

**Price Discovery, Investor Distraction and Analyst Recommendations under  
Continuous Disclosure Requirements in Australia**

A Thesis Submitted for the Degree of  
Doctor of Philosophy

by

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in

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October 12, 2012

## **CERTIFICATE OF AUTHORSHIP/ORIGINALITY**

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Student

## **Acknowledgements**

In January 2008 my wife and I thought it could be a good idea to have an international experience together and Australia seemed like a wonderful place to live. Within a week of sending my application documents to the PhD in Finance I received a surprising reply from David Michayluk. Not only because it was much faster than expected but also because Dave was in Buenos Aires at the moment and wanted to have an interview to assess my eligibility to the program. From that moment and until today when I'm giving the final touches to my thesis he has always been supportive, enthusiastic and insightful. For accepting to be my supervisor and for believing in me and my work more than anyone else (including myself) I am immensely grateful.

I am also grateful to my alternate supervisor, Terry Walter, for his timely comments and suggestions. Thanks Adrian Lee for the keen interest in my work and for the contributing comments. To all my fellow PhD students, it has been a pleasure to share all these years with you. Finally, I would also like to thank the University for the financial assistance during my candidature.

It would have been impossible to pursue my doctoral studies without the support of my beloved wife Yani. Thanks for sharing this journey with me. Special thanks to my mother, Isabel, for her endless love and her continuous support.

## **Abstract**

Disclosure rules directly affect the availability of information to investors and therefore influence their choices. Australia has a unique disclosure environment whereby firms are required to immediately disclose any information that could have an effect on the price of the firm's securities. This thesis contributes to the literature on market efficiency and information disclosure by examining three separate questions on the continuous disclosure environment in Australia during the period 2005 – 2009. The first essay (Chapter 2) analyses how disclosure regulation in Australia contributes to the price discovery process. We measure the impact of the frequency of market sensitive announcements (MSAs) on the speed and the accuracy with which prices incorporate new information. We find a favourable impact of disclosure on the speed of price discovery for firms with a disclosure frequency above a minimum threshold. With regards to accuracy, first we find that there is twice as much information contribution on days around market sensitive announcements compared to other days. Secondly, we also provide evidence that the frequency of disclosure contributes to reducing the informativeness of earnings announcements by lowering the level of disagreement among investors and the amount of new information disclosed in the earnings announcement. This last effect highlights the importance of voluntary disclosures in reducing the informativeness of earnings for the smallest firms. The second essay (Chapter 3) tests the investor distraction hypothesis, assessing the impact of concurrent information releases under continuous disclosure requirements (CDRs) in Australia in the market response to firms' information disclosures. Despite having several attributes to increase investor awareness, the magnitude and the speed of the short term market reaction to MSAs released by firms trading on the ASX are adversely affected by the level of investor distraction measured by the total number of MSAs released on the announcement day. The relative order in which MSAs are released during the day also affects the promptness and magnitude of the market reaction. The initial underreaction to MSAs released on high distraction days is followed by a longer delay in the market

reaction. Increased delayed market reaction is not caused by either additional information releases by the company or by analyst recommendation revisions made public after the MSA. Our results emphasise the importance of actions taken in the Australian market to reduce the impact of investor distraction that could be emulated in other markets, such as labelling certain announcements as market sensitive and using trading halts to attract investor attention. The third essay (Chapter 4) analyses the information content of analyst recommendations in Australia. Recent literature casts doubt on the contribution of analysts to the information environment of the firms they follow, suggesting only a small portion of the analysts' recommendation is influential or even going as far as to argue they simply piggyback on firms' information disclosures. Our findings support the market's view of analysts as interpreters and disseminators of public information. Recommendation revisions are more likely to be influential when the recommendation is related to smaller firms, released by an experienced analyst and when the change in the recommendation skips a level.

**Keywords:** disclosure frequency, price discovery, analyst recommendations, investor attention.

**JEL classification:** G11, G14, G18, G24, G28.

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## **Chapter 1. Introduction**

### **1.1. Continuous Disclosure Requirements in Australia**

Disclosure rules directly affect the availability of information to investors and the efficiency of price discovery. Regulators in most markets share the vision that their actions should be directed to maintaining a fair, orderly, efficient and transparent market<sup>1</sup>. However, the design of disclosure regulations has some noteworthy differences with respect to the relative importance of periodic and non-periodic reporting. The focus in the Australian market is motivated by the fact that during the last decade markets in several countries such as New Zealand, Canada, United Kingdom and the United States have adopted policies to increase the relevance of continuous disclosure. Australia was a pioneer in having a disclosure environment dominated by continuous (non-periodic) disclosure instead of periodic disclosure when it imposed statutory civil and criminal penalties on continuous disclosure requirements and favoured the requisite of half-yearly reporting over quarterly reporting in 1994 (Heggen 2006).

There are four reasons why the continuous disclosure environment in Australia provides an attractive setting to study the efficiency of price discovery, the investor distraction hypothesis and the information content of analyst recommendation revisions. First, the immediacy requirement in Australia requires information to be promptly disclosed to the market. In Chapter 3 of the Australian Securities Exchange (ASX) listing rules, Rule 3.1 states that: “Once an entity is or becomes aware of any information concerning it that a reasonable person would expect to have a material effect on the

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<sup>1</sup> Take for example Australia and the United States. Under Australia’s Corporations Act, the Australian Securities Exchange (ASX), in its role as market licensee, must “to the extent that it is reasonably practicable to do so, do all things necessary to ensure that the market is a fair, orderly and transparent market”. In the US, the mission of the Securities and Exchange Commission (SEC) is “to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation”.

price or value of the entity's securities, the entity must immediately tell the ASX that information"<sup>2</sup>. Secondly, announcements submitted by firms to the ASX are analysed and classified by the ASX as either market sensitive (MSA) or non-market sensitive (non-MSA) providing investors with an indication of the relevance of the news. Thirdly, once classified into one or many of the 19 types, company announcements are made available to all investors in a centralised platform. Finally, a trading halt is imposed when a market sensitive announcement is released. These trading interruptions can take one of two forms. One is an ordinary procedure followed by which the ASX places a company's securities into a Pre-Opening Phase when it receives an announcement and considers it to be market sensitive. This trade interruption is 10 minutes long for most announcements and it is 60 minutes long for takeover announcements. The other kind of trade interruption is a proper trading halt requested by a company when it expects the occurrence of an event but is not in a position to accurately inform the market. These trading halts last until the announcement is made or the commencement of trading on the second day after the trading halt was imposed.

Several studies support the positive role of CDRs in improving disclosure frequency, in levelling the playing field to all investors and in providing a precise signal of the market sensitivity of announcements. Brown et al. (1999) analyse the disclosing behaviour of firms as well as the responses of investors and analysts to the new disclosure environment after the introduction of statutory penalties on continuous disclosure requirements by comparing the pre and post-sanctions periods. Favourable consequences of the new regulation are found in the increase in the quantity of voluntary disclosures for firms with no analyst following and in the improved timeliness of price discovery for smaller firms. The effect of CDRs on analysts' behaviour is supported by Brown et al.'s (2009) finding that the proportion of negative recommendations is seven times higher in Australia than in the US. They relate this difference to the fact that CDRs make it illegal to selectively disclose information, lowering the incentive for analysts to please the firm's management with their recommendations. Brown et al. (2005) conclude there is an unusual amount of information impounded into prices as a

---

<sup>2</sup> Exclusions to disclosure apply when information meets all of the following three requirements: i) a reasonable person would not expect the information to be disclosed; ii) the information is confidential; and iii) either disclosing the information would be a breach of a law; or the information is an unfinished proposal or negotiation, a matter of supposition, generated for internal management purposes, or a trade secret.

consequence of announcements marked as market sensitive. Analysing order flows and price changes around 19 announcement types from July 1998 to June 2003 they report significantly larger price changes around days with MSAs compared to days with non-MSA announcements.

The above analysis gives rise to three event studies related to continuous disclosure requirements in Australia. Chapter 2 is motivated by the lack of understanding of the long term impact of MSAs to long term price discovery and fills this gap by measuring the impact of the frequency of MSAs on the speed and the accuracy with which prices incorporate new information. Chapter 3 tests the investor distraction hypothesis, assessing the impact of concurrent information releases under CDRs in Australia in the market response to firms' information disclosures. The results shed light on the extent to which disclosure requirements in Australia contribute to reducing the effects of distracting information on the reaction to specific news released by companies. Chapter 4 analyses the information content of analyst recommendations revisions in Australia. Recent works suggest the alleged informativeness of analyst recommendation revisions is the result of a confounding effect produced by the proximity of their recommendations to other corporate events and news. Examining the reaction to analyst recommendation revisions released around MSAs and controlling for confounding effects allows us to test whether analysts are more valuable as producers of private information or as interpreters of public information.

## **1.2. Disclosure Frequency and the Efficiency of Price Discovery**

Chapter 2 explores whether the specific characteristics of the Australian disclosure regulation favour the speed and the accuracy of the price discovery process. The relevance of the disclosure regulation – price discovery relation rests in the fact that different market regulators give more or less margin for management's discretion on what and when to disclose. Australia's disclosure requirements are among the most demanding regulations in terms of delivering information to investors in an accurate, transparent and timely manner. In this context, the increased importance of continuous disclosure via non-periodic announcements in different markets around the world brings attention to the Australian market. In particular, this chapter is motivated by Lerman and Livnat's

(2010) counterintuitive findings in their study of the impact of an increase in the number of items that require mandatory filing in the US. After the regulatory modification they find that the increase in the informativeness of the new non-periodic reports released during a period was also accompanied by an increase in the informativeness of periodic reports at the end of the period.

We hypothesise that in a market where certain announcements are marked as market sensitive the frequency of MSAs released by a firm should positively affect the speed and the accuracy of the price discovery process. To have a comprehensive idea of the contribution of continuous disclosure requirements to the efficiency of price discovery we first measure the speed of price discovery between two consecutive preliminary final statements (PFSs) by using a measure of timeliness based on Beekes and Brown (2006). Secondly, to determine the accuracy of price discovery under continuous disclosure we measure the informativeness of PFSs and information contribution of MSAs. Following Beaver (1968), the informativeness of PFSs is measured using absolute abnormal returns and abnormal volume around the PFS announcement as proxies for the new information contributed by the PFS. This chapter contributes to a growing body of literature measuring the impact of disclosure frequency on the information environment of firms (Brown et al. 2004b; Debreceeny and Rahman 2005; Butler et al. 2007; Jo and Kim 2007; Hsu 2009).

### **1.3. The Investor Distraction Hypothesis**

Combining the predictions of the investor attention hypothesis and a measure of the competing information faced by earnings announcements, Hirshleifer et al. (2009) propose the investor distraction hypothesis, which predicts that the confounding effect of concurrent information will decrease the response to new information by investors who are already attention constrained. Chapter 3 analyses the investor distraction hypothesis under CDRs in Australia. On any single day, the volume of information about firms exceeds what an average investor can gather and process to make investment decisions. In this scenario, news about some firms may attract more attention and distract investors away from information releases made by other firms.

This chapter extends the existing literature by analysing the extent to which the confounding effect of concurrent information deteriorates the market response to new information in Australia using all MSA types and not only earnings announcements. In Australia, the sources of distraction are reduced by marking those announcements expected to be more relevant as market sensitive. For the period 2005 – 2009 the average total number of daily announcements is reduced from 425 to a daily average of 104 MSAs. Despite this screening process the amount of potentially distracting information is still considerable and the predictions of the investor distraction hypothesis are expected to hold. In the first place, the number of MSAs released on the announcement day is expected to negatively affect the short term market response to MSAs. Secondly, the level of distraction on the announcement day is expected to positively affect the delayed market response to MSAs. This research also provides evidence on the effectiveness of trading halts requested by the firms in reducing the impact of distracting information on the market reaction to specific news released by companies. Another by-product of this chapter is that it provides evidence on whether management strategically discloses MSAs across times of the days or days of the week.

#### **1.4. Informativeness of Analyst Recommendations**

In Chapter 4 we analyse the information content of analyst recommendations in Australia. Recent works cast doubt on the relevance of analyst recommendation revisions, suggesting only a small portion is influential (Loh and Stulz 2011), or going as far as arguing they simply piggyback on firms' information disclosures (Altunkılıç and Hansen 2009). The relevance of the topic rests in the fact that it challenges the prevailing view of analysts making a significant contribution to the price discovery process (Stickel 1995; Womack 1996; Barber et al. 2001).

A challenging aspect of this study is that our sample of MSA-related recommendation revisions contains, by definition, analyst recommendations released during a window starting 3 trading days before and finishing 3 days after the release of a MSA by the firm. For this reason, an important portion of the market reaction to recommendation revisions made after MSAs is expected to be related to the original disclosure and not to the recommendation itself. However, we cannot rule out that

analysts help investors in understanding the information contained in public disclosures. One limitation to separating the two effects is the lack of a time stamp for the recommendation revisions. We overcome this problem by implementing a methodological innovation. The market reaction to the sample of MSA-related revisions is compared with the market reaction to two control groups. One group contains all standalone revisions: those revisions released outside the 3-day window. The second control group contains those MSAs not closely preceded or followed by analyst revisions, standalone MSAs. Using these two control groups we are able to deal with the confounding effects of overlapping announcements and revisions.

This chapter contributes to the existing literature in a number of ways. A major contribution of our study is that, unlike most papers in the field that analyse only recommendations around earnings announcements, recommendation revisions released around all MSA types are analysed here. Secondly, it sheds light on which role of analysts is more valuable to investors; their role as interpreters of public information or the role as developers of private information. Thirdly, it provides evidence on whether the interpretative role is such or if it is just the consequence of analysts timing their recommendations to piggyback on corporate events. Finally, it contributes to distinguishing the type of events and firms for which the role of analysts interpreting public information is more valuable.

The remainder of the thesis focuses on Australia's continuous disclosure requirements to investigate the three aforementioned topics. Chapter 2 analyses the impact of disclosure frequency on the efficiency of price discovery. Chapter 3 studies the investor distraction hypothesis. Chapter 4 evaluates the relative informativeness of analyst recommendation revisions. Chapter 5 summarises the findings of the thesis and explores directions for future research.

## **Chapter 2.** **Price Discovery under Continuous Disclosure Requirements in Australia**

### **2.1. Introduction**

Disclosure regulation provides a significant contribution to the price discovery process. O'Hara (2001) identifies two factors affecting the efficiency of the price discovery process: the fairness and integrity of prices and the information structure. The role of disclosure regulation is also supported by Healy and Palepu (2001), but only in the presence of failures in the information market since without market imperfections, firms would voluntarily produce an efficient amount of information for investors. Without appropriate disclosure regulation, Leftwich (1980) and Beaver (1998) identify two events that may occur: (1) information underproduction as a consequence of positive externalities to third parties, namely, prospective investors or related firms; and (2) uneven information distribution across investors, creating information asymmetries among them. To prevent these from happening regulators across markets agree on the importance of disclosure regulation to maintaining a fair, orderly, efficient and transparent market. However, the design of disclosure regulations has some noteworthy differences with respect to the relative importance of periodic and non-periodic reporting.

In this chapter we measure the effectiveness of the Australian disclosure environment in accomplishing the desired goals by measuring the impact of disclosure frequency in the timeliness<sup>3</sup> and the accuracy of price discovery. This chapter is motivated by Lerman and Livnat's (2010) findings in their study of the impact of an increase in the number of items that require mandatory filing of Form 8-K reports in the US<sup>4</sup>. After the regulatory modification they find that the increase in

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<sup>3</sup> In this work we refer to timeliness of price discovery as the extent to which daily share prices throughout the year anticipate the value of the shares ten trading days after the Preliminary Final Statement (earnings release) has been made public. The terms timeliness and speed of price discovery are used interchangeably.

<sup>4</sup> In July 2002, the Sarbanes-Oxley Act was enacted as a response to a series of corporate accounting frauds. Section 409 of the Act requires public firms to disclose "on a rapid and current basis such additional information concerning material changes in the financial condition or operations of the issuer". To cope with Section 409 of the Sarbanes-Oxley Act, in August 2004 the SEC issued rule "Additional Form 8-K Disclosure Requirements and Acceleration of Filing Date" to increase the number of events which firms should disclose filing a Form 8-K.

the informativeness of the new non-periodic reports released during a period was accompanied by an increase in the informativeness of periodic reports at the end of the period. This finding is somewhat counterintuitive. Since the periodic report (Earnings Release) reflects the performance of the firm during the period, an increased volume of relevant information released during a given period is expected to reduce the volume of new information discovered with the release of the periodic report.

This research is relevant for policy makers worldwide who are concerned about the impact of continuous disclosure on the price discovery process. The findings are also particularly relevant for investors able to choose the markets in which to trade, and there are also implications for market structure design. The remainder of this chapter is structured as follows. Section 2.2 explains the disclosure environment in Australia. Section 2.3 discusses sample selection and methodology. Section 2.4 develops the hypotheses. Section 2.5 reports and interprets the results. Finally, Section 2.6 concludes.

## **2.2. Disclosure Environment in Australia**

### *2.2.1. Disclosure Regulation*

Australia pioneered the shift towards a disclosure environment dominated by continuous (non-periodic) disclosure instead of periodic disclosure. When the Companies and Securities Advisory Committee (CASAC) was asked to examine the need for a regulatory framework based on continuous disclosure in 1991, it concluded a statutory-backed system of continuous disclosure complemented by a half-yearly reporting requirement will promote investor confidence in the integrity of Australian capital markets (CASAC 1991). Continuous disclosure requirements were already considered in Chapter 3 of the Australian Securities Exchange (ASX) listing rules. Rule 3.1 states that: “Once an entity is or becomes aware of any information concerning it that a reasonable person would expect to have a material effect on the price or value of the entity’s securities, the entity must immediately tell

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On the background section, the SEC mentions that the limited number of events covered by Form 8-K gave firms the opportunity to delay the disclosure of relevant information until the release of periodic reports. This regulatory change also imposed a reduction of the form filing deadline from 15 days to four business days.

ASX that information”.<sup>5</sup> Following CASACs recommendation, statutory backing to the rule was provided by the Corporate Law Reform Act 1994. Other countries adopted statutory backing to continuous disclosure requirements. In 2001, the UK’s Financial Services Authority took the responsibility of enforcing the listing rules, including continuous obligations. More recently, New Zealand adopted a continuous disclosure regime similar to the one in Australia in December 2002. In Canada, National Instrument 51-102 Continuous Disclosure Obligation was released on December 2003 and became effective in all 13 Canadian jurisdictions. In 2004 a regulatory modifications to the 1990 Ontario Securities Act was put in place, including statutory civil penalties for misrepresentations in continuous disclosure documents (Heggen 2006).

The regulatory changes in Australia were in the opposite direction of the changes adopted by the US Securities and Exchange Commission (SEC), increasing the frequency of periodic reporting from annual after the SEC Act of 1934, to semi-annual reporting from 1955, and quarterly reporting requirements from 1970 (Butler et al. 2007). Disclosure regulation in the US is based on a periodic reporting model as described by Heggen (2006). Although major exchanges in the US require continuous disclosure of price sensitive information by listed firms, there is no statutory backing for the requirement (Commonwealth of Australia 2002). The SEC requires firms to disclose certain major non-periodic events by filing a Form 8-K. To cope with the 2002 Sarbanes-Oxley Act, in August 2004 the SEC increased the number of events which firms should disclose filing a Form 8-K and imposed a reduction of the form filing deadline from 15 days to four business days. In the background section, the SEC mentions that the limited number of events covered by Form 8-K gave firms the opportunity to delay the disclosure of relevant information until the release of periodic reports. These later modifications in the US regulation are in the direction of increasing the relative importance of continuous disclosure over periodic disclosure.

Despite being ranked well ahead of markets in other developed countries like the US, the UK and Canada (Schwab and Porter 2008; Schwab 2009, 2010) in the Regulation of Securities Exchanges

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<sup>5</sup> Exclusions to disclosure apply when information meets all the following three requirements: i) a reasonable person would not expect the information to be disclosed; ii) the information is confidential; and iii) either disclosing the information would be a breach of a law; or the information is an unfinished proposal or negotiation, a matter of supposition, generated for internal management purposes, or a trade secret.

ranking included in the Global Competitiveness Report during the 2008 – 2010 period, one criticised aspect of the CDRs is the soft enforcement of Rule 3.1<sup>6</sup>. To prevent breaches to CDRs, the ASX monitors trading in the market and requires a formal reply from firms that show unusual price and volume movements on whether there is information that should be disclosed to the market. Gong's (2007) finding that 30% of the firms disclose new information to the market after being queried supports the idea that some firms withhold information under CDRs. In addition, Hsu (2009) argues that the number of firms identified to have infringed CDRs is small and the penalty of doing so is low. As a remedy to address breaches of CDRs, the fine was increased from \$200,000 under the Corporations Act 2001, to \$1 million under the Corporate Law Economic Reform Program Act 2004 (CLERP 9) that became effective on 1 July 2004. In spite of this increase in the fine, lack of enforcement is still the main concern about the regulatory framework in Australia. As a response, in August 2009 the Australian government decided the Australian Securities and Investments Commission (ASIC) should undertake the supervision of real-time trading on Australia's licensed markets. Real time supervision by ASIC began on the 1<sup>st</sup> of August, 2010. In this framework ASX, as a market operator, retains the duty to enforce compliance with market listing rules, including continuous disclosure monitoring. This short description of specific issues surrounding CDRs indicate that, despite being one of the most developed disclosure regimes, CDRs is not without some concerns.

### *2.2.2. Disclosure Regulation and Price Discovery*

Price discovery is one of the primary functions of financial markets. There are two main approaches to studying price discovery. Short term price discovery is mainly studied in the microstructure literature assuming, as Hasbrouck (1991) does, that public information is directly impounded into prices while private information has to be inferred from the unexpected component of trades. The daily contribution to the price discovery process is dissected in different ways; studying how different trade sizes (Barclay and Warner 1993); after hours-trades (Cao et al. 2000; Barclay and Hendershott 2003); and different exchanges (Eun and Sabherwal 2003) contribute to price discovery.

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<sup>6</sup> Enforcement of disclosure is the responsibility of the ASX. Under Australia's Corporations Act, the ASX, in its role of market licensee, must "to the extent that it is reasonably practicable to do so, do all things necessary to ensure that the market is a fair, orderly and transparent market".

Long term efficiency of price discovery, which is the focus of our work, is also examined from different perspectives in the literature; measuring the contribution of analysts (Gleason and Lee 2003); regulatory modifications (Chang et al. 2007; Heflin et al. 2003); and corporate governance quality (Beekes and Brown 2006) to the price discovery process.

There is limited evidence on the effect of different types of disclosure and disclosure regulation on the timeliness and accuracy of price discovery. Ball and Brown (1968) were the first to relate disclosure and the timeliness of price discovery. They found about 90% of the new information contributed by the annual report were already impounded into prices at the beginning of the month in which the report was issued. These results suggest most of the information provided by the annual report reaches the market through other information releases. The work of Alford et al. (1993) provides the first evidence about timeliness in Australia. They use US firms as a benchmark to compare the informativeness of earnings and the timeliness of price discovery in 16 countries for the period 1983 – 1990. They find the price discovery process is timelier for firms in Australia, France, the Netherlands, the UK, and Canada than it is for firms in the US. In the first four countries, periodic reports are semi-annual, making clear there are additional means besides periodic reports by which information gets impounded into stock prices. Their results are prior to the establishment of the CDRs in Australia. Another indication of the limited importance of the frequency of periodic reports is offered by Butler et al. (2007). They analyse the effect of voluntary and mandatory periodic reporting on the speed of price adjustment to new information for US firms in the period 1950 – 1973 using the natural experiment provided by the increase in reporting frequency from half-yearly to quarterly imposed by the SEC in 1970. Their finding, that firms voluntarily increasing their reporting frequency from half-yearly to quarterly show improvements in the timeliness of price discovery while firms reacting to mandatory requirements do not, suggests the value of periodic disclosures not only rests on its frequency but also on the quality of the information disclosed in them. The closest attempt to investigating a causal relationship between timeliness of price discovery and disclosure is Beekes and Brown (2007). They find a positive correlation between the timeliness of price discovery and two alternative measures of timeliness. One measure uses the convergence of analyst's forecasts; the other measure uses cumulative returns on days where firms release MSAs.

Studies on the initial reaction to CDRs have mixed results. Brown et al. (1999) analyse the disclosing behaviour of firms as well as the responses of investors and analysts to the new disclosure environment by comparing the pre and post-sanctions periods. Favourable consequences of the new regulation are found in the increase in the quantity of voluntary disclosures for firms with no analyst following and in the improved timeliness of price discovery for smaller firms. Although the introduction of CDRs in Australia had a marginal impact on the overall timeliness of price discovery, this finding by Brown et al. is particularly important in light of Leuz and Verrecchia's (2000) argument that it is difficult to find significant differences after a regulatory change in a market with an already rich informational environment. Against the new ruling, they discover that after CDRs, analysts make less accurate forecasts and there is no significant change in the relation between the number of voluntary disclosures and monthly stock price volatility. The impairment of analysts' forecasts could be interpreted as a desirable consequence of CDRs if it is caused by a drop in the selective disclosure of information. The effect of CDRs on analysts' behaviour is further supported by Brown et al.'s (2009) finding that the proportion of negative recommendations is seven times higher in Australia than in the US. They relate this difference to the fact that CDRs makes it illegal to selectively disclose information, lowering the incentive for analysts to please the firm's management with their recommendations<sup>7</sup>.

Disclosure regulation and good corporate governance practices are two aspects improving market transparency. Using data from 250 Australian firms in 2002, Beekes and Brown (2006) analyse the effect of corporate governance quality on the information disclosures made by firms and in the timeliness of the market response. They measure informativeness using four variables: i) the frequency of market sensitive disclosures; ii) the number of analysts following; iii) measures of accuracy, bias, and disagreement in analysts' forecasts; and iv) a measure of timeliness. They find better governed firms report more frequently and face faster price adjustment to news. Another interesting finding is that 'good news' firms and larger firms show a timelier market response to information disclosure. By not controlling for the disclosure of mandatory MSAs in their assessment of the impact of corporate governance quality on the timeliness of price discovery, Beekes and Brown

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<sup>7</sup> Their sample period is mostly pre-Regulation Fair Disclosure regulation in the US.

do not contemplate that some of the information getting impounded into prices reaches the market is provided by firms acting according to the regulation. In support of the contribution of CDR to market transparency, Mahipala et al. (2009) find that the fact that management earnings forecasts contain good or bad news does not affect the level of asymmetric information borne by uninformed investors before the announcements. Furthermore, evidence on the impact of CDRs on information asymmetries among investors is not conclusive. Poskitt (2005) makes the only comparison of the levels of informed trading before and after CDRs, finding no significant changes in informed trading in the year before and after the enactment of the Corporation Law Reform Act 1994. This lack of change could be interpreted as an offsetting of the predictions of Diamond (1985) and Kim and Verrecchia (1994). Diamond argues that precise and frequent public disclosures are expected to be related to low levels of information asymmetry. In contrast, Kim and Verrecchia suggest public disclosure is a source of private information for investors with superior analytical capabilities.

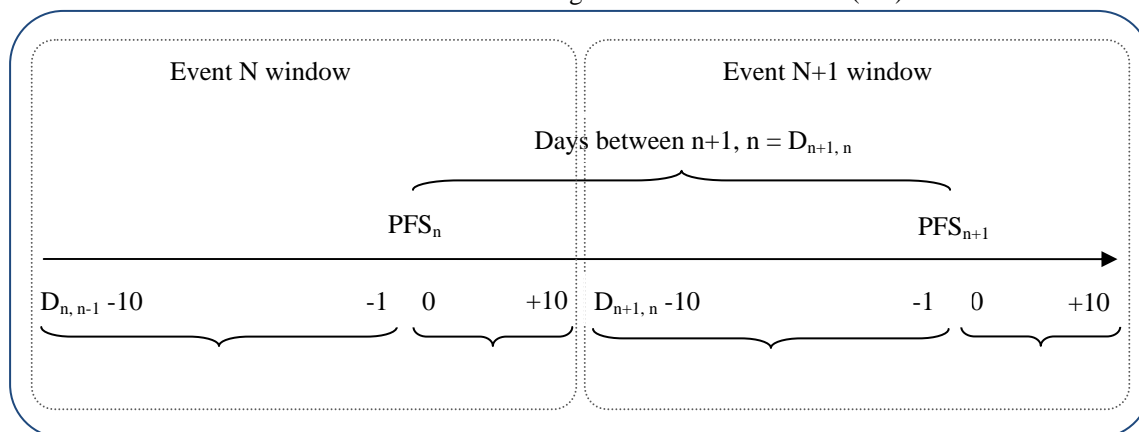
One aspect of CDRs seems to be irrefutable: announcements flagged as MSAs have an impact on the securities traded. Brown et al. (2005) analyse the order flows and price changes around 19 types of announcements from July 1998 to June 2003. They estimate order placements and revisions, trading activity, order imbalance, price changes and time between trades in the 60 minutes prior and subsequent to each announcement in sub-intervals of 1 to 15 minutes. They find abnormally low traded volumes, abnormally high order revisions and abnormally low levels of new orders before Preliminary Final Statement (PFS) releases. These announcements are always market sensitive and the timing is generally predictable since they occur with regularity each year after the end of a company's financial reporting period. Brown et al. also report significantly larger price changes around MSAs compared to other announcements. Their results indicate that, in the short-term, there is an unusual amount of information impounded into prices as a consequence of announcements marked as market sensitive. There are, however, no studies analysing the long term impact of MSA on the price discovery process. The importance of the long-term timeliness and accuracy of price discovery to measure the effectiveness of disclosure regulation, the lack of studies linking these two variables with specific types of announcements, and the rich information set provided by the Australian market represent a unique opportunity to make a valuable contribution to the disclosure literature.

## 2.3. Sample Description and Methodology

### 2.3.1. Sample Selection

Taking all firms trading on the ASX during the period 2005 – 2009 as a starting point, the sample is composed of 6,384 firm-years (events) having two consecutive PFSs within 211 and 300 trading days. Beekes and Brown (2006) support the use of PFS as the primary announcement of results for Australian companies due to the fact these announcements contain financial statements and details of any completed or planned capital raisings. The length of each event window is defined by the distance in days between the two consecutive PFSs<sup>8</sup>. The event window begins 10 trading days after the previous PFS and ends 10 trading days after the event related PFS<sup>9</sup> (Figure 2.1).

Figure 2.1  
Event windows for calculating the Timeliness Measure (Mc)



The total number of firm-days is 1,612,918, with a mean event window length of 252.65 days. Among the 1,940 firms included in the sample, around 30% appear in all five years and 67% have events in three or more years. Stock prices, trading information and announcements are sourced from Securities Industry Research Centre of Asia-Pacific (SIRCA). Market capitalisation data is obtained from Morningstar's DatAnalysis and analyst following is obtained from the Institutional Brokers' Estimate System (IBES).

<sup>8</sup> This methodology differs from that used in Beekes and Brown (2006), where a fixed 250 trading day event window is considered.

<sup>9</sup> Results are robust to extending the length of the after PFS window to 15 trading days.

### *2.3.2. Timeliness and Accuracy of Price Discovery*

To have a comprehensive idea of the contribution of continuous disclosure requirements to the efficiency of price discovery we measure the impact of the frequency of non-periodic MSAs on the timeliness and accuracy with which prices incorporate new information. The information contained in the release of the Preliminary Final Statement (PFS) is used as a benchmark when comparing information from other news releases generated prior to the PFS. First, we measure the impact of the disclosure frequency of non-periodic MSAs on the speed of price discovery between two consecutive PFSs using a measure of timeliness based on Beekes and Brown (2006). Second, accuracy is measured by analysing the effect of disclosure frequency on the informativeness of earnings announcements proxied by abnormal volume and absolute abnormal returns from the announcement day to the second day after the announcement (days 0 to +2).

#### *2.3.2.1. Timeliness Measures*

There are different interpretations of timeliness in the disclosure literature. The term timeliness is used by Carter and Soo (1999) and Lerman and Livnat (2010) to refer to the time elapsed between the occurrence of an event and the time when the firm makes the announcement. In another definition, Ball and Brown (1968) Alford et al. (1993) and Beekes and Brown (2006) consider timeliness as the speed of price adjustment to new information. This last definition is the one adopted in this research.

Ball and Brown (1968) first introduced the concept of timeliness of price discovery when assessing the relevance of accounting income information in the process of pricing securities. Their work was extended to a multinational scale by Alford et al. (1993), who estimate the timeliness of price discovery for 16 countries. Butler et al. (2007) use the same portfolio based measure introduced by Ball and Brown (1968) and also calculate an individual firm intra-period timeliness measure (IPT). IPT calculates timeliness as the area under a curve formed by the proportion of the annual buy-hold return achieved by the buy-hold returns at the end of each month. In this way, timeliness is the sum of the areas of the twelve monthly rectangles. The sooner the twelve month buy-hold return is reached by the monthly buy-hold returns, the higher the area under the curve. Therefore, high IPT values are associated with timelier price discovery processes. An alternative timeliness measure, also inspired by

Ball and Brown, is explored by Beekes and Brown. To determine the average speed of price discovery throughout the year they measure to what extent daily share prices throughout the year anticipate the value of the shares ten trading days after the Preliminary Final Statement has been made public.

$$Mc = \left( \sum_{t=-249}^{t=0} |\ln(P_0) - \ln(P_t)| \right) / 250 \quad (2.1)$$

where  $\ln(P_0)$  is the logarithm of the price ten trading days after the release of the PFS, which is the end of the event window, and  $\ln(P_t)$  is the logarithm of the price at time  $t$ . Beekes and Brown (2006) use both raw prices and market adjusted prices<sup>10</sup>. As opposed to the IPT measure, low (high) values of the  $Mc$  measure are associated with a timelier (less timely) price discovery process.

In choosing a variable to measure timeliness of price discovery our approach focuses on individual firms. This characteristic rules out Ball and Brown's (1968) and Alford et al.'s (1993) portfolio-based measures. In addition, our analysis incorporates the effect of MSAs that are disclosed on a daily basis, making less appropriate the use of a monthly measure as the IPT suggested by Butler et al. (2007). Because our study examines individual firms with a daily frequency, we consider that it is more appropriate to use the daily frequency developed by Beekes and Brown (2006). All four alternative timeliness measures suggested by Beekes and Brown are used in this work: 1)  $Mc$  considering market adjusted prices; 2) Raw  $Mc$  without an adjustment for market returns; 3)  $Mc$  Deflated calculated by dividing  $Mc$  by one plus the absolute rate of return for the year to account for the impact of idiosyncratic price volatility; 4) Raw  $Mc$  Deflated is similar to the  $Mc$  Deflated but uses unadjusted prices. Therefore, the impact of disclosure frequency on the timeliness of price discovery is first analysed using Equation 2.2:

$$Mc_{Def} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover \\ + b_4 \cdot Number\ of\ Analysts + b_5 \cdot Disclosure + \varepsilon_i \quad (2.2)$$

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<sup>10</sup> The market adjusted version is  $Mc = (\sum_{t=-249}^{t=0} [|\ln(P_0) - \ln(All\ Ords_0)|] - [|\ln(P_t) - \ln(All\ Ords_t)|]) / 250$ .

where  $MC_{Def}$  is the deflated timeliness measure using market adjusted returns. Size is the logarithm of the average market capitalisation for the period. Good News is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is the yearly share turnover measured as total shares traded during the period divided by the number of shares outstanding at the beginning of the period. Number of Analysts is the number of analysts following the company. Disclosure is alternatively measured by number of days with MSAs or number of MSA documents. To consider the separate effect of each announcement type, Equation 2.3 considers six of the 19 announcement types.

$$\begin{aligned}
 MC_{Def} = & a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Liquidity \\
 & + b_4 \cdot Number\ of\ Analysts + b_5 \cdot Tak + b_6 \cdot Cap \\
 & + b_7 \cdot Ass + b_8 \cdot Rep + b_9 \cdot Oth + b_{10} \cdot Add + \varepsilon_i \quad (2.3)
 \end{aligned}$$

where *Tak* is the frequency of Takeover MSAs; *Cap* is the frequency of Issued Capital MSAs; *Ass* is the frequency of Asset Acquisition and Disposal MSAs; *Rep* is the frequency of Progress Report MSAs; *Oth* is the frequency of Other MSAs; and *Add* is the frequency of Chairman's Address MSAs<sup>11</sup>.

### 2.3.2.2. Accuracy Measures

Accuracy of price discovery is estimated by analysing the effect of disclosure frequency on the informativeness of earnings announcements proxied by abnormal volume and absolute abnormal returns from the announcement day to the second day after the announcement (days 0 to +2) (Beaver 1968; Francis et al. 2002a, b; and Lerman and Livnat 2010). Before studying the relation between disclosure frequency and the informativeness of earnings announcements, we analyse whether the unusual short term amount of information impounded into prices as a consequence of MSAs found by Brown et al. (2005) is also present in the long term or if it is reverted in the days and weeks that follow the announcements. In order to do so, we measure information content of MSAs using a

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<sup>11</sup> The criteria followed to select these six announcement types is explained in section 2.3.3 below.

methodology based on Ball and Shivakumar (2008) and Beyer et al. (2010). In an attempt to quantify the contribution of new information of quarterly earnings releases to stock prices, Ball and Shivakumar regress calendar-year returns on returns of the three-day earnings announcement windows for each quarter for US firms between 1972 and 2006. Their estimate of information contribution, abnormal adjusted  $R^2$ , is the difference between the adjusted  $R^2$  for the regression and the 4.8% expected adjusted  $R^2$  for those 12 days under the null hypothesis that daily returns are i.i.d. across time<sup>12</sup>. They find the abnormal adjusted  $R^2$  for quarterly earnings announcements accounts for 5.9% to 9.3% (using arithmetic and logarithmic returns) of the total information impounded into prices throughout the year. In the final three years of the sample, they find a remarkable increase in abnormal adjusted  $R^2$  that is attributed to the increase in number of firms with concurrent management forecasts.

Since the number of MSAs is not evenly distributed across firms, it is not possible to estimate the abnormal adjusted  $R^2$  following Ball and Shivakumar's (2008) methodology. Instead, an alternative methodology based on Beyer et al. (2010) is used. Beyer et al. consider different information events and regress the quarterly cumulative abnormal return on the cumulative abnormal returns around days with earnings announcements, pre-earnings announcements, management earnings forecasts, analyst forecasts, and SEC form filings to determine the total abnormal  $R^2$  and the partial abnormal  $R^2$  for each disclosure category. They find that 28% of the return variance occurs on these information-event days but they do not provide a measure of the information contribution of these days in excess of the expected contribution on ordinary days. We use a similar methodology, measuring the information contribution of MSAs by regressing the firms' cumulative abnormal returns (CARs) between two consecutive PFSs on the CARs in the three days around the disclosure of MSAs (Equation 2.4).

$$CAR = a + b_1 \cdot CAR_{Tak} + b_2 \cdot CAR_{Cap} + b_3 \cdot CAR_{Ass} + b_4 \cdot CAR_{Rep} + b_5 \cdot CAR_{Oth} + b_6 \cdot CAR_{Add} + \varepsilon_i \quad (2.4)$$

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<sup>12</sup> The expected 4.8% is the result of the 12 days (four windows of three days each) over the 252 trading days. Ball and Shivakumar change the denominator each year to reflect the number of trading days.

where  $CAR$  is the firm's cumulative abnormal return between two consecutive PFSs;  $car_{tak}$  is the cumulative abnormal return around days with Takeover MSAs;  $car_{Cap}$  is the cumulative abnormal return around days with Issued Capital MSAs;  $car_{Ass}$  is the cumulative abnormal return around days with Asset Acquisition and Disposal MSAs;  $car_{Rep}$  is the cumulative abnormal return around days with Progress Report MSAs;  $car_{Oth}$  is the cumulative abnormal return around days with Other MSAs; and  $car_{Add}$  is the cumulative abnormal return around days with Chairman's Address MSAs.

To determine the total and partial abnormal  $R^2$  we count the total number of MSAs as well as the number of MSAs of each type. The expected or normal  $R^2$  under the hypothesis that abnormal returns are independently and identically distributed is the number of MSAs multiplied by 3 (days -1 to +1 around each MSA) and divided by the number of trading days between the two consecutive PFSs (252 days). The difference between the regression  $R^2$  and the expected  $R^2$  under i.i.d. returns is the measure of information content.

### *2.3.3. Market Sensitive Announcements Classification*

All disclosure variables are based on the announcements flagged as market sensitive. Panel A in Table 2.1 shows the number of days between two consecutive PFSs in which companies disclosed all types of MSAs and we classify them as days with periodic MSAs and days with non-periodic MSAs. Out of the 84,064 firm-days with MSAs (5% of all firm-days included in the sample), 71% are non-periodic suggesting non-recurrent announcements provide a valuable source of information to investors. We also count the number of documents disclosed by companies between two consecutive PFSs. In doing this we account for the fact that there are days in which firms make more than one MSA. The average number of market sensitive documents disclosed by firms on disclosing days is 1.1.

Panel B in Table 2.1 describes the distribution of documents according to announcement types. The classification of announcement types is based on the 19 sub-codes assigned by the ASX. First, we count the number of documents containing information of a certain type. Due to the fact that there are days in which firms make more than one MSA and that some MSAs contain more than one type of announcement, the sum of documents in Panel B does not match the total in Panel A. Second, we limit the sample to unique documents. That is MSAs containing only one announcement type and

issued on days in which no other MSAs are disclosed by the firm. Document counts and unique document counts are used to measure the impact of different announcement types on the timeliness and accuracy of price discovery.

Among periodic announcements, 'Periodic Reports' is the most common type both considering all documents and unique documents. This type includes PFSs, Annual Reports and Half Yearly Reports, among others. All the other periodic types refer to quarterly reporting and are limited to mining firms and to those admitted on the basis of commitments. Within the group of non-periodic announcements, 'Progress Report' is overwhelmingly the most frequent type, appearing in 38% of all the announcements and accounting for 42% of all unique documents disclosed during the period. Among sectors, Panel C reports Materials and Energy sectors together disclose more announcements (38% and 19% of all announcements) than all the other sectors put together. The higher number of announcements is driven by the disclosure of Progress Reports. When the sample is divided into 'good news' and 'bad news' firm-years according to the sign of the change in annual earnings for the firm throughout the period (reported in Table 2.2), we find 'good news' firms on average are larger (\$1,150.39 Million to \$736.75 Million), have a higher number of analysts following (1.49 to 1.37), disclose less frequently (13.83 to 15.18 documents) and have a timelier price discovery process.

When we analyse the impact of individual announcement types on the efficiency of price discovery we select six non-periodic announcement types out of the 19 types using the following criteria. First, we exclude announcements with some sort of recurrence ('Periodic Report', 'Quarterly Activities Report', 'Quarterly Cash Flow Report', 'Commitments Test Entity', and 'Dividend'). From the group on non-periodic announcements we exclude announcement types 'Notice of Meeting', 'Notice of Call', 'Letter to Shareholders', and 'Warrants' because of the low frequency of occurrence. Additionally, announcements under 'ASX Query' are excluded because they are not company initiated. Finally, 'Stock Exchange' announcements are excluded because they are mostly trading halts and suspensions from official quotation which are issued before other MSAs with specific information are disclosed.

