

The Impact of Wide Social Media Dissemination of Disclosures on Information Asymmetry:  
A New Zealand Context.

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## Abstract

The type and number of social media platforms a company uses in their corporate disclosures has received little examination in the disclosure literature. The disclosure literature has noted the differences between social media platforms (Müller, Schneiders, & Schäfer, 2016; Soo Jung & Hadley, 2014). There however has been few studies on the impact this difference has on the information environment of companies. Further, there has been little effort to understand how the number of social media platforms used impacts on the information environment of companies. Based on a sample of 92 social media users and 58 non-users of social media listed on the NZSX and using the Investor Recognition Hypothesis, this study examines the effects of social media dissemination within the New Zealand context. Previous research in other countries has established that social media dissemination reduces information asymmetry, as it widely spreads the news (Blankespoor, Miller, & White, 2014b; Prokofieva, 2015b). The results confirm these findings, even when the public announcements are available on the NZX Material Announcements Platform (MAP). Comparing the main social media platforms used in New Zealand (Twitter, Facebook, LinkedIn and YouTube), the findings show that LinkedIn was the only one negatively associated with information asymmetry. The study also concludes that as New Zealand companies continue to adopt and expand social media use, having more than one social media platform does not significantly affect information asymmetry.

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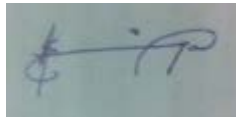
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## Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

A rectangular box containing a handwritten signature in blue ink. The signature is stylized and appears to be a combination of letters and a flourish.

Signed \_\_\_\_\_ Date 30/01/2017 \_\_\_\_\_

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

This paper examines the role the type of social media and the breadth of social media presence chosen by a firm in disseminating corporate announcements plays in reducing information asymmetry in the New Zealand context. Social media use is relatively new in New Zealand. KPMG talked to 1850 New Zealand managers and found that over 50% of them were either expanding or initiating social media use (KPMG, 2015), encapsulating the early adoption phase of social media in New Zealand. In 2013, the Financial Markets Authority (FMA) in New Zealand mandated that material corporate disclosures should be channelled through the NZX Market Announcement Platform (MAP) first before being announced on Twitter, Facebook or any other social media platform. This is markedly different from the US where companies are permitted to release new information over social media platforms. Looking specifically at earnings disclosures and focusing only on Twitter, Blankespoor et al. (2014b) as well as Prokofieva (2015b) argued that social media reduces information asymmetry (Blankespoor et al., 2014b; Prokofieva, 2015a), as social media works as a dissemination channel to widely spread disclosures. Critically, there is evidence showing that merely increasing dissemination of the same information does indeed lower information asymmetry (Bushee, Core, Guay, & Hamm, 2010; Bushee, Matsumoto, & Miller, 2003). Looking at the totality of social media disclosures, and all the major social media platforms used in New Zealand, and using a mixed methods research design, this study seeks to not only confirm the importance of social media in a continuous disclosure context but also highlight that the type and number of social media platforms used by a company significantly affects a company's information environment.

## **1.2 Aims of the study**

This study has the following aims:

- It seeks to confirm whether social media has a significant effect on information asymmetry in New Zealand.
- It examines whether the type of social media platform used (Twitter, Facebook, LinkedIn and YouTube) has a significant effect on information asymmetry.
- Finally, it examines whether the breadth of social media presence represented by the number of social media platforms used has a significant effect on information asymmetry.

This study argues that social media platforms are inherently different (Hui & Wei, 2015). Companies should not just treat all the different social media platforms as generic. They should carefully choose the type of social media they use to announce their corporate announcements to reduce information asymmetry.

The study also argues that using more than one social media platform to disseminate disclosures should help companies effectively disseminate their disclosures thus lowering information asymmetry.

Using the Investor Recognition Hypothesis (IRH), the study postulates that using the right type and number of social media platforms should help the firm reach more uninformed investors, thereby reducing information asymmetry.

