0.08	1.00					
d_For	-0.07	0.87***	1.00				
MV	-0.08	0.37***	0.37***	1.00			
D/A	0.17	-0.04	-0.04	-0.24*	1.00		
CA/CL	-0.22	0.03	0.14	-0.04	-0.39***	1.00	
PAT/S	-0.15	-0.07	-0.07	0.08	-0.25*	0.27*	1.00
ROE	0.02	0.01	0.01	0.43***	-0.25*	0.09	0.17
Sgr	-0.04	-0.05	-0.02	-0.01	0.27*	-0.13	0.15
PATgr	-0.09	-0.02	-0.17	0.21	-0.12	-0.01	0.11
Agr	-0.08	-0.04	-0.06	0.18	0.30**	-0.10	0.18
EXP/S	0.18	0.00	-0.05	-0.38***	-0.01	0.17	-0.25*
M/B	0.26*	0.33**	0.25*	0.33**	-0.05	0.02	0.25*
EntryB	-0.15	-0.01	0.00	0.24*	-0.54***	-0.08	0.14
I	0.21	0.21	0.15	0.33**	-0.20	0.11	-0.06
Re	0.25*	0.09	0.04	0.19	-0.15	0.13	-0.12
P	0.09	0.06	0.08	0.43***	-0.10	0.07	-0.06
Ra	0.32**	0.15	0.12	0.17	0.04	0.00	-0.11
F	0.23	0.00	0.01	0.41***	-0.14	0.16	-0.02
U	0.07	0.12	0.12	0.48***	-0.13	0.14	-0.02
C	0.18	0.15	0.12	0.38***	-0.17	0.10	-0.07
T	0.17	0.10	0.10	0.45***	-0.11	0.13	-0.04
DQ	0.18	0.13	0.11	0.42***	-0.14	0.12	-0.06
Sent	0.29**	0.15	0.18	0.34**	-0.19	0.05	0.00
NoAnn	0.12	0.04	0.05	0.43***	-0.10	0.12	-0.05

	ROE	*Sgr*	*PATgr*	*Agr*	*EXP/S*	*M/B*	*EntryB*
ROE	1.00						
Sgr	0.24*	1.00					
PATgr	0.34**	0.18	1.00				
Agr	0.38***	0.69***	0.22	1.00			
EXP/S	-0.18	-0.02	-0.10	-0.20	1.00		
M/B	0.39***	0.02	0.19	0.07	0.04	1.00	
EntryB	-0.17	-0.23	-0.14	-0.34**	-0.15	-0.10	1.00
I	0.00	0.13	0.08	0.03	0.01	0.14	0.15
Re	0.27*	0.19	0.10	0.18	0.11	0.27*	-0.04

Note: For definitions of variables see Table 15. Statistical significance: * p<0.10; ** p<0.05; *** p<0.01.

Appendix 9 cont.

Pair-wise correlations between variables

	ROE	*Sgr*	*PATgr*	*Agr*	*EXP/S*	*M/B*	*EntryB*
P	0.07	0.01	0.07	0.04	-0.13	0.04	0.08
Ra	0.16	0.30**	0.08	0.23*	0.15	0.33**	-0.17
F	0.14	0.00	0.14	0.08	-0.11	0.17	0.06
U	0.14	0.14	0.10	0.16	-0.09	0.11	0.04
C	0.06	0.10	0.09	0.06	-0.04	0.13	0.11
T	0.16	0.14	0.12	0.16	-0.06	0.18	0.01
DQ	0.11	0.12	0.10	0.11	-0.05	0.15	0.06
Sent	0.16	0.02	0.05	-0.07	-0.08	0.36**	0.03
NoAnn	0.12	0.08	0.11	0.12	-0.10	0.15	0.04

	I	*Re*	*P*	*Ra*	*F*	*U*	*C*
I	1.00						
Re	0.71***	1.00					
P	0.79***	0.59***	1.00				
Ra	0.63***	0.60***	0.44***	1.00			
F	0.81***	0.73***	0.91***	0.49***	1.00		
U	0.85***	0.64***	0.88***	0.57***	0.86***	1.00	
C	0.96***	0.76***	0.92***	0.60***	0.91***	0.91***	1.00
T	0.88***	0.72***	0.89***	0.68***	0.91***	0.98***	0.94***
DQ	0.93***	0.75***	0.92***	0.65***	0.93***	0.96***	0.99***
Sent	0.60***	0.54***	0.50***	0.60***	0.58***	0.60***	0.61***
NoAnn	0.83***	0.72***	0.95***	0.55***	0.95***	0.92***	0.94***

	T	*DQ*	*Sent*	*NoAnn*
T	1.00			
DQ	0.98***	1.00		
Sent	0.66***	0.64***	1.00	
NoAnn	0.95***	0.96***	0.60***	1.00

Note: For definitions of variables see Table 15. Statistical significance: * p<0.10; ** p<0.05; *** p<0.01.

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