Table 2.1  
Distribution of Market Sensitive Announcements

This table describes the distribution of Market Sensitive Announcements (MSAs) that occur for 1,940 stocks traded on the Australian Stock Exchange (6,384 firm-years) during the period 2005-2009. In Panel A, MSA count is segmented between the numbers of days between two consecutive Preliminary Final Statements (PFSs) in which companies disclose MSAs and the number of documents disclosed by companies between two PFSs. In Panel B, Documents counts the number of documents that contain information about each announcement type. Unique Documents counts the number of documents containing only information about each announcement type. Panel C shows the number of documents containing information about each type by sector.

| Panel A: Market Sensitive Announcements by Recurrence |        |     |           |     |  |
|---|--------|-----|-----------|-----|--|
| Recurrence  | Days   |     | Documents |     |  |
| Periodic MSAs   | 24,228 | 29% | 27,274    | 30% |  |
| Non-Periodic MSAs                                     | 59,836 | 71% | 65,167    | 70% |  |
| All MSA   | 84,064 |     | 92,441    |     |  |

| Panel B: Market Sensitive Announcements by Type |           |     |                  |     |  |
|---|-----------|-----|------------------|-----|--|
| Announcement Type<br>(ASX Sub-codes)            | Documents |     | Unique Documents |     |  |
| Takeover  | 3,332     | 4%  | 2,892            | 4%  |  |
| Shareholder Details                             | 762       | 1%  | 646              | 1%  |  |
| Periodic Reports                                | 9,199     | 10% | 8,300            | 10% |  |
| Quarterly Activities Report                     | 9,451     | 10% | 6,433            | 8%  |  |
| Quarterly Cash Flow Report                      | 3,551     | 4%  | 939              | 1%  |  |
| Issued Capital                                  | 8,156     | 9%  | 7,037            | 9%  |  |
| Asset Acquisition / Disposal                    | 7,677     | 8%  | 6,894            | 9%  |  |
| Notice of Meeting                               | 129       | 0%  | 97               | 0%  |  |
| Stock Exchange                                  | 4,701     | 5%  | 3,435            | 4%  |  |
| Dividend  | 1,376     | 1%  | 1,205            | 1%  |  |
| Progress Report                                 | 35,423    | 38% | 33,634           | 42% |  |
| Company Administration                          | 355       | 0%  | 299              | 0%  |  |
| Notice of Call                                  | 7         | 0%  | 6                | 0%  |  |
| Other   | 2,127     | 2%  | 1,761            | 2%  |  |
| Chairman's Address                              | 686       | 1%  | 613              | 1%  |  |
| Letter to Shareholders                          | 52        | 0%  | 40               | 0%  |  |
| ASX Query                                       | 2,031     | 2%  | 1,838            | 2%  |  |
| Warrants  | 2         | 0%  | 1                | 0%  |  |
| Commitments Test Entity                         | 4,715     | 5%  | 4,414            | 5%  |  |
| Total   | 93,732    |     | 80,484           |     |  |

Table 2.1 (Continued)  
Distribution of Market Sensitive Announcements

This table describes the distribution of Market Sensitive Announcements (MSAs) that occur for 1,940 stocks traded on the Australian Stock Exchange (6,384 firm-years) during the period 2005-2009. In Panel A, MSA count is segmented between the numbers of days between two consecutive Preliminary Final Statements (PFSs) in which companies disclose MSAs and the number of documents disclosed by companies between two PFSs. In Panel B, Documents counts the number of documents that contain information about each announcement type. Unique Documents counts the number of documents containing only information about each announcement type. Panel C shows the number of documents containing information about each type by sector.

| Panel C: Market Sensitive Announcements by Type and Sector |        |           |             |                           |                     |             |            |                           |                               |           |
|--|--------|-----------|-------------|---------------------------|---------------------|-------------|------------|---------------------------|-------------------------------|-----------|
| Announcement Type<br>(ASX Sub-codes)                       | Energy | Materials | Industrials | Consumer<br>Discretionary | Consumer<br>Staples | Health Care | Financials | Information<br>Technology | Telecommunication<br>Services | Utilities |
| Takeover   | 324    | 905       | 322         | 316                       | 170                 | 130         | 522        | 75                        | 52                            | 76        |
| Shareholder Details  | 78     | 253       | 58          | 50                        | 20                  | 39          | 90         | 35                        | 11                            | 12        |
| Periodic Reports   | 441    | 1,002     | 1,480       | 1,069                     | 428                 | 837         | 1,927      | 742                       | 221                           | 153       |
| Quarterly Activities Report                                | 1,508  | 4,778     | 40          | 8                         | 6                   | 4           | 34         | 10                        | 0                             | 45        |
| Quarterly Cash Flow Report                                 | 149    | 771       | 7           | 4                         | 1                   | 1           | 1          | 2                         | 0                             | 3         |
| Issued Capital   | 759    | 2,848     | 519         | 402                       | 191                 | 596         | 1,167      | 321                       | 110                           | 124       |
| Asset Acquisition / Disposal                               | 757    | 1,740     | 891         | 577                       | 197                 | 412         | 1,626      | 426                       | 120                           | 148       |
| Notice of Meeting  | 10     | 29        | 3           | 10                        | 6                   | 7           | 19         | 7                         | 3                             | 3         |
| Stock Exchange   | 459    | 1,539     | 234         | 183                       | 71                  | 357         | 324        | 161                       | 57                            | 50        |
| Dividend   | 11     | 52        | 104         | 80                        | 26                  | 16          | 819        | 15                        | 7                             | 75        |
| Progress Report  | 10,015 | 14,682    | 1,701       | 715                       | 330                 | 2,993       | 1,274      | 1,102                     | 319                           | 503       |
| Company Administration                                     | 11     | 60        | 34          | 42                        | 18                  | 30          | 79         | 6                         | 11                            | 8         |
| Notice of Call   | 0      | 4         | 0           | 0                         | 0                   | 2           | 0          | 0                         | 0                             | 0         |
| Other  | 176    | 488       | 213         | 130                       | 86                  | 217         | 246        | 83                        | 64                            | 58        |
| Chairman's Address   | 21     | 77        | 122         | 110                       | 41                  | 43          | 118        | 57                        | 14                            | 10        |
| Letter to Shareholders                                     | 6      | 9         | 2           | 2                         | 1                   | 4           | 8          | 6                         | 0                             | 2         |
| ASX Query  | 235    | 803       | 148         | 114                       | 37                  | 195         | 138        | 101                       | 30                            | 37        |
| Warrants   | 1      | 0         | 0           | 0                         | 0                   | 0           | 0          | 0                         | 0                             | 0         |
| Commitments Test Entity                                    | 160    | 365       | 513         | 525                       | 204                 | 1,416       | 336        | 569                       | 182                           | 144       |
| Total  | 15,121 | 30,405    | 6,391       | 4,337                     | 1,833               | 7,299       | 8,728      | 3,718                     | 1,201                         | 1,451     |

Table 2.2  
Distribution of Market Sensitive Announcements across Firms Grouped by the Direction of the News

This table provides descriptive statistics of the sample of 6,384 firm-years during the period 2005-2009 divided according to the sign of the news. Firm-years with a positive change in annual earnings throughout the period are considered 'good news'. Firm-years with a negative change in annual earnings throughout the period are considered 'bad news'. Both t-tests for means and Wilcoxon-tests for medians are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                             | Entire Sample<br>(n = 6,384) |        |                       | Bad News Firms<br>(n = 3,065) |        |                       | Good News Firms<br>(n = 3,319) |        |                       | Tests of<br>Differences |          |
|--------------------------------------|------------------------------|--------|-----------------------|-------------------------------|--------|-----------------------|--------------------------------|--------|-----------------------|-------------------------|----------|
|                                      | Mean                         | Median | Standard<br>Deviation | Mean                          | Median | Standard<br>Deviation | Mean                           | Median | Standard<br>Deviation | t-value                 | z-value  |
| Market Capitalisation (A\$ Millions) | 951.80                       | 51.00  | 4872.66               | 736.75                        | 47.61  | 3772.50               | 1150.39                        | 53.41  | 5696.55               | -3.39***                | -2.05*** |
| Number of Analysts                   | 1.43                         | 0      | 3.19                  | 1.37                          | 0      | 3.19                  | 1.49                           | 0      | 3.19                  | -1.58                   | -2.46*** |
| Non-Periodic MSAs                    | 10.21                        | 7      | 10.61                 | 10.73                         | 8      | 10.84                 | 9.72                           | 7      | 10.37                 | 3.79***                 | 5.28***  |
| Total MSAs                           | 14.48                        | 12     | 11.49                 | 15.18                         | 13     | 11.63                 | 13.83                          | 11     | 11.33                 | 4.68***                 | 6.55***  |
| Days with Non-Periodic MSAs          | 9.37                         | 7      | 9.10                  | 9.87                          | 7      | 9.31                  | 8.91                           | 6      | 8.88                  | 4.22***                 | 5.47***  |
| Days with all MSAs                   | 13.17                        | 11     | 9.80                  | 13.80                         | 12     | 9.93                  | 12.59                          | 10     | 9.65                  | 4.92***                 | 6.50***  |
| Days with unique Non-Periodic MSAs   | 12.61                        | 11     | 9.33                  | 9.99                          | 8      | 9.09                  | 8.97                           | 7      | 8.63                  | 4.62***                 | 5.80***  |
| Days with unique MSAs                | 9.46                         | 7      | 8.87                  | 13.22                         | 11     | 9.47                  | 12.04                          | 10     | 9.16                  | 5.08***                 | 6.46***  |
| Mc                                   | 0.33                         | 0.24   | 0.27                  | 0.36                          | 0.27   | 0.30                  | 0.29                           | 0.22   | 0.25                  | 9.80***                 | 10.29*** |
| Mc_def                               | 0.20                         | 0.18   | 0.11                  | 0.21                          | 0.19   | 0.12                  | 0.19                           | 0.16   | 0.11                  | 9.33***                 | 9.48***  |
| Event length                         | 252.65                       | 253    | 7.30                  | 253.08                        | 253    | 7.49                  | 252.24                         | 253    | 7.10                  | 4.60***                 | 5.20***  |

## 2.4. Hypotheses Development

The first hypothesis to be analysed is related to how the MSAs disclosed under CDRs contribute to the timeliness of price discovery for firms trading on the ASX. If CDRs are effective in diminishing the information underproduction problem, the frequency of disclosure is expected to have a favourable impact on the timeliness of price discovery. Therefore, the hypothesis to be tested is:

*H<sub>1</sub>: The timeliness of price discovery is positively related to the frequency of MSAs disclosed by a firm.*

First, frequency of disclosure is proxied both by the number of MSAs released and by the number of days in which MSAs were released between two consecutive PFSs. Using these simple count measures ignores the timing and the relevance of the releases of MSAs. For this reason we also use a time weighted sum of MSAs and a return weighted sum of MSAs as proxies of disclosure frequency.

Previous studies find that a firm's information environment is related to different firm characteristics. The inclusion of a firm size variable to control for the amount of pre-disclosure information in studies of information disclosure is motivated by both Atiase's (1985) finding that the level of pre-disclosure information is positively related to firm size and by Atiase et al.'s (1988) finding that it is more difficult for investors to anticipate small firms' earnings than large firms' earnings. Consistent with this idea and considering that large firms are expected to produce more information, it is common to control for firm size (Beekes and Brown 2006; Brown et al. 2004b; Brown and Hillegeist 2007; Chae 2005; Diamond and Verrecchia 1991; Eleswarapu et al. 2004). We expect a negative coefficient on the size variable.

Discretionary disclosure should also be investigated when analysing the speed of price discovery. Different reasons are given to interpret why managers have incentives to delay the disclosure of either good or bad news. Kothari et al. (2009) argue that career concerns and the threat of lower bonus payments motivate managers to delay the disclosure of bad news. Consistent with this bad news delay, Beekes and Brown (2006) find that in Australia 'good news' firms show a timelier

price discovery process than 'bad news' firms. In contrast, Skinner (1994) suggests managers have an incentive to disclose bad news as early as possible to lower litigation problems as well as adverse reputation effects. In the presence of agency problems, Healy et al. (1999) support the earlier disclosure of bad news because its release is more credible than the disclosure of good news. In Australia, Hsu (2009) finds that 'bad news' firms disclose MSAs more frequently than firms defined as 'good news' firms. Contradictory evidence in Australia can be attributed to differences in the definition of good and bad news firms. In Hsu, the definition is related to the sign of the change in annual earnings. In Brown et al. (1999) and in Beekes and Brown, the definition is related to the firm's under or over performance compared to the market. Based on previous work it is not possible to infer a sign for the news coefficient. In addition, even in the absence of discretionary disclosure, the response of investors to different types of information (good or bad) cannot be predicted.

There are reasons to believe turnover has an impact on the price discovery process. Brennan et al. (1993) suggest that size can affect the speed of price adjustment in two ways. One way is related to Merton's (1987) investor recognition hypothesis. Larger firms attract the attention of more investors and this contributes to the price discovery process. The second reason is related to size as a proxy for trading volume. They find share turnover favours the speed of price adjustment even when considered together with explanatory variables measuring size and the number of analysts. In their study of the incorporation of new information into prices by different agents, Piotroski and Roulstone (2004) control for liquidity measured by the annual share turnover finding the relative amount of information impounded into stock prices is positively affected by share turnover. Based on this evidence, the expected sign of the turnover coefficient is negative. Firms with higher share turnover are expected to have a timelier price discovery process.

The presence of analysts making forecasts and recommendations based on their assessment of the firms' prospects is regarded as a relevant piece of additional information contributing to the price discovery process (Stickel 1995; Womack 1996). Brennan et al. (1993) find the speed of price adjustment to new information that has common effects on firms, increases with the number of analysts only when this number is above a certain threshold. Regarding firm related information, Dempsey (1989) finds that the explanatory power of the number of analysts following on the

timeliness of price discovery overshadows that of firm size. These findings together with the intuition that analysts provide the market with private information motivate the use of the number of analysts as an explanatory variable in studies of the firm information environment (Brown et al. 2004b; Chae 2005; Eleswarapu et al. 2004). This evidence leads us to expect a negative sign accompanying the analyst coefficient.

Disclosure patterns vary across industries. In addition to the obvious differences in the information flow caused by the type of business, there are regulatory differences in the number of periodic reports required for firms in the mining sector in Australia. Chapter 5 of the Australian Securities Exchange listing rules states that mining exploration entities must complete quarterly reports on production, development and exploration activities. In addition, companies in the resources sector have to comply with the principles of the Australasian Joint Ore Reserves Committee Code (JORC Code). To account for these particularities, a dummy variable for mining firms will be used. The evidence in Beekes and Brown (2006) suggests that quarterly reports do not have an effect on the timeliness of price discovery. Secondly, the sample will be divided by sector to determine the types of announcements that are more relevant for the speed of price discovery within each sector. All the above mentioned characteristics are expected to shape the way in which information is impounded into prices. To determine if the frequency of MSAs is responsible for a timelier price discovery process we include controls for firm size, good news, turnover, analyst following and sector.

The second working hypothesis is related to the accuracy of price discovery, measuring the impact of the frequency of disclosure of MSAs on the informativeness of earnings announcements (PFSs). If the information disclosed by means of MSAs is truly relevant in the long-term, the market reaction to PFSs should be negatively associated with the frequency of disclosure. Therefore, the hypothesis to be tested is:

*H<sub>2</sub>: The informativeness of PFSs is negatively related to the frequency of MSAs disclosed by a firm.*

Informativeness of PFSs is measured using abnormal volume and absolute abnormal returns from the announcement day to the second day after the announcement (days 0 to +2). Before testing hypothesis 2, we analyse whether the unusual short term amount of information impounded into prices as a consequence of MSAs found by Brown et al. (2005) is also present in the long term or if it is reversed in the days and weeks that follow the announcements. In order to measure the long-term impact of MSAs on the price discovery process, we measure the information contribution of MSAs by regressing the firms' cumulative abnormal returns (CARs) between two consecutive PFSs on the CARs in the three days around the disclosure of MSAs. If the information content of MSAs is maintained in the long run then the cumulative abnormal returns around days with MSAs should explain a higher portion of the annual cumulative abnormal return than days with non-MSAs and days with no news. To measure the incremental information content, we assume that a normal contribution would be one in which abnormal returns are i.i.d. The difference between the observed  $R^2$  and the expected  $R^2$  under the assumption that abnormal returns are i.i.d. will determine if MSAs contribute a higher or lower than expected portion of information.

Table 2.3  
Market Sensitive Announcements and the Timeliness of Price Discovery

This table examines the timeliness of price discovery for firms trading on the ASX during 2005-2009 between two consecutive Preliminary Final Statements (PFSs) using the following equation:

$$Mc_{Def} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + b_5 \cdot Disclosure + \varepsilon_i$$

The dependent variable is Beekes and Brown's (2006) deflated Timeliness measure using market adjusted returns. Disclosure is measured in days (models 1 and 3) and number of documents (models 2 and 4). Models 1 and 2 consider all MSAs, while models 3 and 4 are based on non-periodic MSAs. Size is proxied by the natural logarithm of the average market capitalisation for the period. Good news is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is measured by yearly share turnover. For each model the first two columns report OLS coefficients and t values. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable            | All MSA Days<br>(1) |           | All MSA Documents<br>(2) |           | Non-Periodic MSA Days<br>(3) |           | Non-Periodic MSA Documents<br>(4) |           |
|---------------------|---------------------|-----------|--------------------------|-----------|------------------------------|-----------|-----------------------------------|-----------|
|                     | Coefficient         | t-value   | Coefficient              | t-value   | Coefficient                  | t-value   | Coefficient                       | t-value   |
| Intercept           | 0.5375              | 37.82***  | 0.5383                   | 37.83***  | 0.5473                       | 38.40***  | 0.5485                            | 38.42***  |
| Size                | -0.0201             | -25.04*** | -0.0200                  | -24.92*** | -0.0202                      | -25.08*** | -0.0205                           | -24.96*** |
| Good News           | -0.0197             | -7.62***  | -0.0199                  | -7.67***  | -0.0202                      | -7.77***  | -0.0204                           | -7.84***  |
| Turnover            | 0.0214              | 10.18***  | 0.0218                   | 10.26***  | 0.0225                       | 10.37***  | 0.0230                            | 10.47***  |
| Number of Analysts  | -0.0003             | -0.63     | -0.0004                  | -0.81     | -0.0003                      | -0.59     | -0.0003                           | -0.76     |
| Days                | 0.0016              | 9.80***   |                          |           | 0.0014                       | 8.26***   |                                   |           |
| Documents           |                     |           | 0.0013                   | 9.03***   |                              |           | 0.0011                            | 7.35***   |
| N                   | 6,384               |           | 6,384                    |           | 6,384                        |           | 6,384                             |           |
| Adj. R <sup>2</sup> | 0.1784              |           | 0.1771                   |           | 0.1731                       |           | 0.1712                            |           |
| F-Value             | 278.11***           |           | 275.72***                |           | 268.21***                    |           | 264.71***                         |           |

## 2.5. Results

### 2.5.1. *Disclosure Frequency and the Timeliness of Price Discovery*

The overall impact of market sensitive announcements on the timeliness of price discovery is reported in Table 2.3. The first two columns analyse the impact of all MSAs, while the last two columns focus on non-periodic MSAs. Disclosure in both cases is measured both as the number of days with MSAs between two consecutive PFSs and as the number of MSAs documents released between two consecutive PFSs. To control for characteristics that are known or suspected to have an impact on the timeliness of price discovery, each model includes variables that measure firm size, good news, turnover and number of analysts.

Regardless of the model used, the signs and the significance of the coefficients in Table 2.3 are similar. As expected, Size has a negative sign indicating that price discovery is timelier for large firms than for small firms. We also find good news firms show a faster price discovery process. This result does not appear to be driven by selective disclosure because, as Table 2.2 shows, good news firms disclose on average a lower number of MSAs than bad news firms. In consequence, the faster price discovery for 'good news' firms seems to be attributed to investor reaction to news more than selective disclosure. Turnover coefficients suggest that it takes longer for highly traded stocks to incorporate value relevant information into prices. This delay could be the consequence of a higher proportion of trades being executed by less informed investors. It may also simply reflect the lower impact on prices when there is high turnover. Analyst following shows the expected negative sign, however the coefficients are not significantly different from zero. With regards to Disclosure, all the alternative measures show positive and significant coefficients implying that the increased frequency of disclosure delays the pricing of relevant information. Care should be exercised in interpreting these results because the distribution of MSAs is heavily skewed towards zero.

To determine if MSAs create confusion among investors or if it is the effect of the high number of events with low number of announcements that drives our results, the sample is truncated to create different sub-samples containing events with 12 or more and 18 or more days with non-periodic MSAs (more than one day per month). Table 2.4 confirms the sign and significance of the Size, Good News and Turnover coefficients. However, when all events with 12 or more days with non-periodic

MSAs are considered, the sign of the disclosure coefficient becomes negative as expected under the hypothesis that more disclosure increases the timeliness of price discovery. Furthermore, when only events with 18 or more days with non-periodic MSAs are considered, the disclosure coefficient is negative and statistically significant at the 5% level. This robustness check confirms that more disclosure increases timeliness.

Table 2.4  
Non-Periodic Market Sensitive Announcements above Minimum Thresholds and the Timeliness of Price Discovery

This table shows the impact of different market sensitive announcement measures between two consecutive Preliminary Final Statements (PFSs) on the timeliness of price discovery for firms trading on the ASX and with 12 or more (Model 1) and 18 or more (Model 2) days with non-periodic MSAs using the following equation:

$$Mc_{Def} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + b_5 \cdot Disclosure + \varepsilon_i$$

The dependent variable is Beekes and Brown's (2006) deflated Timeliness measure using market adjusted returns. Disclosure is measured by the number of days with non-periodic MSAs. Size is proxied by the natural logarithm of the average market capitalisation for the period. Good news is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is measured by yearly share turnover. For each model the first two columns report OLS coefficients and t values. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable            | Non-periodic MSA Days $\geq$ 12<br>(1) |           | Non-periodic MSA Days $\geq$ 18<br>(2) |          |
|---------------------|--|-----------|--|----------|
|                     | Coefficient                            | t-value   | Coefficient                            | t-value  |
| Intercept           | 0.5424                                 | 27.20***  | 0.5059                                 | 13.49*** |
| Size                | -0.0176                                | -17.13*** | -0.0151                                | -7.21*** |
| Good News           | -0.021                                 | -4.11***  | -0.0152                                | -2.10**  |
| Turnover            | 0.0189                                 | 8.07***   | 0.0170                                 | 4.09***  |
| Number of Analysts  | -0.0011                                | -1.37     | -0.0007                                | -0.61    |
| Days                | -0.0002                                | -1.12     | -0.0005                                | -2.21**  |
| N                   | 1,876                                  |           | 882                                    |          |
| Adj. R <sup>2</sup> | 0.1552                                 |           | 0.1301                                 |          |
| F-Value             | 69.87***                               |           | 27.34***                               |          |

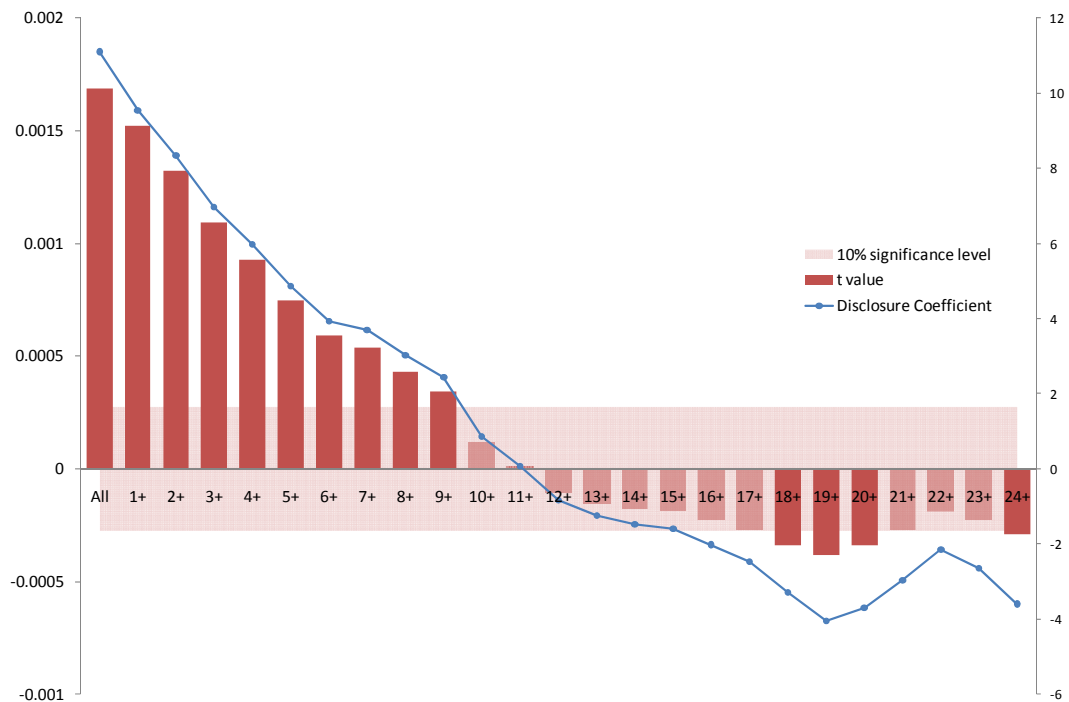
Figure 2.2 depicts the value and statistical significance of the disclosure coefficient for the full sample and for all subsamples containing from 1 or more days with non-periodic MSAs to 24 or more days with non-periodic MSAs. The figure shows that the disclosure coefficient is negative for all samples with at least 12 days with non-periodic MSAs although coefficients are statistically significant at the 5% level for subsamples of 18, 19, 20, and 24 or more days with non-periodic MSAs. These results suggest there is a threshold above which the timeliness of price discovery increases with disclosure frequency. This result is comparable to Brennan et al.'s (1993) finding that the marginal effect of the number of analysts on the speed of price adjustment increases as the number of analysts is larger.

Figure 2.2  
Disclosure Coefficients above Minimum Thresholds of Days with Non-Periodic MSAs

This figure shows the value of the disclosure coefficient on the following equation:

$$Mc_{Def} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Liquidity + b_4 \cdot Disclosure + \varepsilon_i$$

Different truncated samples are examined according to the number of days with non-periodic MSAs. The left hand side vertical axis (line) measures the value of the Disclosure coefficient. The right hand side vertical axis (bars) measures the corresponding heteroscedasticity corrected t values. The shaded area corresponds to the 10% significance level.



To further understand the response to market sensitive announcements, Table 2.5 reports the results for Equation 2.3, where the variable Disclosure is replaced by the six announcement types. Using the description in Section 2.3.3, announcement type is first measured as the number of documents containing a certain announcement type (Column 1 in Table 2.5). Second, announcement type is measured by the number of unique documents. That is, MSAs containing only one announcement type (Column 2 in Table 2.5). Thirdly, announcement type is measured by weighting unique MSA documents according to the time distance between the announcements and the end of the event period (Column 3 in Table 2.5). Finally, announcement type is measured by weighting unique documents by the return on the announcement day (Column 4 in Table 2.5).

Considering all documents (column 1), three types of announcements show the expected negative sign: 'Asset Acquisition and Disposal'; 'Other'; and 'Chairman's Address'. 'Issued Capital' and 'Progress Report' announcements coefficients are statistically significant at the 1% level but show a positive sign. When considering unique documents (column 2), both 'Asset Acquisition and Disposal' and 'Chairman's Address' announcements remain negative and statistically significant. The contribution of MSAs to the timeliness of price discovery appears to decay when documents are time weighted (column 3) and the only type that remains negative and statistically significant at the 1% level is 'Chairman's Address'. In column 4, where MSAs are weighted based on the returns on the announcement day, 'Asset Acquisition and Disposal', 'Other', and 'Chairman's Address' announcements remain a significant contribution to the speed of price discovery.

Table 2.5  
Announcement Types and the Timeliness of Price Discovery

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX using the following equation:

$$M_{CDef} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is Beekes and Brown's (2006) deflated Timeliness measure using market adjusted returns. Size is proxied by the natural logarithm of the average market capitalisation for the period. Good news is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is measured by yearly share turnover. Number of Analysts is the number of analysts following the firm on each period. Announcement Type is first measured in number of documents containing information on each category. This means that MSAs with more than one information type are counted more than once. Secondly, Announcement Type is measured by the number of documents with MSAs that only disclosed information regarding one category. Thirdly, Announcement Type is measured by weighting unique MSA documents according to the time distance between the announcements and the end of the period. Finally, Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                     | Documents<br>(1) |            | Unique Documents<br>(2) |            | Time Weighted<br>Unique Documents<br>(3) |            | Return Weighted<br>Unique Documents<br>(4) |            |
|------------------------------|------------------|------------|-------------------------|------------|--|------------|--|------------|
|                              | Coefficient      | t-value    | Coefficient             | t-value    | Coefficient                              | t-value    | Coefficient                                | t-value    |
| Intercept                    | 0.5246           | 34.82 ***  | 0.5272                  | 35.32 ***  | 0.5308                                   | 35.71 ***  | 0.5159                                     | 34.43 ***  |
| Size                         | -0.0188          | -21.89 *** | -0.0190                 | -22.30 *** | -0.0190                                  | -22.55 *** | -0.0181                                    | -22.00 *** |
| Good News                    | -0.0197          | -7.53 ***  | -0.0198                 | -7.59 ***  | -0.0200                                  | -7.63 ***  | -0.0198                                    | -7.60 ***  |
| Turnover                     | 0.0224           | 10.41 ***  | 0.0226                  | 10.43 ***  | 0.0232                                   | 10.51 ***  | 0.0239                                     | 10.76 ***  |
| Number of Analysts           | -0.0001          | -0.19      | -0.0001                 | -0.20      | -0.0001                                  | -0.30      | -0.0002                                    | -0.49      |
| Announcement Type            |                  |            |                         |            |  |            |  |            |
| Takeover                     | 0.0007           | 1.42       | 0.0008                  | 1.44       | 0.0016                                   | 1.37       | -0.0004                                    | -0.03      |
| Issued Capital               | 0.0049           | 5.31 ***   | 0.0048                  | 4.67 ***   | 0.0053                                   | 2.87 ***   | -0.0131                                    | -1.36      |
| Asset Acquisition / Disposal | -0.0017          | -2.40 **   | -0.0015                 | -2.05 **   | -0.0019                                  | -1.32      | -0.0241                                    | -2.91 ***  |
| Progress Report              | 0.0012           | 6.53 ***   | 0.0013                  | 6.63 ***   | 0.0024                                   | 6.42 ***   | 0.0310                                     | 5.48 ***   |
| Other                        | -0.0028          | -2.05 *    | -0.0020                 | -1.30      | -0.0035                                  | -1.25      | -0.0502                                    | -3.32 ***  |
| Chairman's Address           | -0.0119          | -3.32 ***  | -0.0110                 | -2.91 ***  | -0.0158                                  | -3.38 ***  | -0.0501                                    | -3.42 ***  |
| N                            | 6,384            |            | 6,384                   |            | 6,384                                    |            | 6,384                                      |            |
| Adj. R <sup>2</sup>          | 0.1758           |            | 0.1743                  |            | 0.1714                                   |            | 0.1731                                     |            |
| F-Value                      | 137.19 ***       |            | 135.78 ***              |            | 133.06 ***                               |            | 134.61 ***                                 |            |

These results have some interesting implications. The effect of Asset Acquisition and Disposal announcements on the timeliness of price discovery is in line with previous findings suggesting disclosure on this area provides investors with valuable information about firms' prospects, in particular for firms with growth opportunities (Chung et al. 1998; Brailsford and Yeoh 2004; da Silva Rosa et al. 2004). The anticipatory role of Chairman's Addresses when flagged as market sensitive is related to the fact that first quarter results as well as forecasts for the year frequently are discussed in these statements. Finally, given that almost 40% of MSAs labelled 'Other' are companies' briefings to investors and analysts; the negative and statistically significant coefficient for this announcement type is of particular interest. Briefings are voluntary in nature<sup>13</sup> and should only discuss information already disclosed to the market. This means that by approaching investors and analysts, companies are able to bring attention to material information that was previously disclosed and was either ignored or misunderstood by investors. The evidence on 'Progress Report' announcements appears to contradict the essence of this type of announcement. Firms issue progress reports to update investors about the latest developments and, presumably, to lessen the level of disagreement about the firm's future prospects. However, information contained in progress reports is difficult to interpret and it is frequently related to long term profit generating capacity. In this sense, at the same time it makes investors more informed, this announcement type is a source of uncertainty and disagreement.

#### *2.5.1.1. Disclosure Frequency and the Timeliness of Price Discovery across Industry Sectors*

To analyse the impact of MSAs on the timeliness of price discovery across different sectors, Table 2.6 shows the results of the regression in Equation 2.4 segmented according to Global Industry Classification Standard (GICS). Before focusing on disclosure, it is worth mentioning that this segmentation shows analyst following, despite having no significant effect on the speed of price discovery for the entire sample, shows a significant contribution to the timeliness of price discovery in the Health Care sector. This finding is supportive of analysts' contribution to understanding and analysing information in sectors with higher levels of disclosure complexity. More than half of the companies in the Health Care sector belong to the Pharmaceuticals and the Biotechnology industries.

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<sup>13</sup> Brown, Taylor and Walter (1999) also use announcements labelled 'Other' as a proxy for voluntary disclosure.

Table 2.6  
Announcement Types and the Timeliness of Price Discovery by GICS Sector

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by sector using the following equation:

$$M_{CDef} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is Beekes and Brown's (2006) deflated Timeliness measure using market adjusted returns. Size is proxied by the natural logarithm of the average market capitalisation for the period. Good news is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Materials   |          | Financials  |          | Industrials |          | Consumer Discretionary |          | Energy      |          |
|----------------------------|-------------|----------|-------------|----------|-------------|----------|------------------------|----------|-------------|----------|
|                            | Coefficient | t-value  | Coefficient | t-value  | Coefficient | t-value  | Coefficient            | t-value  | Coefficient | t-value  |
| Intercept                  | 0.4397      | 16.00*** | 0.4974      | 13.04*** | 0.5090      | 11.49*** | 0.5338                 | 9.40***  | 0.5019      | 8.79***  |
| Size                       | -0.0124     | -8.15*** | -0.0187     | -8.88*** | -0.0179     | -7.26*** | -0.0186                | -6.06*** | -0.0152     | -5.26*** |
| Good News                  | -0.0119     | -2.44**  | -0.0359     | -5.97*** | -0.0194     | -2.66*** | -0.0363                | -4.14*** | -0.0086     | -1.07    |
| Turnover                   | 0.0179      | 5.68***  | 0.0305      | 3.18***  | 0.0181      | 1.80*    | 0.0351                 | 2.91***  | 0.0179      | 3.77***  |
| Number of Analysts         | -0.0014     | -1.46    | 0.0012      | 1.27     | 0.0015      | 1.17     | -0.0014                | -1.06    | 0.0008      | 0.47     |
| Announcement Type          |             |          |             |          |             |          |                        |          |             |          |
| Takeover                   | -0.0256     | -0.94    | 0.0102      | 0.49     | -0.0162     | -0.58    | 0.0307                 | 0.59     | 0.0321      | 0.58     |
| Issued Capital             | 0.0589      | 2.54**   | -0.0375     | -2.74*** | -0.0457     | -1.80*   | 0.0011                 | 0.03     | -0.0080     | -0.16    |
| Asset Acquisition/Disposal | -0.0287     | -1.42    | 0.0211      | 1.26     | -0.0456     | -2.47**  | -0.0413                | -1.89*   | -0.0434     | -1.19    |
| Progress Report            | 0.0099      | 0.86     | 0.0465      | 2.81***  | 0.0157      | 0.93     | -0.0084                | -0.37    | -0.0401     | -1.64    |
| Other                      | -0.1092     | -2.35**  | -0.0157     | -0.47    | -0.0106     | -0.31    | -0.1133                | -3.05*** | 0.0496      | 0.50     |
| Chairman's Address         | -0.1538     | -4.24*** | 0.0173      | 0.67     | 0.0178      | 0.53     | -0.0546                | -2.33**  | 0.2457      | 1.54     |
| N                          | 2,087       |          | 985         |          | 672         |          | 536                    |          | 654         |          |
| Adj. R <sup>2</sup>        | 0.0816      |          | 0.1942      |          | 0.1189      |          | 0.1859                 |          | 0.0763      |          |
| F-Value                    | 19.53***    |          | 24.71***    |          | 10.05***    |          | 13.22***               |          | 6.40***     |          |

Table 2.6 (Continued)  
Announcement Types and the Timeliness of Price Discovery by GICS Sector

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by sector using the following equation:

$$M_{CDef} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is Beekes and Brown's (2006) deflated Timeliness measure using market adjusted returns. Size is proxied by the natural logarithm of the average market capitalisation for the period. Good news is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Health Care |          | Information Technology |          | Consumer Staples |          | Telecommunication Services |          | Utilities   |          |
|----------------------------|-------------|----------|------------------------|----------|------------------|----------|----------------------------|----------|-------------|----------|
|                            | Coefficient | t-value  | Coefficient            | t-value  | Coefficient      | t-value  | Coefficient                | t-value  | Coefficient | t-value  |
| Intercept                  | 0.4972      | 9.97***  | 0.4983                 | 7.15***  | 0.5400           | 10.57*** | 0.4651                     | 6.67***  | 0.5793      | 6.11***  |
| Size                       | -0.0170     | -6.11*** | -0.0167                | -4.04*** | -0.0209          | -7.17*** | -0.0144                    | -3.54*** | -0.0229     | -4.00*** |
| Good News                  | -0.0087     | -1.11    | -0.0334                | -3.42*** | -0.0063          | -0.56    | -0.0187                    | -1.02    | -0.0313     | -1.65    |
| Turnover                   | 0.0186      | 3.57***  | 0.0416                 | 2.39**   | 0.0456           | 2.09**   | 0.0197                     | 6.89***  | 0.1012      | 2.98***  |
| Number of Analysts         | -0.0024     | -1.78*   | -0.0034                | -1.44    | -0.0004          | -0.18    | 0.0000                     | 0.01     | -0.0009     | -0.22    |
| Announcement Type          |             |          |                        |          |                  |          |                            |          |             |          |
| Takeover                   | 0.0075      | 0.17     | 0.1101                 | 1.88*    | -0.0627          | -1.96*   | 0.1042                     | 2.00**   | -0.0674     | -0.85    |
| Issued Capital             | 0.0199      | 0.72     | -0.0404                | -1.12    | -0.0592          | -1.36    | 0.0595                     | 0.83     | 0.0781      | 0.78     |
| Asset Acquisition/Disposal | -0.0205     | -0.59    | 0.0111                 | 0.41     | 0.0128           | 0.30     | -0.0212                    | -0.47    | 0.0090      | 0.15     |
| Progress Report            | 0.0093      | 0.58     | 0.0217                 | 0.99     | 0.0370           | 1.19     | -0.0240                    | -0.61    | -0.0306     | -0.66    |
| Other                      | -0.0020     | -0.05    | -0.0345                | -0.67    | -0.0535          | -0.97    | -0.1104                    | -1.93*   | -0.0987     | -1.32    |
| Chairman's Address         | -0.0732     | -0.67    | -0.0732                | -1.49    | -0.0302          | -0.66    | -0.4433                    | -4.81*** | 0.2565      | 2.41**   |
| N                          | 618         |          | 410                    |          | 198              |          | 115                        |          | 109         |          |
| Adj. R <sup>2</sup>        | 0.1364      |          | 0.1228                 |          | 0.2772           |          | 0.2566                     |          | 0.2092      |          |
| F-Value                    | 10.75***    |          | 6.73***                |          | 8.55***          |          | 4.93***                    |          | 3.86***     |          |

The impact of the six announcement types on the speed of price discovery across sectors varies widely and no announcement type either contributes to or harms timeliness in all sectors. Announcements in the Health Care and Energy sectors appear to have no impact on the speed of price discovery. Consistent with the results in Table 2.5, two announcement types are only associated with a faster price discovery process: ‘Asset Acquisition and Disposal’, in the Industrials and Consumer Discretionary sectors, and ‘Other’, in the Materials, Consumer Discretionary and Telecommunication Services sectors. The remaining announcement type showing a contribution to the timeliness of price discovery for the entire sample, ‘Chairman’s Address’, is also found to be a contribution to timeliness in the Materials, Consumer Discretionary and Telecommunication Services sectors. However, in the Utilities sector, the announcement type harms the speed of price discovery. Mixed results are found for ‘Takeover’ and ‘Issued Capital’ announcements. MSAs related to takeovers show a significant contribution to timeliness in the Consumer Staples sector, but appear to harm timeliness in the information Technology and Telecommunication Services sectors. Similarly, MSAs related to issued capital contribute to timeliness in the Financials and Industrials sectors and harm the speed of price discovery in the Materials sector. Finally, the adverse impact of ‘Progress Report’ MSAs on the speed of price discovery is driven by firms in the Financials sector.

The partial analysis by sector shows the impact of the different announcement types on the timeliness of price discovery is not homogenous across sectors. Table 2.6 identifies two types of announcements that contribute to the timeliness of price discovery in at least two sectors and do not harm timeliness in any sector: ‘Asset Acquisition and Disposal’, and ‘Other’. There are three types of announcements with mixed effects on timeliness: ‘Takeover’, ‘Chairman’s Address’ and ‘Issued Capital’. Finally, the Financials sector is found to contain the only announcement type that harms the speed of price discovery, ‘Progress Report’.

Table 2.7  
Announcement Types and the Timeliness of Price Discovery for Companies with Analyst Following

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX and having analyst following using the following equation:

$$Mc_{Def} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is Beekes and Brown's (2006) deflated Timeliness measure using market adjusted returns. Size is proxied by the natural logarithm of the average market capitalisation for the period. Good news is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is measured by yearly share turnover. Number of Analysts is the number of analysts following the firm on each period. Announcement Type is first measured in number of documents containing information on each category. This means that MSAs with more than one information type are counted more than once. Secondly, Announcement Type is measured by the number of documents with MSAs that only disclosed information regarding one category. Thirdly, Announcement Type is measured by weighting unique MSA documents according to the time distance between the announcements and the end of the period. Finally, Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                     | Documents<br>(1) |           | Unique Documents<br>(2) |           | Time Weighted<br>Unique Documents<br>(3) |           | Return Weighted<br>Unique Documents<br>(4) |           |
|------------------------------|------------------|-----------|-------------------------|-----------|--|-----------|--|-----------|
|                              | Coefficient      | t-value   | Coefficient             | t-value   | Coefficient                              | t-value   | Coefficient                                | t-value   |
| Intercept                    | 0.4901           | 14.42 *** | 0.4956                  | 14.57 *** | 0.4997                                   | 14.96 *** | 0.4618                                     | 14.43 *** |
| Size                         | -0.0163          | -8.62 *** | -0.0166                 | -8.76 *** | -0.0168                                  | -9.03 *** | -0.0148                                    | -8.28 *** |
| Good News                    | -0.0286          | -6.29 *** | -0.0292                 | -6.40 *** | -0.0299                                  | -6.54 *** | -0.0291                                    | -6.41 *** |
| Turnover                     | 0.0292           | 3.47 ***  | 0.0294                  | 3.49 ***  | 0.0301                                   | 3.52 ***  | 0.0284                                     | 3.58 ***  |
| Number of Analysts           | -0.0020          | -2.18 **  | -0.0020                 | -2.12 **  | -0.0020                                  | -2.18 **  | -0.0020                                    | -2.24 **  |
| Announcement Type            |                  |           |                         |           |  |           |  |           |
| Takeover                     | -0.0003          | -0.36     | -0.0002                 | -0.20     | 0.0006                                   | 0.33      | -0.0236                                    | -1.36     |
| Issued Capital               | 0.0047           | 3.04 ***  | 0.0041                  | 2.30 **   | 0.0026                                   | 0.83      | -0.0138                                    | -0.86     |
| Asset Acquisition / Disposal | -0.0022          | -2.31 **  | -0.0018                 | -1.68 *   | -0.0010                                  | -0.49     | -0.0498                                    | -4.04 *** |
| Progress Report              | 0.0012           | 3.81 ***  | 0.0013                  | 3.76 ***  | 0.0023                                   | 3.64 ***  | 0.0530                                     | 4.77 ***  |
| Other                        | -0.0049          | -2.77 *** | -0.0047                 | -2.28 **  | -0.0087                                  | -2.44 **  |  | -3.81 *** |
| Chairman's Address           | -0.0081          | -1.68 *   | -0.0063                 | -1.25     | -0.0078                                  | -1.25     | -0.0760                                    | -0.93     |
| N                            | 1,814            |           | 1,814                   |           | 1,814                                    |           | 1,814                                      |           |
| Adj. R <sup>2</sup>          | 0.1970           |           | 0.1934                  |           | 0.1890                                   |           | 0.2110                                     |           |
| F-Value                      | 45.48 ***        |           | 44.46 ***               |           | 43.25 ***                                |           | 49.47 ***                                  |           |

### *2.5.1.2. Disclosure Frequency and the Timeliness of Price Discovery in Presence of Analyst*

#### *Following*

As discussed in Section 2.4, the presence of analysts is commonly regarded as a valuable source of information to investors. We find little evidence of analysts contributing to the speed of price discovery. Only 28% of the 6,384 firm-years have analyst following. The large number of zeros for the analyst following variable may be responsible for the lack of significance of the analyst coefficients. To overcome this limitation, in Table 2.7, we analyse the impact of the variable number of analysts on the timeliness measure a subsample containing only those events with at least one analyst following. For the group of firm-years with at least one analyst following, the coefficient of number of analysts is negative and statistically significant at the 5% level. This finding highlights the importance of analysts in the interpretation and diffusion of corporate information among investors. Further evidence of analysts' contribution to the speed of price discovery will be discussed in the following section.