## **1.3 Rationale and Motivation**

Other studies in the area of social media have ably looked at information asymmetry using event studies (Blankespoor et al., 2014b; Prokofieva, 2015b), or looked at the US environment (Blankespoor et al., 2014b; Hui & Wei, 2015), or looked at one social media platform mainly Twitter (Blankespoor et al., 2014b; Prokofieva, 2015b), or only looked at certain types of disclosure (Blankespoor et al., 2014b; Lee, Hutton, & Shu, 2015; Prokofieva, 2015b). These studies have found that social media is a disseminating mechanism that helps transmit disclosure messages to uninformed investors, lowering

information asymmetry. This study however seeks to examine and confirm social media impact on information asymmetry within a New Zealand context.

The study however does not use event studies. It is not important for this study to accurately time the information events but measure the effects of social media dissemination over a period. This then overcomes the difficulty of making accurate timing of events (MacKinlay, 1997) when using events studies. Further in this study there is no intention to focus on one specific type of news event like earnings announcements etc. but it is rather the breadth of information dissemination that is important (Fang & Peress, 2009).

For this study, it was therefore important to capture information asymmetry over a period and not around information events. Some in the literature have argued that in fact, in the short term, information asymmetry could actually increase information asymmetry. This is because disclosures may be costly for some investors to process in the short term or that some disclosures induce either added uncertainty or a divergence of views (Bamber, Barron, & Stevens, 2011; Krinsky & Lee, 1996).

Existing literature has focused on Twitter as a social media platform (Blankespoor et al., 2014b; Prokofieva, 2015a). There however has been little examination of other social media platforms like Facebook, YouTube and LinkedIn used by firms to disseminate their corporate announcements. While differences in social media platforms has been highlighted there has been very little attempt to show how this difference affects the companies using these platforms. For instance, research has found that an increasing number of users now use Facebook or Twitter (Müller et al., 2016; Soo Jung & Hadley, 2014) as a primary source of information. It has also been found that Facebook is by far the most accessed social media platform for news and users spend more time engaged with content on Twitter (Mitchell, Stocking, & Matsa, 2016), or that users respond more quickly to disclosures released on Twitter than they do on Facebook (Mi, Lijun, Jianling, Weiguo, & Wang, 2015). Alternatively, even those Facebook users engage more with content (427 mins) than they do with disclosures on Twitter (10 mins). Social media platforms used by firms are clearly different in nature and the way users engage with content is different. However, it is little understood how this difference affects a company's information environment. This study attempts to address that by looking at

the impact the different types of social media platforms have on information asymmetry.

While there is evidence that social media as a dissemination mechanism improves a company's information environment by widely transmitting information to a broad spectrum of investors (Blankespoor, Miller, & White, 2014c; Prokofieva, 2015b), little is understood about how many social media platforms are needed to accomplish this. A large number of social media platforms allows a company to reach more users (Hui & Wei, 2015). Since different social media platforms appeal to different demographics, consistent with the Investor Recognition Hypothesis, this would allow the company to reach more uninformed investors lowering information asymmetry. What research has not clearly examined is whether there is a point at which the breadth of social media becomes too much, beyond which the media starts to work against the very goals of social media disclosure. For instance, Bushee and Noe (2000) found that increased disclosures attracted short term investors introducing stock volatility.

#### **1.4 Research Design**

A mixed methods research design is adopted for this research. It was important in this study to use the context of New Zealand not only because social media could be different and the laws of social media use are different to other countries but to gain a deeper understanding (Creswell, 2014) of social media use in New Zealand as social media adoption gets underway. Therefore, content analysis is used to extract the qualitative context. The databases, DataStream and NZX Company Research are used to get the quantitative data. The study looked at 150 NZSX companies. NZSX is the main stock index of NZX.

## **1.5 Contributions**

The study is of direct practical significance to regulatory authorities as it underscores the importance of social media use for information disclosures in New Zealand. The study is also of practical importance to companies within New Zealand. It highlights the importance of social media as a dissemination mechanism in New Zealand for policy makers and authorities as well as companies assessing the viability of social media disclosures. Further, it seeks to contribute to existing research on dissemination and how social media is a useful mechanism to help companies improve their information environment.