### *2.5.1.3. Disclosure Frequency and the Timeliness of Price Discovery across Size Quintiles*

Results so far are supportive of the idea that firm size contributes to the timeliness of price discovery. To further the understanding of the interrelation between disclosure frequency and the speed of price discovery, we partition the sample into quintiles based on firms' size measured by market capitalisation. There are no significant modifications in the coefficients for the control variables, except for number of analysts following. Table 2.8 reports a significant contribution of the number of analysts following to the speed of price discovery at both ends of the size spectrum (quintiles 1 and 5). Surprisingly, the number of analyst coefficient for firms in quintile 3 is positive and significant at the 1% level. Findings in the previous section lead us to speculate whether this result is influenced by the number of firms with no analyst following within quintile 3. In fact, only 250 of the firm-years in quintile 3 (20% of the 1,277 firm-years in the quintile) are followed by at least one analyst.

Table 2.8  
Announcement Types and the Timeliness of Price Discovery by Size Quintile

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by sector using the following equation:

$$M_{CDef} = a_1 + b_1 \cdot Size + b_2 \cdot Good\ News + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is Beekes and Brown's (2006) deflated Timeliness measure using market adjusted returns. Size is proxied by the natural logarithm of the average market capitalisation for the period. Good news is a dummy variable taking the value 1 if the sign of the change in annual earnings for the firm throughout the period is positive and 0 otherwise. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Quintile 1 (Low) |          | Quintile 2  |         | Quintile 3  |          | Quintile 4  |          | Quintile 5 (High) |          |
|----------------------------|------------------|----------|-------------|---------|-------------|----------|-------------|----------|-------------------|----------|
|                            | Coefficient      | t-value  | Coefficient | t-value | Coefficient | t-value  | Coefficient | t-value  | Coefficient       | t-value  |
| Intercept                  | 0.7989           | 7.28***  | 0.4244      | 2.56*** | 0.3867      | 2.44**   | 0.4437      | 3.23***  | 0.4711            | 11.27*** |
| Size                       | -0.0360          | -5.13*** | -0.0134     | -1.35   | -0.0111     | -1.24    | -0.0142     | -1.95*   | -0.0156           | -7.71*** |
| Good News                  | -0.0229          | -3.45*** | -0.0076     | -1.28   | -0.0140     | -2.40**  | -0.0293     | -5.13*** | -0.0256           | -5.15*** |
| Turnover                   | 0.0186           | 4.59***  | 0.0253      | 5.09*** | 0.0292      | 5.81***  | 0.0266      | 4.31***  | 0.0192            | 5.56***  |
| Number of Analysts         | -0.0353          | -2.30**  | -0.0001     | -0.02   | 0.0091      | 2.62***  | 0.0011      | 0.85     | -0.0010           | -2.04**  |
| Announcement Type          |                  |          |             |         |             |          |             |          |                   |          |
| Takeover                   | -0.0099          | -0.30    | -0.0404     | -0.93   | 0.0652      | 2.22**   | -0.0032     | -0.10    | -0.0112           | -0.66    |
| Issued Capital             | 0.0298           | 1.40     | -0.0091     | -0.43   | -0.0143     | -0.61    | -0.0525     | -2.93*** | -0.0380           | -2.20**  |
| Asset Acquisition/Disposal | 0.0101           | 0.52     | -0.0215     | -1.01   | -0.0449     | -2.35**  | -0.0298     | -1.77*   | -0.0365           | -2.36**  |
| Progress Report            | 0.0064           | 0.50     | 0.0312      | 2.52**  | 0.0324      | 2.72***  | 0.0493      | 3.96***  | 0.0653            | 5.02***  |
| Other                      | -0.0279          | -0.94    | -0.0068     | -0.13   | -0.1134     | -3.35*** | -0.0375     | -1.31    | -0.0578           | -2.39**  |
| Chairman's Address         | -0.0263          | -0.50    | -0.0064     | -0.17   | -0.0832     | -3.22*** | -0.0486     | -1.67*   | -0.0524           | -2.37**  |
| N                          | 1,276            |          | 1,277       |         | 1,277       |          | 1,277       |          | 1,277             |          |
| Adj. R <sup>2</sup>        | 0.0451           |          | 0.0517      |         | 0.0995      |          | 0.1052      |          | 0.1849            |          |
| F-Value                    | 7.02***          |          | 7.95***     |         | 15.10***    |          | 16.00***    |          | 29.95***          |          |

Disclosure results across size quintiles are disappointing for continuous disclosure requirements. No announcement type is found to contribute to the timeliness of price discovery for firm-years in quintiles 1 and 2. The only MSA type showing a significant coefficient in quintile 2, but with a positive sign, is 'Progress Report'. As firm size increases in quintiles 3, 4 and 5, the contribution of announcement types 'Asset Acquisition and Disposal', 'Other', 'Chairman's Address', and 'Issued Capital' becomes more noticeable. These results show that disclosure regulation per se has no significant effect on the speed of price discovery for small firms. One possible explanation for this finding could be related to a lack of attention from investors to smaller firms. However, we cannot discard the fact that the timeliness measures could be affected by the lower number of MSAs disclosed by smaller firms, which is almost 40% lower for firms in quintile 1 compared to that of firms in quintile 5.

Overall our results lend partial support to hypothesis 1, finding that time and return weighted frequency of disclosure of MSAs is restricted to larger firms, firms with high frequency of disclosure, and to certain announcement types: 'Asset Acquisition and Disposal', 'Other', and 'Chairman's Address'. The remainder of the chapter discusses the impact of frequency of disclosure under continuous disclosure requirements on the accuracy of price discovery in Australia.

### *2.5.2. Disclosure Frequency and the Accuracy of Price Discovery*

In this section we focus on the impact of frequency of disclosure on the accuracy of price discovery. As an introduction to the above mentioned analysis we first examine whether the information content of the selected six non-periodic MSA types is significant and remains relevant in the long term. In order to do so, next we measure the information content of MSAs using a methodology based on Ball and Shivakumar (2008) and Beyer et al. (2010).

#### *2.5.2.1. Information Content of Market Sensitive Announcements*

Considering all firm-years we find strong support for the information contribution of MSAs. The overall abnormal adjusted  $R^2$  of the six selected MSA types in Table 2.9 is 9.66%. That is, the adjusted  $R^2$  is 98% above the expected  $R^2$  for the 8.28 MSAs under the hypothesis that daily returns

are i.i.d. Using partial  $R^2$  to analyse the information contribution of individual announcement types provides evidence that ‘Issued Capital’, ‘Asset Acquisition and Disposal’, ‘Progress Report’ and ‘Chairman’s Address’ announcements are associated with a higher than expected information contribution. However, ‘Takeover’ and ‘Other’ announcements show a lower than expected information contribution.

Table 2.9  
Information Content of Market Sensitive Announcements by Sector

This table shows the information contribution of announcement types using the following equation:

$$CAR = a + b_1 \cdot CAR_{Tak} + b_2 \cdot CAR_{Cap} + b_3 \cdot CAR_{Ass} + b_4 \cdot CAR_{Rep} + b_5 \cdot CAR_{Oth} + b_6 \cdot CAR_{Add} + \varepsilon_i$$

The dependent variable is the firm’s cumulative abnormal return between two consecutive PFSs;  $car_{tak}$ ,  $car_{cap}$ ,  $car_{ass}$ ,  $car_{rep}$ ,  $car_{oth}$  and  $car_{add}$  are the cumulative abnormal return around days with Takeover, Issued Capital, Asset Acquisition and Disposal, Progress Report, Other and Chairman’s Address announcements, respectively. Abnormal  $R^2$  is the difference between each variable’s partial  $R^2$  and the expected partial  $R^2$  under i.i.d daily returns. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Announcement Type            | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
|------------------------------|-------------|----------|---------------|--------------|----------------|
| Intercept                    | 0.10        | 9.78***  |               |              |                |
| Takeover                     | 0.62        | 5.64***  | 0.0038        | 0.45         | -0.0016        |
| Issued Capital               | 0.94        | 8.53***  | 0.0377        | 1.10         | 0.0246         |
| Asset Acquisition / Disposal | 1.00        | 8.86***  | 0.0345        | 1.08         | 0.0216         |
| Progress Report              | 0.78        | 20.88*** | 0.1153        | 5.27         | 0.0526         |
| Other                        | 0.64        | 4.73***  | 0.0025        | 0.28         | -0.0008        |
| Chairman's Address           | 1.08        | 3.62***  | 0.0013        | 0.10         | 0.0002         |
| N                            | 6,384       |          |               |              |                |
| Adj. $R^2$                   | 0.1951      |          |               | 8.28         | 0.0966         |
| F-Value                      | 257.49***   |          |               |              |                |

When the sample is segmented by sector in Table 2.10, all but Energy and Consumer Staples sectors show positive abnormal adjusted  $R^2$  with an excess over the expected  $R^2$  ranging from 48% in the Materials sector, to 370% in the Utilities sector.

Table 2.10  
Information Content of Market Sensitive Announcements by GICS Sector

This table shows the information contribution of announcement types using the following equation:

$$CAR = a + b_1 \cdot CAR_{Tak} + b_2 \cdot CAR_{Cap} + b_3 \cdot CAR_{Ass} + b_4 \cdot CAR_{Rep} + b_5 \cdot CAR_{Oth} + b_6 \cdot CAR_{Add} + \varepsilon_i$$

The dependent variable is the firm's cumulative abnormal return between two consecutive PFSSs;  $car_{tak}$ ,  $car_{cap}$ ,  $car_{ass}$ ,  $car_{rep}$ ,  $car_{oth}$  and  $car_{add}$  are the cumulative abnormal return around days with Takeover, Issued Capital, Asset Acquisition and Disposal, Progress Report, Other and Chairman's Address announcements, respectively. Abnormal  $R^2$  is the difference between each variable's partial  $R^2$  and the expected partial  $R^2$  under i.i.d daily returns. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Energy                       | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
|------------------------------|-------------|----------|---------------|--------------|----------------|
| Intercept                    | 0.20        | 5.79***  |               |              |                |
| Takeover                     | 0.60        | 2.42*    | 0.0051        | 0.50         | -0.0008        |
| Issued Capital               | 0.94        | 4.92***  | 0.0240        | 1.16         | 0.0102         |
| Asset Acquisition / Disposal | 0.98        | 3.68***  | 0.0323        | 1.16         | 0.0185         |
| Progress Report              | 0.61        | 6.22***  | 0.1378        | 15.31        | -0.0445        |
| Other                        | 0.72        | 1.03     | 0.0013        | 0.27         | -0.0019        |
| Chairman's Address           | 1.72        | 0.79     | 0.0006        | 0.03         | 0.0002         |
| N                            | 674         |          |               |              |                |
| Adj. $R^2$                   | 0.2011      |          |               | 18.43        | -0.0183        |
| F-Value                      | 27.15***    |          |               |              |                |
| Materials                    | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.22        | 10.32*** |               |              |                |
| Takeover                     | 0.75        | 3.55***  | 0.0032        | 0.43         | -0.0020        |
| Issued Capital               | 0.80        | 5.05***  | 0.0277        | 1.36         | 0.0114         |
| Asset Acquisition / Disposal | 1.02        | 7.66***  | 0.0293        | 0.83         | 0.0193         |
| Progress Report              | 0.73        | 14.24*** | 0.1097        | 7.04         | 0.0260         |
| Other                        | 1.45        | 2.87***  | 0.0047        | 0.23         | 0.0019         |
| Chairman's Address           | 0.21        | 0.25     | 0.0000        | 0.04         | -0.0004        |
| N                            | 2,087       |          |               |              |                |
| Adj. $R^2$                   | 0.1745      |          |               | 9.94         | 0.0562         |
| F-Value                      | 73.29***    |          |               |              |                |
| Industrials                  | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.01        | 0.54     |               |              |                |
| Takeover                     | 0.39        | 2.13**   | 0.0091        | 0.48         | 0.0034         |
| Issued Capital               | 1.69        | 2.45     | 0.0689        | 0.77         | 0.0597         |
| Asset Acquisition / Disposal | 0.77        | 4.28***  | 0.0188        | 1.33         | 0.0030         |
| Progress Report              | 0.82        | 5.62***  | 0.0752        | 2.53         | 0.0451         |
| Other                        | -0.50       | -1.05    | 0.0025        | 0.32         | -0.0013        |
| Chairman's Address           | 2.46        | 5.41***  | 0.0229        | 0.18         | 0.0207         |
| N                            | 672         |          |               |              |                |
| Adj. $R^2$                   | 0.1974      |          |               | 5.61         | 0.1306         |
| F-Value                      | 27.22***    |          |               |              |                |
| Consumer Discretionary       | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.05        | 1.66*    |               |              |                |
| Takeover                     | 1.02        | 2.92***  | 0.0245        | 0.59         | 0.0175         |
| Issued Capital               | 0.28        | 0.67     | 0.0027        | 0.75         | -0.0063        |
| Asset Acquisition / Disposal | 0.56        | 1.47     | 0.0140        | 1.08         | 0.0012         |
| Progress Report              | 1.24        | 5.29***  | 0.1029        | 1.33         | 0.0870         |
| Other                        | 0.44        | 0.29     | 0.0006        | 0.24         | -0.0023        |
| Chairman's Address           | 1.27        | 2.45***  | 0.0063        | 0.21         | 0.0039         |
| N                            | 536         |          |               |              |                |
| Adj. $R^2$                   | 0.1510      |          |               | 4.20         | 0.1010         |
| F-Value                      | 15.67***    |          |               |              |                |
| Consumer Staples             | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.02        | 0.57     |               |              |                |
| Takeover                     | 0.09        | 0.52     | 0.0005        | 0.86         | -0.0097        |
| Issued Capital               | 0.19        | 0.34     | 0.0007        | 0.96         | -0.0108        |
| Asset Acquisition / Disposal | 1.26        | 1.35     | 0.0297        | 0.99         | 0.0179         |
| Progress Report              | 0.44        | 2.26**   | 0.0246        | 1.67         | 0.0047         |
| Other                        | -0.21       | -0.24    | 0.0007        | 0.43         | -0.0045        |
| Chairman's Address           | 1.08        | 1.44     | 0.0043        | 0.21         | 0.0019         |
| N                            | 198         |          |               |              |                |
| Adj. $R^2$                   | 0.0605      |          |               | 5.13         | -0.0005        |
| F-Value                      | 2.05*       |          |               |              |                |

Table 2.10 (Continued)  
Information Content of Market Sensitive Announcements by GICS Sector

This table shows the information contribution of announcement types using the following equation:

$$CAR = a + b_1 \cdot CAR_{Tak} + b_2 \cdot CAR_{Cap} + b_3 \cdot CAR_{Ass} + b_4 \cdot CAR_{Rep} + b_5 \cdot CAR_{Oth} + b_6 \cdot CAR_{Add} + \varepsilon_i$$

The dependent variable is the firm's cumulative abnormal return between two consecutive PFSSs;  $car_{Tak}$ ,  $car_{Cap}$ ,  $car_{Ass}$ ,  $car_{Rep}$ ,  $car_{Oth}$  and  $car_{Add}$  are the cumulative abnormal return around days with Takeover, Issued Capital, Asset Acquisition and Disposal, Progress Report, Other and Chairman's Address announcements, respectively. Abnormal  $R^2$  is the difference between each variable's partial  $R^2$  and the expected partial  $R^2$  under i.i.d daily returns. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Health Care                  | Coefficient | t-value | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
|------------------------------|-------------|---------|---------------|--------------|----------------|
| Intercept                    | -0.01       | -0.27   |               |              |                |
| Takeover                     | 1.01        | 4.22*** | 0.0024        | 0.21         | -0.0001        |
| Issued Capital               | 0.59        | 1.80*   | 0.0628        | 0.96         | 0.0513         |
| Asset Acquisition / Disposal | 1.10        | 2.74*** | 0.0635        | 0.67         | 0.0555         |
| Progress Report              | 0.73        | 9.61*** | 0.1203        | 4.84         | 0.0626         |
| Other                        | 0.66        | 5.00*** | 0.0114        | 0.35         | 0.0072         |
| Chairman's Address           | 1.12        | 1.40    | 0.0016        | 0.07         | 0.0008         |
| N                            | 618         |         |               |              |                |
| Adj. $R^2$                   | 0.2619      |         |               | 7.11         | 0.1773         |
| F-Value                      | 36.14***    |         |               |              |                |
| Financials                   | Coefficient | t-value | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | -0.03       | -1.76*  |               |              |                |
| Takeover                     | 0.26        | 0.71    | 0.0010        | 0.53         | -0.0053        |
| Issued Capital               | 1.04        | 4.71*** | 0.0465        | 1.18         | 0.0324         |
| Asset Acquisition / Disposal | 0.94        | 4.21*** | 0.0498        | 1.65         | 0.0302         |
| Progress Report              | 0.98        | 4.53*** | 0.0851        | 1.29         | 0.0697         |
| Other                        | -0.00       | -0.00   | 0.0000        | 0.25         | -0.0030        |
| Chairman's Address           | 0.85        | 0.98    | 0.0018        | 0.12         | 0.0004         |
| N                            | 985         |         |               |              |                |
| Adj. $R^2$                   | 0.1843      |         |               | 5.03         | 0.1244         |
| F-Value                      | 36.82***    |         |               |              |                |
| Information Technology       | Coefficient | t-value | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.14        | 3.34*** |               |              |                |
| Takeover                     | -0.08       | -0.18   | 0.0000        | 0.18         | -0.0021        |
| Issued Capital               | 1.61        | 3.05*** | 0.0563        | 0.78         | 0.0469         |
| Asset Acquisition / Disposal | 0.57        | 1.54    | 0.0040        | 1.04         | -0.0084        |
| Progress Report              | 0.77        | 3.01*** | 0.0538        | 2.69         | 0.0218         |
| Other                        | 0.66        | 2.94*** | 0.0070        | 0.20         | 0.0046         |
| Chairman's Address           | 0.33        | 0.36    | 0.0002        | 0.14         | -0.0015        |
| N                            | 410         |         |               |              |                |
| Adj. $R^2$                   | 0.1213      |         |               | 5.03         | 0.0613         |
| F-Value                      | 9.27***     |         |               |              |                |
| Telecommunication Services   | Coefficient | t-value | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.18        | 2.00**  |               |              |                |
| Takeover                     | 0.65        | 0.56    | 0.0003        | 0.45         | -0.0051        |
| Issued Capital               | 1.23        | 2.80*** | 0.0323        | 0.96         | 0.0209         |
| Asset Acquisition / Disposal | 2.88        | 1.95*   | 0.0747        | 1.04         | 0.0622         |
| Progress Report              | 1.80        | 1.56    | 0.0714        | 2.77         | 0.0384         |
| Other                        | -1.28       | -1.35   | 0.0055        | 0.56         | -0.0012        |
| Chairman's Address           | -4.56       | -1.23   | 0.0028        | 0.12         | 0.0014         |
| N                            | 115         |         |               |              |                |
| Adj. $R^2$                   | 0.1869      |         |               | 5.90         | 0.1166         |
| F-Value                      | 4.14***     |         |               |              |                |
| Utilities                    | Coefficient | t-value | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.06        | 1.19    |               |              |                |
| Takeover                     | 0.34        | 0.46    | 0.0036        | 0.70         | -0.0047        |
| Issued Capital               | 1.86        | 9.00*** | 0.2855        | 1.14         | 0.2719         |
| Asset Acquisition / Disposal | 1.35        | 3.03*** | 0.1152        | 1.36         | 0.0990         |
| Progress Report              | 0.69        | 4.12*** | 0.0651        | 4.61         | 0.0101         |
| Other                        | 0.12        | 0.27    | 0.0002        | 0.53         | -0.0061        |
| Chairman's Address           | 0.90        | 0.81    | 0.0024        | 0.09         | 0.0013         |
| N                            | 109         |         |               |              |                |
| Adj. $R^2$                   | 0.4720      |         |               | 8.43         | 0.3716         |
| F-Value                      | 15.20***    |         |               |              |                |

The same four announcement types that stand out in the entire sample are the ones that show higher than expected information contribution in the highest number of sectors. ‘Asset Acquisition and Disposal’ and ‘Progress Report’ announcements exceed the expected information contribution in nine out of ten sectors while ‘Issued Capital’ and ‘Chairman’s Address’ announcements exceed the expected  $R^2$  in eight out of the ten sectors. Also reflecting the results for the entire sample, ‘Takeover’ announcements exceed the expected  $R^2$  in two out of ten sectors and ‘Other’ announcements show a higher than expected information content in three of the ten sectors.

The information contribution of the six announcement types taken together is also higher than expected in all size quintiles as reported in Table 2.11. Individually, the information content of ‘Issued Capital’, ‘Asset Acquisition and Disposal’, and ‘Progress Report’ announcements is higher than expected in all five groups, while information content in ‘Chairman’s Address’ announcements is higher in four out of five quintiles. The remaining two announcement types, ‘Takeover’ and ‘Other’, have higher than expected  $R^2$  in three and two quintiles, respectively.

As expected, the assessment of the information contribution of MSAs is very favourable showing days surrounding the disclosure of MSAs contribute twice as much information as ordinary days. This finding is consistent across sectors and firm sizes. In the following sub-section we analyse the impact that the amount of information disclosed throughout the year has on the informativeness of earnings announcements (Preliminary Final Statements).

Table 2.11

## Information Content of Market Sensitive Announcements by Size Quintile

This table shows the information contribution of announcement types using the following equation:

$$CAR = a + b_1 \cdot CAR_{Tak} + b_2 \cdot CAR_{Cap} + b_3 \cdot CAR_{Ass} + b_4 \cdot CAR_{Rep} + b_5 \cdot CAR_{Oth} + b_6 \cdot CAR_{Add} + \varepsilon_i$$

The dependent variable is the firm's cumulative abnormal return between two consecutive PFSs;  $car_{Tak}$ ,  $car_{Cap}$ ,  $car_{Ass}$ ,  $car_{Rep}$ ,  $car_{Oth}$  and  $car_{Add}$  are the cumulative abnormal return around days with Takeover, Issued Capital, Asset Acquisition and Disposal, Progress Report, Other and Chairman's Address announcements, respectively. Abnormal  $R^2$  is the difference between each variable's partial  $R^2$  and the expected partial  $R^2$  under i.i.d daily returns. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Quintile 1 (Low)             | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
|------------------------------|-------------|----------|---------------|--------------|----------------|
| Intercept                    | 0.41        | 12.68*** |               |              |                |
| Takeover                     | 0.60        | 1.94**   | 0.0025        | 0.14         | 0.0008         |
| Issued Capital               | 0.63        | 3.85***  | 0.0264        | 1.22         | 0.0119         |
| Asset Acquisition / Disposal | 0.75        | 4.85***  | 0.0304        | 0.76         | 0.0213         |
| Progress Report              | 0.52        | 7.27***  | 0.0515        | 4.09         | 0.0028         |
| Other                        | 0.72        | 0.93     | 0.0011        | 0.08         | 0.0001         |
| Chairman's Address           | -0.86       | -1.12    | 0.0005        | 0.03         | 0.0001         |
| N                            | 1,276       |          |               |              |                |
| Adj. $R^2$                   | 0.1124      |          |               | 6.33         | 0.0370         |
| F-Value                      | 26.77***    |          |               |              |                |
| Quintile 2                   | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.13        | 5.58***  |               |              |                |
| Takeover                     | 0.78        | 4.65***  | 0.0047        | 0.17         | 0.0027         |
| Issued Capital               | 1.24        | 6.71***  | 0.0545        | 1.14         | 0.0409         |
| Asset Acquisition / Disposal | 1.28        | 5.18***  | 0.0343        | 0.85         | 0.0243         |
| Progress Report              | 0.70        | 12.26*** | 0.1089        | 5.64         | 0.0418         |
| Other                        | 0.42        | 1.88*    | 0.0011        | 0.14         | -0.0006        |
| Chairman's Address           | 0.67        | 0.99     | 0.0004        | 0.06         | -0.0002        |
| N                            | 1,277       |          |               |              |                |
| Adj. $R^2$                   | 0.2040      |          |               | 7.99         | 0.1089         |
| F-Value                      | 54.26***    |          |               |              |                |
| Quintile 3                   | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | 0.01        | 0.44     |               |              |                |
| Takeover                     | 0.44        | 2.25**   | 0.0016        | 0.32         | -0.0022        |
| Issued Capital               | 1.01        | 4.51***  | 0.0304        | 1.01         | 0.0184         |
| Asset Acquisition / Disposal | 1.20        | 7.74***  | 0.0427        | 0.85         | 0.0326         |
| Progress Report              | 0.89        | 10.95*** | 0.1488        | 6.04         | 0.0769         |
| Other                        | 0.44        | 0.81     | 0.0004        | 0.20         | -0.0020        |
| Chairman's Address           | 2.15        | 5.53***  | 0.0085        | 0.11         | 0.0072         |
| N                            | 1,277       |          |               |              |                |
| Adj. $R^2$                   | 0.2324      |          |               | 8.53         | 0.1309         |
| F-Value                      | 64.10**     |          |               |              |                |
| Quintile 4                   | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | -0.00       | -0.06    |               |              |                |
| Takeover                     | 0.51        | 2.39**   | 0.0034        | 0.54         | -0.0030        |
| Issued Capital               | 1.37        | 3.42***  | 0.0334        | 0.97         | 0.0219         |
| Asset Acquisition / Disposal | 0.92        | 3.68***  | 0.0218        | 1.13         | 0.0084         |
| Progress Report              | 0.93        | 11.12*** | 0.1446        | 5.38         | 0.0806         |
| Other                        | 0.71        | 5.18***  | 0.0091        | 0.35         | 0.0049         |
| Chairman's Address           | 1.25        | 2.09**   | 0.0020        | 0.13         | 0.0004         |
| N                            | 1,277       |          |               |              |                |
| Adj. $R^2$                   | 0.2142      |          |               | 8.49         | 0.1132         |
| F-Value                      | 57.70***    |          |               |              |                |
| Quintile 5 (High)            | Coefficient | t-value  | Partial $R^2$ | Average MSAs | Abnormal $R^2$ |
| Intercept                    | -0.00       | -0.35    |               |              |                |
| Takeover                     | 0.79        | 4.06***  | 0.0202        | 1.09         | 0.0072         |
| Issued Capital               | 0.67        | 3.15***  | 0.0263        | 1.17         | 0.0123         |
| Asset Acquisition / Disposal | 1.30        | 3.84***  | 0.0468        | 1.81         | 0.0252         |
| Progress Report              | 1.00        | 8.22***  | 0.1726        | 5.19         | 0.1108         |
| Other                        | 0.91        | 2.46**   | 0.0059        | 0.61         | -0.0014        |
| Chairman's Address           | 1.93        | 3.73***  | 0.0068        | 0.15         | 0.0050         |
| N                            | 1,277       |          |               |              |                |
| Adj. $R^2$                   | 0.2786      |          |               | 10.04        | 0.1592         |
| F-Value                      | 81.69***    |          |               |              |                |

### *2.5.2.2 Disclosure Frequency and the Informativeness of Preliminary Final Statements*

The impact of frequency of disclosure on the informativeness of earnings, measured as abnormal volume and absolute abnormal return following the release of PFSs, is presented in Tables 2.12 and 2.13, respectively. Abnormal volume is negatively associated with firm size and with changes in earnings. The size effect is in line with intuition and with Atiase et al.'s (1988) finding that it is more difficult for investors to anticipate small firms' earnings than large firms' earnings. However, the coefficient for the  $\Delta\text{Earn}$  variable suggests that a higher change in earnings throughout the period causes a lower market reaction to the earnings announcement. Analyst following appears to increase the informativeness of earnings announcements. This can be inferred from the positive and statistically significant coefficients of the variable number of analysts. Column 1, in Table 2.12, also shows abnormal volume after Preliminary Final Statements are released is negatively associated with the frequency of disclosure. Absolute abnormal returns also show a negative relation with firm size and with changes in earnings. In contrast with the volume analysis, absolute abnormal returns are positively associated with both firms' turnover and the frequency of disclosure. These findings can be interpreted in light of Beaver's (1968) view that abnormal traded volume is a proxy for a change in individual investors' expectations and abnormal return is a proxy for market wide changes in expectations around earnings announcements. Taking together, the results in column 1 of Tables 2.12 and 2.13 indicate that an increased frequency of disclosure reduces the level of disagreement between investors, while there is still some new information contained in the PFSs that were not impounded into prices before its release. Extending the analysis of informativeness to announcement types Table 2.12 reports that, regardless of the way announcement types are weighted, 'Progress Report' MSAs reduce the level of abnormal volume following PFSs. This finding highlights progress reports importance in lowering the difference of opinion among investors. When MSAs classified as 'Other', 'Takeover' and 'Chairman's Address' are weighted by the return on the announcement day, they are associated with lower absolute abnormal returns following PFSs. This means that these announcement types are preempting the information that later in the year is disclosed in the Preliminary Final Statement.

Table 2.12  
Announcement Types and the Informativeness of Earnings – Abnormal Volume

This table shows the impact of different types of market sensitive announcements on the informativeness of earnings for firms trading on the ASX using the following equations:

$$Abnvol = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + b_5 \cdot Disclosure + \varepsilon_i$$

$$Abnvol = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnov + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the average volume for days 0 to 2 after the PFS normalised by the average volume for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is first measured in number of documents containing information on each category. This means that MSAs with more than one information type are counted more than once. Secondly, Announcement Type is measured by the number of documents with MSAs that only disclosed information regarding one category. Thirdly, Announcement Type is measured by weighting unique MSA documents according to the time distance between the announcements and the end of the period. Finally, Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                        | Non-Periodic<br>MSA Documents<br>(1) |         | Unique Documents<br>(2) |          | Time Weighted<br>Unique Documents<br>(3) |          | Return Weighted<br>Unique Documents<br>(4) |          |
|---------------------------------|--------------------------------------|---------|-------------------------|----------|--|----------|--|----------|
|                                 | Coefficient                          | t-value | Coefficient             | t-value  | Coefficient                              | t-value  | Coefficient                                | t-value  |
| Intercept                       | 3.0808                               | 4.16*** | 3.5174                  | 4.75***  | 3.5796                                   | 4.75***  | 3.8381                                     | 5.11***  |
| Size                            | -0.1272                              | -3.01** | -0.1577                 | -3.70*** | -0.1583                                  | -3.66*** | -0.1696                                    | -3.92*** |
| $\Delta Earn$                   | -0.0009                              | -2.07*  | -0.0007                 | -1.72*   | -0.0007                                  | -1.91*   | -0.0004                                    | -0.92    |
| Turnover                        | 0.1403                               | 0.87    | 0.1424                  | 0.89     | 0.1528                                   | 0.95     | 0.1583                                     | 1.00     |
| Number of Analysts<br>Documents | 0.0625                               | 3.35*** | 0.0587                  | 3.15***  | 0.0577                                   | 3.07***  | 0.0567                                     | 3.01***  |
| Announcement Type               |                                      |         |                         |          |  |          |  |          |
| Takeover                        |                                      |         | 0.0042                  | 0.24     | 0.0127                                   | 0.39     | -0.1859                                    | -0.49    |
| Issued Capital                  |                                      |         | 0.0136                  | 0.30     | -0.0763                                  | -0.82    | -0.0446                                    | -0.11    |
| Asset Acquisition/Disposal      |                                      |         | 0.0353                  | 1.20     | 0.0667                                   | 1.21     | 1.2330                                     | 1.49     |
| Progress Report                 |                                      |         | -0.0277                 | -3.90*** | -0.0560                                  | -4.19*** | -0.9056                                    | -3.15*** |
| Other                           |                                      |         | 0.1090                  | 1.02     | 0.2201                                   | 1.15     | 0.4773                                     | 0.71     |
| Chairman's Address              |                                      |         | 0.2178                  | 1.58     | 0.2804                                   | 1.63     | 0.7814                                     | 1.10     |
| N                               | 6,384                                |         | 6,384                   |          | 6,384                                    |          | 6,384                                      |          |
| Adj. R <sup>2</sup>             | 0.0025                               |         | 0.0029                  |          | 0.0034                                   |          | 0.0062                                     |          |
| F-Value                         | 4.18***                              |         | 2.86***                 |          | 3.15***                                  |          | 4.97***                                    |          |

Table 2.13  
Announcement Types and the Informativeness of Earnings – Absolute Abnormal Return

This table shows the impact of different types of market sensitive announcements on the informativeness of earnings for firms trading on the ASX using the following equations:

$$Absabnret = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + b_5 \cdot Disclosure + \varepsilon_i$$

$$Absabnret = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the absolute abnormal return for days 0 to 2 after the PFS derived from a market model for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is first measured in number of documents containing information on each category. This means that MSAs with more than one information type are counted more than once. Secondly, Announcement Type is measured by the number of documents with MSAs that only disclosed information regarding one category. Thirdly, Announcement Type is measured by weighting unique MSA documents according to the time distance between the announcements and the end of the period. Finally, Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                        | Non-Periodic<br>MSA Documents<br>(1) |           | Unique Documents<br>(2) |           | Time Weighted<br>Unique Documents<br>(3) |           | Return Weighted<br>Unique Documents<br>(4) |           |
|---------------------------------|--------------------------------------|-----------|-------------------------|-----------|--|-----------|--|-----------|
|                                 | Coefficient                          | t-value   | Coefficient             | t-value   | Coefficient                              | t-value   | Coefficient                                | t-value   |
| Intercept                       | 0.2830                               | 17.56***  | 0.2728                  | 15.78***  | 0.2782                                   | 16.27***  | 0.2691                                     | 15.83***  |
| Size                            | -0.0104                              | -11.59*** | -0.0099                 | -10.26*** | -0.0102                                  | -10.63*** | -0.0095                                    | -10.45*** |
| $\Delta Earn$                   | -0.0000                              | -4.08***  | -0.0000                 | -4.07***  | -0.0000                                  | -3.86***  | -0.0000                                    | -4.24***  |
| Turnover                        | 0.0124                               | 5.42***   | 0.0121                  | 5.44***   | 0.0122                                   | 5.33***   | 0.0123                                     | 5.38***   |
| Number of Analysts<br>Documents | 0.0007                               | 1.59      | 0.0007                  | 1.72*     | 0.0007                                   | 1.66*     | 0.0007                                     | 1.73*     |
| Announcement Type               |                                      |           |                         |           |  |           |  |           |
| Takeover                        |                                      |           | -0.0008                 | -1.60     | -0.0001                                  | -0.13     | -0.0293                                    | -2.67***  |
| Issued Capital                  |                                      |           | 0.0023                  | 1.97**    | 0.0023                                   | 1.14      | 0.0041                                     | 0.39      |
| Asset Acquisition/Disposal      |                                      |           | 0.0005                  | 0.68      | 0.0027                                   | 1.89*     | -0.0091                                    | -1.00     |
| Progress Report                 |                                      |           | 0.0003                  | 1.63      | 0.0005                                   | 1.77*     | 0.0076                                     | 1.14      |
| Other                           |                                      |           | -0.0035                 | -1.70*    | -0.0061                                  | -1.77*    | -0.0357                                    | -2.48**   |
| Chairman's Address              |                                      |           | -0.0012                 | -0.31     | -0.0014                                  | -0.31     | -0.0322                                    | -2.35**   |
| N                               | 6,384                                |           | 6,384                   |           | 6,384                                    |           | 6,384                                      |           |
| Adj. R <sup>2</sup>             | 0.0341                               |           | 0.0348                  |           | 0.0345                                   |           | 0.0353                                     |           |
| F-Value                         | 46.07***                             |           | 24.01***                |           | 23.79***                                 |           | 24.39***                                   |           |

Table 2.14 shows there are four sectors for which individual announcement types reduce the level of disagreement among investors after earnings are released. For firms in the Financials sector abnormal volume is negatively related to the return weighted frequency of ‘Progress Report’ announcements. For firms in the Industrials sector the frequency of both ‘Takeover’ and ‘Chairman’s Address’ MSAs reduce the level of post-earnings abnormal volume. In the Consumer Discretionary sector, the frequency of MSAs labelled as ‘Other’ shows a negative and statistically significant coefficient at the 10% level. Finally, abnormal volume in the Information Technology sector is negatively related with the frequency of announcements in the ‘Issued Capital’ and Progress Report’ categories. The sector analysis of the informativeness of earnings measured by absolute abnormal returns is reported in Table 2.15. Takeover announcements significantly reduce the level of absolute abnormal returns in the Materials, Industrials, Consumer Discretionary, Consumer Staples and Health Care sectors. The frequency of ‘Issued Capital’ announcements reduces the informativeness of PFSs in the Financials sector. ‘Asset Acquisition and Disposal’ MSAs are related to a lower reaction after earnings announcements in the Industrials and Utilities sectors. Also relevant in reducing the reaction to earnings announcements in the Utilities sector are ‘Progress Report’ announcements. Emphasising the relevance of voluntary disclosure, a similar effect is observed for announcements classified as ‘Other’ in the Financials and Industrials sectors. Finally, ‘Chairman’s Address’ announcements reduce the informativeness of earnings in the Industrials sector. Despite the specific influence of different announcement types in the informativeness of earnings in each sector, from the previous analysis emerges a clear pattern showing MSAs preempt an important portion of the information revealed in the earnings announcement, highlighting that in a sound disclosure environment the confirmatory role of earnings announcement prevails over the role of providing new information to investors. This assertion does not preclude the possibility of finding earnings surprises in well functioning markets.

Table 2.14  
Announcement Types and the Informativeness of Earnings by GICS Sector – Abnormal Volume

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by sector using the following equation:

$$Abnvol = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the abnormal volume for days 0 to 2 after the PFS normalised by the average volume for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Materials   |          | Financials  |         | Industrials |         | Consumer Discretionary |         | Energy      |         |
|----------------------------|-------------|----------|-------------|---------|-------------|---------|------------------------|---------|-------------|---------|
|                            | Coefficient | t-value  | Coefficient | t-value | Coefficient | t-value | Coefficient            | t-value | Coefficient | t-value |
| Intercept                  | 4.6366      | 3.52***  | 4.9416      | 2.38**  | 0.0740      | 0.04    | 3.5659                 | 1.09    | 4.0994      | 2.00**  |
| Size                       | -0.2223     | -2.75*** | -0.2238     | -1.98*  | 0.0423      | 0.43    | -0.1178                | -0.70   | -0.2421     | -1.87*  |
| $\Delta Earn$              | -0.0006     | -2.27*** | 0.0296      | 0.76    | 0.0130      | 0.24    | -0.0406                | -0.67   | -0.0101     | -0.28   |
| Turnover                   | -0.0922     | -1.49    | 0.1583      | 0.61    | -0.2494     | -2.09** | -0.4430                | -1.39   | 0.7998      | 1.22    |
| Number of Analysts         | 0.0935      | 3.02***  | 0.0451      | 1.86*   | 0.1076      | 1.28    | 0.0363                 | 0.79    | 0.0359      | 0.77    |
| Announcement Type          |             |          |             |         |             |         |                        |         |             |         |
| Takeover                   | 0.0877      | 0.13     | 0.1605      | 0.18    | -1.5764     | -2.48** | -0.2069                | -0.17   | 0.8843      | 0.56    |
| Issued Capital             | 0.8914      | 1.05     | -1.0428     | -1.44   | 0.4229      | 0.53    | 1.8950                 | 0.63    | 2.3638      | 1.44    |
| Asset Acquisition/Disposal | 1.3963      | 1.28     | 2.9254      | 1.14    | -0.0242     | -0.04   | -0.7128                | -1.05   | 2.9300      | 0.93    |
| Progress Report            | -0.7604     | -1.22    | -1.3685     | -1.89*  | -0.3395     | -0.64   | -1.1197                | -1.27   | -0.1773     | -0.19   |
| Other                      | -0.0968     | -0.09    | 0.0785      | 0.06    | -0.2020     | -0.25   | -1.7207                | -1.80*  | 1.4787      | 0.62    |
| Chairman's Address         | 0.7171      | 0.55     | 1.7499      | 0.82    | -1.1899     | -1.68*  | 1.7117                 | 1.01    | 5.3425      | 0.83    |
| N                          | 2,087       |          | 985         |         | 672         |         | 536                    |         | 654         |         |
| Adj. R <sup>2</sup>        | 0.0097      |          | 0.0067      |         | 0.0073      |         | -0.0094                |         | 0.0126      |         |
| F-Value                    | 3.04***     |          | 1.66*       |         | 1.49        |         | 0.50                   |         | 1.83*       |         |

Table 2.14 (Continued)  
Announcement Types and the Informativeness of Earnings by GICS Sector – Abnormal Volume

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by sector using the following equation:

$$Abnvol = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the abnormal volume for days 0 to 2 after the PFS normalised by the average volume for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Health Care |         | Information Technology |         | Consumer Staples |         | Telecommunication Services |         | Utilities   |         |
|----------------------------|-------------|---------|------------------------|---------|------------------|---------|----------------------------|---------|-------------|---------|
|                            | Coefficient | t-value | Coefficient            | t-value | Coefficient      | t-value | Coefficient                | t-value | Coefficient | t-value |
| Intercept                  | 2.4468      | 0.77    | 3.7012                 | 1.14    | -0.2431          | -0.24   | 0.7995                     | 0.32    | -0.1189     | -0.68   |
| Size                       | -0.1330     | -0.71   | -0.1111                | -0.68   | 0.0117           | 0.19    | -0.0148                    | -0.09   | -0.9264     | -0.91   |
| $\Delta Earn$              | 0.3052      | 1.09    | 0.2565                 | 0.88    | 0.0058           | 0.19    | -0.0062                    | -0.13   | 0.6222      | 0.76    |
| Turnover                   | 1.1832      | 1.59    | -0.2810                | -1.28   | -0.2882          | -1.04   | -0.1649                    | -2.26** | -0.0000     | -0.00   |
| Number of Analysts         | 0.0026      | 0.04    | 0.0386                 | 0.63    | 0.0949           | 2.65    | -0.0762                    | -1.38   |             |         |
| Announcement Type          |             |         |                        |         |                  |         |                            |         | -3.5213     | -0.62   |
| Takeover                   | 1.6120      | 0.66    | -1.7131                | -1.55   | -0.0680          | -0.11   | 0.7800                     | 0.37    | -5.7646     | -0.81   |
| Issued Capital             | -0.1677     | -0.18   | -3.1063                | -2.19** | 2.8107           | 2.05**  | 2.1529                     | 0.54    | -8.3631     | -1.12   |
| Asset Acquisition/Disposal | 0.9448      | 0.58    | -0.3769                | -0.33   | 0.7687           | 0.91    | 0.2383                     | 0.15    | -7.2886     | -1.10   |
| Progress Report            | -0.3086     | -0.56   | -1.9139                | -1.82*  | -0.0284          | -0.04   | 0.8166                     | 0.43    | 0.4646      | 0.17    |
| Other                      | 2.5285      | 0.88    | -1.3682                | -1.23   | 0.9011           | 0.74    | 6.4693                     | 0.94    | -1.2419     | -0.16   |
| Chairman's Address         | -1.7724     | -0.74   | -0.9135                | -0.46   | 1.5110           | 1.12    | -3.3662                    | -1.40   | -0.1189     | -0.68   |
| N                          | 618         |         | 410                    |         | 198              |         | 115                        |         | 109         |         |
| Adj. R <sup>2</sup>        | 0.0417      |         | 0.0045                 |         | 0.0242           |         | -0.0464                    |         | -0.0642     |         |
| F-Value                    | 3.68***     |         | 1.18                   |         | 1.49             |         | 0.49                       |         | 0.35        |         |

Table 2.15  
Announcement Types and the Informativeness of Earnings by GICS Sector – Absolute Abnormal Return

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by sector using the following equation:

$$Absabnret = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the absolute abnormal return for days 0 to 2 after the PFS derived from a market model for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Materials   |          | Financials  |          | Industrials |          | Consumer Discretionary |          | Energy      |          |
|----------------------------|-------------|----------|-------------|----------|-------------|----------|------------------------|----------|-------------|----------|
|                            | Coefficient | t-value  | Coefficient | t-value  | Coefficient | t-value  | Coefficient            | t-value  | Coefficient | t-value  |
| Intercept                  | 0.2349      | 8.53***  | 0.3150      | 5.36***  | 0.2954      | 4.34***  | 0.2889                 | 5.71***  | 0.2763      | 5.63***  |
| Size                       | -0.0079     | -5.08*** | -0.0121     | -4.11*** | -0.0110     | -2.89**  | -0.0107                | -3.94*** | -0.0102     | -3.78*** |
| $\Delta Earn$              | -0.0001     | -6.96*** | 0.0044      | 1.31     | -0.0045     | -1.35    | 0.0017                 | 0.81     | -0.0010     | -0.88    |
| Turnover                   | 0.0089      | 3.43***  | 0.0262      | 2.95***  | 0.0129      | 1.22     | 0.0185                 | 1.77*    | 0.0199      | 2.07**   |
| Number of Analysts         | 0.0006      | 0.76     | 0.0011      | 1.09     | 0.0024      | 2.17**   | 0.0016                 | 1.53     | 0.0002      | 0.15     |
| Announcement Type          |             |          |             |          |             |          |                        |          |             |          |
| Takeover                   | -0.0346     | -1.80*   | -0.0183     | -0.74    | -0.0443     | -1.72*   | -0.0429                | -1.74*   | 0.0104      | 0.14     |
| Issued Capital             | 0.0944      | 3.79***  | -0.0453     | -2.38**  | 0.0312      | 0.84     | -0.0066                | -0.23    | 0.0490      | 0.86     |
| Asset Acquisition/Disposal | -0.0087     | -0.43    | -0.0155     | -0.70    | -0.0468     | -2.72*** | -0.0243                | -1.31    | -0.0048     | -0.13    |
| Progress Report            | 0.0184      | 1.40     | -0.0144     | -0.69    | 0.0203      | 1.27     | 0.0076                 | 0.37     | -0.0005     | -0.02    |
| Other                      | -0.0676     | -1.45    | -0.0613     | -2.08**  | -0.0535     | -2.25**  | -0.0237                | -0.62    | -0.0075     | -0.06    |
| Chairman's Address         | -0.0314     | -0.72    | -0.0142     | -0.45    | -0.0538     | -2.29**  | -0.0301                | -1.08    | -0.0465     | -0.21    |
| N                          | 2,087       |          | 985         |          | 672         |          | 536                    |          | 654         |          |
| Adj. R <sup>2</sup>        | 0.0352      |          | 0.0450      |          | 0.0458      |          | 0.0330                 |          | 0.0148      |          |
| F-Value                    | 8.61***     |          | 5.64***     |          | 4.22***     |          | 2.82***                |          | 1.98***     |          |

Table 2.15 (Continued)  
Announcement Types and the Informativeness of Earnings by GICS Sector – Absolute Abnormal Return

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by sector using the following equation:

$$Absabnret = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the absolute abnormal return for days 0 to 2 after the PFS derived from a market model for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Health Care |          | Information Technology |         | Consumer Staples |         | Telecommunication Services |         | Utilities   |         |
|----------------------------|-------------|----------|------------------------|---------|------------------|---------|----------------------------|---------|-------------|---------|
|                            | Coefficient | t-value  | Coefficient            | t-value | Coefficient      | t-value | Coefficient                | t-value | Coefficient | t-value |
| Intercept                  | 0.3061      | 4.06***  | 0.0834                 | 1.30    | 0.1645           | 2.90*** | 0.2153                     | 1.79*   | 0.4474      | 3.14*** |
| Size                       | -0.0106     | -2.71*** | 0.0012                 | 0.31    | -0.0047          | -1.53   | -0.0055                    | -0.73   | -0.0231     | -2.60** |
| $\Delta Earn$              | -0.0017     | -0.26    | -0.0023                | -0.50   | 0.0063           | 2.62*** | -0.0026                    | -0.49   | 0.0183      | 0.50    |
| Turnover                   | 0.0016      | 0.42     | 0.0153                 | 1.44    | -0.0055          | -0.45   | 0.0028                     | 0.77    | 0.2553      | 2.32**  |
| Number of Analysts         | -0.0008     | -0.63    | -0.0044                | -2.33** | 0.0018           | 1.16    | -0.0060                    | -1.58   | -0.0001     | -0.04   |
| Announcement Type          |             |          |                        |         |                  |         |                            |         |             |         |
| Takeover                   | -0.0496     | -1.98**  | -0.0573                | -1.20   | -0.0534          | -2.35** | 0.1098                     | 0.85    | 0.0277      | 0.40    |
| Issued Capital             | -0.0339     | -0.94    | -0.0140                | -0.37   | -0.0419          | -0.97   | 0.0813                     | 0.71    | -0.0772     | -1.24   |
| Asset Acquisition/Disposal | 0.0370      | 0.73     | 0.0200                 | 0.63    | 0.0143           | 0.37    | 0.1824                     | 1.43    | -0.1335     | -1.88*  |
| Progress Report            | -0.0291     | -1.45    | 0.0295                 | 1.28    | 0.0262           | 0.54    | 0.0037                     | 0.05    | -0.1112     | -2.16** |
| Other                      | -0.0193     | -0.67    | 0.0048                 | 0.08    | 0.0174           | 0.31    | -0.0822                    | -0.77   | 0.1404      | 1.25    |
| Chairman's Address         | -0.0752     | -0.83    | -0.0357                | -0.75   | 0.0337           | 0.93    | -0.0006                    | -0.00   | 0.6262      | 2.71*** |
| N                          | 618         |          | 410                    |         | 198              |         | 115                        |         | 109         |         |
| Adj. R <sup>2</sup>        | 0.0202      |          | -0.0018                |         | 0.0001           |         | -0.0269                    |         | 0.3600      |         |
| F-Value                    | 2.27**      |          | 0.93                   |         | 1.00             |         | 0.70                       |         | 7.08***     |         |

The assessment of the relation between disclosure frequency and the informativeness of earnings (measured by abnormal volume in Table 2.16 and by absolute abnormal return in Table 2.17) within size quintiles has two important findings. First, the frequency of voluntary disclosures (MSAs labelled as 'Other') reduces the informativeness of earnings for the smallest firms, both measured by abnormal volume and absolute abnormal return. The other interesting finding is that no announcement type is related to a lower informativeness of earnings for the larger group of firm-years.

This section provides support to hypothesis 2, highlighting how the prompt disclosure of non-periodic MSAs under continuous disclosure requirements reduces the level of disagreement among investors as well as the level of novel information disclosed in the earnings announcement. It is interesting to compare our results with those obtained by Lerman and Livnat (2010) in their study of the impact of an increase in the number of items that require mandatory filing of Form 8-K reports in the US. After the regulatory modification they find that the increase in the informativeness of the new non-periodic reports was accompanied by an increase in the informativeness of periodic reports. This finding is somewhat counterintuitive. When we weight MSAs according to the return on the announcement day, our results imply that the higher the informativeness of the MSAs disclosed throughout the year, the lower the informativeness of the earnings announcements.

Table 2.16  
Announcement Types and the Informativeness of Earnings by Size Quintiles –Abnormal Volume

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by size quintile using the following equation:

$$Abnvol = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Turnover + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the abnormal volume for days 0 to 2 after the PFS normalised by the average volume for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Quintile 1 (Low) |          | Quintile 2  |         | Quintile 3  |         | Quintile 4  |          | Quintile 5 (High) |         |
|----------------------------|------------------|----------|-------------|---------|-------------|---------|-------------|----------|-------------------|---------|
|                            | Coefficient      | t-value  | Coefficient | t-value | Coefficient | t-value | Coefficient | t-value  | Coefficient       | t-value |
| Intercept                  | 12.4025          | 2.08**   | 5.0836      | 0.70    | 13.1653     | 2.00**  | -0.4290     | -0.13    | 3.8429            | 2.44**  |
| Size                       | -0.7644          | -1.96**  | -0.2784     | -0.66   | -0.6839     | -1.93*  | 0.0800      | 0.46     | -0.1437           | -2.25** |
| $\Delta Earn$              | -0.0317          | -0.84    | 0.1057      | 1.83*   | 0.0212      | 1.07    | -0.0008     | -4.60*** | 0.0030            | 0.57    |
| Turnover                   | 1.5995           | 2.31**   | -0.0110     | -0.10   | -0.0168     | -0.11   | -0.1849     | -2.93*** | -0.1288           | -2.24** |
| Number of Analysts         | 2.3642           | 1.67*    | 0.0820      | 0.32    | 0.1036      | 0.80    | 0.0369      | 0.99     | 0.0397            | 1.91*   |
| Announcement Type          |                  |          |             |         |             |         |             |          |                   |         |
| Takeover                   | -1.1112          | -1.02    | 1.8868      | 0.86    | -1.4183     | -1.70*  | -0.3531     | -0.48    | -0.0442           | -0.08   |
| Issued Capital             | 0.8364           | 0.73     | 0.0977      | 0.15    | -0.4702     | -0.45   | -1.0943     | -2.38**  | -0.3537           | -0.52   |
| Asset Acquisition/Disposal | 0.4137           | 0.38     | 5.2444      | 1.29    | 0.6772      | 0.66    | -0.2390     | -0.51    | 0.2529            | 0.34    |
| Progress Report            | -0.5862          | -0.67    | -0.6181     | -1.41   | -1.2207     | -1.59   | -1.0609     | -3.39*** | -0.7751           | -1.51   |
| Other                      | -3.5597          | -3.18*** | -0.8556     | -0.55   | 0.8267      | 0.59    | 0.3578      | 0.40     | 2.0178            | 1.24    |
| Chairman's Address         | 1.4279           | 0.75     | -1.5922     | -1.79*  | 0.6776      | 0.38    | 1.7883      | 1.14     | -0.1843           | -0.23   |
| N                          | 1,276            |          | 1,277       |         | 1,277       |         | 1,277       |          | 1,277             |         |
| Adj. R <sup>2</sup>        | 0.0245           |          | 0.0233      |         | -0.0005     |         | 0.0125      |          | 0.0038            |         |
| F-Value                    | 4.21***          |          | 4.50***     |         | 0.94        |         | 2.62***     |          | 1.49              |         |

Table 2.17  
Announcement Types and the Informativeness of Earnings by Size Quintiles – Absolute Abnormal Return

This table shows the impact of different types of market sensitive announcements on the timeliness of price discovery for firms trading on the ASX by size quintile using the following equation:

$$Absabnret = a_1 + b_1 \cdot Size + b_2 \cdot \Delta Earn + b_3 \cdot Liquidity + b_4 \cdot Number\ of\ Analysts + \sum_{n=5}^{10} b_n \cdot Announcement\ Type_n + \varepsilon_i$$

The dependent variable is the absolute abnormal return for days 0 to 2 after the PFS derived from a market model for days -200 to -11 before the PFS. Size is proxied by the natural logarithm of the average market capitalisation for the period.  $\Delta Earn$  is the change in EPS normalised by the share price at the beginning of the period. Turnover is measured by yearly share turnover. Announcement Type is measured by weighting unique documents by the return on the announcement day. For each model White heteroscedasticity corrected t values are reported. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Variable                   | Quintile 1 (Low) |          | Quintile 2  |          | Quintile 3  |          | Quintile 4  |          | Quintile 5 (High) |          |
|----------------------------|------------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------------|----------|
|                            | Coefficient      | t-value  | Coefficient | t-value  | Coefficient | t-value  | Coefficient | t-value  | Coefficient       | t-value  |
| Intercept                  | 0.1767           | 1.47     | 0.3762      | 2.34**   | 0.6478      | 3.69***  | 0.1618      | 1.34     | 0.2896            | 9.45***  |
| Size                       | -0.0043          | -0.55    | -0.0161     | -1.67*   | -0.0308     | -3.09*** | -0.0035     | -0.54    | -0.0103           | -7.06*** |
| $\Delta Earn$              | 0.0004           | 0.20     | 0.0069      | 3.19***  | 0.0006      | 0.37     | -0.0000     | -4.79*** | -0.0006           | -2.18**  |
| Turnover                   | 0.0236           | 2.49**   | 0.0078      | 3.04***  | 0.0159      | 2.50**   | 0.0151      | 3.06***  | 0.0067            | 3.12***  |
| Number of Analysts         | -0.0115          | -0.50    | 0.0145      | 1.42     | 0.0040      | 1.22     | 0.0016      | 0.95     | 0.0006            | 1.76*    |
| Announcement Type          |                  |          |             |          |             |          |             |          |                   |          |
| Takeover                   | 0.0218           | 0.37     | -0.0771     | -2.63*** | -0.0428     | -1.44    | -0.0653     | -4.22*** | -0.0086           | -0.62    |
| Issued Capital             | 0.0459           | 1.61     | -0.0105     | -0.51    | 0.0049      | 0.20     | -0.0215     | -1.29    | -0.0139           | -1.11    |
| Asset Acquisition/Disposal | 0.0047           | 0.16     | 0.0015      | 0.07     | -0.0305     | -1.57    | -0.0287     | -2.16**  | -0.0008           | -0.06    |
| Progress Report            | 0.0159           | 0.89     | 0.0121      | 0.98     | 0.0061      | 0.39     | -0.0113     | -0.86    | 0.0073            | 0.86     |
| Other                      | -0.1168          | -2.58**  | -0.0815     | -2.08**  | -0.0241     | -0.57    | -0.0197     | -0.70    | -0.0270           | -1.41    |
| Chairman's Address         | -0.1098          | -2.90*** | 0.0043      | 0.07     | -0.0117     | -0.42    | -0.0517     | -2.28**  | -0.0149           | -0.84    |
| N                          | 1,276            |          | 1,277       |          | 1,277       |          | 1,277       |          | 1,277             |          |
| Adj. R <sup>2</sup>        | 0.0115           |          | 0.0097      |          | 0.0154      |          | 0.0145      |          | 0.0450            |          |
| F-Value                    | 2.48***          |          | 2.25***     |          | 3.00***     |          | 2.88***     |          | 7.02***           |          |

## 2.6. Conclusions

This work is the first comprehensive attempt to determine the contribution of disclosures made according to continuous disclosure requirements to the timeliness and accuracy of price discovery in Australia. Using a sample of 1,940 firms trading on the Australian Stock Exchange during the period 2005 – 2009, we find that the frequency of disclosure of MSAs increases the speed of price adjustment when it is above a certain threshold (more than one day with non-periodic MSAs per month). This nonlinear relation is similar to Brennan et al.'s (1993) finding that the speed of price adjustment to new information increases with the number of analysts only when this number is above a minimum. This finding provides partial support to continuous disclosure requirements. Furthermore, disclosure results across size quintiles show no announcement type contributes to the timeliness of price discovery for firm-years in the smallest group. The contribution of frequency of disclosure to the speed of price discovery is concentrated in the three top size quintiles. These results could either be explained by investors' lack of attention to smaller firms or by the fact that the timeliness measures could be affected by the lower number of MSAs disclosed by smaller firms, which is almost 40% lower for firms in quintile 1 compared to that of firms in quintile 5.

The information contribution of MSAs is strongly supported by the finding that the adjusted  $R^2$  doubles its expected value. This finding is widely corroborated in four out of the six announcement types analysed for the entire sample and across sectors: 'Issued Capital', 'Asset Acquisition and Disposal', 'Progress Report' and 'Chairman's Address'. Two other announcement types, 'Takeover' and 'Other', show a lower than expected information contribution in the entire sample and for most sectors. We recognise that the three day window around the MSA that we use could be ignoring the full information content of announcements that are initially followed by investor underreaction. There are no significant differences in the information contribution of MSAs across size quintiles, with all five groups having a positive abnormal adjusted  $R^2$ .

The impact of disclosure on the accuracy of price discovery shows that increased frequency of disclosure reduces the level of disagreement between investors, while there is still some new information contained in the PFSs that were not impounded into prices before its release. At the individual announcement type level we find MSAs preempt an important portion of the information

revealed in the earnings announcement and therefore reduce the informativeness of Preliminary Final Statements. When the sample is segmented into size quintiles it becomes evident the relevance of voluntary disclosures (MSAs labelled as 'Other') in reducing the informativeness of earnings, both measured by abnormal volume and absolute abnormal return. This analysis highlights the favourable impact of continuous disclosure of non-periodic MSAs in reducing the level of disagreement among investors as well as the amount of new information disclosed in the earnings announcement.

In summary, we first find that overall when the frequency of MSAs is above a certain threshold it favours the timeliness of price discovery even after controlling for size, good news, turnover, sector and number of analysts following. Secondly, we find that frequency of disclosure contributes to the accuracy of price discovery observed as both a higher information contribution of MSAs and a lower informativeness of earnings announcements. These findings are supportive of the contribution of continuous disclosure requirements to creating a fair, orderly and transparent market.

## **Chapter 3.** **Continuous Disclosure Requirements and the Investor Distraction Hypothesis**

### **3.1. Introduction**

An important factor determining the market reaction to information arrival is the level of investor distraction when the particular piece of information is released to the market. On any single day, the volume of information about firms exceeds what an average investor can gather and process to make investment decisions. In this respect, the overall volume of information in the market at a certain point in time is likely to affect the level of attention investors can pay to specific information releases by individual firms. Disclosure regulation attempts to level the playing field across investors by promoting transparency. However, higher transparency standards mean more information reaches the market, potentially leading to increases in the level of investor distraction. The interplay between investor distraction and transparency is of particular interest under the four distinctive characteristics of the continuous disclosure environment in Australia mentioned in Chapter 1.

Overall, this work contributes to the existing literature by analysing the investor distraction hypothesis using all MSAs, not only earnings announcements, made by firms trading on the ASX using intraday market data for the period 2005 – 2009. As a by-product, this research provides evidence on whether management strategically times disclosures. The chapter is organised as follows. Section 3.2 reviews the literature. Section 3.3 presents the methodology and develops the hypotheses. Section 3.4 describes the data. The results are discussed in section 3.5. Section 3.6 summarises and concludes.

### **3.2. Literature Review**

In connection with Kahneman's (1973) idea that humans have limited cognitive resources that hinder their ability to perform multiple tasks simultaneously, several hypotheses have predictions about the way different aspects of the information environment affect the behaviour of investors. The

four hypotheses in the literature are the investor recognition hypothesis, the investor limited attention hypothesis, the investor inattention hypothesis and the investor distraction hypothesis. All of these related works have predictions about the way in which this limitation affects how investors decide whether to buy or sell some stocks and not others; the way information is presented to investors; the timing of information disclosures depending on whether they contain good or bad news; and how simultaneous information about different stocks can be processed. Each of the four areas of prediction is explained in detail next.

The effects on buying and selling behaviour are derived from Merton's (1987) *investor recognition hypothesis*, which rests on the idea that information gathering costs limit the amount of different securities an investor can hold. Merton suggests that high information gathering costs drive investors to hold only a set of assets that they know about. In this view, investors only pay attention to the firms they follow and neglect information about other firms even if they can profit from that information. This argument by Merton is consistent with Arbel et al.'s (1983) findings of a neglected firm effect. They empirically report firms that have low institutional holdings and are barely followed by analysts show superior returns compared to firms widely held by institutional investors or followed by a large number of analysts. Their findings are attributable to small and also medium sized companies. In contrast, Beard and Sias (1997) find for a later period that the neglected firm effect disappears after controlling for the correlation between neglect and market capitalisation. For a sample of 1,544 firms trading in the NYSE in 2000, Bertin et al. (2008) report a positive relation between two measures of firm neglect, number of analysts following and the extent to which their earnings announcements are reported, and the level of liquidity for the stocks. Therefore, they find support in this relation for a return premium for neglected stocks. The relative importance of information gathering costs is reduced over time as communications and more transparent disclosure policies require less effort to follow a larger number of securities.

From the perspective of limited attention, Barber and Odean (2008) argue that individual investors' buying decisions are influenced by the level of public exposure of firms. When facing many investing alternatives they reduce their choice set to stocks showing attention-grabbing events. Using data provided by different brokerage firms and comparing the buy-sell imbalances to those of a

group of institutional investors they find that individual investors are net buyers of stocks with high public exposure. They use three proxies for the existence of attention-grabbing events: unusual trading volume, high abnormal returns and news from Dow Jones News Service. The experiment does not measure the impact of mandatory and voluntary disclosures by the firms, limiting the analysis of individual investor attention to public sources of information and market data. As opposed to Merton's (1987) information gathering costs argument, Barber and Odean's prediction based on limited attention of individual investors seems to be reinforced as their access to information increases.

The impact of investor limited attention on the way information is presented is relevant for firms making voluntary disclosures as well as for disclosure regulatory attempts. Modelling firms' alternative forms of presenting disclosure information, Hirshleifer and Teoh (2003) argue that under investor limited attention disclosures with equal information value can have different effects on investors depending on the structure of presentation or the place in the report where information is located. Another consequence of limited investor attention on the design of disclosure requirements is discussed by Hirshleifer et al. (2004); they suggest disclosure by one firm can distract investors' attention away from other disclosures by the same firm or from the information implicit on non-disclosures by other firms. They conclude that regulatory attempts to increase disclosure under limited attention could diminish investor discernment and it cannot be assured that more disclosure is desirable.

In light of this conjecture it is worth analysing the impacts of continuous disclosure requirements in Australia, which at the same time suppose an increase in the number of disclosures by firms and provides investors with an indication of which announcements are more informative. There is support to the idea that market sensitive announcements are informative. Brown et al. (2004a) and Brown et al. (2005) find some support for the informativeness of MSAs in Australia, showing that after MSAs are released order flow increases significantly and firms show significantly larger price changes. Overall, these results show there is an unusual amount of information impounded into prices as a consequence of announcements marked as market sensitive.

The timing of information disclosures rests on the idea that managers will try to time the market by disclosing information in a way that minimises the short term adverse effect of bad news and

maximises the short term impact of good news. Motivated by anecdotal evidence, Patell and Wolfson (1982) find the likelihood of disclosing bad news increases after trading and interpret this behaviour as managers' attempt to disclose unfavourable news when there is lower public attention. Support for the timing consequences of the investor inattention hypothesis is also found by Dellavigna and Pollet (2009) in a study that compares the response to earnings announcements on Friday to the response on the other weekdays for the period January 1984 to June 2006. Measuring return and volume, they find a lower immediate response and a higher delayed response (drift) to earnings surprises on Friday. However, there are two limitations to their results. One is that they do not control for concurrent news on announcements days, mainly because they argue that it is the day of the week that determines the level of investor attention. The second limitation is related to the fact that Friday is the second day, after Monday, with a low frequency of earnings announcements. This condition should at least contribute to receiving higher attention per earning announcement compared to other weekdays.

Doyle and Magilke (2009) find after market hours reporting is more related to the level of complexity of the firms' operations that requires more time to interpret the results, than to management's opportunistic behaviour trying to release bad news when there is less investor attention. They analyse the importance of investor inattention in the time of the day disclosure decision including firms switching from reporting before the market opens to after the market closes and vice versa. To study the day of the week behaviour, they include firms that change the reporting day from Monday – Thursday to Friday and vice versa. Their proxies for the level of attention are the size of the firm, the number of analysts following and the level of institutional ownership. One limiting feature of this work is that they overlook specific characteristics of firms that could increase or decrease the level of attention they receive, such as the number of mandatory and voluntary disclosures, and the impact of concurrent news releases by other firms.

A strategic timing behaviour of voluntary disclosures on days with lower expected investor attention is the main finding in Kasznik and Kremer (2009). Using management earnings forecasts issued between 1995 and 2007, they find managers are more likely to release bad news earnings forecasts on days in which the level of concurrent news is higher. The proxies for investor inattention are days with Federal Open Market Committee meetings and the number of other concurrent news

announcements in the media. Among other specific firm characteristics, they find this likelihood is greater for small firms because they get less media attention.

The timing decision in Gennotte and Trueman (1996) is supported by a microstructure argument. They suggest market makers' ability to infer informed trading and incorporate relevant information into prices following an after hour announcement is diminished by incoming orders by noise traders and from trades motivated by other disclosures. Even though they do not explicitly mention it, the last part of the argument is related to the idea of limited attention. Taking into account this assumption, they argue announcements issued after trading hours have a lower impact on prices than announcements issued during trading hours and they analyse two strategic aspects of mandatory announcements. One aspect is the timing of the announcement. They expect managers will make positive earnings announcements during trading hours and negative earnings announcements after the end of the trading day, even after Friday's session. They also expect strategic behaviour when disclosing several pieces of information, indicating that managers will tend to split good news into separate announcements, and to communicate bad news in aggregate.

Contrary to what Gennotte and Trueman's (1996) strategic timing of good and bad news announcements theory suggests, Abad et al. (2009) find that firms included in the Spanish IBEX 35 index issue about two thirds of negative earnings surprises during trading hours while they disclose two thirds of positive earnings after hours. They analyse liquidity after both types of announcements, finding that during the day it takes an hour and a half after the announcement until liquidity improves, while for overnight announcements liquidity improves immediately after the market opens the following day. They relate these findings to the fact that the Spanish market is a pure order-driven market and they suggest trading halts might be suitable to allow a wider information spread before trading resumes. The evidence of the impact of limited attention on the strategic timing of mandatory and voluntary disclosures is not conclusive, and there are several market characteristics that may influence what are the high and low attention times in each market. Consequently, additional evidence is required in this field.

Combining the predictions of the investor attention hypothesis and a measure of the competing information faced by earnings announcements, Hirshleifer et al. (2009) propose the investor

distraction hypothesis, which predicts that the confounding effect of concurrent information will decrease the response to new information by investors who are already attention constrained. In support for their hypothesis they find that the return and volume reaction to earnings announcements are less sensitive on days with higher levels of concurrent earnings announcements than on days with a lower number of earnings announcements. Also confirming their hypothesis, earnings announcements on high news days show a higher return drift than earnings announcements issued on low news days over a 60 day period, indicating that the initial under reaction is reverted afterwards. Hirshleifer et al. find several characteristics that produce a more deteriorating impact on investor attention. A higher level of investor distraction is related to industry unrelated announcements, big earnings surprises, and to earnings announcements by smaller firms. The authors suggest this last counterintuitive finding might be a consequence of small firms showing extremely high earnings surprises.

In summary, the literature focuses on how investors' limited attention affects the way in which investors decide whether to buy or sell some stocks and not others; the way information is presented to investors; the timing of information disclosures depending on whether they contain good or bad news; and how concurrent information about different stocks can damage investors' promptness to react to incoming information. In this last relation, the common practice is to consider concurrent earnings announcements, voluntary earnings forecasts, macroeconomic announcements and different measures of media coverage. There are no studies using all sources of mandatory disclosure as a proxy for concurrent information.

### **3.3. Hypotheses Development and Methodology**

The underlying assumption of the investor distraction hypothesis is that, given investors' limited processing capacity, the market reaction to information releases will be affected by the level of competing information investors face at any given point in time. Following Hirshleifer et al. (2009), there are two observable consequences of the investor distraction hypothesis. The most direct consequence of the investor distraction hypothesis is that the short term reaction to MSAs should be

negatively related to the level of distracting information in the market on the release date. Therefore, the first hypothesis to be tested is:

*H<sub>1</sub>: The short term response to MSAs is negatively related to the number of concurrent MSAs released on the announcement day.*

The second prediction of the investor distraction hypothesis is that following the immediate under reaction to information released on days with a higher number of concurrent announcements a correction is expected to occur in the post-announcement period. Therefore, an additional test of the impact of distraction on investor behaviour is related to the delayed response to MSAs.

*H<sub>2</sub>: Delayed response to MSAs is positively related to the number of concurrent MSAs released on the announcement day.*

The benchmark values for both groups of dependent variables, the short term response and the delayed response, are calculated from the 10 trading days before the announcement day. The short term response is measured for one trading day starting after the MSA is released. This is a substantial improvement over Hirshleifer et al.'s (2009) two-day window. Using intraday data the response to MSAs is crucial because the speed of adjustment to prices after some MSAs is expected to be very quick and would make it difficult to distinguish them from other announcements when using a less timely response over a two-day window. The delayed market reaction is also measured for a shorter period than in Hirshleifer et al. They measure delayed response initially using a 60 day window, and also varying the size to 30 and 90 days. Since this study includes all MSAs, a long post-announcement window would significantly reduce the number of events. For that reason the post-announcement window will cover 10 trading days. For each window, only those company-announcements that do not overlap with posterior announcements are included in the analysis.

Hirshleifer et al. (2009) estimate the market reaction by measuring the cumulative abnormal return and the abnormal volume. Since their study is limited to earnings announcements they are able to control for the magnitude of new information disclosed using a measure of earnings surprise. By including all types of MSAs in our study, we cannot control for the expected return reaction to each announcement. For this reason we focus on two levels of market reaction measures. One is the

magnitude of the market response, measuring abnormal number of trades and abnormal volume for the one and ten-day periods:

- One-Day Abnormal Number of Trades: number of trades on day one divided by the average number of trades for the benchmark period.
- One-Day Abnormal Trading Volume: trading volume on day one divided by the average trading volume for the benchmark period.
- Ten-Day Abnormal Number of Trades: average number of trades for the post-announcement period divided by the average number of trades for the benchmark period.
- Ten-Day Abnormal Trading Volume: average trading volume for the post-announcement period divided by the average trading volume for the benchmark period.

The other level is related to the speed of the market reaction, measuring the number of minutes it takes to reach different marks:

- One-Day Speed of Number of Trades: number of minutes it takes to reach the average benchmark number of trades divided by the total number of minutes in one trading day.
- One-Day Speed of Trading Volume: number of minutes it takes to reach the average benchmark trading volume divided by the total number of minutes in one trading day.

The fundamental independent variable to examine the investor distraction hypothesis is the total number of concurrent MSAs released on the announcement day. For any given day, total number of MSAs is the count of MSAs released between the market close in the previous day and the last trading minute on this day. Distraction does not affect all announcements released during the day in the same way. Announcements released later on the day are expected to suffer more from MSAs previously released during day. For this reason we also include a variable measuring the relative order in which each MSA is released during the day.

Several other control variables are included to determine whether firm specific characteristics (size, industry), announcements specific characteristics (type of announcement, good/bad news) and time specific characteristics (time of the day, day of the week, month of the year) have an impact on the magnitude or speed of market reaction to MSAs. Despite the indication of announcements as

market sensitive, the impact on the market of an announcement made by a large firm is expected to be higher than the impact of another market sensitive announcement issued by a small firm. The type of announcements is also expected to cause differential effects. Both a takeover announcement and an on market buy-back can be market sensitive. But if both are disclosed on the same day, the relative impact of the buy-back announcement is expected to be much lower. Finally, considering the timing of MSAs as well as the sign of the return reaction will provide evidence on whether managers strategically disclose good and bad news. Even though Australia's continuous disclosure requirements leave little space to let managers decide when to disclose market relevant information, there is some room for management's discretionary disclosure throughout the day. Firms can also request a trading halt when they have an impending announcement but they cannot accurately inform the market. This type of trading halt may increase investor attention at the time the announcement is finally released. For this reason we control for those MSAs that are preceded by a trading halt request made by the company.

### **3.4. Sample Description**

The final sample is composed of 24,519 MSAs that are not preceded or followed by another MSA released by the same company for at least ten trading days<sup>14</sup>. Announcements, stock prices and trading information for firms trading on the ASX between 2005 and 2009 are sourced from Securities Industry Research Centre of Asia-Pacific (SIRCA). Table 3.1 and Figure 3.1 summarise the distribution of MSAs across days of the week, times of the day and distraction quintiles measured by the number of MSAs released on the announcement day. Contradicting Dellavigna and Pollet's (2009) finding that only 6% of earnings announcements are released on Fridays, the proportion of MSAs released either on Mondays (18.4%) or Fridays (19%) is only slightly lower than the proportion of MSAs released on other weekdays. Furthermore, when only periodic MSAs are considered, the proportion MSAs released on Fridays is slightly higher than on other days (22% for bad news and 21.2% for good news).

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<sup>14</sup> The only exception is MSAs released within two trading days after a trading halt or a suspension from quotation. These MSAs are kept and identified as announcements preceded by a halt or suspension.

Table 3.1  
Sample and Descriptive Statistics

This table reports the distribution of the sample of 24,519 MSAs during the period 2005-2009. In Panel A MSAs are grouped by day of the week. In Panel B MSAs are grouped according to the time of the day they are released. In Panel C MSAs are grouped into quintiles according to the level of distraction on the announcement day measured by the total number of MSAs released on the announcement day. One-day returns are calculated using the last price before the MSA is released as the base price. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively.

Panel A. Distribution and Market Reaction across MSA types by the Day of the Week

| Day of the Week     | Bad News   |                    |                                  |                    |                                    |                    |                    |                    | Good News                                       |                  |                                 |                  |                   |                  |  |                  |
|---------------------|--|--------------------|----------------------------------|--------------------|------------------------------------|--------------------|--------------------|--------------------|---|------------------|---------------------------------|------------------|-------------------|------------------|--|------------------|
|                     | Periodic MSAs                                    |                    | Non-Periodic MSAs                |                    | Multiple MSAs                      |                    | Total              |                    | Periodic MSAs                                   |                  | Non-Periodic MSAs               |                  | Multiple MSAs     |                  | Total  |                  |
|                     | Obs.   | One-Day Return     | Obs.                             | One-Day Return     | Obs.                               | One-Day Return     | Obs.               | One-Day Return     | Obs.  | One-Day Return   | Obs.                            | One-Day Return   | Obs.              | One-Day Return   | Obs.   | One-Day Return   |
| Monday              | 511  | -6.40%<br>[-4.48%] | 952                              | -5.62%<br>[-3.85%] | 473                                | -5.89%<br>[-4.28%] | 1,936              | -5.89%<br>[-4.14%] | 463   | 6.42%<br>[4.55%] | 1,492                           | 8.34%<br>[5.00%] | 630               | 7.92%<br>[5.19%] | 2,585  | 7.89%<br>[5.00%] |
| Tuesday             | 524  | -6.32%<br>[-4.47%] | 1,130                            | -6.07%<br>[-4.17%] | 521                                | -6.02%<br>[-3.69%] | 2,175              | -6.12%<br>[-4.13%] | 445   | 6.28%<br>[4.48%] | 1,760                           | 7.93%<br>[5.13%] | 641               | 8.11%<br>[4.35%] | 2,846  | 7.71%<br>[4.79%] |
| Wednesday           | 513  | -6.30%<br>[-4.17%] | 1,151                            | -5.59%<br>[-3.81%] | 548                                | -5.76%<br>[-4.00%] | 2,212              | -5.80%<br>[-3.96%] | 481   | 7.02%<br>[4.76%] | 1,766                           | 8.06%<br>[4.82%] | 723               | 8.42%<br>[4.71%] | 2,970  | 7.98%<br>[4.76%] |
| Thursday            | 538  | -6.14%<br>[-4.37%] | 1,099                            | -5.38%<br>[-3.70%] | 467                                | -5.40%<br>[-3.55%] | 2,104              | -5.58%<br>[-3.84%] | 557   | 7.44%<br>[4.82%] | 1,733                           | 7.56%<br>[4.78%] | 748               | 7.03%<br>[4.47%] | 3,038  | 7.41%<br>[4.76%] |
| Friday              | 588  | -7.10%<br>[-4.76%] | 923                              | -5.34%<br>[-3.55%] | 510                                | -6.21%<br>[-4.11%] | 2,021              | -6.07%<br>[-4.02%] | 522   | 7.88%<br>[5.25%] | 1,443                           | 8.72%<br>[4.88%] | 667               | 7.81%<br>[4.76%] | 2,632  | 8.32%<br>[5.00%] |
| Total               | 2,674  | -6.47%<br>[-4.47%] | 5,255                            | -5.61%<br>[-3.85%] | 2,519                              | -5.86%<br>[-3.92%] | 10,448             | -5.89%<br>[-4.00%] | 2,468   | 7.05%<br>[4.78%] | 8,194                           | 8.09%<br>[4.96%] | 3,409             | 7.84%<br>[4.74%] | 14,071                                       | 7.85%<br>[4.84%] |
| Test of Differences |  |                    |                                  |                    |                                    |                    |                    |                    |   |                  |                                 |                  |                   |                  |  |                  |
| Friday – Other Days | -0.81% <sup>***</sup><br>[-0.39% <sup>**</sup> ] |                    | 0.33%<br>[0.34% <sup>***</sup> ] |                    | -0.43%<br>[-0.24% <sup>***</sup> ] |                    | -0.22%<br>[-0.02%] |                    | 1.05% <sup>***</sup><br>[0.59% <sup>***</sup> ] |                  | 0.76% <sup>**</sup><br>[-0.05%] |                  | -0.04%<br>[0.09%] |                  | 0.58% <sup>**</sup><br>[0.21% <sup>*</sup> ] |                  |

Table 3.1 (Continued)  
Descriptive Statistics

This table reports the distribution of the sample of 24,519 MSAs during the period 2005-2009. In Panel A MSAs are grouped by day of the week. In Panel B MSAs are grouped according to the time of the day they are released. In Panel C MSAs are grouped into quintiles according to the level of distraction on the announcement day measured by the total number of MSAs released on the announcement day. One-day returns are calculated using the last price before the MSA is released as the base price. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively.

Panel B. By the Time of the Day

| Time of the Day                | Bad News      |                     |                   |                       |               |                      |       |                         | Good News     |                     |                   |                     |               |                        |       |                        |
|--------------------------------|---------------|---------------------|-------------------|-----------------------|---------------|----------------------|-------|-------------------------|---------------|---------------------|-------------------|---------------------|---------------|------------------------|-------|------------------------|
|                                | Periodic MSAs |                     | Non-Periodic MSAs |                       | Multiple MSAs |                      | Total |                         | Periodic MSAs |                     | Non-Periodic MSAs |                     | Multiple MSAs |                        | Total |                        |
|                                | Obs.          | One-Day Return      | Obs.              | One-Day Return        | Obs.          | One-Day Return       | Obs.  | One-Day Return          | Obs.          | One-Day Return      | Obs.              | One-Day Return      | Obs.          | One-Day Return         | Obs.  | One-Day Return         |
| After Hours                    | 711           | -6.78%<br>[-4.76%]  | 758               | -5.74%<br>[-3.84%]    | 495           | -5.83%<br>[-3.90%]   | 1,964 | -6.14%<br>[-4.24%]      | 570           | 6.78%<br>[5.00%]    | 810               | 7.55%<br>[4.36%]    | 522           | 6.89%<br>[4.50%]       | 1,902 | 7.14%<br>[4.55%]       |
| Before Hours                   | 628           | -6.18%<br>[-4.00%]  | 1,376             | -5.36%<br>[-3.57%]    | 723           | -5.54%<br>[-3.85%]   | 2,727 | -5.60%<br>[-3.75%]      | 581           | 6.73%<br>[4.29%]    | 2,362             | 8.04%<br>[4.91%]    | 1,009         | 6.86%<br>[4.25%]       | 3,952 | 7.55%<br>[4.68%]       |
| Trading Hours                  | 1,335         | -6.43%<br>[-4.48%]  | 3,121             | -5.69%<br>[-3.88%]    | 1,301         | -6.05%<br>[-4.00%]   | 5,757 | -5.94%<br>[-4.03%]      | 1,317         | 7.31%<br>[4.95%]    | 5,022             | 8.20%<br>[5.00%]    | 1,878         | 8.64%<br>[5.13%]       | 8,217 | 8.16%<br>[5.00%]       |
| Test of Differences            |               |                     |                   |                       |               |                      |       |                         |               |                     |                   |                     |               |                        |       |                        |
| Trading Hours-<br>Before Hours |               | -0.25%<br>[-0.48%*] |                   | -0.32%*<br>[-0.31%**] |               | -0.52%**<br>[-0.15%] |       | -0.34%**<br>[-0.28%***] |               | 0.59%<br>[0.66%***] |                   | 0.16%<br>[0.09%]    |               | 1.78%***<br>[0.88%***] |       | 0.61%***<br>[0.32%***] |
| Trading Hours –<br>After Hours |               | 0.35%<br>[0.28%**]  |                   | 0.05%<br>[-0.04%]     |               | -0.23%<br>[-0.10%]   |       | 0.20%<br>[0.21%**]      |               | 0.53%<br>[-0.05%]   |                   | 0.65%<br>[0.64%***] |               | 1.75%***<br>[0.63%***] |       | 1.02%***<br>[0.45%***] |

Table 3.1 (Continued)  
Descriptive Statistics

This table reports the distribution of the sample of 24,519 MSAs during the period 2005-2009. In Panel A MSAs are grouped by day of the week. In Panel B MSAs are grouped according to the time of the day they are released. In Panel C MSAs are grouped into quintiles according to the level of distraction on the announcement day measured by the total number of MSAs released on the announcement day. One-day returns are calculated using the last price before the MSA is released as the base price. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively.

Panel C. Distribution and Market Reaction across MSA types by Distraction Quintile

| Distraction Quintile | Bad News      |                      |                   |                         |               |                      |       |                      |                | Good News     |                  |                   |                          |               |                      |       |                        |                |
|----------------------|---------------|----------------------|-------------------|-------------------------|---------------|----------------------|-------|----------------------|----------------|---------------|------------------|-------------------|--------------------------|---------------|----------------------|-------|------------------------|----------------|
|                      | Periodic MSAs |                      | Non-Periodic MSAs |                         | Multiple MSAs |                      | Total |                      |                | Periodic MSAs |                  | Non-Periodic MSAs |                          | Multiple MSAs |                      | Total |                        |                |
|                      | Obs.          | One-Day Return       | Obs.              | One-Day Return          | Obs.          | One-Day Return       | Obs.  | One-Day Return       | Number of MSAs | Obs.          | One-Day Return   | Obs.              | One-Day Return           | Obs.          | One-Day Return       | Obs.  | One-Day Return         | Number of MSAs |
| 1 (Low)              | 283           | -7.15%<br>[-4.48%]   | 1,279             | -5.72%<br>[-3.85%]      | 287           | -7.00%<br>[-4.11%]   | 1,849 | -6.14%<br>[-4.00%]   | 61<br>[64]     | 280           | 6.58%<br>[4.40%] | 2,206             | 8.41%<br>[5.00%]         | 500           | 8.32%<br>[4.78%]     | 2,986 | 8.22%<br>[4.88%]       | 61<br>[63]     |
| 2                    | 265           | -6.13%<br>[-4.35%]   | 1,353             | -5.63%<br>[-3.92%]      | 367           | -6.15%<br>[-3.91%]   | 1,985 | -5.79%<br>[-4.00%]   | 82<br>[82]     | 309           | 6.98%<br>[4.73%] | 2,025             | 8.40%<br>[5.00%]         | 600           | 9.14%<br>[5.00%]     | 2,934 | 8.40%<br>[5.00%]       | 82<br>[83]     |
| 3                    | 350           | -6.73%<br>[-4.35%]   | 1,259             | -5.60%<br>[-3.85%]      | 403           | -6.11%<br>[-3.99%]   | 2,012 | -5.90%<br>[-3.96%]   | 99<br>[98]     | 350           | 6.63%<br>[4.36%] | 1,955             | 7.94%<br>[5.00%]         | 589           | 7.99%<br>[4.55%]     | 2,894 | 7.79%<br>[4.84%]       | 99<br>[99]     |
| 4                    | 479           | -6.88%<br>[-4.48%]   | 1,035             | -5.68%<br>[-3.70%]      | 575           | -5.64%<br>[-3.67%]   | 2,089 | -5.94%<br>[-3.85%]   | 129<br>[127]   | 438           | 7.38%<br>[4.93%] | 1,536             | 7.70%<br>[4.87%]         | 829           | 7.18%<br>[4.53%]     | 2,803 | 7.50%<br>[4.76%]       | 129<br>[127]   |
| 5 (High)             | 1,297         | -6.16%<br>[-4.55%]   | 329               | -4.88%<br>[-3.13%]      | 887           | -5.40%<br>[-4.05%]   | 2,513 | -5.72%<br>[-4.19%]   | 333<br>[310]   | 1,091         | 7.20%<br>[5.00%] | 472               | 7.20%<br>[4.35%]         | 891           | 7.22%<br>[4.76%]     | 2,454 | 7.21%<br>[4.76%]       | 324<br>[284]   |
| High-Low Distraction |               | 0.99% **<br>[-0.06%] |                   | 0.84% **<br>[0.72% ***] |               | 1.60% ***<br>[0.06%] |       | 0.41% **<br>[-0.19%] |                |               | 0.62%<br>[0.60%] |                   | -1.21% **<br>[-0.65% **] |               | -1.10% *<br>[-0.02%] |       | -1.02% ***<br>[-0.12%] |                |

Dellavigna and Pollet (2009) explain the low proportion of earnings announcements on Fridays arguing firms would not choose a high inattention day (Friday) to release a scheduled announcement. Remarkably, Panel A in Table 3.1 shows that the one-day return in response to both good and bad news periodic MSAs released on Fridays is significantly higher than the one-day return in response to periodic MSAs released from Monday to Thursday. Even though our focus is not on return reaction<sup>15</sup>, it is important to mention that these findings reject the idea of Fridays as a high inattention day per se and are consistent with the weekend effect.

Regarding disclosure across times of the day, the proportion of bad news released during market hours (55%) is slightly lower than the proportion of good news released during market hours (58%). This difference is consistent across periodic MSAs, non-periodic MSAs and multiple MSAs. Panel B in Table 3.1 demonstrates there is an incentive to release good news MSAs during trading hours. Mean and median one-day returns are significantly higher in response to good news MSAs released during market hours than in response to MSAs released before or after hours. The higher return response to MSAs released during market hours over the response to MSAs released before trading hours is explained by multiple and periodic MSAs. The difference between MSAs released during market hours and MSAs released after market hours is explained by multiple MSAs and also by non-periodic MSAs. For bad news MSAs, mean and median one-day returns in response to MSAs released during market hours are significantly higher (more negative) than returns following MSAs released before market hours. Our findings suggest there is to some extent selective disclosure of bad news after trading hours (19% of bad news and only 14% of good news are released after hours). However, median returns following MSAs released during market hours are significantly lower (less negative) than returns in response to after-hours MSAs. Therefore, trying to disguise bad news by releasing them after market hours does not seem to be an effective practice.

The distribution of MSAs across investor distraction quintiles measured by the number of MSAs released on the announcement day is remarkably different for good and bad news. The proportion of bad news MSAs released on high distraction days (Quintile 5) is considerably larger

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<sup>15</sup> As was noted in Section 3, we cannot measure return reaction in a proper way because we cannot control for the expected return reaction to all MSA type. For this reason we focus the magnitude of the market reaction and on the speed of the market reaction.

(25%) than the proportion of bad news MSAs (18%) released on low distraction days (Quintile 1). For good news MSAs high distraction days (Quintile 5) is the least populated quintile with 17% of all observations. For both good and bad news MSAs there is a lower mean one-day return market reaction on high distraction days compared to those released on low distraction days (41 basis points lower for bad news and 102 basis points for good news). However, median one-day returns are not significantly different between announcements released on the top and bottom distraction level quintiles. Since periodic MSAs tend to be clustered in time, their distribution is much more concentrated on high distraction days. In this context, the proportion of periodic MSAs released during high distraction days is indeed higher for bad news (48.5%) than for good news (44.2%). Panel C in Table 3.1 reports mean one-day return in response to bad news MSAs is 99 basis points lower on high distraction days (Quintile 5) than on low distraction days (Quintile 1). There is, however, no significant difference in median returns. For multiple MSAs the proportion of MSAs increases monotonically across distraction quintiles. The proportion of bad news multiple MSAs (35.2%) is considerably higher than the proportion of goods news multiple MSAs (26.1%) released on high distraction days. The mean one-day return response to both good and bad news multiple MSAs on high distraction days are significantly lower than on low distraction days, but no difference in median returns is found.

The distribution of non-periodic MSAs across distraction quintiles is the opposite of that for periodic and multiple MSAs. The proportion of bad news non-periodic MSAs drops from 24.3% on low distraction days to 6.3% on high distraction days. Similarly, the proportion of good news non-periodic MSAs drops from 26.9% on low distraction days to 5.8% on high distraction days. The presence of different levels of investor distraction seems to have an impact on the return response to non-periodic MSAs. Both mean and median one-day return responses to good and bad news non-periodic MSAs on high distraction days are significantly lower than one-day responses on low distraction days.

Figure 3.1  
Distribution and Market Reaction to MSAs

This figure shows the distribution of and the median one-day return response to MSAs. In Panel A MSAs are grouped by the day of the week and the time of the day of the announcement. In Panel B MSAs are grouped into quintiles according to the level of distraction on the announcement day measured by the total number of MSAs released on the announcement day.

Panel A. Across Days of the Week and Times of the Day

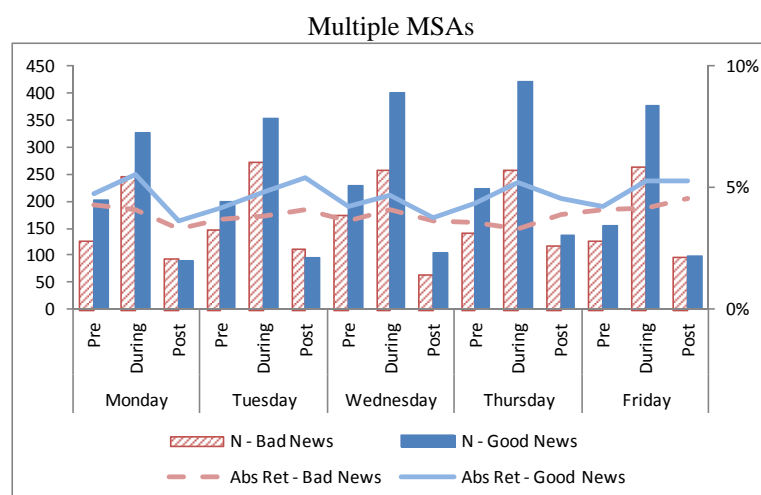
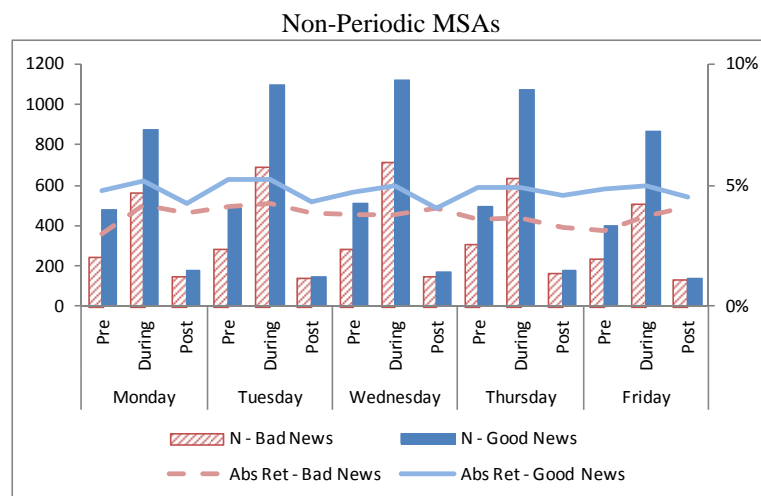
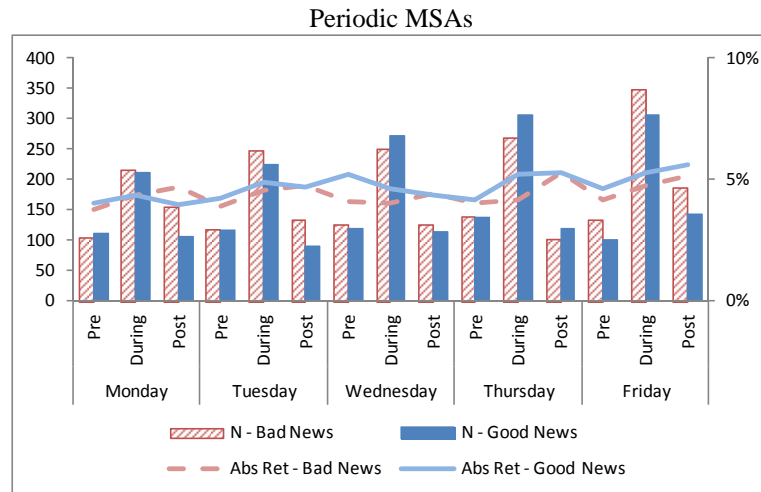
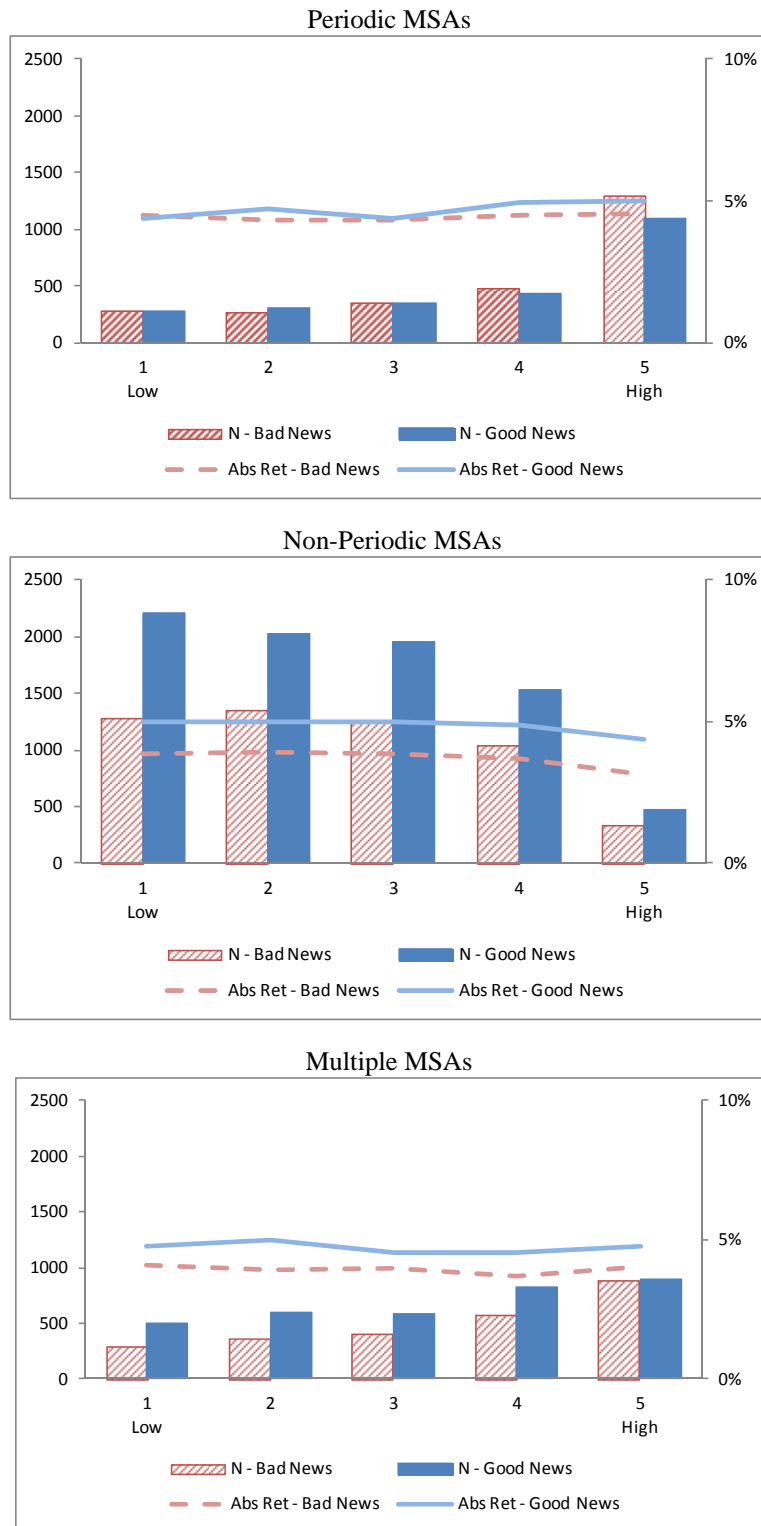


Figure 3.1 (Continued)  
 Distribution and Market Reaction to MSAs

This figure shows the distribution of MSAs by the day of the week and the time of the day. The right hand side axis exhibits median one-day absolute returns for good news an bad news MSAs. Panels A, B and C contain periodic, non-periodic and multiple MSAs, respectively.

Panel B. By Level of Distraction Quintile



### 3.5. Results

To analyse the magnitude and the speed of the market response to MSAs the sample is first divided by the sign of the one-day return into good news and bad news MSAs. Second, the sample is partitioned into level of distraction quintiles. Finally, within each news sign and distraction quintile, the sample is divided into one-day return quintiles.

#### 3.5.1. Magnitude of the market response

The magnitude of trading after the release of MSAs is compared to the average daily trading during the benchmark period in Tables 3.2 and 3.3. Panel A of Table 3.2 shows the level of distraction negatively affects the mean [median] one-day abnormal number of trades in response to MSAs. Comparing distraction quintiles 1 and 5 it becomes evident that the one-day abnormal number of trades in response to MSAs on high distraction days is significantly lower than the one-day abnormal number of trades in response to MSAs on low distraction days. These findings are consistent across return quintiles and support the investor distraction hypothesis. The impact of distraction is more important for good news MSAs. For these announcements, the median one-day abnormal number of trades on high distraction days across return quintiles is between 32% and 53% lower than on low distraction days. For bad news MSAs the median one-day abnormal number of trades on high distraction days drops by 15% to 42% compared to low distraction days.

Another revealing finding in Panel A is that even on low distraction days the level of distraction seems to be affecting the magnitude of the short term response to MSAs<sup>16</sup> and the impact is more acute for bad news MSAs. Median one-day abnormal number of trades in response to bad news MSAs is above 1 only for MSAs in the top two return quintiles. Even though median one-day returns for the lowest three quintiles are economically significant (-1.47%, -2.55%, and -4.01%), the median number of trades during the first day after the bad news MSAs in these quintiles is between 86% and 49% of the number of trades executed in the ten days before the announcement. A similar but less severe pattern is present for good news MSAs in return quintiles 1 and 2. With median one-day returns of 1.58% and 2.98%, respectively, the median number of trades during the first day is between 93% and

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<sup>16</sup> This finding is sensible considering that the median number of MSAs released on low distraction days is 64.

59% of the number of trades executed in the ten days before the announcement. Panel B of Table 3.2 confirms the findings in Panel A. The ten-day abnormal number of trades after MSAs for most distraction quintiles and return quintiles is higher than 1. These results show investor attention increases during the days that follow the release of MSAs, making up in many cases for the poor initial attention. There is not, however, a clear pattern showing that groups of MSAs initially ignored the most are the ones receiving the most attention in the ten days that follow the announcement. Return quintiles 2 and 5 for bad news MSAs and return quintiles 3 and 5 for good news MSAs experience significant differences in the delayed abnormal number of trades across high and low distraction days. The sign of these differences is not what is expected, suggesting that the impact of the level of distraction on the announcement day persists during the days that follow the announcement.

Using abnormal trading volume, Table 3.3 provides further support for the investor distraction hypothesis. One-day abnormal trading volumes in response to MSAs released on low distraction days are significantly higher than abnormal trading volumes following MSAs released on high distraction days. For good news MSAs the market reaction measured by one-day abnormal volume across return quintiles is very similar to the one observed for abnormal number of trades. For bad news though, median one-day abnormal values above 1 are only observed for MSAs in the high return quintile, showing trading volume is more sensitive to the level of distraction than it is the number of trades.

The delayed market reaction measured in Panel B by the ten-day abnormal trading volume shows that trading volumes pick up in the ten days that follow the release of a MSA. Within bad news MSAs this is more evident for announcements released during days with low or mid levels of distraction, and for MSAs in the two top return quintiles. For good news MSAs, ten-day abnormal trading volume values above 1 are found in almost every distraction quintile and return quintile. The delayed trading volume response is not differentially affected by the level of distraction on the announcement day. Differences between the ten-day abnormal trading after MSAs released on high distraction days is not significantly different from the ten-day abnormal trading after MSAs released on low distraction days.

Table 3.2

## Abnormal Number of Trades in Response to MSAs

This table reports median abnormal number of trades in response to the sample of 24,519 MSAs during the period 2005-2009. In Panel A abnormal number of trades is measured as the number of trades on day one divided by the average number of trades for the ten-day benchmark period. In Panel B abnormal number of trades is measured as the average number of trades for the ten-day post-announcement period divided by the average number of trades for the ten-day benchmark period. Difference between the top and the bottom quintiles are reported. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively.

| Panel A. One-Day          |                    |                      |                    |                      |                      |                      |                     |                      |                      |                      |
|---------------------------|--------------------|----------------------|--------------------|----------------------|----------------------|----------------------|---------------------|----------------------|----------------------|----------------------|
| Distraction Quintiles     | Bad News           |                      |                    |                      |                      | Good News            |                     |                      |                      |                      |
|                           | Return Quintiles   |                      |                    |                      |                      | Return Quintiles     |                     |                      |                      |                      |
|                           | 1 (Low)            | 2                    | 3                  | 4                    | 5 (High)             | 1 (Low)              | 2                   | 3                    | 4                    | 5 (High)             |
| 1 (Low)                   | 1.01<br>[0.75]     | 1.09<br>[0.84]       | 1.19<br>[0.78]     | 1.54<br>[1.03]       | 3.42<br>[1.64]       | 1.11<br>[0.87]       | 1.38<br>[0.93]      | 1.94<br>[1.19]       | 2.60<br>[1.41]       | 8.12<br>[2.72]       |
| 2                         | 1.14<br>[0.72]     | 1.13<br>[0.76]       | 1.19<br>[0.76]     | 1.72<br>[0.93]       | 2.53<br>[1.35]       | 1.07<br>[0.76]       | 1.37<br>[0.87]      | 1.60<br>[0.98]       | 2.32<br>[1.27]       | 8.56<br>[2.62]       |
| 3                         | 1.04<br>[0.75]     | 0.99<br>[0.82]       | 1.26<br>[0.75]     | 1.34<br>[0.83]       | 2.62<br>[1.50]       | 1.33<br>[0.83]       | 1.33<br>[0.81]      | 1.70<br>[1.04]       | 2.05<br>[1.21]       | 6.36<br>[2.23]       |
| 4                         | 0.99<br>[0.72]     | 1.15<br>[0.86]       | 1.12<br>[0.84]     | 1.39<br>[0.88]       | 2.80<br>[1.41]       | 1.15<br>[0.78]       | 1.23<br>[0.78]      | 1.68<br>[0.98]       | 1.98<br>[1.19]       | 5.42<br>[2.00]       |
| 5 (High)                  | 0.82<br>[0.64]     | 0.85<br>[0.49]       | 1.00<br>[0.62]     | 1.00<br>[0.69]       | 1.96<br>[1.09]       | 0.84<br>[0.59]       | 1.08<br>[0.59]      | 1.10<br>[0.70]       | 1.54<br>[0.89]       | 3.08<br>[1.29]       |
| High – Low<br>Distraction | 0.19**<br>[0.11**] | 0.24***<br>[0.35***] | 0.19*<br>[0.16***] | 0.54***<br>[0.34***] | 1.46***<br>[0.56***] | 0.28***<br>[0.28***] | 0.29**<br>[0.34***] | 0.83***<br>[0.48***] | 1.05***<br>[0.51***] | 5.04***<br>[1.44***] |
| Panel B. Ten-Day          |                    |                      |                    |                      |                      |                      |                     |                      |                      |                      |
| Distraction Quintiles     | Bad News           |                      |                    |                      |                      | Good News            |                     |                      |                      |                      |
|                           | Return Quintiles   |                      |                    |                      |                      | Return Quintiles     |                     |                      |                      |                      |
|                           | 1 (Low)            | 2                    | 3                  | 4                    | 5 (High)             | 1 (Low)              | 2                   | 3                    | 4                    | 5 (High)             |
| 1 (Low)                   | 1.30<br>[1.07]     | 1.36<br>[1.06]       | 1.36<br>[1.03]     | 1.40<br>[1.02]       | 1.71<br>[1.12]       | 1.25<br>[1.03]       | 1.41<br>[1.08]      | 1.61<br>[1.14]       | 1.84<br>[1.22]       | 3.09<br>[1.57]       |
| 2                         | 1.17<br>[0.99]     | 1.25<br>[1.02]       | 1.37<br>[0.99]     | 1.29<br>[1.02]       | 1.47<br>[1.01]       | 1.24<br>[1.04]       | 2.04<br>[1.08]      | 1.50<br>[1.05]       | 2.12<br>[1.14]       | 3.06<br>[1.43]       |
| 3                         | 1.22<br>[0.98]     | 1.19<br>[0.99]       | 1.19<br>[0.92]     | 1.25<br>[0.97]       | 1.41<br>[1.00]       | 1.32<br>[1.06]       | 1.36<br>[1.08]      | 1.33<br>[1.07]       | 1.53<br>[1.13]       | 2.60<br>[1.40]       |
| 4                         | 1.24<br>[1.02]     | 1.13<br>[0.98]       | 2.30<br>[0.94]     | 1.23<br>[0.99]       | 1.44<br>[0.97]       | 1.23<br>[0.96]       | 1.31<br>[1.03]      | 1.58<br>[1.06]       | 1.44<br>[1.13]       | 2.24<br>[1.26]       |
| 5 (High)                  | 1.22<br>[1.03]     | 1.17<br>[0.95]       | 1.40<br>[0.96]     | 1.31<br>[0.99]       | 1.42<br>[1.02]       | 1.27<br>[1.04]       | 1.34<br>[1.08]      | 1.35<br>[1.04]       | 1.65<br>[1.19]       | 1.94<br>[1.11]       |
| High – Low<br>Distraction | 0.07<br>[0.04]     | 0.18*<br>[0.11***]   | -0.04<br>[0.07*]   | 0.10<br>[0.02]       | 0.29**<br>[0.10**]   | -0.02<br>[0.02]      | 0.06<br>[0.01]      | 0.26***<br>[0.10***] | 0.19<br>[0.03]       | 1.15**<br>[0.46***]  |

Table 3.3

## Abnormal Trading Volume in Response to MSAs

This table reports median abnormal trading volume in response to the sample of 24,519 MSAs during the period 2005-2009. In Panel A abnormal trading volume is measured as the trading volume on day one divided by the average trading volume for the ten-day benchmark period. In Panel B abnormal trading volume is measured as the average trading volume for the ten-day post-announcement period divided by the average trading volume for the ten-day benchmark period. Difference between the top and the bottom quintiles are reported. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively.

| Panel A. One-Day          |                  |                     |                    |                      |                      |                     |                     |                     |                      |                     |
|---------------------------|------------------|---------------------|--------------------|----------------------|----------------------|---------------------|---------------------|---------------------|----------------------|---------------------|
| Distraction Quintiles     | Bad News         |                     |                    |                      |                      | Good News           |                     |                     |                      |                     |
|                           | Return Quintiles |                     |                    |                      |                      | Return Quintiles    |                     |                     |                      |                     |
|                           | 1 (Low)          | 2                   | 3                  | 4                    | 5 (High)             | 1 (Low)             | 2                   | 3                   | 4                    | 5 (High)            |
| 1 (Low)                   | 1.13<br>[0.64]   | 1.22<br>[0.78]      | 1.35<br>[0.73]     | 1.98<br>[0.92]       | 6.06<br>[1.74]       | 1.24<br>[0.75]      | 1.50<br>[0.90]      | 2.16<br>[1.03]      | 2.95<br>[1.43]       | 10.74<br>[2.72]     |
| 2                         | 1.26<br>[0.70]   | 1.38<br>[0.64]      | 1.55<br>[0.72]     | 13.15<br>[0.84]      | 3.75<br>[1.29]       | 1.40<br>[0.68]      | 1.57<br>[0.80]      | 4.30<br>[0.94]      | 2.74<br>[1.29]       | 9.36<br>[2.57]      |
| 3                         | 1.54<br>[0.64]   | 1.06<br>[0.67]      | 2.05<br>[0.73]     | 1.66<br>[0.79]       | 3.91<br>[1.37]       | 1.77<br>[0.77]      | 1.73<br>[0.68]      | 1.96<br>[0.94]      | 2.42<br>[1.25]       | 6.99<br>[2.45]      |
| 4                         | 1.06<br>[0.65]   | 1.25<br>[0.70]      | 1.42<br>[0.76]     | 1.73<br>[0.86]       | 4.96<br>[1.46]       | 1.29<br>[0.71]      | 1.50<br>[0.70]      | 1.93<br>[0.93]      | 2.39<br>[1.30]       | 5.93<br>[2.00]      |
| 5 (High)                  | 0.94<br>[0.54]   | 0.91<br>[0.44]      | 1.36<br>[0.50]     | 1.20<br>[0.59]       | 3.08<br>[1.03]       | 0.97<br>[0.52]      | 1.20<br>[0.49]      | 1.55<br>[0.68]      | 1.84<br>[0.91]       | 3.98<br>[1.15]      |
| High – Low<br>Distraction | 0.19<br>[0.10*]  | 0.32**<br>[0.34***] | -0.01<br>[0.23***] | 0.78***<br>[0.33***] | 2.99***<br>[0.71***] | 0.27**<br>[0.22***] | 0.30**<br>[0.41***] | 0.61**<br>[0.35***] | 1.11***<br>[0.52***] | 6.76**<br>[1.57***] |
| Panel B. Ten-Day          |                  |                     |                    |                      |                      |                     |                     |                     |                      |                     |
| Distraction Quintiles     | Bad News         |                     |                    |                      |                      | Good News           |                     |                     |                      |                     |
|                           | Return Quintiles |                     |                    |                      |                      | Return Quintiles    |                     |                     |                      |                     |
|                           | 1 (Low)          | 2                   | 3                  | 4                    | 5 (High)             | 1 (Low)             | 2                   | 3                   | 4                    | 5 (High)            |
| 1 (Low)                   | 1.45<br>[1.07]   | 1.51<br>[1.09]      | 1.45<br>[1.07]     | 1.50<br>[1.16]       | 2.48<br>[1.40]       | 1.43<br>[1.06]      | 1.50<br>[1.12]      | 2.01<br>[1.24]      | 2.40<br>[1.33]       | 3.47<br>[1.92]      |
| 2                         | 1.29<br>[1.00]   | 1.49<br>[1.07]      | 1.65<br>[1.01]     | 5.27<br>[1.14]       | 1.80<br>[1.23]       | 1.36<br>[1.03]      | 1.72<br>[1.12]      | 2.09<br>[1.10]      | 2.02<br>[1.21]       | 3.23<br>[1.73]      |
| 3                         | 1.53<br>[1.01]   | 1.34<br>[1.00]      | 1.47<br>[0.92]     | 1.45<br>[1.06]       | 2.14<br>[1.33]       | 1.65<br>[1.05]      | 1.61<br>[1.09]      | 1.46<br>[1.07]      | 1.67<br>[1.25]       | 3.68<br>[1.73]      |
| 4                         | 1.38<br>[1.02]   | 1.33<br>[1.04]      | 2.30<br>[1.02]     | 1.51<br>[1.07]       | 2.41<br>[1.31]       | 1.48<br>[0.94]      | 1.48<br>[1.03]      | 1.62<br>[1.06]      | 1.73<br>[1.23]       | 2.45<br>[1.61]      |
| 5 (High)                  | 1.48<br>[1.05]   | 2.42<br>[0.99]      | 3.12<br>[0.97]     | 1.51<br>[1.05]       | 2.56<br>[1.30]       | 1.46<br>[1.02]      | 1.62<br>[1.10]      | 1.66<br>[1.10]      | 1.88<br>[1.31]       | 2.16<br>[1.23]      |
| High – Low<br>Distraction | -0.02<br>[0.02]  | -0.90<br>[0.10*]    | -1.67<br>[0.10]    | -0.01<br>[0.11]      | -0.08<br>[0.10]      | -0.03<br>[0.03]     | -0.11<br>[0.01]     | 0.35<br>[0.15]      | 0.52<br>[0.01]       | 1.31*<br>[0.69***]  |

### 3.5.2. *Speed of the market response*

Table 3.4 shows how fast trading occurs after the release of MSAs compared to the average daily trading during the ten-day benchmark period. Panel A reports speed of trading measured using the number of trades. In all return quintiles mean and median values of speed of trading are significantly higher in response to MSAs released on low distraction days than in response to those released on days with high level of distraction. It is remarkable that these patterns are present despite the fact that differences in speed of trading are considerable across return quintiles. The difference in speed of trading between bad news and good news is considerable for MSAs in the two lower distraction quintiles and in the two higher return quintiles. In response to good (bad) news MSAs released in low distraction days it takes a median of between 23% (36%) and 94% (101%) of a day to execute the average number of trades executed during the control period. For announcements released on high distraction days these differences are greatly reduced. In response to good (bad) news MSAs released in high distraction days it takes a median of between 61% (105%) and 65% (107%) of a day to execute the average number of trades executed during the control period.

Panel B of Table 3.4 describes a similar pattern for good news and bad news MSAs across return quintiles and distraction quintiles. The speed at which average daily trading volumes are reached is significantly slower for MSAs released on high distraction days. Comparing the speed of response to bad news MSAs in the high distraction quintile of Panels A and B of Table 3.4, reveals that the impact of high distraction on the speed of trading volume is more important than the impact on the speed of number of trades across all return quintiles. This finding suggests that in terms of speed of trading investors react more cautiously to bad news on high distraction days. In contrast, speed of trading volume in response to good news MSAs in high distraction days is faster than the speed of number of trades in the three top return quintiles.

Table 3.4

## Speed of Trading in Response to MSAs

This table reports median speed of trading in response to the sample of 24,519 MSAs during the period 2005-2009. In Panel A speed of trading is measured as the number of minutes it takes to reach the average benchmark number of trades divided by the total number of minutes in one trading day. In Panel B speed of trading is measured as the number of minutes it takes to reach the average benchmark trading volume divided by the total number of minutes in one trading day. Difference between the top and the bottom quintiles are reported. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively.

| Panel A. One-Day Speed of Number of Trades |                       |                        |                        |                        |                        |                        |                        |                        |                        |                        |
|--|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Distraction Quintiles                      | Bad News              |                        |                        |                        |                        | Good News              |                        |                        |                        |                        |
|  | Return Quintiles      |                        |                        |                        |                        | Return Quintiles       |                        |                        |                        |                        |
|  | 1 (Low)               | 2                      | 3                      | 4                      | 5 (High)               | 1 (Low)                | 2                      | 3                      | 4                      | 5 (High)               |
| 1 (Low)                                    | 1.15<br>[1.01]        | 1.10<br>[0.94]         | 1.15<br>[0.93]         | 1.06<br>[0.74]         | 0.70<br>[0.36]         | 1.03<br>[0.94]         | 1.06<br>[0.79]         | 0.90<br>[0.71]         | 0.74<br>[0.43]         | 0.56<br>[0.23]         |
| 2  | 1.19<br>[1.01]        | 1.12<br>[0.95]         | 1.14<br>[0.92]         | 1.05<br>[0.81]         | 0.89<br>[0.47]         | 1.15<br>[0.99]         | 1.06<br>[0.86]         | 0.97<br>[0.78]         | 0.86<br>[0.57]         | 0.59<br>[0.22]         |
| 3  | 1.18<br>[1.01]        | 1.25<br>[0.94]         | 1.21<br>[1.00]         | 1.07<br>[0.82]         | 0.81<br>[0.45]         | 1.08<br>[0.94]         | 1.09<br>[0.88]         | 0.97<br>[0.77]         | 0.87<br>[0.64]         | 0.62<br>[0.27]         |
| 4  | 1.16<br>[0.99]        | 1.19<br>[0.92]         | 1.19<br>[0.89]         | 1.10<br>[0.80]         | 0.79<br>[0.48]         | 1.19<br>[0.98]         | 1.18<br>[0.95]         | 1.05<br>[0.81]         | 0.93<br>[0.64]         | 0.63<br>[0.32]         |
| 5 (High)                                   | 1.39<br>[1.07]        | 1.48<br>[1.20]         | 1.43<br>[1.04]         | 1.29<br>[0.96]         | 1.08<br>[0.65]         | 1.29<br>[1.05]         | 1.38<br>[1.02]         | 1.29<br>[0.99]         | 1.16<br>[0.84]         | 1.06<br>[0.61]         |
| High – Low<br>Distraction                  | -0.24***<br>[-0.06**] | -0.38***<br>[-0.27***] | -0.28***<br>[-0.11***] | -0.23***<br>[-0.22***] | -0.38***<br>[-0.28***] | -0.26***<br>[-0.11***] | -0.32***<br>[-0.23***] | -0.40***<br>[-0.28***] | -0.42***<br>[-0.42***] | -0.50***<br>[-0.38***] |
| Panel B. One-Day Speed of Trading Volume   |                       |                        |                        |                        |                        |                        |                        |                        |                        |                        |
| Distraction Quintiles                      | Bad News              |                        |                        |                        |                        | Good News              |                        |                        |                        |                        |
|  | Return Quintiles      |                        |                        |                        |                        | Return Quintiles       |                        |                        |                        |                        |
|  | 1 (Low)               | 2                      | 3                      | 4                      | 5 (High)               | 1 (Low)                | 2                      | 3                      | 4                      | 5 (High)               |
| 1 (Low)                                    | 1.36<br>[1.10]        | 1.28<br>[0.96]         | 1.35<br>[1.01]         | 1.19<br>[0.74]         | 0.87<br>[0.30]         | 1.26<br>[0.99]         | 1.24<br>[0.89]         | 1.10<br>[0.75]         | 1.01<br>[0.47]         | 0.74<br>[0.22]         |
| 2  | 1.36<br>[1.03]        | 1.33<br>[1.01]         | 1.34<br>[0.95]         | 1.20<br>[0.80]         | 1.07<br>[0.48]         | 1.32<br>[1.02]         | 1.22<br>[0.90]         | 1.19<br>[0.80]         | 1.05<br>[0.56]         | 0.71<br>[0.23]         |
| 3  | 1.45<br>[1.07]        | 1.47<br>[1.03]         | 1.33<br>[1.02]         | 1.25<br>[0.82]         | 1.00<br>[0.46]         | 1.28<br>[0.99]         | 1.33<br>[0.96]         | 1.14<br>[0.76]         | 0.99<br>[0.60]         | 0.74<br>[0.24]         |
| 4  | 1.36<br>[1.02]        | 1.45<br>[1.01]         | 1.37<br>[0.91]         | 1.29<br>[0.80]         | 0.94<br>[0.45]         | 1.47<br>[1.04]         | 1.33<br>[1.01]         | 1.30<br>[0.80]         | 1.00<br>[0.56]         | 0.77<br>[0.28]         |
| 5 (High)                                   | 1.59<br>[1.17]        | 1.74<br>[1.33]         | 1.70<br>[1.12]         | 1.44<br>[1.03]         | 1.23<br>[0.69]         | 1.48<br>[1.14]         | 1.56<br>[1.11]         | 1.38<br>[0.96]         | 1.30<br>[0.77]         | 1.28<br>[0.56]         |
| High – Low<br>Distraction                  | -0.23**<br>[-0.07]    | -0.46***<br>[-0.37***] | -0.35***<br>[-0.11***] | -0.25**<br>[-0.29***]  | -0.36***<br>[-0.39***] | -0.22***<br>[-0.15***] | -0.32**<br>[-0.22***]  | -0.28***<br>[-0.21***] | -0.30***<br>[-0.30***] | -0.53***<br>[-0.35***] |

### 3.5.3. Investor Distraction and the Short Term Response to MSAs

The preceding section reports significant differences in the magnitude and in the speed of response to MSAs released on days with high and low levels of investor distraction measured by the total number of MSAs. This section analyses the extent to which the total number of MSAs released on the announcement day affects the market response to MSAs when other firm, announcement and information environment characteristics are considered. In Tables 3.5 to 3.9, each magnitude and speed of market response measure is regressed against the level of distraction measured by the number of MSAs released on the announcement days and a number of control variables.

$$\begin{aligned} \text{Short Term Reaction} = & a_1 + b_1 \cdot \text{Size} + b_2 \cdot \text{Number of MSAs} & (3.1) \\ & + b_3 \cdot \text{Relative order} + b_4 \cdot \text{Good News} \\ & + b_5 \cdot \text{Before/after hours} + b_6 \cdot \text{Friday} + b_7 \cdot \text{Halt} + \varepsilon_i \end{aligned}$$

where Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise.

Table 3.5  
Investor Distraction and the Short Term Market Reaction to MSAs

This table shows the impact of sources of distraction on the short term magnitude and the speed of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Panel A. Investor Distraction and the Magnitude of Reaction to MSAs |                                      |           |                                    |          |
|---|--------------------------------------|-----------|------------------------------------|----------|
|   | One-Day Abnormal<br>Number of Trades |           | One-Day Abnormal<br>Trading Volume |          |
|   | Coefficient                          | t-value   | Coefficient                        | t-value  |
| Intercept   | 12.97                                | 11.00***  | 18.38                              | 5.32***  |
| Size  | -0.37                                | -10.05*** | -0.44                              | -5.00*** |
| Number of MSAs  | -0.80                                | -9.40***  | -1.16                              | -5.12*** |
| Relative Order  | -2.02                                | -5.31***  | -4.14                              | -3.98*** |
| Good News   | 0.98                                 | 10.33***  | 0.52                               | 1.29     |
| Outside Market Hours  | -0.24                                | -0.98     | -1.24                              | -1.71*   |
| Friday  | 0.11                                 | 0.58      | 0.72                               | 1.23     |
| Halt  | 1.96                                 | 3.75***   | 1.94                               | 3.30***  |
| N   | 24,519                               |           | 24,519                             |          |
| Adj. R <sup>2</sup>   | 0.0133                               |           | 0.0022                             |          |
| F-Value   | 48.36***                             |           | 8.55***                            |          |

| Panel B. Investor Distraction and the Speed of Reaction to MSAs |                                      |           |                                    |           |
|---|--------------------------------------|-----------|------------------------------------|-----------|
|   | One-Day Speed of<br>Number of Trades |           | One-Day Speed of<br>Trading Volume |           |
|   | Coefficient                          | t-value   | Coefficient                        | t-value   |
| Intercept   | 0.80                                 | 8.46***   | 1.75                               | 14.02***  |
| Size  | -0.04                                | -11.57*** | -0.07                              | -17.54*** |
| Number of MSAs  | 0.22                                 | 16.08***  | 0.20                               | 11.79***  |
| Relative Order  | -0.02                                | -0.57     | -0.03                              | -0.48     |
| Good News   | -0.14                                | -9.88***  | -0.16                              | -8.45***  |
| Outside Market Hours  | -0.03                                | -1.45     | -0.04                              | -1.48     |
| Friday  | 0.06                                 | 3.06***   | 0.08                               | 3.45***   |
| Halt  | -0.41                                | -10.10*** | -0.47                              | -7.48***  |
| N   | 24,519                               |           | 24,519                             |           |
| Adj. R <sup>2</sup>   | 0.0266                               |           | 0.0240                             |           |
| F-Value   | 96.74***                             |           | 87.22***                           |           |

The impact of the number of MSAs released on the announcement day has the expected sign in both the magnitude and the speed of market response regressions. Panel A of Table 3.5 shows that the magnitude of the short term market response to MSAs, both measured by the abnormal number of trades and the abnormal trading volume, is negatively related to the number of MSAs released on the announcement day. Panel B shows that the higher the number of MSAs released on the announcement day, the longer it takes to reach the average daily number of trades and the average daily trading volume. Coefficients of the number of MSAs variable are positive and statistically significant in both

regressions. The delaying effect on the speed of market reaction of the number of MSAs released on the announcement day is present across all MSA types. Panels A and B of Table 3.7 show positive and statistically significant coefficients for the number of MSAs variable. Interestingly enough, Panels A and B of Table 3.6 show only the magnitude of market response to periodic and multiple MSAs is negatively affected by the level of competing information in the market. These results show the initial speed of market reaction to non-periodic MSAs is affected by investor distraction but the magnitude of the one-day reaction does not weaken regardless of the amount of competing information released on the announcement day.

Table 3.6  
Investor Distraction and the Magnitude of the Short Term Reaction to MSAs by Announcement Type

This table shows the impact of sources of distraction on the short term magnitude of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Panel A. One-Day Abnormal Number of Trades |               |          |                   |           |               |          |
|--|---------------|----------|-------------------|-----------|---------------|----------|
|  | Periodic MSAs |          | Non-Periodic MSAs |           | Multiple MSAs |          |
|  | Coefficient   | t-value  | Coefficient       | t-value   | Coefficient   | t-value  |
| Intercept                                  | 10.59         | 2.98***  | 10.84             | 12.75***  | 17.97         | 3.74***  |
| Size                                       | -0.16         | -2.22**  | -0.42             | -15.70*** | -0.49         | -3.30*** |
| Number of MSAs                             | -1.05         | -3.03*** | -0.20             | -1.21     | -1.19         | -4.30*** |
| Relative Order                             | -1.87         | -2.38**  | -1.78             | -5.37***  | -2.67         | -2.49*** |
| Good News                                  | 0.30          | 1.15     | 1.17              | 13.39***  | 1.08          | 4.13***  |
| Outside Market Hours                       | -0.09         | -0.17    | -0.10             | -0.51     | -0.56         | -0.88    |
| Friday                                     | 0.73          | 1.18     | 0.19              | 1.09      | -0.49         | -1.98*   |
| Halt                                       | 1.31          | 2.17**   | 1.46              | 1.96*     | 1.81          | 2.33**   |
| N  | 5,142         |          | 13,449            |           | 5,928         |          |
| Adj. R <sup>2</sup>                        | 0.0068        |          | 0.0319            |           | 0.0100        |          |
| F-Value                                    | 6.03***       |          | 63.18***          |           | 9.54***       |          |

| Panel B. One-Day Abnormal Trading Volume |               |         |                   |          |               |          |
|--|---------------|---------|-------------------|----------|---------------|----------|
|  | Periodic MSAs |         | Non-Periodic MSAs |          | Multiple MSAs |          |
|  | Coefficient   | t-value | Coefficient       | t-value  | Coefficient   | t-value  |
| Intercept                                | 18.95         | 2.09**  | 17.12             | 3.62***  | 18.26         | 6.47***  |
| Size                                     | -0.25         | -1.35   | -0.55             | -3.82*** | -0.47         | -5.25*** |
| Number of MSAs                           | -2.10         | -2.35** | -0.18             | -0.73    | -1.37         | -6.54*** |
| Relative Order                           | -3.15         | -1.57   | -5.77             | -3.25*** | -2.06         | -2.21**  |
| Good News                                | 0.07          | 0.11    | 0.52              | 0.72     | 1.00          | 4.55***  |
| Outside Market Hours                     | -0.29         | -0.20   | -2.54             | -2.05**  | 0.47          | 0.89     |
| Friday                                   | 2.16          | 1.35    | 0.77              | 0.90     | -0.37         | -1.51    |
| Halt                                     | 1.99          | 1.22    | 1.80              | 1.58     | 1.73          | 2.48**   |
| N  | 5,142         |         | 13,449            |          | 5,928         |          |
| Adj. R <sup>2</sup>                      | 0.0033        |         | 0.0015            |          | 0.0209        |          |
| F-Value                                  | 3.42***       |         | 3.93***           |          | 19.10***      |          |

Table 3.7

## Investor Distraction and the Speed of the Short Term Reaction to MSAs by Announcement Type

This table shows the impact of sources of distraction on the short term speed of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

Panel A. One-Day Speed of Number of Trades

|                      | Periodic MSAs        |                      | Non-Periodic MSAs    |                      | Multiple MSAs        |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                      | Coefficient          | t-value              | Coefficient          | t-value              | Coefficient          | t-value              |
| Intercept            | 1.54                 | 6.20 <sup>***</sup>  | 0.81                 | 6.40 <sup>***</sup>  | 1.07                 | 5.01 <sup>***</sup>  |
| Size                 | -0.08                | -9.31 <sup>***</sup> | -0.00                | -1.42                | -0.06                | -8.72 <sup>***</sup> |
| Number of MSAs       | 0.22                 | 8.38 <sup>***</sup>  | 0.10                 | 4.40 <sup>***</sup>  | 0.24                 | 9.10 <sup>***</sup>  |
| Relative Order       | -0.01                | -0.16                | -0.07                | -1.27                | 0.06                 | 0.68                 |
| Good News            | -0.04                | -1.17                | -0.18                | -9.53 <sup>***</sup> | -0.12                | -4.13 <sup>***</sup> |
| Outside Market Hours | -0.03                | -0.63                | -0.07                | -2.43 <sup>**</sup>  | 0.05                 | 1.06                 |
| Friday               | 0.09                 | 1.96 <sup>**</sup>   | 0.04                 | 1.74 <sup>*</sup>    | 0.02                 | 0.52                 |
| Halt                 | -0.44                | 3.02 <sup>***</sup>  | -0.33                | -3.58 <sup>**</sup>  | -0.40                | -8.44 <sup>***</sup> |
| N                    | 5,142                |                      | 13,449               |                      | 5,928                |                      |
| Adj. R <sup>2</sup>  | 0.0428               |                      | 0.0089               |                      | 0.0506               |                      |
| F-Value              | 33.86 <sup>***</sup> |                      | 18.21 <sup>***</sup> |                      | 45.04 <sup>***</sup> |                      |

Panel B. One-Day Speed of Trading Volume

|                      | Periodic MSAs        |                       | Non-Periodic MSAs    |                      | Multiple MSAs        |                       |
|----------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|-----------------------|
|                      | Coefficient          | t-value               | Coefficient          | t-value              | Coefficient          | t-value               |
| Intercept            | 2.82                 | 8.42 <sup>***</sup>   | 1.64                 | 9.52 <sup>***</sup>  | 2.22                 | 8.53 <sup>***</sup>   |
| Size                 | -0.14                | -11.94 <sup>***</sup> | -0.03                | -6.02 <sup>***</sup> | -0.11                | -12.13 <sup>***</sup> |
| Number of MSAs       | 0.21                 | 6.05 <sup>***</sup>   | 0.07                 | 2.18 <sup>**</sup>   | 0.21                 | 6.73 <sup>***</sup>   |
| Relative Order       | -0.06                | -0.47                 | -0.05                | -0.72                | 0.07                 | 0.67                  |
| Good News            | -0.06                | -0.49                 | -0.21                | -8.21 <sup>***</sup> | -0.11                | -2.84 <sup>***</sup>  |
| Outside Market Hours | -0.04                | 0.53                  | -0.06                | -1.61                | -0.01                | 0.12                  |
| Friday               | 0.12                 | 2.20 <sup>**</sup>    | 0.07                 | 2.04 <sup>**</sup>   | 0.03                 | 0.70                  |
| Halt                 | -0.24                | -0.83                 | -0.46                | -3.71 <sup>***</sup> | -0.52                | -8.32 <sup>***</sup>  |
| N                    | 5,142                |                       | 13,449               |                      | 5,928                |                       |
| Adj. R <sup>2</sup>  | 0.0444               |                       | 0.0077               |                      | 0.0470               |                       |
| F-Value              | 35.16 <sup>***</sup> |                       | 16.00 <sup>***</sup> |                      | 42.79 <sup>***</sup> |                       |

Panels A and B of Tables 3.8 and 3.9 strengthen the argument in favour of the investor distraction hypothesis. The coefficient of the number of MSAs variable has the expected sign and is statistically significant in the regressions across return quintiles using both the speed of market response measures and the magnitude of the market reaction measures as dependent variables.

Table 3.8

## Investor Distraction and the Magnitude of the Short Term Reaction to MSAs by Return Quintiles on the Announcement Day

This table shows the impact of sources of distraction on the short term magnitude of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

## Panel A. One-Day Abnormal Number of Trades

|                      | Return Quintile 1 |          | Return Quintile 2 |          | Return Quintile 3 |          | Return Quintile 4 |          | Return Quintile 5 |          |
|----------------------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|----------|
|                      | Coefficient       | t-value  | Coefficient       | t-value  | Coefficient       | t-value  | Coefficient       | t-value  | Coefficient       | t-value  |
| Intercept            | 4.24              | 9.89***  | 4.21              | 10.47*** | 5.75              | 8.59***  | 6.78              | 11.00*** | 28.95             | 5.64***  |
| Size                 | -0.09             | -5.77*** | -0.07             | -5.99*** | -0.11             | -5.03*** | -0.12             | -5.21*** | -0.73             | -4.39*** |
| Number of MSAs       | -0.23             | -6.87*** | -0.28             | -6.59*** | -0.34             | -5.69*** | -0.58             | -9.08*** | -2.20             | -5.90*** |
| Relative Order       | -0.94             | -7.22*** | -1.11             | -6.83*** | -1.56             | -8.25*** | -1.08             | -4.93*** | -5.44             | -2.97*** |
| Good News            | 0.09              | 1.79*    | 0.26              | 4.98***  | 0.43              | 5.82***  | 0.67              | 7.69***  | 3.37              | 8.40***  |
| Outside Market Hours | 0.04              | 0.55     | 0.01              | 0.13     | -0.29             | -2.12**  | 0.04              | 0.29     | -0.93             | -0.80    |
| Friday               | -0.13             | -2.12**  | -0.07             | -1.15    | -0.07             | -0.58    | 0.03              | 0.21     | 0.47              | 0.56     |
| Halt                 | 1.44              | 2.18**   | 0.48              | 2.35**   | 1.03              | 1.91*    | 0.16              | 0.63     | 3.73              | 2.45**   |
| N                    | 4,884             |          | 4,906             |          | 4,908             |          | 4,896             |          | 4,925             |          |
| Adj. R <sup>2</sup>  | 0.0406            |          | 0.0382            |          | 0.0305            |          | 0.0334            |          | 0.0185            |          |
| F-Value              | 30.49***          |          | 28.82***          |          | 23.08***          |          | 25.15***          |          | 14.23***          |          |

## Panel B. One-Day Abnormal Trading Volume

|                      | Return Quintile 1 |          | Return Quintile 2 |          | Return Quintile 3 |          | Return Quintile 4 |         | Return Quintile 5 |          |
|----------------------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|---------|-------------------|----------|
|                      | Coefficient       | t-value  | Coefficient       | t-value  | Coefficient       | t-value  | Coefficient       | t-value | Coefficient       | t-value  |
| Intercept            | 5.10              | 5.91***  | 4.69              | 7.81***  | 5.25              | 4.47***  | 26.38             | 1.77*   | 28.28             | 4.20***  |
| Size                 | -0.11             | -3.74*** | -0.08             | -3.95*** | 0.04              | 0.37     | -0.60             | -1.48   | -0.36             | -2.51**  |
| Number of MSAs       | -0.29             | -4.61*** | -0.32             | -5.39*** | -0.38             | -2.74*** | -1.63             | -2.17** | -2.65             | -3.83*** |
| Relative Order       | -0.95             | -3.15*** | -1.21             | -4.87*** | -3.57             | -1.60    | -5.60             | -1.77*  | -9.35             | -2.76*** |
| Good News            | 0.14              | 1.19     | 0.36              | 4.31***  | 0.79              | 1.52     | -1.63             | -0.90   | 2.99              | 4.31***  |
| Outside Market Hours | 0.22              | 1.66*    | 0.03              | 0.20     | -1.58             | -0.96    | -2.98             | -1.24   | -1.87             | -0.86    |
| Friday               | -0.08             | -0.47    | -0.11             | -1.16    | -0.39             | -0.90    | 0.84              | 0.44    | 2.91              | 1.42     |
| Halt                 | 1.50              | 2.23**   | 0.43              | 1.92*    | 0.65              | 0.81     | -1.12             | -1.03   | 4.24              | 2.63***  |
| N                    | 4,884             |          | 4,906             |          | 4,908             |          | 4,896             |         | 4,925             |          |
| Adj. R <sup>2</sup>  | 0.0121            |          | 0.0195            |          | 0.0001            |          | 0.0001            |         | 0.0089            |          |
| F-Value              | 9.52***           |          | 14.96***          |          | 0.95              |          | 1.07              |         | 7.32***           |          |

Table 3.9

## Investor Distraction and the Speed of the Short Term Reaction to MSAs by Return Quintiles on the Announcement Day

This table shows the impact of sources of distraction on the short term speed of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

## Panel A. One-Day Speed of Number of Trades

|                      | Return Quintile 1 |          | Return Quintile 2 |          | Return Quintile 3 |          | Return Quintile 4 |           | Return Quintile 5 |          |
|----------------------|-------------------|----------|-------------------|----------|-------------------|----------|-------------------|-----------|-------------------|----------|
|                      | Coefficient       | t-value  | Coefficient       | t-value  | Coefficient       | t-value  | Coefficient       | t-value   | Coefficient       | t-value  |
| Intercept            | 1.44              | 7.56***  | 1.61              | 7.07***  | 1.28              | 6.29***  | 1.59              | 7.71***   | 0.92              | 3.77***  |
| Size                 | -0.05             | -7.22*** | -0.07             | -9.22*** | -0.06             | -8.55*** | -0.08             | -10.42*** | -0.08             | -8.42*** |
| Number of MSAs       | 0.15              | 5.75***  | 0.20              | 6.51***  | 0.21              | 6.99***  | 0.22              | 7.51***   | 0.27              | 8.34***  |
| Relative Order       | -0.09             | -1.28    | -0.06             | -0.66    | 0.05              | 0.53     | -0.07             | -0.76     | 0.06              | 0.63     |
| Good News            | -0.06             | -2.10**  | -0.08             | -2.53**  | -0.18             | -6.00*** | -0.22             | -6.70***  | -0.19             | -5.55*** |
| Outside Market Hours | -0.04             | -1.06    | -0.05             | -0.97    | 0.00              | 0.06     | -0.06             | -1.25     | -0.00             | 0.04     |
| Friday               | 0.12              | 3.10***  | 0.06              | 1.46     | 0.07              | 1.64     | 0.07              | 1.60      | -0.00             | -0.01    |
| Halt                 | -0.42             | -5.03*** | -0.40             | -4.45*** | -0.20             | -1.54    | -0.37             | -4.44***  | -0.42             | -8.81*** |
| N                    | 4,884             |          | 4,906             |          | 4,908             |          | 4,896             |           | 4,925             |          |
| Adj. R <sup>2</sup>  | 0.0258            |          | 0.0339            |          | 0.0367            |          | 0.0418            |           | 0.0416            |          |
| F-Value              | 19.49***          |          | 25.61***          |          | 27.68***          |          | 31.47***          |           | 31.53***          |          |

## Panel B. One-Day Speed of Trading Volume

|                      | Return Quintile 1 |          | Return Quintile 2 |           | Return Quintile 3 |           | Return Quintile 4 |           | Return Quintile 5 |           |
|----------------------|-------------------|----------|-------------------|-----------|-------------------|-----------|-------------------|-----------|-------------------|-----------|
|                      | Coefficient       | t-value  | Coefficient       | t-value   | Coefficient       | t-value   | Coefficient       | t-value   | Coefficient       | t-value   |
| Intercept            | 2.43              | 9.57***  | 2.60              | 9.33***   | 2.43              | 8.45***   | 2.93              | 10.88***  | 1.99              | 6.05***   |
| Size                 | -0.08             | -9.66*** | -0.11             | -11.44*** | -0.11             | -10.90*** | -0.13             | -12.95*** | -0.13             | -10.85*** |
| Number of MSAs       | 0.13              | 3.73***  | 0.20              | 5.38***   | 0.18              | 4.57***   | 0.18              | 5.00***   | 0.28              | 6.57***   |
| Relative Order       | -0.09             | -0.83    | -0.06             | -0.52     | 0.16              | -1.40     | -0.25             | -2.05**   | 0.12              | 0.90      |
| Good News            | -0.06             | -1.47    | -0.13             | -3.13***  | -0.20             | -4.69***  | -0.23             | -5.43***  | -0.23             | -4.95***  |
| Outside Market Hours | -0.05             | 0.91     | -0.08             | 1.21      | 0.03              | 0.51      | -0.13             | -1.97**   | 0.02              | 0.33      |
| Friday               | 0.09              | 2.04**   | 0.09              | 1.68*     | 0.17              | 3.03***   | 0.08              | 1.45      | 0.02              | 0.40      |
| Halt                 | -0.56             | -4.24*** | -0.42             | -3.34***  | -0.22             | -1.19     | -0.40             | -2.88***  | -0.47             | -4.86***  |
| N                    | 4,884             |          | 4,906             |           | 4,908             |           | 4,896             |           | 4,925             |           |
| Adj. R <sup>2</sup>  | 0.0246            |          | 0.0372            |           | 0.0371            |           | 0.0384            |           | 0.0401            |           |
| F-Value              | 18.62***          |          | 28.07***          |           | 27.00***          |           | 31.05***          |           | 30.37***          |           |

The relative order in which a MSA is released also reduces the magnitude of the short term market response. The negative and statistically significant coefficients of the relative order variable in Panel A of Table 3.5 imply that the amount of market sensitive information present at the moment a MSA is released affects investors' awareness even after considering the total amount of information disclosed on the announcement date. The importance of the relative order on the speed of market reaction is also present across MSA types (Table 3.6) and return quintiles (Table 3.8). There is, however, no significant impact of the relative order of announcements on the speed of the market reaction to MSAs. One possible explanation for this finding is that, unlike the magnitude measures that are calculated over one entire day, the speed of market reaction measures are likely to be affected by the large stock of MSAs present at the time trading resumes at the start of the day.

#### *3.5.4. Investor Distraction and the Delayed Response to MSAs*

The previous section provides support for the investor distraction hypothesis showing the number of MSAs released on the announcement day negatively affects the short term market response to MSAs. This section analyses the second observable consequence of the investor distraction hypothesis; the extent to which the total number of MSAs released on the announcement day affects the relation between the delayed market response to MSAs and the short term market response to MSAs. Panel A of Table 3.10 reports coefficients for Equation 3.1 using the delayed abnormal number of trades differential and the delayed abnormal trading volume differential as dependent variables. That is, the difference between the delayed (ten-day) and the short term (one-day) magnitude of the market reaction (number of trades and trading volume). Positive values of the delayed differentials are associated with a higher magnitude of delayed market reaction and negative values of the delayed differentials are associated with a higher magnitude of initial market response. The coefficients of the number of MSAs released on the announcement day are positive and statistically significant. These results support the investor distraction hypothesis by showing that the difference between the delayed market reaction and the short term market reaction to MSAs increases with the level of distraction on the announcement day. The coefficient of the relative order variable is also positive and statistically significant.

Table 3.10  
Investor Distraction and the Delayed Market Reaction to MSAs

This table shows the impact of sources of distraction on the delayed magnitude of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. Revision is a dummy variable equal to 1 if the MSA is followed by an analyst recommendation revision. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

Panel A. Investor Distraction and the Delayed Market Reaction Differential to MSAs

|                      | Delayed Abnormal Number of Trades Differential |                      | Delayed Abnormal Trading Volume Differential |                     |
|----------------------|--|----------------------|--|---------------------|
|                      | Coefficient                                    | t-value              | Coefficient                                  | t-value             |
| Intercept            | -8.73  | -7.91 <sup>***</sup> | -11.65                                       | 4.16 <sup>***</sup> |
| Size                 | 0.25   | 5.82 <sup>***</sup>  | 0.21   | 2.84 <sup>***</sup> |
| Number of MSAs       | 0.61   | 8.59 <sup>***</sup>  | 1.11   | 4.77 <sup>***</sup> |
| Relative Order       | 2.18   | 6.29 <sup>***</sup>  | 3.69   | 4.43 <sup>***</sup> |
| Good News            | -0.65  | -6.68 <sup>***</sup> | 0.52   | -1.49               |
| Outside Market Hours | 0.25   | 1.19                 | 0.74   | 1.25                |
| Friday               | -0.05  | -0.36                | -0.47  | -1.12               |
| Halt                 | -1.56  | -3.40 <sup>**</sup>  | -1.67  | -3.20 <sup>**</sup> |
| N                    | 24,519   |                      | 24,519                                       |                     |
| Adj. R <sup>2</sup>  | 0.0092   |                      | 0.0019                                       |                     |
| F-Value              | 33.36 <sup>***</sup>                           |                      | 7.52 <sup>***</sup>                          |                     |

Panel B. Investor Distraction and the Delayed Market Reaction Differential to MSAs by Analyst Recommendation Revisions

|                      | Delayed Abnormal Number of Trades Differential |                      | Delayed Abnormal Trading Volume Differential |                      |
|----------------------|--|----------------------|--|----------------------|
|                      | Coefficient                                    | t-value              | Coefficient                                  | t-value              |
| Intercept            | -8.85  | -7.85 <sup>***</sup> | -11.86                                       | -4.21 <sup>***</sup> |
| Size                 | 0.26   | 5.77 <sup>***</sup>  | 0.22   | 2.94 <sup>***</sup>  |
| Number of MSAs       | 0.62   | 8.59 <sup>***</sup>  | 1.11   | 4.77 <sup>***</sup>  |
| Relative Order       | 2.19   | 6.30 <sup>***</sup>  | 3.70   | 4.44 <sup>***</sup>  |
| Good News            | -0.65  | -6.69 <sup>***</sup> | -0.52  | -1.50                |
| Outside Market Hours | 0.25   | 1.21                 | 0.75   | 1.27                 |
| Friday               | -0.05  | -0.36                | -0.47  | -1.12                |
| Halt                 | -1.56  | -3.39 <sup>**</sup>  | -1.66  | -3.18 <sup>**</sup>  |
| Revision             | -0.43  | -3.15 <sup>**</sup>  | -0.77  | -2.94 <sup>**</sup>  |
| N                    | 24,519   |                      | 24,519                                       |                      |
| Adj. R <sup>2</sup>  | 0.0092   |                      | 0.0018                                       |                      |
| F-Value              | 29.35 <sup>***</sup>                           |                      | 6.65 <sup>***</sup>                          |                      |

The positive relation between the level of distraction and the incremental delayed market reaction to MSAs could be partially explained by incremental information produced after the announcement release. Since the sample only includes MSAs with no other announcements overlapping in the post-event window, the additional information could be that produced by analysts. Panel B of Table 3.10 reports the coefficients of the regression of the incremental delayed market reaction to MSAs on the same variables included in Panel A of Table 3.10 and allowing for an

additional dummy variable taking the value 1 when an analyst recommendation revision is released on the announcements date or in the following three days. A positive coefficient for the revision variable would suggest analyst recommendation revisions contribute to the increased investor attention during the days that follow the release of MSAs. However, the coefficients of the revision dummy variable are negative and statistically significant in both the incremental delayed number of trades and the incremental delayed trading volume regressions. These findings suggest analyst revisions are just another way in which higher attention to certain announcements is revealed rather than being the cause of abnormal trading in the days that follow the release of MSAs.

### *3.5.5. Investor Distraction and Firm Selective Disclosure*

The impact of disclosing MSAs outside market hours is measured by including a dummy variable taking the value 1 for MSAs released either before or after market hours. There is no consistent impact of the outside market hours dummy variable on either the magnitude or the speed of market response to MSAs. In most regressions the coefficients are not statistically significant. To analyse the reason for this lack of consistency a dummy for MSAs released before market hours and a dummy for MSAs released after market hours are separately included in the regressions. Table 3.11 reports MSAs released before market hours are associated with a higher magnitude and a quicker speed of market reaction. This finding is consistent with the slightly higher proportion of good news MSAs released before market hours (Panel B of Table 3.1 show that 28% of good news and 26% of bad news are released before market hours). In Tables 3.12 and 3.13, the influence of before hours MSAs is not present across all MSA types.

Table 3.11  
Investor Distraction and the Short Term Market Reaction to MSAs  
(Before Hours Dummy)

This table shows the impact of sources of distraction on the short term magnitude and the speed of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

Panel A. Investor Distraction and the Magnitude of Reaction to MSAs

|                     | One-Day Abnormal<br>Number of Trades |           | One-Day Abnormal<br>Trading Volume |          |
|---------------------|--------------------------------------|-----------|------------------------------------|----------|
|                     | Coefficient                          | t-value   | Coefficient                        | t-value  |
| Intercept           | 12.67                                | 11.96***  | 17.35                              | 5.71***  |
| Size                | -0.38                                | -10.34*** | -0.46                              | -5.14*** |
| Number of MSAs      | -0.78                                | -8.66***  | -1.19                              | -4.64*** |
| Relative Order      | -1.41                                | -8.78***  | -2.28                              | -7.69*** |
| Good News           | 0.97                                 | 9.92***   | 0.53                               | 1.33     |
| Before Market Hours | 0.44                                 | 3.72***   | 0.23                               | 0.79     |
| Friday              | 0.12                                 | 0.65      | 0.74                               | 1.26     |
| Halt                | 2.00                                 | 3.83***   | 1.97                               | 3.32***  |
| N                   | 24,519                               |           | 24,519                             |          |
| Adj. R <sup>2</sup> | 0.0136                               |           | 0.0020                             |          |
| F-Value             | 49.35***                             |           | 7.98***                            |          |

Panel B. Investor Distraction and the Speed of Reaction to MSAs

|                     | One-Day Speed of<br>Number of Trades |           | One-Day Speed of<br>Trading Volume |           |
|---------------------|--------------------------------------|-----------|------------------------------------|-----------|
|                     | Coefficient                          | t-value   | Coefficient                        | t-value   |
| Intercept           | 0.80                                 | 8.67***   | 1.75                               | 14.31***  |
| Size                | -0.03                                | -10.45*** | -0.07                              | -16.44*** |
| Number of MSAs      | 0.21                                 | 15.52***  | 0.19                               | 11.21***  |
| Relative Order      | -0.06                                | -2.00**   | -0.06                              | -1.62     |
| Good News           | -0.14                                | -9.64***  | -0.16                              | -8.25***  |
| Before Market Hours | -0.12                                | -7.40***  | -0.15                              | -6.72***  |
| Friday              | 0.05                                 | 2.88***   | 0.08                               | 3.29***   |
| Halt                | -0.42                                | -10.38*** | -0.48                              | -7.69***  |
| N                   | 24,519                               |           | 24,519                             |           |
| Adj. R <sup>2</sup> | 0.0284                               |           | 0.0256                             |           |
| F-Value             | 103.32***                            |           | 92.90***                           |           |

Table 3.12  
Investor Distraction and the Magnitude of the Short Term Reaction to MSAs by Announcement Type  
(Before Hours Dummy)

This table shows the impact of sources of distraction on the short term magnitude of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

Panel A. One-Day Abnormal Number of Trades

|                     | Periodic MSAs       |                      | Non-Periodic MSAs    |                       | Multiple MSAs       |                      |
|---------------------|---------------------|----------------------|----------------------|-----------------------|---------------------|----------------------|
|                     | Coefficient         | t-value              | Coefficient          | t-value               | Coefficient         | t-value              |
| Intercept           | 10.61               | 3.48 <sup>***</sup>  | 10.63                | 12.26 <sup>***</sup>  | 17.58               | 3.98 <sup>***</sup>  |
| Size                | -0.19               | -2.75 <sup>***</sup> | -0.43                | -15.98 <sup>***</sup> | -0.51               | -3.36 <sup>***</sup> |
| Number of MSAs      | -1.02               | -2.79 <sup>***</sup> | -0.21                | -1.27                 | -1.19               | -4.00 <sup>***</sup> |
| Relative Order      | -1.52               | -7.96 <sup>***</sup> | -1.33                | -6.00 <sup>***</sup>  | -1.77               | -4.19 <sup>***</sup> |
| Good News           | 0.31                | 1.10                 | 1.16                 | 13.29 <sup>***</sup>  | 1.08                | 4.00 <sup>***</sup>  |
| Before Market Hours | 0.55                | 2.14 <sup>**</sup>   | 0.39                 | 2.60 <sup>***</sup>   | 0.23                | -1.04                |
| Friday              | 0.73                | 1.14                 | 0.19                 | 1.12                  | -0.47               | -1.90 <sup>*</sup>   |
| Halt                | 1.36                | 2.23 <sup>**</sup>   | 1.53                 | 2.06 <sup>**</sup>    | 1.83                | 2.34 <sup>**</sup>   |
| N                   | 5,142               |                      | 13,449               |                       | 5,928               |                      |
| Adj. R <sup>2</sup> | 0.0072              |                      | 0.0319               |                       | 0.0099              |                      |
| F-Value             | 6.34 <sup>***</sup> |                      | 64.35 <sup>***</sup> |                       | 9.45 <sup>***</sup> |                      |

Panel B. One-Day Abnormal Trading Volume

|                     | Periodic MSAs       |                      | Non-Periodic MSAs   |                      | Multiple MSAs        |                      |
|---------------------|---------------------|----------------------|---------------------|----------------------|----------------------|----------------------|
|                     | Coefficient         | t-value              | Coefficient         | t-value              | Coefficient          | t-value              |
| Intercept           | 18.79               | 2.42 <sup>**</sup>   | 15.11               | 3.75 <sup>***</sup>  | 18.59                | 6.95 <sup>***</sup>  |
| Size                | -0.28               | -1.61                | -0.57               | -3.84 <sup>***</sup> | -0.51                | -5.43 <sup>***</sup> |
| Number of MSAs      | -2.07               | -2.20 <sup>**</sup>  | -0.24               | -0.94                | -1.30                | -5.92 <sup>***</sup> |
| Relative Order      | -2.55               | -4.64 <sup>***</sup> | -2.47               | -5.23 <sup>***</sup> | -2.10                | -4.10 <sup>**</sup>  |
| Good News           | 0.08                | 0.11                 | 0.54                | 0.76                 | 0.98                 | 4.47 <sup>***</sup>  |
| Before Market Hours | 0.55                | 0.80                 | -0.37               | -0.81                | 0.98                 | 2.82 <sup>***</sup>  |
| Friday              | 2.18                | 1.30                 | 0.73                | 0.85                 | -0.33                | -1.35                |
| Halt                | 1.93                | 1.24                 | 1.91                | 1.68 <sup>*</sup>    | 1.80                 | 2.58 <sup>**</sup>   |
| N                   | 5,142               |                      | 13,449              |                      | 5,928                |                      |
| Adj. R <sup>2</sup> | 0.0033              |                      | 0.0011              |                      | 0.0222               |                      |
| F-Value             | 3.46 <sup>***</sup> |                      | 3.08 <sup>***</sup> |                      | 20.21 <sup>***</sup> |                      |

Table 3.13  
Investor Distraction and the Speed of the Short Term Reaction to MSAs by Announcement Type  
(Before Hours Dummy)

This table shows the impact of sources of distraction on the short term speed of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

Panel A. One-Day Speed of Number of Trades

|                     | Periodic MSAs |          | Non-Periodic MSAs |          | Multiple MSAs |          |
|---------------------|---------------|----------|-------------------|----------|---------------|----------|
|                     | Coefficient   | t-value  | Coefficient       | t-value  | Coefficient   | t-value  |
| Intercept           | 1.50          | 6.30***  | 0.78              | 6.24***  | 1.10          | 5.17***  |
| Size                | -0.08         | -8.84*** | -0.00             | -1.19    | -0.06         | -7.64*** |
| Number of MSAs      | 0.22          | 8.09***  | 0.10              | 4.40***  | 0.23          | 8.89***  |
| Relative Order      | -0.00         | -0.01    | -0.05             | -1.32    | -0.08         | -1.29    |
| Good News           | -0.04         | -1.15    | -0.17             | -9.30*** | -0.12         | -4.12*** |
| Before Market Hours | -0.07         | -2.05**  | -0.11             | -4.94*** | -0.11         | -3.39*** |
| Friday              | 0.09          | 1.99**   | 0.04              | 1.61*    | 0.01          | 0.33     |
| Halt                | -0.44         | 3.07***  | -0.34             | -3.74**  | -0.41         | -8.61*** |
| N                   | 5,142         |          | 13,449            |          | 5,928         |          |
| Adj. R <sup>2</sup> | 0.0433        |          | 0.0101            |          | 0.0509        |          |
| F-Value             | 34.26***      |          | 20.59***          |          | 46.43***      |          |

Panel B. One-Day Speed of Trading Volume

|                     | Periodic MSAs |           | Non-Periodic MSAs |          | Multiple MSAs |           |
|---------------------|---------------|-----------|-------------------|----------|---------------|-----------|
|                     | Coefficient   | t-value   | Coefficient       | t-value  | Coefficient   | t-value   |
| Intercept           | 2.77          | 8.63***   | 1.63              | 9.55***  | 2.21          | 8.63***   |
| Size                | -0.13         | -11.47*** | -0.03             | -5.74*** | -0.10         | -11.11*** |
| Number of MSAs      | 0.20          | 5.84***   | 0.07              | 2.21**   | 0.20          | 6.42***   |
| Relative Order      | -0.04         | -0.47     | -0.07             | -1.36    | -0.01         | -0.09     |
| Good News           | -0.06         | -1.38     | -0.20             | -8.00*** | -0.10         | -2.81***  |
| Before Market Hours | -0.07         | -1.26     | -0.14             | -4.75*** | -0.14         | -3.21***  |
| Friday              | 0.13          | 2.23**    | 0.06              | 1.93*    | 0.02          | 0.54      |
| Halt                | -0.24         | -0.85     | -0.48             | -3.87*** | -0.53         | -8.47***  |
| N                   | 5,142         |           | 13,449            |          | 5,928         |           |
| Adj. R <sup>2</sup> | 0.0446        |           | 0.0091            |          | 0.0485        |           |
| F-Value             | 35.32***      |           | 18.65***          |          | 44.13***      |           |

Our findings in Section 3.4 suggest there is to some extent selective disclosure of bad news after trading hours (19% of bad news and only 14% of good news are released after hours). These findings are corroborated in Table 3.14 where after market hours MSAs are associated with a lower magnitude of market reaction and a slower speed of market reaction. Regarding MSA types, Tables 3.15 and 3.16 provide evidence that the effect of releasing MSAs after market hours remains for non-periodic MSAs and for multiple MSAs. There is, however, very little impact on the market reaction to periodic MSAs.

In Section 3.4 we reject the idea of Fridays as a high inattention day per se. In the same line, selective disclosure across days of the week seems to be less effective than across times of the day. Table 3.5 shows releasing MSAs on Fridays has no significant impact on the one-day magnitude of abnormal trading measures. It does, however, slow down the speed of trading in response to MSAs. Table 3.9 shows the impact on the speed of market response to MSAs released on Fridays is limited to announcements in the lower return quintiles.

Table 3.14  
Investor Distraction and the Short Term Market Reaction to MSAs  
(After Hours Dummy)

This table shows the impact of sources of distraction on the short term magnitude and the speed of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

| Panel A. Investor Distraction and the Magnitude of Reaction to MSAs |                                      |           |                                    |           |
|---|--------------------------------------|-----------|------------------------------------|-----------|
|   | One-Day Abnormal<br>Number of Trades |           | One-Day Abnormal<br>Trading Volume |           |
|   | Coefficient                          | t-value   | Coefficient                        | t-value   |
| Intercept   | 13.32                                | 12.22***  | 18.28                              | 5.83***   |
| Size  | -0.39                                | -9.74***  | -0.49                              | -4.91***  |
| Number of MSAs  | -0.72                                | -8.55***  | -1.07                              | -4.72***  |
| Relative Order  | -2.45                                | -13.63*** | -3.66                              | -4.44***  |
| Good News   | 0.94                                 | 10.01***  | 0.47                               | 1.16      |
| After Market Hours  | -1.03                                | -7.14***  | -1.68                              | -4.66***  |
| Friday  | 0.13                                 | 0.69      | 0.77                               | 1.29      |
| Halt  | 2.05                                 | 3.92***   | 2.08                               | 3.60***   |
| N   | 24,519                               |           | 24,519                             |           |
| Adj. R <sup>2</sup>   | 0.0143                               |           | 0.0023                             |           |
| F-Value   | 51.83***                             |           | 9.02***                            |           |
| Panel B. Investor Distraction and the Speed of Reaction to MSAs     |                                      |           |                                    |           |
|   | One-Day Speed of<br>Number of Trades |           | One-Day Speed of<br>Trading Volume |           |
|   | Coefficient                          | t-value   | Coefficient                        | t-value   |
| Intercept   | 0.68                                 | 7.28***   | 1.59                               | 13.06***  |
| Size  | -0.03                                | -10.56*** | -0.07                              | -16.58*** |
| Number of MSAs  | 0.20                                 | 14.70***  | 0.18                               | 10.42***  |
| Relative Order  | 0.16                                 | 5.15***   | 0.20                               | 5.00***   |
| Good News   | -0.13                                | -9.33***  | -0.15                              | -7.96***  |
| After Market Hours  | 0.18                                 | 7.37***   | 0.23                               | 6.89***   |
| Friday  | 0.05                                 | 2.87***   | 0.08                               | 3.28***   |
| Halt  | -0.42                                | -10.56*** | -0.49                              | -7.84***  |
| N   | 24,519                               |           | 24,519                             |           |
| Adj. R <sup>2</sup>   | 0.0289                               |           | 0.0260                             |           |
| F-Value   | 105.38***                            |           | 94.44***                           |           |

Table 3.15  
Investor Distraction and the Magnitude of the Short Term Reaction to MSAs by Announcement Type  
(After Hours Dummy)

This table shows the impact of sources of distraction on the short term magnitude of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

Panel A. One-Day Abnormal Number of Trades

|                     | Periodic MSAs       |                      | Non-Periodic MSAs    |                       | Multiple MSAs       |                      |
|---------------------|---------------------|----------------------|----------------------|-----------------------|---------------------|----------------------|
|                     | Coefficient         | t-value              | Coefficient          | t-value               | Coefficient         | t-value              |
| Intercept           | 11.49               | 3.44 <sup>***</sup>  | 11.26                | 12.56 <sup>***</sup>  | 18.25               | 3.93 <sup>***</sup>  |
| Size                | -0.20               | -2.33 <sup>**</sup>  | -0.43                | -16.12 <sup>***</sup> | -0.53               | -3.13 <sup>***</sup> |
| Number of MSAs      | -0.98               | -2.89 <sup>***</sup> | -0.19                | -1.18                 | -1.12               | -4.22 <sup>***</sup> |
| Relative Order      | -2.53               | -7.30 <sup>***</sup> | -2.26                | -10.83 <sup>***</sup> | -2.63               | -4.93 <sup>***</sup> |
| Good News           | 0.28                | 1.04                 | 1.14                 | 12.90 <sup>***</sup>  | 1.06                | 4.05 <sup>***</sup>  |
| After Market Hours  | -0.86               | -3.11 <sup>***</sup> | -0.97                | -4.93 <sup>***</sup>  | -0.97               | -2.37 <sup>**</sup>  |
| Friday              | 0.69                | 1.08                 | 0.22                 | 1.27                  | -0.44               | -1.93 <sup>*</sup>   |
| Halt                | 1.38                | 2.26 <sup>**</sup>   | 1.57                 | 2.12 <sup>**</sup>    | 1.88                | 2.45 <sup>**</sup>   |
| N                   | 5,142               |                      | 13,449               |                       | 5,928               |                      |
| Adj. R <sup>2</sup> | 0.0075              |                      | 0.0330               |                       | 0.0103              |                      |
| F-Value             | 6.59 <sup>***</sup> |                      | 66.57 <sup>***</sup> |                       | 9.80 <sup>***</sup> |                      |

Panel B. One-Day Abnormal Trading Volume

|                     | Periodic MSAs       |                      | Non-Periodic MSAs   |                      | Multiple MSAs        |                      |
|---------------------|---------------------|----------------------|---------------------|----------------------|----------------------|----------------------|
|                     | Coefficient         | t-value              | Coefficient         | t-value              | Coefficient          | t-value              |
| Intercept           | 19.87               | 2.34 <sup>**</sup>   | 16.09               | 3.87 <sup>***</sup>  | 18.38                | 6.97 <sup>***</sup>  |
| Size                | -0.30               | -1.37                | -0.59               | -3.80 <sup>***</sup> | -0.49                | -5.12 <sup>***</sup> |
| Number of MSAs      | -2.03               | -2.30 <sup>**</sup>  | -0.22               | -0.87                | -1.26                | -6.02 <sup>***</sup> |
| Relative Order      | -3.72               | -4.27 <sup>***</sup> | -3.56               | -7.12 <sup>***</sup> | -3.56                | -5.95 <sup>***</sup> |
| Good News           | 0.06                | 0.08                 | 0.55                | 0.61                 | 0.96                 | 4.44 <sup>***</sup>  |
| After Market Hours  | -1.04               | -1.39                | -2.13               | -3.70 <sup>***</sup> | -1.16                | -3.02 <sup>***</sup> |
| Friday              | 2.12                | 1.29                 | 0.80                | 0.93                 | -0.33                | -1.39                |
| Halt                | 1.96                | 1.27                 | 2.18                | 2.00 <sup>**</sup>   | 1.82                 | 2.61 <sup>**</sup>   |
| N                   | 5,142               |                      | 13,449              |                      | 5,928                |                      |
| Adj. R <sup>2</sup> | 0.0034              |                      | 0.0013              |                      | 0.0220               |                      |
| F-Value             | 3.54 <sup>***</sup> |                      | 3.59 <sup>***</sup> |                      | 20.01 <sup>***</sup> |                      |

Table 3.16  
Investor Distraction and the Speed of the Short Term Reaction to MSAs by Announcement Type  
(After Hours Dummy)

This table shows the impact of sources of distraction on the short term speed of the market reaction to the sample of 24,519 MSAs during the period 2005-2009. Size is the logarithm of market capitalisation. Number of MSAs is the total number of MSAs released on the announcement day. Relative order uses the time stamp to determine the rank of the MSAs relative to all the MSAs released on the announcement day. Good News is a dummy variable taking the value 1 if the sign of the one-day return reaction is positive and 0 otherwise. Outside market hours is a dummy variable taking the value 1 if the MSA is released either before or after hours and 0 otherwise. Friday is a dummy variable equal to 1 if the MSA is released on a Friday. Halt is a dummy variable taking the value 1 if the firm requested a trading halt in anticipation of the release of the MSA and 0 otherwise. \*\*\*, \*\*, \* denotes that the coefficient is significantly different from zero at the 1%, 5% and 10% level, respectively.

Panel A. One-Day Speed of Number of Trades

|                     | Periodic MSAs        |                      | Non-Periodic MSAs    |                      | Multiple MSAs        |                      |
|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                     | Coefficient          | t-value              | Coefficient          | t-value              | Coefficient          | t-value              |
| Intercept           | 1.42                 | 5.85 <sup>***</sup>  | 0.67                 | 5.38 <sup>***</sup>  | 0.93                 | 4.33 <sup>***</sup>  |
| Size                | -0.08                | -8.65 <sup>***</sup> | -0.01                | -1.43                | -0.06                | -7.58 <sup>***</sup> |
| Number of MSAs      | 0.21                 | 7.98 <sup>***</sup>  | 0.10                 | 4.25 <sup>***</sup>  | 0.22                 | 8.31 <sup>***</sup>  |
| Relative Order      | 0.10                 | 1.36                 | 0.13                 | 3.34 <sup>***</sup>  | 0.17                 | 2.62 <sup>***</sup>  |
| Good News           | -0.04                | -1.09                | -0.17                | -9.14 <sup>***</sup> | -0.11                | -3.93 <sup>***</sup> |
| After Market Hours  | 0.08                 | 1.47                 | 0.15                 | 4.40 <sup>***</sup>  | 0.24                 | 4.57 <sup>***</sup>  |
| Friday              | 0.09                 | 2.09 <sup>**</sup>   | 0.04                 | 1.49                 | 0.01                 | 0.23                 |
| Halt                | -0.44                | 3.06 <sup>***</sup>  | -0.34                | -3.76 <sup>***</sup> | -0.42                | -8.88 <sup>***</sup> |
| N                   | 5,142                |                      | 13,449               |                      | 5,928                |                      |
| Adj. R <sup>2</sup> | 0.0432               |                      | 0.0099               |                      | 0.0536               |                      |
| F-Value             | 34.13 <sup>***</sup> |                      | 20.29 <sup>***</sup> |                      | 48.97 <sup>***</sup> |                      |

Panel B. One-Day Speed of Trading Volume

|                     | Periodic MSAs        |                       | Non-Periodic MSAs    |                      | Multiple MSAs        |                       |
|---------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|-----------------------|
|                     | Coefficient          | t-value               | Coefficient          | t-value              | Coefficient          | t-value               |
| Intercept           | 2.72                 | 8.26 <sup>***</sup>   | 1.46                 | 8.61 <sup>***</sup>  | 2.06                 | 7.92 <sup>***</sup>   |
| Size                | -0.13                | -11.29 <sup>***</sup> | -0.03                | -5.97 <sup>***</sup> | -0.10                | -11.20 <sup>***</sup> |
| Number of MSAs      | 0.20                 | 5.78 <sup>***</sup>   | 0.06                 | 2.05 <sup>**</sup>   | 0.19                 | 6.01 <sup>***</sup>   |
| Relative Order      | 0.04                 | 0.46                  | 0.19                 | 3.56 <sup>***</sup>  | 0.24                 | 2.99 <sup>***</sup>   |
| Good News           | -0.06                | -1.34                 | -0.20                | -7.80 <sup>***</sup> | -0.10                | -2.68 <sup>***</sup>  |
| After Market Hours  | 0.06                 | 0.88                  | 0.23                 | 4.93 <sup>***</sup>  | 0.23                 | 3.62 <sup>***</sup>   |
| Friday              | 0.13                 | 2.30 <sup>**</sup>    | 0.06                 | 1.78 <sup>*</sup>    | 0.02                 | 0.50                  |
| Halt                | -0.24                | -0.85                 | -0.48                | -3.93 <sup>***</sup> | -0.53                | -8.65 <sup>***</sup>  |
| N                   | 5,142                |                       | 13,449               |                      | 5,928                |                       |
| Adj. R <sup>2</sup> | 0.0445               |                       | 0.0095               |                      | 0.0493               |                       |
| F-Value             | 35.23 <sup>***</sup> |                       | 19.39 <sup>***</sup> |                      | 44.91 <sup>***</sup> |                       |

### 3.5.6. Market Mechanisms to reduce Investor Distraction

Every time a firm releases a MSA the ASX places a company's securities into Pre-Opening Phase for at least 10 minutes to give investors the opportunity to digest the new information before trading resumes. The other kind of trade interruption is a trading halt requested by a company when it expects the occurrence of an event but is not in a position to accurately inform the market. These trading halts last until the announcement is made or until the commencement of trading on the second day after the trading halt was imposed, whichever occurs first. This second trading halt type could

also be a means by which companies could increase investor awareness of an incoming announcement. To test how effective this mechanism is we include a dummy variable in all models to identify those MSAs that were preceded by a trading halt request by the company.

Indeed, Panel A of Table 3.5 reports positive and significant coefficients for the trading halt variable in both regressions. That is, for the one-day abnormal number of trades and the one-day abnormal trading volume these results suggest firms increase investor attention by requesting trading halts in anticipation of MSAs. The impact of trading halts requested by the firms is also found to increase the speed of trading. In Panel B the coefficients accompanying the halt variable in the speed of response regressions are negative and statistically significant. Panel B of Tables 3.6 and 3.7 provide evidence that trading halts requested before non-periodic and multiple MSAs are more effective than trading halts in anticipation of periodic MSAs. There are two plausible explanations for this finding that are not mutually exclusive. One is that the increase in investor awareness produced by trading halts is only marginal among periodic MSAs which are already expected. Another possible explanation is related to the fact that periodic MSAs tend to be clustered in time and therefore subject to higher levels of investor distraction that cannot be offset by a trading halt request. The impact of trading halts in reducing the impact of investor distraction is also observed in the delayed market reaction to MSAs. Coefficients for the halt dummy in Table 3.10, where the dependent variables are the delayed abnormal number of trades differential and the delayed abnormal trading volume differential, are negative and statistically significant.

### **3.6. Conclusions**

This research contributes to the literature by studying the impact of the level of investor distraction on the magnitude and the speed of market reaction to relevant information in a market with disclosure regulation that reduces the number of potentially confounding events and provides investors with mechanisms to distinguish those announcements that are expected to be more relevant. Another contribution of this work to the investor distraction literature is the inclusion of all announcement types and not only earnings releases. This feature represents a considerable

improvement to the understanding of how competing information affects the promptness and the magnitude of the market reaction to scheduled and unscheduled announcements.

Using a sample of 24,519 MSAs released by companies trading on the ASX between 2005 and 2009 our findings support the investor distraction hypothesis and also identify the extent to which the consequences of investor distraction can be reduced by improving the signalling of announcements according to their expected importance and by providing firms with market mechanisms to attract investor attention. We find that the magnitude of the short term market response to MSAs is negatively related to the number of MSAs released on the announcement day. We also find the level of distraction on the announcement day increases the time it takes to reach the average daily number of trades and the average daily trading volume. The impact of distraction on the speed of the market reaction is present across all MSAs types. However, the magnitude of the market reaction to non-MSAs is not affected by the level of distraction present on the announcement day. A second proxy for the level of distraction is the relative order in which announcements are released during the day. This distraction proxy is found to be more relevant than the number of MSAs in reducing the short term magnitude of the market reaction, but has no significant impact on the speed of the market reaction to MSAs. Further support for the investor distraction hypothesis is found when the delayed market response to MSAs is analysed. The difference between the magnitude of the delayed market reaction and the magnitude of the short term market reaction increases with the level of distraction on the announcement day. The findings also suggest analyst revisions are not responsible for the increase in delayed market reaction but just another way in which higher attention to certain announcements is revealed in the days that follow the release.

Despite the requisite of immediateness in the disclosure of relevant information, our findings suggest there is to some extent selective disclosure. Across hours of the day we find there is a higher propensity to release bad news after trading hours. This selective disclosure is encouraged by the fact that after market hours MSAs are associated with a lower magnitude of market reaction and a slower speed of market reaction to non-periodic and multiple MSAs. There is, however, little impact of releasing MSAs after market hours on the market reaction to periodic MSAs. Regarding disclosure across days of the week, we find that MSAs released on Fridays are associated with a slower speed of

market response. Finally, our results demonstrate that by requesting a trading halt in anticipation of MSAs firms attract investor attention and partially offset the impact of the level of distraction produced by the volume of competing information. In the short term, both the magnitude of the market reaction and the speed of the market reaction increase in response to post-halt MSAs. Additionally, the delayed market reaction differential is negative following MSAs released after a trading halt requested by the firm.

## **Chapter 4.** **Information Content of Analyst Revisions under Continuous Disclosure Requirements**

### **4.1. Introduction**

The prevailing view of analysts making a contribution to the price discovery process (Frankel et al. 2006; Ivkovic and Jegadeesh 2004; Livnat and Zhang 2009) has been challenged by Loh and Stulz (2011), suggesting only a small portion of analysts' recommendation revisions is influential. Altinkılıç and Hansen (2009) go even further, arguing that analysts simply piggyback on firms' information disclosure. Most papers in this area examine recommendations around earnings, ignoring the possibility that recommendations could be following other information releases made by the firms, such as mergers and acquisitions, resource discoveries, patent approvals, or other relevant information that could potentially be disclosed at any other time. The four attributes of the continuous disclosure environment in Australia mentioned in Chapter 1 provide an attractive setting to revisit the relation between analyst revisions and corporate news: 1) the requirement to immediately disclose any piece of material information; 2) announcements submitted by firms to the ASX are analysed and classified by the exchange as either market sensitive (MSA) or non-market sensitive (non-MSA); 3) once classified into one or many of the 19 types, company announcements are made available to all investors in a centralised platform (CAP); and 4) a trading halt is imposed when a MSA is released.

We add to the discussion by examining the information content of analyst recommendations revisions in Australia in three areas. First, we determine whether proximity to relevant corporate news positively affects the information content of analyst revisions. Second, we examine whether analyst revisions are merely timed to piggyback on corporate news or if the analysts produce private information and/or interpret and disseminate public information. Thirdly, we explore characteristics related to analysts, firms, recommendations, and corporate news that are related to the information contribution by analysts.

We find that recommendation revisions released around company news announcements are more informative than those released at any other time. A considerable proportion of the recommendation revisions released around MSAs are made public on the same day or in the three days that follow a MSA. These recommendation revisions are found to be more likely to be influential. This finding supports the view that analysts' role in the market may relate more to interpreting and disseminating the news rather than generating private information. The chapter is organised as follows. Section 4.2 reviews the literature. Section 4.3 presents the methodology and develops the working hypotheses. Section 4.4 describes the data and leads to section 4.5 where the results are discussed. Section 4.6 summarises and concludes.

## **4.2. Literature Review**

Analysts' contribution to the price discovery process via recommendations is widely supported in the literature studying both the US market (Stickel 1995; Womack 1996; Barber et al. 2001) and the Australian market (Chan et al. 2006 and Comerton-Forde et al. 2009). Other studies such as Bhushan (1989) and Dempsey (1989) show that the number of analysts following a firm is negatively related to the informativeness of earnings announcements. Brennan et al. (1993) also find a higher speed of adjustment of prices to market wide information with the aid of analysts<sup>17</sup>. Among those who support the information contribution by analysts, there are three main strands of literature. First, there are works discussing the sign of the relation between the informativeness of analyst reports and the informativeness of firms' public information disclosures, mainly earnings announcements. Second, some papers examine whether analysts are more valuable as private information developers or as public information interpreters. Third, there are studies that provide evidence of the firm specific and analyst specific characteristics that make analyst reports more informative.

Studies on the relation between the informativeness of analyst reports and firms' public information disclosures are not conclusive. Francis et al. (2002a) and Frankel et al. (2006) find that the informativeness of analyst reports is reinforced with the information content of earnings

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<sup>17</sup> Based on these findings, the use of the number of analysts as a proxy for the level of information production about firms became common practice, suggesting analysts reports pre-empt information contained in earnings announcements (Brennan and Subrahmanyam 1995; Eleswarapu et al. 2004; Gomes et al. 2007).

announcements. Francis et al. identify a positive relation in both directions. Between the aggregated information content of analyst reports issued during a quarter and the informativeness after the earnings announcements in the same quarter; and also between the informativeness on the earnings announcement and the aggregated information content of the analyst reports released by analysts in the following period. To consider the impact of additional sources of information, they control for management earnings forecasts. However, they omit other sources of concurrent information disclosed on analyst report days, assuming all information impounded into prices on days with analyst reports is caused by the reports. In contrast, Livnat and Zhang (2009) and Chen et al. (2010) find the return around analyst revisions is negatively related to the returns around the most recent public announcement made by the firm. That is, highly informative disclosures are followed by forecast revisions that are not very informative, and vice versa. Chen et al. find the information content of analyst reports released before earnings announcements is negatively related to the informativeness of earnings. The enactment of Regulation Fair Disclosure (Reg. FD) in the US should have an impact on the informativeness of analyst reports. Francis et al. examine 1980 – 1999 and Frankel et al. examine 1995 – 2002 and these periods are mostly pre-Reg. FD. Studies around Reg. FD enactment suggest the informativeness of analysts' forecasts and recommendations is reduced in the post-Reg. FD period (Gintschel and Markov 2004), the number of analysts decreased and forecast dispersion increased (Irani and Karamanou 2003). Loh and Stulz (2011), in contrast, find analyst revisions are more likely to be informative after Reg. FD and the Global Research Analyst Settlement.

To determine whether analysts are more valued as private information developers or as public information interpreters, the informativeness of analyst forecasts and revisions is also analysed before and after company announcements and researchers have also found mixed results. Ivkovic and Jegadeesh (2004) find support for the value of analysts as private information producers. They argue that the role of analysts as developers of private information should be related to more informative forecast and recommendation revisions before the announcements. The role of analysts as interpreters of public information should be associated with higher information content of forecast and recommendation revisions after earnings announcements. Their main finding is that the price reaction to analyst forecast and recommendation revisions is weaker after earnings announcements than for

other periods, indicating that analysts are valued for their ability to produce private information. This is consistent with the fact that the period covered is mainly before the enactment of Reg. FD (Quarterly earnings forecasts are considered from January 1990 to March 2002 and stock recommendations from November 1993 to March 2002). Chen et al. (2010) also support the role of analysts as developers of private information, showing that the information content of analyst reports during the week before earnings announcements is higher than the informativeness of the reports issued the week after earnings releases for the period 1994 – 2003.

An opposite result is obtained by Livnat and Zhang (2009) in their study of the informativeness of forecast revisions using both earnings announcements and 8-K filings as sources of firms' public disclosures for US firms in the period 1996 - 2008. They support the idea that analysts are mainly regarded as interpreters of public information by their finding that the market reaction to forecast revisions made promptly after public disclosures (in the following three days), is stronger than the reaction to other forecast revisions. They find a higher response to revisions after 8-K filings and relate it to the fact that information contained in those reports is not structured and many times is predominantly qualitative, making it more difficult for investors to interpret the potential impact on the firm's performance. It is noteworthy that Reg. FD had no impact on their results, because there are good reasons to believe that under selective disclosure, analysts had an advantage to pre-empt the information disclosed by firms. This finding is related to the way in which they measure the role of analysts as private information producers, using all revisions outside the three-day window after announcements. They do not make a separate analysis of revisions made shortly before public announcements.

There are firm and analyst characteristics that have been identified as contributing to the informativeness of analyst reports. According to Loh and Stulz (2011), influential recommendation changes tend to be associated with small firms, growth firms, and firms with high institutional ownership. Also, Frankel et al. (2006) find that the level of uncertainty measured by return volatility and high trading volume contributes to the informativeness of analyst reports. In addition, Chen et al. (2010) provide evidence that the interpretation role of analysts is more important for complex firms in terms of their growth opportunities and focus on R&D. On the analyst side, Loh and Stulz find leader

analysts, star analysts, and away from consensus revisions are the most influential. A major concern about the results of analyst reports informativeness tests is the overlapping of the impact of earnings announcements and analyst recommendation or forecast revisions. Aware of this possibility, Loh and Stulz create a sample that excludes recommendation revisions issued around the three-day window around earnings announcement days, around earnings guidance days, or around days with multiple analyst recommendations. They consider a recommendation to be influential if the three-day compounded abnormal return around recommendation revisions exceeds the average abnormal return during the previous three months. According to this measure, only 10% of the recommendation changes between 1993 and 2006 were influential. The confounding effect of other news is addressed by Asquith et al. (2005), who find about half of the reports in their study are released simultaneously with other news about the firms, such as dividend changes, stock splits, capital raisings, mergers, major management changes, credit rating changes, lawsuits, and significant new contracts and/or product introductions.

Altinkılıç and Hansen (2009) take this concern further, questioning the extent to which recommendation revisions are informative. They suggest previous studies find a high level of informativeness of analysts' revisions because they measure daily returns, incorporating confounding effects of related news and announcements. For the period 1997 – 2003 they find that almost 80% of the recommendation revisions are released hours after firms' earnings announcements and after other related news announcements. To analyse the market reaction to recommendation revisions they measure returns around a three-day window, defining the pre-announcement period as the day before the revision and the first part of the revision before the recommendation is released. The event period considers 40 minutes centred on the recommendation announcements. Finally, the post-recommendation period begins after the 40 minute window and ends the following day. Altinkılıç and Hansen find pre-revision returns are economically and statistically significant and associated with corporate events announced before the recommendation revision. They link these returns with previous corporate events because of the high proportion of revisions following firm news. To control for the possibility of having a biased low market reaction to recommendation revisions as a consequence of the size of the event window, they expand the event window to one and two hours

around the recommendation, finding similar results. An additional control that they do not make is to identify the time of the corporate announcements and compare the market responses around those announcements and around the analyst revisions to determine which is more informative.

There are a handful of studies of the impact of analyst recommendations in Australia. For the period November 1996 to March 2002, Chan et al. (2006) measure market-adjusted returns in the six months following stock recommendations and find the returns differ from zero. Measuring six months market-adjusted returns starting two weeks before the recommendation date, they find support for the idea that analysts may be following recent corporate events. However, Chan et al. interpret their findings as produced by an information leakage or a tendency to follow recent price trends. Examining the extent to which analyst recommendations contribute to the abnormal performance of active Australian small-cap equity funds, Comerton-Forde et al. (2009) measure cumulative abnormal returns (CARs) on the 20 days around analyst recommendations dates. For continuing coverage recommendations they find CARs are significantly different from zero and in the direction of the recommendation. Comerton-Forde et al. recognise analyst revisions typically occur around earnings announcements and around new information events. In fact, their results provide evidence consistent with the idea that analysts piggyback on previous information, because the direction and significance of the CAR is evident in the ten days before the recommendation date as well. Using a sample of 267 recommendation revisions about 40 firms trading on the ASX in the period 1998 – 1999, Laohapolwatana et al. (2006) investigate the relation between the number of voluntary disclosures and the number of recommendation revisions. To account for voluntary disclosures they use data of announcements released by firms under continuous disclosure requirements and also the number of news related to the firms. Even though no evidence of the simultaneity of announcements and recommendations is provided, the study reflects a positive relation between the quantity of announcements and the number of recommendation revisions. This literature review shows recent works challenge the role of analysts as developers of private information, and even as interpreters of public information.

### 4.3. Hypotheses Development and Methodology

To put in context our contribution to the literature we relate our terminology to that used by Altinkılıç and Hansen (2009). We distinguish between a strong and a weak form of piggybacking. The strong form is that found in Altinkılıç and Hansen, where analyst revisions are an information free event disguised by the fact that analysts modify their recommendations promptly giving the illusion that the market reaction to corporate news is instead a response to the information provided by analysts. The alternative view of a weak form of piggybacking rests on the idea that analysts' contribution could be enhanced by the proximity of relevant corporate announcements but not necessarily be explained only by them. To determine whether the information content of analyst revisions is affected by their proximity to relevant corporate news we split the sample of analyst recommendation revisions into two groups. MSA-related revisions are those released in a 7-day window around MSAs disclosed by the firm. The window starts 3 trading days before and finishes 3 days after the release of a MSA by the firm. Standalone revisions are those that are outside the aforementioned window and therefore not motivated or contaminated by MSAs. In order to deal with confounding effects we compare the market reaction to MSA-related revisions with market reactions to two control groups. The first control group is that of standalone revisions. The second control group contains those MSAs not closely preceded or followed by analyst revisions; standalone MSAs matched by announcement type.

Hypothesis 1 analyses the way in which proximity to relevant corporate news affects the information content of analyst revisions. Generally, support for some form of analyst piggybacking would be present if the market reaction to MSA-related revisions exceeds the market reaction to standalone revisions.

*H<sub>1</sub>: The market reaction to MSA-related analyst revisions is larger than the market reaction to standalone revisions.*

The following three hypotheses assume  $H_1$  is corroborated and are designed to distinguish between the two forms of piggybacking, weak or strong. Each hypothesis separately considers pre-MSA revisions, same-day revisions and post-MSA revisions. Testing these three hypotheses we perform a finer analysis to estimate which analyst role benefits the most from the proximity of corporate news. Is it their role as a producer of private information? Or is it their role as interpreters and disseminators of information already disclosed by firms? Finding support for the weak form of piggybacking for pre-MSA revisions is associated with analysts' role as producers of private information, while support for the weak form of piggybacking for same-day and post-MSA revisions is related to their ability to process, understand and/or disseminate public information.

Hypothesis 2 is related to pre-MSAs revisions and corresponds to the left portion of Figure 4.1. The natural control group to test the weak form of piggybacking for the sample of pre-MSA revisions is the group of standalone revisions.

*H<sub>2</sub>: The market reaction to pre-MSA analyst revisions is larger than the market reaction to standalone analyst revisions.*

Support for the weak form of piggybacking and to the role of analysts as producers of private information will be provided if the market reaction to pre-MSA revisions is larger than the market reaction to standalone revisions.

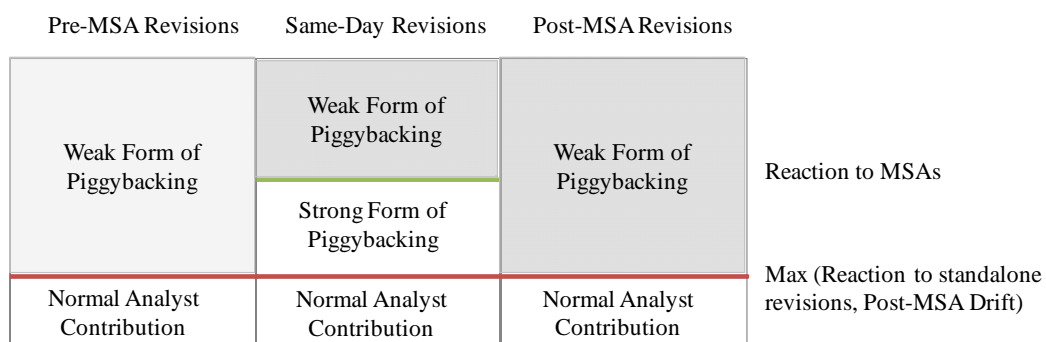
Our third hypothesis is concerned with same-day recommendation revisions. These revisions are suspected of incurring in the strong form of piggybacking on corporate news. That is, we expect that much of the market reaction during these days is caused by the corporate announcement itself more than by the analyst recommendation revision. As a consequence, as observed in the central portion of Figure 4.1, the control group to determine the information contribution of these revisions is the group of standalone MSAs matched by announcement type, instead of standalone revisions. We believe the market reaction to standalone MSAs is larger than the market reaction to standalone revisions. The main reason to support this view is that, by the ASX definition, MSAs should contain information that is expected to affect investors' choices to buy or sell a firm's securities. Additionally,

MSAs are released by the ASX on a centralised platform that all investors can access, as opposed to analyst revisions that are released to a restricted number of each analyst’s clients. The difference between the market reaction to same-day revisions and the market reaction to the control group of MSAs, if positive in absolute terms, will indicate the presence of the weak form of piggybacking and will determine the extent of the analysts’ contribution as interpreters and/or disseminators of public information. A negative difference would imply a strong form of analyst piggybacking on announcement day. That is, analyst revisions do not add information to the market on top of the typical MSAs.

*H<sub>3</sub>: The market reaction to same-day analyst revisions is larger than the market reaction to MSAs.*

Figure 4.1  
Weak and Strong forms of Piggybacking

This figure is a graphical representation of the weak and strong forms of piggybacking by analyst recommendation revisions. The left portion of the figure represents H<sub>2</sub>, where a market reaction in excess of the market reaction for the control group of standalone revisions is evidence in support of the weak form of piggybacking and of the role of analysts as producers of private information. The centre of the figure is related to H<sub>3</sub>. Support for the weak form of analyst piggybacking and for the role of analysts as interpreters and/or disseminators of public information is provided if the market reaction to same-day revisions is higher than the market reaction to the control group of MSAs. The right portion of the figure depicts H<sub>4a</sub> and H<sub>4b</sub>, where support for the weak form of analyst piggybacking is found if the market reaction to post-MSA revisions exceeds both the market reaction to the control group of standalone revisions and the delayed market reaction to the control group of MSAs (post-MSA drift).



Producers of private information

Interpreters and/or disseminators of public information

Analysts' contribution as interpreters and/or disseminators of public information is also tested using post-MSA revisions. Two alternative benchmarks are employed to determine to what extent analyst revisions contribute information after relevant corporate news are made public. The first control group is standalone revisions, the same used for pre-MSA revisions. The second control group is delayed market reaction to MSAs (Post-MSA drift). As can be seen in the right portion of Figure 4.1, support for the weak form of piggybacking and for analysts' contribution as interpreters and/or disseminators of public information will be provided if the market reaction to post-MSA revisions is larger than the post-MSA drift or standalone revisions, whichever is larger.

*H<sub>4a</sub>: The market reaction to post-MSA analyst revisions is larger than the market reaction to standalone analyst revisions.*

*H<sub>4b</sub>: The market reaction to post-MSA analyst revisions is larger than the delayed market reaction to MSAs (post-MSA drift).*

The market reaction is measured separately for upward and downward revisions using abnormal returns and abnormal volume. Abnormal returns are calculated subtracting the same day All Ordinaries Index return. Abnormal volume is calculated subtracting the average daily volume for the fiscal year from the volume on the day a revision is released and dividing it by the average daily volume for the fiscal year. Positive (negative) differences in abnormal return for upgrades (downgrades) for pre-MSA revisions can be associated with new information being produced by analysts in excess of the typical amount of information produced in standalone revisions. For same-day and post-MSA revisions these differences could be understood to be either a contribution derived of analysts' ability to interpret recently released information or the product of their dissemination activities. Differences in abnormal volume can be interpreted with analysts' role as disseminators of information already impounded into prices.

#### **4.4. Sample Description**

Analyst revisions are sourced from the Institutional Brokers' Estimate System (I/B/E/S) database. There are eight types of revisions – four positive (+1; +2; +3; +4) and four negative (-1; -2; -

3; -4) – according to the change of recommendations from and to any of the following five categories: strong buy, buy, hold, sell and strong sell. Stock prices, trading information and announcements are sourced from Securities Industry Research Centre of Asia-Pacific (SIRCA). To determine the information content of analyst revisions we create an experiment using a sample group of analyst revisions and two control groups. The sample group – MSA-related revisions – consists of changes in analyst recommendations for firms trading on the ASX during the 2005 – 2009 period released within a 7-day window around MSAs released by the firm. The window starts 3 trading days before and finishes 3 days after the release of a MSA by the firm. The first control group – standalone revisions – consists of analyst revisions released outside the 7-day window around MSAs. The second control group contains 24,079 MSAs released by companies in the sample group that are not surrounded by analyst recommendations.

We use both all MSA-related and standalone revisions, and a restricted sample of consistent MSA-related and standalone revisions. To consider a revision as consistent, the sign of the market adjusted return on the revision day must coincide with the sign of the revision. Table 4.1 reports that the proportion of revisions distributed within the 7-day window around MSAs is 43% for all revisions and 45% for consistent revisions. These figures are well under the 80% proportion of revisions in response to corporate events documented by Altinkılıç and Hansen (2009). If the window is extended to 11 and 21 days around MSAs, the proportion of revisions increases to 57% and 71%, respectively. The proportion of consistent revisions is slightly higher for MSA-related revisions (55%) than for standalone revisions (52%). For the entire sample, the proportion of revisions that are followed by a return of an opposite sign is (46%) higher than the 32% reported by Loh and Stulz (2011). The final sample consists of 435 firms. When only consistent revisions are considered, the number of firms is reduced to 249.

Table 4.1

## Distribution of Analyst Revisions

This table reports the distribution of analyst revisions released for firms trading on the ASX during the 2005 – 2009 period. In Panel A, analyst revisions are split into those released within three days before or after a MSA (MSA-Related) and those revisions outside the 7-day window (standalone revisions). Panel B divides MSA-related revisions among those released in the three days before a MSA (Pre-MSA), those released on the day a MSA is released (same-day), and those released in the three days that follow the release of a MSA (Post-MSA). Two sample groups are described. One unrestricted containing all analyst revisions. The other sample group, consistent revisions, includes only revisions for which the sign of the market adjusted return on the revision day coincides with the sign of the revision.

## Panel A. MSA-Related and Standalone Analyst Revisions

| Group       | All Analyst Revisions |            |       | Consistent Analyst Revisions |            |       |
|-------------|-----------------------|------------|-------|------------------------------|------------|-------|
|             | Upgrades              | Downgrades | Total | Upgrades                     | Downgrades | Total |
| Standalone  | 2,766                 | 2,830      | 5,596 | 1,399                        | 1,523      | 2,922 |
| MSA-Related | 2,115                 | 2,128      | 4,243 | 1,108                        | 1,237      | 2,345 |
| Total       | 4,881                 | 4,958      | 9,839 | 2,507                        | 2,760      | 5,267 |

## Panel B. MSA-Related Analyst Revisions by Period around MSAs

| Period   | All Analyst Revisions |            |       | Consistent Analyst Revisions |            |       |
|----------|-----------------------|------------|-------|------------------------------|------------|-------|
|          | Upgrades              | Downgrades | Total | Upgrades                     | Downgrades | Total |
| Pre-MSA  | 187                   | 211        | 398   | 86                           | 121        | 207   |
| Same-Day | 732                   | 741        | 1,473 | 402                          | 413        | 815   |
| Post-MSA | 1,196                 | 1,176      | 2,372 | 620                          | 703        | 1,323 |

## Panel C. MSA-Related Analyst Revisions by Day around MSAs

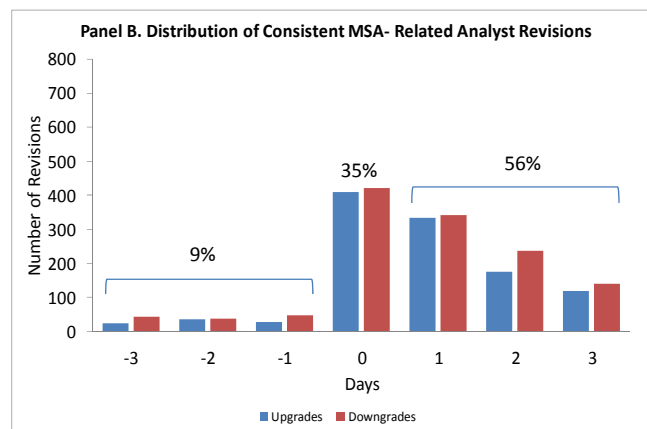
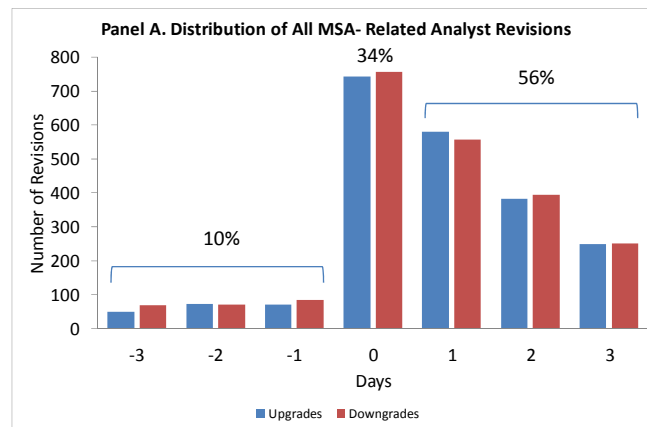
| Day | All Analyst Revisions |            |       | Consistent Analyst Revisions |            |       |
|-----|-----------------------|------------|-------|------------------------------|------------|-------|
|     | Upgrades              | Downgrades | Total | Upgrades                     | Downgrades | Total |
| -3  | 49                    | 62         | 111   | 24                           | 38         | 62    |
| -2  | 70                    | 69         | 139   | 35                           | 37         | 72    |
| -1  | 68                    | 80         | 148   | 27                           | 46         | 73    |
| 0   | 732                   | 741        | 1,473 | 402                          | 413        | 815   |
| 1   | 572                   | 549        | 1,121 | 329                          | 336        | 665   |
| 2   | 377                   | 382        | 759   | 171                          | 228        | 399   |
| 3   | 247                   | 245        | 492   | 120                          | 139        | 259   |

When MSA-related revisions are split into pre, post and same day, Table 4.1 and Figure 4.2 report the largest group of revisions occurs in the three days that follow MSAs (2,372 revisions). The second group in importance is the same day a MSAs is released with 1,473 revisions. Finally, in the three days before a MSA is released, there are 398 analyst revisions. Similar proportions of post (55%), same-day (35%) and pre-MSA revisions (10%) are observed for the group of consistent

revisions. The same day MSAs are disclosed is the single day in which the largest number of revisions occurs. The second most frequent day in terms of number of revisions is the day after a MSA is disclosed.

Figure 4.2  
Distribution of MSA-Related Analyst Revisions

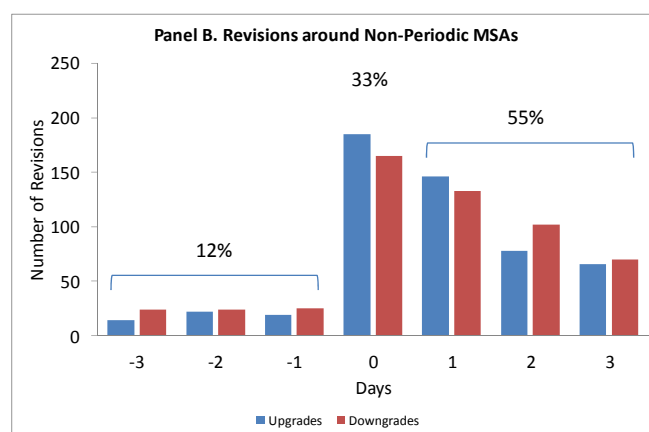
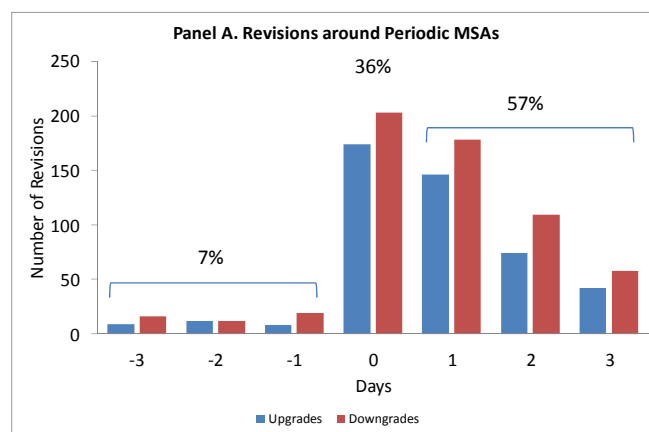
This figure shows the distribution of MSA-related revisions around MSAs. Panel A contains all analyst recommendation revisions. In Panel B the sample is reduced to consistent recommendation revisions.



The distribution pattern is present both around periodic and non-periodic MSAs as shown in Figure 4.3. This finding indicates analysts appear to be more comfortable changing recommendations as a reaction to corporate news rather than in anticipation to them.

Figure 4.3  
Distribution of Analyst Revisions around Periodic and Non-Periodic MSAs

This figure shows the distribution of MSA-related revisions around MSAs. Panel A contains analyst recommendation revisions around periodic MSAs. Panel B contains analyst recommendation revisions around non-periodic MSAs.



## 4.5. Results

### 4.5.1. Information Content of Standalone and MSA-Related Analyst Revisions

Overall, the information content of analyst revisions is partially supported by our results in Panel A of Table 4.2. Mean and median abnormal returns on all upward and downward revisions are statistically different from zero. However, upgrades have little economic relevance with a 9 basis points median abnormal return. Downgrades exhibit a higher market reaction with a -38 (-33) basis points mean (median) abnormal return. At the turnover level, figures are even less supportive showing negative median abnormal volume for both upgrades and downgrades. When only consistent revisions

are considered (Panel B) abnormal returns are both economically and statistically significant.

However, median abnormal volume remains negative for upgrades and downgrades.

Table 4.2  
Market Reaction to MSA-Related and Standalone Analyst Revisions

This table compares the market reaction to different groups of MSA-related analyst revisions (pre, post and same day) for firms trading on the ASX during the 2005 – 2009 period. Panel A reports differences in the market reaction following all upward and downward analyst revisions. Panel B reports differences in the market reaction following consistent upward and downward analyst revisions. Market reaction is measured using both absolute abnormal return and abnormal volume. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively using a t-test (Wilcoxon sign-ranked test).

| Panel A. All Revisions |   |   |   |   |
|------------------------|---|---|---|---|
| Group/Period           | Abnormal Return                                 |   | Abnormal Volume                               |   |
|                        | Upgrades  | Downgrades  | Upgrades                                      | Downgrades                                    |
| All Revisions          | 0.26% <sup>***</sup><br>[0.09% <sup>***</sup> ] | -0.38% <sup>**</sup><br>[-0.33% <sup>***</sup> ]  | 0.29 <sup>***</sup><br>[-0.06 <sup>*</sup> ]  | 0.31 <sup>***</sup><br>[-0.09]                |
| MSA-Related            | 0.43%<br>[0.17%]                                | -0.62%<br>[-0.50%]                                | 0.59<br>[0.06]                                | 0.69<br>[0.05]                                |
| Standalone             | 0.13%<br>[0.02%]                                | -0.20%<br>[-0.19%]                                | 0.06<br>[-0.15]                               | 0.01<br>[-0.20]                               |
| Difference             | 0.30% <sup>***</sup><br>[0.15% <sup>**</sup> ]  | -0.42% <sup>***</sup><br>[-0.31% <sup>***</sup> ] | 0.52 <sup>***</sup><br>[0.22 <sup>***</sup> ] | 0.68 <sup>***</sup><br>[0.25 <sup>***</sup> ] |

| Panel B. Consistent Revisions |   |   |  |   |
|-------------------------------|---|---|--|---|
| Group/Period                  | Abnormal Return                                 |   | Abnormal Volume                                |   |
|                               | Upgrades  | Downgrades  | Upgrades                                       | Downgrades                                    |
| All Revisions                 | 2.56% <sup>***</sup><br>[1.60% <sup>***</sup> ] | -2.69% <sup>***</sup><br>[-1.57% <sup>***</sup> ] | 0.34 <sup>***</sup><br>[-0.02 <sup>***</sup> ] | 0.34 <sup>***</sup><br>[-0.09]                |
| MSA-Related                   | 3.15%<br>[1.89%]                                | -3.35%<br>[-1.85%]                                | 0.63<br>[0.15]                                 | 0.76<br>[0.05]                                |
| Standalone                    | 2.09%<br>[1.36%]                                | -2.15%<br>[-1.33%]                                | 0.11<br>[-0.15]                                | -0.01<br>[-0.21]                              |
| Difference                    | 1.06% <sup>***</sup><br>[0.53% <sup>***</sup> ] | -1.20% <sup>***</sup><br>[-0.52% <sup>***</sup> ] | 0.52 <sup>***</sup><br>[0.29 <sup>***</sup> ]  | 0.76 <sup>***</sup><br>[0.27 <sup>***</sup> ] |

When revisions are split into those closely related to MSAs and those released separated from MSAs we find that analyst revisions benefit from neighbouring corporate news. Table 4.2 reports that the market reaction on days with MSA-related revisions is significantly larger than that of days with standalone analyst revisions both for all revisions (Panel A) and for consistent revisions (Panel B). For all revisions, Panel A reports that the median abnormal return on days with MSA-related revisions exceeds the return on days with standalone revisions by 15 basis points for upgrades and -31 basis points for downgrades. For consistent revisions the difference in medians is larger, 53 bps and -52 bps for upward and downward revisions, respectively. Differences of means for the entire sample and for

consistent revisions are more pronounced. Similarly, mean and median abnormal volume on MSA-related days exceeds that of standalone revision days by about 30%. These differences in means and medians are statistically significant at the 1% level in most cases. The increased information content of recommendation revisions in the proximity of corporate news observed in Table 4.2 could be linked to either form of piggybacking, weak or strong. Additionally, if analysts genuinely contribute new information around MSAs (weak form) it is still to be determined whether they are more valued as producers of private information or as interpreters and/or disseminators of public information. The following sections explore both these possibilities.

#### *4.5.2. Information Content of Pre-MSA, Same-Day and Post-MSA Analyst Revisions*

Comparing the market reaction to MSA-related revisions released before, on the same day and after relevant corporate news, Table 4.3 reports that investors have a stronger reaction when recommendation revisions are released either on the same day or the day after a MSA is disclosed. For the entire sample, Panel A in Table 4.3 exhibits a different market reaction to upward and downward revisions. For all upgrades, the highest abnormal return occurs when revisions are released on the same day a MSA is disclosed. For all downgrades, it is post-MSA revisions that get the highest return reaction. However, most differences of means and medians at the abnormal return level are not statistically significant. At the abnormal volume level, investors react more strongly to same-day and post-MSA revisions, compared to pre-MSA revisions. This behaviour is more noticeable when the sample is restricted to consistent recommendation revisions. Panel B of Table 4.3 reports that consistent post-MSA revisions are more informative than consistent pre-MSA revisions using both the abnormal return and the abnormal volume measures. Similarly, the market reaction to consistent same-day revisions is significantly larger than the market reaction to both pre-MSA and post-MSA revisions. These results hold when measuring abnormal return and abnormal volume for both upgrades and downgrades. The main distinction is that the difference between the market reaction to same-day and pre-MSA revisions as well as the difference between the market reaction to post-MSA and pre-MSA revisions is larger for downgrades.

Table 4.3  
Market Reaction to MSA-Related Analyst Revisions by Period

This table reports results from comparing the market reaction to different groups of MSA-related analyst revisions (pre, post and same day) for firms trading on the ASX during the 2005 – 2009 period. Panel A reports differences in the market reaction following all upward and downward analyst revisions. Panel B reports differences in the market reaction following consistent upward and downward analyst revisions. Market reaction is measured using both absolute abnormal return and abnormal volume. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively using t-test (Wilcoxon sign-ranked test).

| Panel A. All Revisions        |                        |                          |                      |                      |
|-------------------------------|------------------------|--------------------------|----------------------|----------------------|
| Group/Period                  | Abnormal Return        |                          | Abnormal Volume      |                      |
|                               | Upgrades               | Downgrades               | Upgrades             | Downgrades           |
| Pre-MSA                       | -0.29%<br>[-0.12%]     | -0.16%<br>[-0.38%]       | 0.10<br>[-0.09]      | 0.03<br>[-0.19]      |
| Same-Day                      | 0.63%<br>[0.32%]       | -0.64%<br>[-0.46%]       | 0.85<br>[0.15]       | 0.96<br>[0.17]       |
| Post-MSA                      | 0.42%<br>[0.17%]       | -0.69%<br>[-0.53%]       | 0.50<br>[0.05]       | 0.65<br>[0.05]       |
| Post – Pre                    | 0.71%**<br>[0.29%**]   | -0.53%<br>[-0.15%*]      | 0.40*<br>[0.14***]   | 0.62***<br>[0.24***] |
| Same - Pre                    | 0.92%*<br>[0.44%**]    | -0.48%<br>[-0.08%]       | 0.75***<br>[0.25***] | 0.93***<br>[0.37***] |
| Same - Post                   | 0.21%<br>[0.15%]       | 0.06%<br>[0.07%]         | 0.35**<br>[0.11*]    | 0.31**<br>[0.12***]  |
| Panel B. Consistent Revisions |                        |                          |                      |                      |
| Group/Period                  | Abnormal Return        |                          | Abnormal Volume      |                      |
|                               | Upgrades               | Downgrades               | Upgrades             | Downgrades           |
| Pre-MSA                       | 1.95%<br>[1.44%]       | -2.05%<br>[-1.30%]       | 0.14<br>[-0.07]      | -0.06<br>[-0.21]     |
| Same-Day                      | 4.07%<br>[2.40%]       | -4.30%<br>[-2.41%]       | 0.82<br>[0.21]       | 1.17<br>[0.22]       |
| Post-MSA                      | 2.72%<br>[1.70%]       | -3.02%<br>[-1.79%]       | 0.52<br>[0.14]       | 0.66<br>[0.03]       |
| Post – Pre                    | 0.77%**<br>[0.26%]     | -0.97%**<br>[-0.49%**]   | 0.38**<br>[0.21***]  | 0.72***<br>[0.25***] |
| Same - Pre                    | 2.12%***<br>[0.96%***] | -2.25%***<br>[-1.11%***] | 0.68**<br>[0.28***]  | 1.23***<br>[0.43***] |
| Same - Post                   | 1.36%***<br>[0.70%***] | -1.28%***<br>[-0.62%***] | 0.30**<br>[0.07*]    | 0.51**<br>[0.18***]  |

A higher market reaction to same-day and post-MSA could be attributed to investors valuing analysts' ability to interpret and disseminate public information more highly than their skills to anticipate corporate news by producing private information. However, it could also be interpreted as evidence of analysts reacting to corporate news simultaneously with investors and providing no additional information or guidance (strong form of piggybacking). The stronger market reaction to

same-day and post-MSA downward revisions could be interpreted as analysts either proving to be more helpful in understanding and spreading bad news or just benefiting from investors' higher reaction to bad news. To disentangle this dichotomy we further compare market reaction to pre-MSA, same day and post-MSA analyst recommendation revisions with market reaction to their corresponding control groups.

Table 4.4 compares the market reaction (abnormal return and abnormal volume) to consistent MSA-related revisions released on days -3, -2, -1, 0, +1, +2 and +3 relative to MSAs with the market reaction to the control groups consisting of standalone revisions, MSAs, and post-MSA drift as per section 4.3. The market reaction to consistent upward and downward revisions is reported in Panels A and B, respectively<sup>18</sup>. The top part of each panel reports the market reaction to the sample of pre-MSA revisions and the control group of standalone revisions. There is no clear pattern indicating analyst revisions become more valuable to investors the closer they are released relative to corporate news. Median abnormal return and median abnormal volume for upward revisions increase monotonically as revisions are released closer to a MSA, but such behaviour is neither observed for mean values, nor for mean or median values for downgrades. More importantly, the market reaction to upward and downward revisions released on days 3, 2 and 1 before a MSA is not different from the market reaction to the control group of standalone recommendation revisions. Similar results are found when all pre-MSA revisions are compared as a group with standalone revisions (upgrades and downgrades separately). The first finding from the results reported in Table 4.4 is that analysts do not benefit from releasing revisions in anticipation of relevant corporate news.

The performance of same-day recommendation revisions is analysed in the central part of Panels A and B in Table 4.4. For upward revisions, the median abnormal return is 30 basis points higher than the average abnormal return for all MSA types<sup>19</sup> and this result is significant at the 10% level. Median abnormal volume is significantly higher than the values from the control group of MSAs at the 1% level. For downward revisions, Panel B is even more supportive of the information

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<sup>18</sup> Panels C and D report identical figures for pre-MSA and same-day revisions. Standalone revisions are replaced as control group for post-MSA revisions by post-MSA drift.

<sup>19</sup> At this point we use average abnormal return and volume across announcement types. In the following section we use each announcement type average measure as a control.

contribution of analyst revisions either by means of interpretation of recently released corporate news or by alerting investors when a truly relevant piece of information hits the market. Mean (median) abnormal return on days when analyst downgrades coincide with MSAs is 150 (77) basis points lower than on days with standalone bad news MSAs. Similarly, abnormal volume on same-day downgrades exceeds abnormal volume on standalone bad news MSAs. These differences are significant at the 1% level.

The market reaction to post-MSA revisions is larger for both upward and downward revisions compared to the pre-MSA revisions. Panel A reports consistent MSA-related upgrades using standalone revisions as the benchmark for Post-MSAs. A monotonic decrease is evident in the median abnormal return as well as in the mean and median abnormal volume. The only exception to this pattern is in the mean abnormal returns that are at a peak when upgrades are released two days after a MSA. Moreover, the abnormal returns on days 1 and 2 after a MSA exceed the typical mean (median) abnormal return on standalone upward revisions by 69 (47) and 84 (33) basis points, respectively. An analogous picture is observed when abnormal volume figures are analysed, with both measures significantly higher than the values for the control group at the 1% level. Revisions released three days after relevant corporate news are no different from standalone upgrades. A uniform increase in the abnormal return and an even decrease in abnormal volume are reported for post-MSA downgrades in Panel B. These patterns are consistent with the evidence for upward revisions in Panel A; the closer the revisions are released relative to corporate news, the more informative the revisions. Downgrades released the day after a MSA possess the highest abnormal return and abnormal volume over standalone downward revisions<sup>20</sup>. Overall, results in Table 4.4 using consistent revisions support analysts' contribution to the information environment of the firms, either as interpreters or disseminators of public information. In particular, downward revisions are more valuable when released promptly – on the same day or on the days after a MSA is disclosed – while upward revisions are more relevant when released two days after relevant corporate news are made public.

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<sup>20</sup> Panels C and D in Table 4.4 abnormal return differences are even more pronounced and extend to revisions released three days after MSAs. The reason for these results is because the post-MSA drift (the alternative control group used) is negligible.

Table 4.4

## Market Reaction to Consistent MSA-Related Analyst Revisions

This table analyses market reaction to consistent analyst revisions released within 3 trading days around market sensitive announcements (MSAs) for firms trading on the ASX during the 2005 – 2009 period. The benchmark used to test the weak form of piggybacking for the group of pre-MSA revisions is the market reaction to the standalone revisions. For the group of same-day revisions the control is the market reaction to MSAs. Finally, for post-MSA recommendation revisions two control are used. One group is the market reaction to the standalone revisions. The other group is the delayed market reaction to MSAs. Market reaction is measured using both abnormal return and abnormal volume. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively using t-test (Wilcoxon sign-ranked test).

## Panel A. Consistent MSA-Related Upgrades using Standalone Revisions as Benchmark for Post-MSAs

| Day relative to MSA | Observations |         | Abnormal Return  |                  |                        | Abnormal Volume  |                 |                      |
|---------------------|--------------|---------|------------------|------------------|------------------------|------------------|-----------------|----------------------|
|                     | Sample       | Control | Sample           | Control          | Difference             | Sample           | Control         | Difference           |
| -3                  | 24           | 1,399   | 1.45%<br>[1.07%] | 2.09%<br>[1.36%] | -0.64%<br>[-0.29%]     | -0.08<br>[-0.23] | 0.11<br>[-0.15] | -0.19<br>[-0.09]     |
| -2                  | 35           | 1,399   | 2.30%<br>[1.56%] | 2.09%<br>[1.36%] | 0.21%<br>[0.20%]       | 0.23<br>[-0.11]  | 0.11<br>[-0.15] | 0.13<br>[0.04]       |
| -1                  | 27           | 1,399   | 1.95%<br>[1.74%] | 2.09%<br>[1.36%] | -0.14%<br>[0.38%]      | 0.22<br>[0.15]   | 0.11<br>[-0.15] | 0.12<br>[0.29]       |
| 0                   | 402          | 12,990  | 4.11%<br>[2.46%] | 3.93%<br>[2.10%] | 0.14%<br>[0.30%*]      | 0.82<br>[0.21]   | 0.62<br>[-0.04] | 0.20<br>[0.25***]    |
| +1                  | 329          | 1,399   | 2.78%<br>[1.83%] | 2.09%<br>[1.36%] | 0.69%***<br>[0.47%***] | 0.68<br>[0.31]   | 0.11<br>[-0.15] | 0.57***<br>[0.46***] |
| +2                  | 171          | 1,399   | 2.93%<br>[1.69%] | 2.09%<br>[1.36%] | 0.84%***<br>[0.33%***] | 0.57<br>[0.18]   | 0.11<br>[-0.15] | 0.46***<br>[0.32***] |
| +3                  | 120          | 1,399   | 2.26%<br>[1.29%] | 2.09%<br>[1.36%] | 0.17%<br>[-0.07%]      | 0.03<br>[-0.17]  | 0.11<br>[-0.15] | -0.08<br>[-0.02]     |

## Panel B. Consistent MSA-Related Downgrades using Standalone Revisions as Benchmark for Post-MSAs

| Day relative to MSA | Observations |         | Abnormal Return    |                    |                          | Abnormal Volume  |                  |                      |
|---------------------|--------------|---------|--------------------|--------------------|--------------------------|------------------|------------------|----------------------|
|                     | Sample       | Control | Sample             | Control            | Difference               | Sample           | Control          | Difference           |
| -3                  | 38           | 1,523   | -2.12%<br>[-1.61%] | -2.15%<br>[-1.33%] | 0.02%<br>[-0.28%]        | 0.08<br>[-0.01]  | -0.01<br>[-0.21] | 0.09<br>[0.20]       |
| -2                  | 37           | 1,523   | -2.11%<br>[-1.11%] | -2.15%<br>[-1.33%] | 0.03%<br>[0.23%]         | -0.08<br>[-0.31] | -0.01<br>[-0.21] | -0.07<br>[-0.10]     |
| -1                  | 46           | 1,523   | -2.03%<br>[-1.29%] | -2.15%<br>[-1.33%] | -0.11%<br>[-0.05%]       | -0.09<br>[-0.25] | -0.01<br>[-0.21] | -0.08<br>[-0.04]     |
| 0                   | 413          | 11,089  | -4.30%<br>[-2.41%] | -2.80%<br>[-1.62%] | -1.50%***<br>[-0.79%***] | 1.17<br>[0.22]   | 0.35<br>[-0.18]  | 0.82***<br>[0.40***] |
| +1                  | 336          | 1,523   | -3.71%<br>[-2.11%] | -2.15%<br>[-1.33%] | -1.57%***<br>[-0.77%***] | 1.04<br>[0.21]   | -0.01<br>[-0.21] | 1.05***<br>[0.42***] |
| +2                  | 228          | 1,523   | -2.37%<br>[-1.67%] | -2.15%<br>[-1.33%] | -0.22%*<br>[-0.34%*]     | 0.42<br>[-0.02]  | -0.01<br>[-0.21] | 0.43***<br>[0.19***] |
| +3                  | 139          | 1,523   | -2.40%<br>[-1.49%] | -2.15%<br>[-1.33%] | -0.26%<br>[-0.15%]       | 0.10<br>[-0.14]  | -0.01<br>[-0.21] | 0.11<br>[0.07*]      |

Table 4.4 (Continued)  
Market Reaction to Consistent MSA-Related Analyst Revisions

This table analyses market reaction to consistent analyst revisions released within 3 trading days around market sensitive announcements (MSAs) for firms trading on the ASX during the 2005 – 2009 period. The benchmark used to test the weak form of piggybacking for the group of pre-MSA revisions is the market reaction to the standalone revisions. For the group of same-day revisions the control is the market reaction to MSAs. Finally, for post-MSA recommendation revisions two control are used. One group is the market reaction to the standalone revisions. The other group is the delayed market reaction to MSAs. Market reaction is measured using both abnormal return and abnormal volume. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively using t-test (Wilcoxon sign-ranked test).

| Panel C. Consistent MSA-Related Upgrades using Post-MSA Drift as Benchmark for Post-MSAs |              |         |                  |                    |                        |                  |                 |                    |
|--|--------------|---------|------------------|--------------------|------------------------|------------------|-----------------|--------------------|
| Day relative to MSA  | Observations |         | Abnormal Return  |                    |                        | Abnormal Volume  |                 |                    |
|  | Sample       | Control | Sample           | Control            | Difference             | Sample           | Control         | Difference         |
| -3   | 24           | 1,399   | 1.45%<br>[1.07%] | 2.09%<br>[1.36%]   | -0.64%<br>[-0.29%]     | -0.08<br>[-0.23] | 0.11<br>[-0.15] | -0.19<br>[-0.09]   |
| -2   | 35           | 1,399   | 2.30%<br>[1.56%] | 2.09%<br>[1.36%]   | 0.21%<br>[0.20%]       | 0.23<br>[-0.11]  | 0.11<br>[-0.15] | 0.13<br>[0.04]     |
| -1   | 27           | 1,399   | 1.95%<br>[1.74%] | 2.09%<br>[1.36%]   | -0.14%<br>[-0.38%]     | 0.22<br>[0.15]   | 0.11<br>[-0.15] | 0.12<br>[0.29]     |
| 0  | 402          | 12,990  | 4.11%<br>[2.46%] | 3.93%<br>[2.10%]   | 0.14%<br>[0.30%*]      | 0.82<br>[0.21]   | 0.62<br>[-0.04] | 0.20<br>[0.25***]  |
| +1   | 329          | 12,990  | 2.78%<br>[1.83%] | 0.06%<br>[-0.15%]  | 2.72%***<br>[1.98%***] | 0.68<br>[0.31]   | 0.43<br>[-0.12] | 0.26<br>[0.43***]  |
| +2   | 171          | 12,990  | 2.93%<br>[1.69%] | 0.00%<br>[-0.12%]  | 2.93%***<br>[1.81%***] | 0.57<br>[0.18]   | 0.25<br>[-0.21] | 0.32*<br>[0.38***] |
| +3   | 120          | 12,990  | 2.26%<br>[1.29%] | -0.03%<br>[-0.11%] | 2.29%***<br>[1.40%***] | 0.03<br>[-0.17]  | 0.12<br>[-0.24] | -0.09<br>[0.08*]   |

| Panel D. Consistent MSA-Related Downgrades using Post-MSA Drift as Benchmark for Post-MSAs |              |         |                    |                    |                          |                  |                  |                      |
|--|--------------|---------|--------------------|--------------------|--------------------------|------------------|------------------|----------------------|
| Day relative to MSA  | Observations |         | Abnormal Return    |                    |                          | Abnormal Volume  |                  |                      |
|  | Sample       | Control | Sample             | Control            | Difference               | Sample           | Control          | Difference           |
| -3   | 38           | 1,523   | -2.12%<br>[-1.61%] | -2.15%<br>[-1.33%] | 0.02%<br>[-0.28%]        | 0.05<br>[-0.01]  | -0.01<br>[-0.21] | 0.06<br>[0.20]       |
| -2   | 37           | 1,523   | -2.11%<br>[-1.11%] | -2.15%<br>[-1.33%] | 0.03%<br>[0.23%]         | -0.08<br>[-0.31] | -0.01<br>[-0.21] | -0.07<br>[-0.10]     |
| -1   | 46           | 1,523   | -2.03%<br>[-1.29%] | -2.15%<br>[-1.33%] | 0.11%<br>[0.05%]         | -0.09<br>[-0.25] | -0.01<br>[-0.21] | -0.08<br>[-0.04]     |
| 0  | 413          | 11,089  | -4.30%<br>[-2.41%] | -2.80%<br>[-1.62%] | -1.50%***<br>[-0.79%***] | 1.18<br>[0.24]   | 0.35<br>[-0.18]  | 0.83***<br>[0.42***] |
| +1   | 336          | 11,089  | -3.71%<br>[-2.11%] | -2.15%<br>[-1.33%] | -1.57%***<br>[-0.77%***] | 1.04<br>[0.21]   | -0.01<br>[-0.21] | 1.05***<br>[0.42***] |
| +2   | 228          | 11,089  | -2.37%<br>[-1.67%] | -2.15%<br>[-1.33%] | -0.22%<br>[-0.34%*]      | 0.43<br>[-0.01]  | -0.01<br>[-0.21] | 0.43***<br>[0.19***] |
| +3   | 139          | 11,089  | -2.40%<br>[-1.49%] | -2.15%<br>[-1.33%] | -0.26<br>[-0.15%]        | 0.10<br>[-0.14]  | -0.01<br>[-0.21] | 0.11<br>[0.07*]      |

Table 4.5 extends the analysis in Table 4.4 to all recommendation revisions. Results are, as expected, weaker than those reported for consistent revisions. Panels A and C report that only upward revisions released on day +1 have positive excess abnormal return over the two control groups: standalone revisions and post-MSA drift. Support for the strong form of piggybacking is found for days -1 and 0. In particular, the mean (median) abnormal return for same-day revisions is 330 bps (178 bps) lower (at the 1% level) compared to the corresponding values for the control group of MSAs. Panels B and D reflect a similar situation for downward revisions. Same-day downgrades are less informative than the control group of MSAs; the mean abnormal return on same-day downgrades is 216 bps (115 bps) higher than that of days with standalone MSAs. Evidence of analysts' contribution is found for revisions released on day +1 and, to lesser extent, on day +2 relative to relevant corporate news.

#### *4.5.3. Drivers of Increased Information Content of MSA-Related Analyst Revisions*

In the previous section we find an increase in the information content of analyst revisions when they are released in the proximity of MSAs. More specifically, increased information content is found for consistent revisions released on days 0, +1 and +2 and on days +1 and +2 for all revisions. These findings highlight analysts' contribution to the price discovery process by means of their ability to interpret and/or disseminate public information. Besides these timing considerations, there are other characteristics that could contribute to the information content of MSA-related analyst revisions. In this section we analyse which analyst, firm, recommendation revision, and corporate news specific characteristics may enhance the information content of MSA-related revisions. In that respect, this section can be seen as a series of robustness tests to find out whether proximity to relevant corporate news is still a driver of increased informativeness when other key characteristics are considered.

Table 4.5

## Market Reaction to All MSA-Related Analyst Revisions

This table analyses market reaction to all analyst revisions released within 3 trading days around market sensitive announcements (MSAs) for firms trading on the ASX during the 2005 – 2009 period. The benchmark used to test the weak form of piggybacking for the group of pre-MSA revisions is the market reaction to the standalone revisions. For the group of same-day revisions the control is the market reaction to MSAs. Finally, for post-MSA recommendation revisions two control are used. One group is the market reaction to the standalone revisions. The other group is the delayed market reaction to MSAs. Market reaction is measured using both abnormal return and abnormal volume. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively using t-test (Wilcoxon sign-ranked test).

| Panel A. All MSA-Related Upgrades using Standalone Revisions as Benchmark for Post-MSAs |              |         |                    |                  |   |                  |                 |   |
|---|--------------|---------|--------------------|------------------|---|------------------|-----------------|---|
| Day relative to MSA   | Observations |         | Abnormal Return    |                  |   | Abnormal Volume  |                 |   |
|   | Sample       | Control | Sample             | Control          | Difference  | Sample           | Control         | Difference                                    |
| -3  | 49           | 2,766   | -0.52%<br>[-0.06%] | 0.13%<br>[0.02%] | -0.65%<br>[-0.08%]                                | -0.07<br>[-0.11] | 0.06<br>[-0.15] | -0.13<br>[0.04]                               |
| -2  | 70           | 2,766   | 0.18%<br>[0.00%]   | 0.13%<br>[0.02%] | 0.05%<br>[-0.02%]                                 | 0.20<br>[-0.11]  | 0.06<br>[-0.15] | 0.14<br>[0.04]                                |
| -1  | 68           | 2,766   | -0.60%<br>[-0.60%] | 0.13%<br>[0.02%] | -0.72% <sup>**</sup><br>[-0.62% <sup>*</sup> ]    | 0.12<br>[-0.03]  | 0.06<br>[-0.15] | 0.06<br>[0.13]                                |
| 0   | 732          | 12,990  | 0.63%<br>[0.32%]   | 3.93%<br>[2.10%] | -3.30% <sup>***</sup><br>[-1.78% <sup>***</sup> ] | 0.85<br>[0.15]   | 0.62<br>[-0.04] | 0.23 <sup>*</sup><br>[0.20 <sup>***</sup> ]   |
| +1  | 572          | 2,766   | 0.69%<br>[0.37%]   | 0.13%<br>[0.02%] | 0.56% <sup>***</sup><br>[0.35% <sup>***</sup> ]   | 0.58<br>[0.20]   | 0.06<br>[-0.15] | 0.52 <sup>***</sup><br>[0.35 <sup>***</sup> ] |
| +2  | 377          | 2,766   | 0.24%<br>[-0.13%]  | 0.13%<br>[0.02%] | 0.11%<br>[-0.15%]                                 | 0.62<br>[0.05]   | 0.06<br>[-0.15] | 0.56 <sup>***</sup><br>[0.20 <sup>***</sup> ] |
| +3  | 247          | 2,766   | 0.08%<br>[-0.10%]  | 0.13%<br>[0.02%] | -0.04%<br>[-0.12%]                                | 0.13<br>[-0.16]  | 0.06<br>[-0.15] | 0.06<br>[-0.01]                               |

| Panel B. All MSA-Related Downgrades using Standalone Revisions as Benchmark for Post-MSAs |              |         |                    |                    |   |                  |                 |   |
|---|--------------|---------|--------------------|--------------------|---|------------------|-----------------|---|
| Day relative to MSA   | Observations |         | Abnormal Return    |                    |   | Abnormal Volume  |                 |   |
|   | Sample       | Control | Sample             | Control            | Difference  | Sample           | Control         | Difference                                    |
| -3  | 62           | 2,830   | -0.39%<br>[-0.45%] | -0.20%<br>[-0.19%] | -0.19%<br>[-0.26%]                                | 0.03<br>[-0.11]  | 0.01<br>[-0.20] | 0.01<br>[0.09]                                |
| -2  | 69           | 2,830   | 0.05%<br>[-0.10%]  | -0.20%<br>[-0.19%] | 0.25%<br>[0.09%]                                  | -0.07<br>[-0.21] | 0.01<br>[-0.20] | -0.08<br>[-0.01]                              |
| -1  | 80           | 2,830   | -0.15%<br>[-0.54%] | -0.20%<br>[-0.19%] | 0.04%<br>[-0.35%]                                 | 0.11<br>[-0.25]  | 0.01<br>[-0.20] | 0.09<br>[-0.05]                               |
| 0   | 741          | 11,089  | -0.64%<br>[-0.46%] | -2.80%<br>[-1.62%] | 2.16% <sup>***</sup><br>[1.15% <sup>***</sup> ]   | 0.96<br>[0.17]   | 0.35<br>[-0.18] | 0.61 <sup>***</sup><br>[0.36 <sup>***</sup> ] |
| +1  | 549          | 2,830   | -1.02%<br>[-0.63%] | -0.20%<br>[-0.19%] | -0.82% <sup>***</sup><br>[-0.44% <sup>***</sup> ] | 0.99<br>[0.21]   | 0.01<br>[-0.20] | 0.98 <sup>***</sup><br>[0.41 <sup>***</sup> ] |
| +2  | 382          | 2,830   | -0.31%<br>[-0.52%] | -0.20%<br>[-0.19%] | -0.11% <sup>***</sup><br>[-0.33% <sup>***</sup> ] | 0.44<br>[0.02]   | 0.01<br>[-0.20] | 0.42 <sup>***</sup><br>[0.22 <sup>***</sup> ] |
| +3  | 245          | 2,830   | -0.55%<br>[-0.27%] | -0.20%<br>[-0.19%] | -0.35%<br>[-0.08%]                                | 0.19<br>[-0.14]  | 0.01<br>[-0.20] | 0.18 <sup>**</sup><br>[0.06 <sup>**</sup> ]   |

Table 4.5 (Continued)  
Market Reaction to All MSA-Related Analyst Revisions

This table analyses market reaction to all analyst revisions released within 3 trading days around market sensitive announcements (MSAs) for firms trading on the ASX during the 2005 – 2009 period. The benchmark used to test the weak form of piggybacking for the group of pre-MSA revisions is the market reaction to the standalone revisions. For the group of same-day revisions the control is the market reaction to MSAs. Finally, for post-MSA recommendation revisions two control are used. One group is the market reaction to the standalone revisions. The other group is the delayed market reaction to MSAs. Market reaction is measured using both abnormal return and abnormal volume. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively using t-test (Wilcoxon sign-ranked test).

| Panel C. All MSA-Related Upgrades using Post-MSA Drift as Benchmark for Post-MSAs |              |         |                    |                    |   |                  |                 |   |
|---|--------------|---------|--------------------|--------------------|---|------------------|-----------------|---|
| Day relative to MSA   | Observations |         | Abnormal Return    |                    |   | Abnormal Volume  |                 |   |
|   | Sample       | Control | Sample             | Control            | Difference  | Sample           | Control         | Difference                                    |
| -3  | 49           | 2,766   | -0.52%<br>[-0.06%] | 0.13%<br>[0.02%]   | -0.65%<br>[-0.08%]                                | -0.07<br>[-0.11] | 0.06<br>[-0.15] | -0.13<br>[0.04]                               |
| -2  | 70           | 2,766   | 0.18%<br>[0.00%]   | 0.13%<br>[0.02%]   | 0.05%<br>[-0.02%]                                 | 0.20<br>[-0.11]  | 0.06<br>[-0.15] | 0.14<br>[0.04]                                |
| -1  | 68           | 2,766   | -0.60%<br>[-0.60%] | 0.13%<br>[0.02%]   | -0.72% <sup>**</sup><br>[-0.62%]                  | 0.12<br>[-0.03]  | 0.06<br>[-0.15] | 0.06<br>[0.13]                                |
| 0   | 732          | 12,990  | 0.63%<br>[0.32%]   | 3.93%<br>[2.10%]   | -3.30% <sup>***</sup><br>[-1.78% <sup>***</sup> ] | 0.85<br>[0.15]   | 0.62<br>[-0.04] | 0.23 <sup>*</sup><br>[0.20 <sup>***</sup> ]   |
| +1  | 572          | 12,990  | 0.69%<br>[0.37%]   | 0.06%<br>[-0.15%]  | 0.63% <sup>***</sup><br>[0.52% <sup>***</sup> ]   | 0.58<br>[0.20]   | 0.43<br>[-0.12] | 0.15<br>[0.32 <sup>**</sup> ]                 |
| +2  | 377          | 12,990  | 0.24%<br>[-0.13%]  | 0.00%<br>[-0.12%]  | 0.24%<br>[-0.01%]                                 | 0.62<br>[0.05]   | 0.25<br>[-0.21] | 0.37 <sup>***</sup><br>[0.26 <sup>***</sup> ] |
| +3  | 247          | 12,990  | 0.08%<br>[-0.10%]  | -0.03%<br>[-0.11%] | 0.11%<br>[0.01%]                                  | 0.13<br>[-0.16]  | 0.12<br>[-0.24] | 0.01<br>[0.08 <sup>***</sup> ]                |

| Panel D. All MSA-Related Downgrades using Post-MSA Drift as Benchmark for Post-MSAs |              |         |                    |                    |   |                  |                 |   |
|---|--------------|---------|--------------------|--------------------|---|------------------|-----------------|---|
| Day relative to MSA   | Observations |         | Abnormal Return    |                    |   | Abnormal Volume  |                 |   |
|   | Sample       | Control | Sample             | Control            | Difference  | Sample           | Control         | Difference                                    |
| -3  | 62           | 2,830   | -0.39%<br>[-0.45%] | -0.20%<br>[-0.19%] | -0.19%<br>[-0.26%]                                | 0.03<br>[-0.11]  | 0.01<br>[-0.20] | 0.01<br>[0.09]                                |
| -2  | 69           | 2,830   | 0.05%<br>[-0.10%]  | -0.20%<br>[-0.19%] | 0.25%<br>[0.09%]                                  | -0.07<br>[-0.21] | 0.01<br>[-0.20] | -0.08<br>[-0.01]                              |
| -1  | 80           | 2,830   | -0.15%<br>[-0.54%] | -0.20%<br>[-0.19%] | 0.04%<br>[-0.35%]                                 | 0.11<br>[-0.25]  | 0.01<br>[-0.20] | 0.09<br>[-0.05]                               |
| 0   | 741          | 11,089  | -0.64%<br>[-0.46%] | -2.80%<br>[-1.62%] | 2.16% <sup>***</sup><br>[1.15% <sup>***</sup> ]   | 0.96<br>[0.17]   | 0.35<br>[-0.18] | 0.61 <sup>***</sup><br>[0.36 <sup>***</sup> ] |
| +1  | 549          | 11,089  | -1.02%<br>[-0.63%] | 0.16%<br>[-0.02%]  | -1.18% <sup>***</sup><br>[-0.61% <sup>***</sup> ] | 0.99<br>[0.21]   | 0.32<br>[-0.18] | 0.67 <sup>***</sup><br>[0.39 <sup>***</sup> ] |
| +2  | 382          | 11,089  | -0.31%<br>[-0.52%] | 0.11%<br>[-0.08%]  | -0.42% <sup>*</sup><br>[-0.44% <sup>***</sup> ]   | 0.44<br>[0.02]   | 0.23<br>[-0.22] | 0.21<br>[0.24 <sup>***</sup> ]                |
| +3  | 245          | 11,089  | -0.55%<br>[-0.27%] | 0.08%<br>[-0.12%]  | -0.63% <sup>**</sup><br>[-0.15% <sup>*</sup> ]    | 0.19<br>[-0.14]  | 0.14<br>[-0.24] | 0.06<br>[0.10 <sup>**</sup> ]                 |

Using a probit model reported in Table 4.6 we estimate the specific analyst, firm, recommendation revision, and corporate news characteristics that affect the probability of having a genuine increase in the information content of analyst revisions released around relevant corporate news. We restrict the analysis to the 2,345 consistent analyst revisions to determine what makes the difference in terms of information contribution among a group of recommendation changes that “got it right”. The dependent variable takes a value of one if a particular market reaction to a recommendation revision (abnormal return or abnormal volume) exceeds that of the relevant control group as per section 4.2. For same-day analyst revisions we subtract the average market reaction to MSAs of the same type as opposed to the average market reaction to all MSAs. The control variables included in our analysis are related to the firms (size, number of analysts following), the recommendation revisions (sign of the revision, magnitude of the change, time of release relative to a MSA), the analysts (experience), and the MSA type (periodic, progress report, voluntary, multiple types).

After controlling for various characteristics related to analysts, firms, recommendations, and corporate news we find that recommendation revisions released on the same day or within the following three days are more likely to contribute genuine information to investors. This result is statistically significant at the 1% level using both the abnormal return and the abnormal volume based binary dependent variable. Another recommendation related characteristic that is influential to investors is the magnitude of the revision change. Table 4.6 reports that the probability of having above average information contribution increases when the recommendation revision skips at least one level. This finding is supportive of analysts’ ability to augment the impact of recently released news they judge to be more relevant. The probability of releasing influential recommendation revisions increases when analysts have more than two years of experience. Not surprisingly, analyst recommendation revisions are more likely to have an abnormal information contribution when they are related to smaller firms.

Table 4.6  
Probability of Abnormal Information Content of MSA-Related Analyst Revisions

This table reports results of using a probit model to measure the specific analyst, firm, recommendation revision, and corporate news characteristics that affect the probability of having a genuine increase in the information content of analyst revisions released around relevant corporate news for firms trading on the ASX during the 2005 – 2009 period. \*\*\*, \*\*, and \* indicate difference in means (medians) are statistically significant at the 1%, 5% and 10%, respectively.

| Variable              | Returns     |           | Turnover    |          |
|-----------------------|-------------|-----------|-------------|----------|
|                       | Coefficient | $\chi^2$  | Coefficient | $\chi^2$ |
| log_size              | -0.0307     | 23.56***  | -0.0104     | 2.87*    |
| analysts              | -0.0062     | 0.78      | 0.0026      | 0.14     |
| log_pages             | -0.0114     | 0.29      | 0.0054      | 0.07     |
| sign                  | 0.0032      | 0.00      | -0.0925     | 3.11*    |
| magn                  | 0.1803      | 11.38***  | -0.0298     | 0.32     |
| same_post             | 0.3373      | 12.57***  | 0.2496      | 7.46***  |
| experience            | 0.1321      | 5.89**    | -0.0755     | 2.00     |
| periodic              | 0.1156      | 2.45      | 0.0118      | 0.03     |
| progress              | -0.0858     | 1.12      | -0.1716     | 4.61**   |
| voluntary             | -0.3080     | 3.43*     | -0.1684     | 1.15     |
| multiple              | -0.1679     | 2.71*     | -0.1505     | 2.28     |
| $\chi^2$              |             | 154.60*** |             | 42.83*** |
| N                     |             | 2,345     |             | 2,345    |
| Pseudo R <sup>2</sup> |             | 0.0408    |             | 0.0064   |

The complexity of the related market sensitive announcement, measured by the number of pages, does not have any impact on the informativeness of the recommendation revision. This finding suggests that it is not the length of the document what makes the analyst contribution more important in terms of interpreting the information. A possible interpretation for this result is that analysts are more relevant as disseminators of public information alerting investors of the most price sensitive announcements. Another plausible explanation is that

some other complexity measures, such as the number of technical words<sup>21</sup> or the number of images and tables could be more relevant than the length of the document. Unfortunately, we do not have access to these alternative variables.

#### **4.6. Conclusions**

This work adds to the literature examining the contribution of analysts to the information environment of the firms they follow. Using a sample of 9,839 analyst recommendation revisions for firms trading on the ASX during the 2005 – 2009 period, we find analysts tend to release a high proportion of revisions (45%) around relevant information disclosures by the firms they follow, especially on the same day and on the three days after firms make market sensitive announcements (MSAs).

The market reaction to these MSA-related revisions is considerably higher than the market reaction to standalone revisions. Using market reactions to different information events to account for confounding effects, we find support for the weak form of piggybacking. That is, the information contribution of analyst recommendation revisions increases in the proximity of MSAs. These results are mainly driven by revisions released on the same day or in the two days following relevant corporate news supporting the idea that analysts are more valuable as interpreters and disseminators of public information. We find no support for their role as producers of private information.

After controlling for various characteristics related to analysts, firms, recommendations, and corporate news, we still find that recommendation revisions released on the same day or within the following three days are more likely to contribute genuine information to investors. The likelihood of having an influential revision also increases when the recommendation is related to smaller firms, released by an experienced analyst and when the change in the recommendation skips one level. We also find that when analysts revise recommendations around either voluntary announcements or around announcements with multiple information types, the probability of being influential decreases.

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<sup>21</sup> You and Zhang (2009) measure financial reports complexity using a simple word count.

## **Chapter 5. Conclusions**

### **5.1. Summary of the Thesis**

This thesis contributes to the literature on market efficiency and information disclosure by performing three studies on the continuous disclosure environment in Australia during the period 2005 – 2009. The attractiveness of the Australia market rests on four of its characteristics. First, the immediacy requirement in Australia requires information to be promptly disclosed to the market. Secondly, announcements submitted by firms to the ASX are analysed and classified by the ASX as either market sensitive (MSA) or non-market sensitive (non-MSA) providing investors with an indication of the importance of the news. Thirdly, once classified into one or many of the 19 types, company announcements are made available to all investors in a centralised platform. Finally, a trading halt is imposed when a market sensitive announcement is released.

Chapter 2 analyses the efficiency of the disclosure regulation by measuring the impact of disclosure frequency on the speed and the accuracy of the price discovery process. Chapter 3 studies the impact of the level of distraction on the market reaction to MSAs. Finally, Chapter 4 explores whether analyst recommendation revisions issued around MSAs released by the company subject to the report are more informative than those not related to corporate news.

### **5.2. Price Discovery under Continuous Disclosure Requirements in Australia**

Chapter 2 is the first comprehensive attempt to determine the contribution of disclosure frequency to the timeliness and accuracy of price discovery in Australia. Using a sample of 1,940 firms trading on the Australian Stock Exchange during the period 2005 – 2009, we find

that the frequency of disclosure of MSAs increases the speed of price adjustment when it is above a certain threshold (more than one day with non-periodic MSAs per month). This nonlinear relation is similar to Brennan et al.'s (1993) finding that the speed of price adjustment to new information increases with the number of analysts only when this number is above a minimum. This finding provides partial support to the value of continuous disclosure requirements. The contribution of frequency of disclosure to the speed of price discovery is concentrated in the three top size quintiles. These results could either be explained by investors' lack of attention to smaller firms or by the fact that the timeliness measures could be affected by the lower number of MSAs disclosed by smaller firms, which is almost 40% lower for firms in quintile 1 compared to that of firms in quintile 5.

The information contribution of MSAs using a methodology similar to Ball and Shivakumar (2008) is strongly supported by the finding that the adjusted  $R^2$  doubles its expected value. For four of the six MSA types analysed – 'Issued Capital', 'Asset Acquisition and Disposal', 'Progress Report' and 'Chairman's Address' – this finding is robust for the entire sample and across sectors. Two other announcement types, 'Takeover' and 'Other', show a lower than expected information contribution in the entire sample and for most sectors. One possible interpretation of these results is that there may be a tendency to over mark these two announcement types as market sensitive.

The impact of disclosure on the accuracy of price discovery shows that increased frequency of disclosure reduces the level of disagreement between investors, while there is still some new information contained in the PFSs that were not impounded into prices before its release. At the individual announcement type level we find MSAs preempt an important portion of the information revealed in the earnings announcement and, therefore, reduce the informativeness of Preliminary Final Statements. When the sample is segmented into size quintiles it becomes evident the relevance of voluntary disclosures (MSAs labelled as 'Other') reduces the informativeness of earnings, both measured by abnormal volume and absolute abnormal return. This analysis highlights the favourable impact of continuous disclosure of

non-periodic MSAs in reducing the level of disagreement among investors as well as the amount of new information disclosed in the earnings announcement.

In summary, our findings are supportive of the contribution of continuous disclosure requirements to creating a fair, orderly and transparent market. First, we find that when the frequency of MSAs is above a certain threshold it favours the timeliness of price discovery even after controlling for size, good news, liquidity, sector and number of analysts following. Secondly, we find that disclosure frequency contributes to lowering the informativeness of earnings announcements.

### **5.3. Continuous Disclosure Requirements and the Investor Distraction Hypothesis**

In Chapter 3 we extend the existing literature on the investor distraction hypothesis by analysing the extent to which the confounding effect of concurrent information affects the magnitude and the speed of the market response to new information in Australia using all MSA types. This feature represents a considerable improvement to the understanding of how competing information affects the promptness and the magnitude of the market reaction to scheduled and unscheduled announcements. Using a sample of 24,519 MSAs released by companies trading on the ASX between 2005 and 2009 we find that the magnitude of the short term market response to MSAs is negatively related to the number of MSAs released on the announcement day. In support of the investor distraction hypothesis, we also find the level of distraction on the announcement day increases the time it takes to reach the average daily number of trades and the average daily trading volume. The impact of distraction on the speed of the market reaction is present across all MSAs types. However, the magnitude of the market reaction to non-MSAs is not affected by the level of distraction present on the announcement day. The magnitude of the market reaction to MSAs is also found to be negatively affected by the relative order in which announcements are released during the day.

Further support for the investor distraction hypothesis is found when the delayed market response to MSAs is analysed. The difference between the magnitude of the delayed

market reaction and the magnitude of the short term market reaction increases with the level of distraction on the announcement day. The positive relation between the level of distraction and the incremental delayed market reaction to MSAs could be partially explained by additional information produced after the announcement release. Our sample design ensures that no MSAs are released in the post-event window. We explore whether analysts could be responsible for the increased delayed response. The findings suggest analyst revisions are not responsible for the increase in delayed market reaction but just another way in which higher attention to certain announcements is revealed in the days that follow the release.

From a regulatory standpoint our results demonstrate that by requesting a trading halt in anticipation of MSAs, firms attract investor attention and partially offset the impact of the level of distraction produced by the volume of competing information. This effect is consistent with both the short term and in the delayed market response. In the short term, both the magnitude of the market reaction and the speed of the market reaction increase in response to post-halt MSAs. The delayed market reaction differential is negative following MSAs released after a trading halt requested by the firm. Regarding the signalling of MSAs, our study shows this practice considerably reduces the number of confounding announcements. However, this effort is not enough to remove the distractive impact on investors.

Despite the requisite of immediateness in the disclosure of relevant information, Chapter 3 suggests there is to some extent selective disclosure. Across hours of the day we find there is a higher propensity to release bad news after trading hours. This selective disclosure is encouraged by the fact that after market hours MSAs are associated with a lower magnitude of market reaction and a slower speed of market reaction to non-periodic and multiple MSAs. There is, however, little impact of releasing MSAs after market hours on the market reaction to periodic MSAs. Regarding disclosure across days of the week, we find that MSAs released on Fridays are associated with a slower speed of market response.

## **5.4. Information Content of Analyst Revisions under Continuous Disclosure**

### **Requirements**

Using a sample of 9,839 analyst recommendation revisions for firms trading on the ASX during the 2005 – 2009 period, Chapter 4 examines the contribution of analysts to the information environment of the firms they follow. The study adds to the existing literature by relating recommendation revisions to all types of MSAs released under continuous disclosure requirements in Australia. Analysts in our sample tend to release a high proportion of revisions (45%) around relevant information disclosures by the firms they follow, especially on the same day and on the three days after firms make market sensitive announcements (MSAs). This proportion is, however, low compared to the 80% proportion found by Altinkılıç and Hansen (2009) in the US.

The market reaction to these MSA-related revisions is considerably higher than the market reaction to standalone revisions. Using market reactions to different information events – standalone recommendation revisions and standalone MSAs – to account for confounding effects, we find support for the weak form of piggybacking. That is, the information contribution of analyst recommendation revisions increases in the proximity of MSAs but it is not solely explained by the market reaction to corporate announcements. The higher information contribution by analysts is observed for revisions released on the same day or in the two days following relevant corporate news, supporting the idea that analysts are more valuable as interpreters and disseminators of public information. There is no evidence of analysts as producers of private information.

After controlling for various characteristics related to analysts, firms, recommendations, and corporate news, we still find that recommendation revisions released on the same day or within the following three days are more likely to contribute genuine information to investors. The likelihood of having an influential revision also increases when the recommendation is related to smaller firms, released by an experienced analyst and when the change in the recommendation skips one level. We also find that when analysts revise recommendations

around either voluntary announcements or around announcements with multiple information types, the probability of being influential decreases.

### **5.5. Directions for Future Research**

Combining the recent improvements in the searching features of SIRCA's Australian Company Announcements dataset with textual analysis tools specifically designed for studies in finance (Loughran and McDonald 2011) opens new venues for research within the Australian disclosure environment that can build on the findings of this thesis. Among others, these are some new questions that could be answered: i) Is the language tone used by firms different when they announce good and bad news in order to maximise the impact of the former and minimise the impact of the latter?; ii) Are there specific words, strings of words or word repetitions that lead the exchange to signal certain announcements as market sensitive?; and iii) Are there specific words, strings of words or word repetitions associated with a higher market reaction to MSAs? The use of microstructure measures of intra-day returns could also add to the understanding of the short run reaction to MSAs.

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## Appendix 1. Types of Information Disclosed under Continuous Disclosure Requirements

### Takeover Announcement

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|  |                                  |
|--|----------------------------------|
| Intention to Make Takeover Bid                     | Directors' Statement re Takeover |
| Bidder's Statement – Off-market bid                | Variation of Takeover Bid        |
| Target's Statement – Off-market bid                | Takeover – Other                 |
| Bidder's Statement – Market bid                    | Supplementary Bidder's Statement |
| Target's Statement – Market bid                    | Supplementary Target's Statement |
| Off-market bid offer document to bid class holders |                                  |

### Security Holder Details

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|                                    |  |
|------------------------------------|--|
| Becoming a substantial holder      | Security holder details – Other            |
| Change in substantial holding      | Section 205G Notice – Director's Interests |
| Ceasing to be a substantial holder | Initial Director's Interest Notice         |
| Beneficial ownership – Part 6C.2   | Change of Director's Interest Notice       |
| Takeover update – Section 9 Notice | Final Director's Interest Notice           |

### Periodic Reports

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|  |                                    |
|--|------------------------------------|
| Annual Report  | Full Year Audit Review             |
| Top 20 shareholders  | Full Year Directors' Statement     |
| Preliminary Final Report                                     | Periodic Reports – Other           |
| Half Yearly Report   | Half Year Accounts                 |
| Confirmation that Annual Report was sent to Security Holders | Monthly Net Tangible Asset Backing |
| Loan securities on issue                                     | Concise Financial Report           |
| Half Year Audit Review                                       | Daily Fund Update                  |
| Half Year Directors' Statement                               | Half Year Directors' Report        |
| Full Year Accounts   | Full Year Directors' Report        |

### Quarterly Activities Report

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#### Quarterly Cash Flow Report

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#### Issued Capital

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|                                       |                             |
|---------------------------------------|-----------------------------|
| Renounceable Issue                    | Non-Renounceable Issue      |
| Bonus Issue                           | Issued Capital – Other      |
| Placement                             | Disclosure Document         |
| Issues to the Public                  | On-Market Buy-Back          |
| Capital Reconstruction                | Daily Share Buy-Back Notice |
| New Issue Letter of Offer & Acc. Form | Appendix 3B                 |
| Alteration to issued capital          |                             |

#### Asset Acquisition and Disposal

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|                   |                |
|-------------------|----------------|
| Asset Acquisition | Asset Disposal |
| Other             |                |

## Notice of Meeting

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|   |                                 |
|---|---------------------------------|
| Notice of Annual General Meeting        | Alteration to Notice of Meeting |
| Notice of Extraordinary General Meeting | Notice of Meeting – Other       |
| Results of Meeting                      | Notice of General Meeting       |
| Proxy Form                              |                                 |

## ASX Announcement

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|                                     |                                    |
|-------------------------------------|------------------------------------|
| Suspension from Official Quotation  | Admission to Official List         |
| Reinstatement to Official Quotation | Commencement of Official Quotation |
| Removal from Official List          | ASX Announcement – Other           |
| ASX Query                           | CAP Cancellation                   |
| Notice Pending                      | CAP Correction                     |
| Change in Basis of Quotation        | End of Day                         |
| Trading Halt                        | Trading Halt Lifted                |

## Dividend Announcement

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|                        |                     |
|------------------------|---------------------|
| Dividend Books Closing | Dividend Alteration |
| Dividend Pay Date      | Dividend – Other    |
| Dividend Rate          |                     |

## Progress Report

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### Company Administration

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|                                       |                                |
|---------------------------------------|--------------------------------|
| Director Appointment/Resignation      | Company Administration – Other |
| Details of Company Address            | Change of Balance Date         |
| Details of Registered office address  | Trust Deed                     |
| Details of Share Registry address     | Articles of Association        |
| Trustee Appointment/Resignation       | Constitution                   |
|                                       | Responsible Entity             |
| Trust Manager Appointment/Resignation | Appointment/Resignation        |
| Company Secretary                     |                                |
| Appointment/Resignation               |                                |

## Notice of Call (Contributing Shares)

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|                      |                                |
|----------------------|--------------------------------|
| Announcement of call | Notice of call to shareholders |
|----------------------|--------------------------------|

## Other

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|                         |                                |
|-------------------------|--------------------------------|
| Other                   | Open Briefing                  |
| Internal                | Overseas Listing               |
| Reserved For Future Use | Standard & Poor's Announcement |
| Appendix 16A            | CAP Test                       |

## Chairman's Address

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|                            |                                    |
|----------------------------|------------------------------------|
| Chairman's Address – Other | Chairman's Address to Shareholders |
|----------------------------|------------------------------------|

Letter to Shareholders

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Letter to Shareholders – Other

Letter to Shareholders

ASX Query

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ASX Query

Response to ASX Query

Warrants

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Commitments Test Entity Quarterly  
Reports

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Prospectus

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