## **1.6 Structure of the thesis**

The thesis is organised in this manner. Chapter 2 will focus on the growing literature around corporate disclosures with a particular focus on corporate disclosures, internet financial reporting and social media disclosures. The three hypotheses of this study are then presented in Chapter 3. Chapter 4 will look at the methods and the data analysis techniques used in this study. Chapter 5 will then present the results obtained. Chapter 6 will discuss the results and the limitations of the study.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter involves a review of the literature starting from a broad perspective of corporate disclosures revealing the fundamental theories within accounting and the literature covering disclosure practices and motivations. It then narrows down to the Internet Financial Reporting literature. The chapter then reviews the literature on the emerging XBRL and Social Media tools. This chapter, therefore, captures the landmark theoretical contributions within the corporate disclosure area and chronicles the evolution of Internet-based accounting research. It highlights the evolution of the literature from print based disclosures, to continuous disclosures, to the internet disclosures and finally to the emerging technological tools of XBRL and social media. Finally, this chapter highlights future areas the literature could examine.

#### 2.1 Corporate Disclosures (Voluntary and Mandatory)

**2.1.1 Defining corporate disclosures.** Corporate disclosures can be defined as the conveying of information by corporate insiders to the stakeholders outside the company (Farvaque, Refait-Alexandre, & Saïdane, 2011). Stakeholders are not only shareholders and investors but other interested parties as well, like employees, suppliers, customers, banks, community groups and activists. They all have a vested interest in the affairs of the company. Two key questions arise from the above definition, and these are examined in the literature. Firstly, what is the type of information that these companies disclose? Secondly, what is the level of disclosure that the companies have to attain?

Companies can disclose both financial and non-financial disclosures. While the value of financial information has long been recognised (Bushman & Smith, 2001; Healy & Palepu, 2001), recently the value of non-financial information is starting to be

acknowledged. Financial information is historical. Therefore, it may not be relevant nor timely. Realising that non-financial information is relevant, there has been an effort to actively encourage it. The External Reporting Board (XRB) is actively encouraging a move towards Integrated Reporting in New Zealand. Researchers have also found the relevance of non-financial information (Gelb & Zarowin, 2002; Orens, Aerts, & Cormier, 2010).

The other pertinent question with regards disclosures concerns the level of information disclosures a company has to achieve. The level of information disclosure covers both the quality and quantity of disclosures. IFRS (International Accounting Reporting Standards) enables information to have more clarity and comparability (Crémer, 1995) improving quality. The quantity of information disclosed can also improve the level of disclosure and in New Zealand listed companies are required to disclose their performance semi-annually on top of disclosing material information as it arises (NZX Limited, 2014). The literature has covered both the quality and quantity aspects of disclosures.

**2.1.2 Disclosure theories.** This section reviews disclosure theories used to explain information disclosures. The section explains not only the theories but also how literature has used the theories to explain what motivates companies to disclose more information than is required by law.

**Agency theory.** Jensen and Meckling (1976) in their seminal paper define an agency relationship as a contract that exists between principals as shareholders and agents as managers, with managers performing some form of service or active role on behalf of the principals. This is the widely known agency theory. Taking upon this agency, a firm can then be viewed as a nexus of contracts (Leftwich, Watts, & Zimmerman, 1981). There are contracts that not only exist between the investor or shareholder and managers but also other stakeholders. Since the principals or stakeholders have no active role, their interests and that of the agents may sometimes not converge, resulting in agency problems (Jensen & Meckling, 1976). They argue that costs are incurred in a principal-agency relationship, and the agency costs are the costs of monitoring the agent i.e. the costs of setting up a board of directors, or the costs of bonding i.e. the implicit

costs when an agent or manager commits to serve for an appointed time. The other costs identified are the residual costs that are incurred in spite of the monitoring and bonding costs (Jensen & Meckling, 1976). To mitigate against this agency problem principals can put in place optimal contracts and require agents to frequently report compliance (Healy & Palepu, 2001).

Crucially minimum mandatory disclosures (Daske, Hail, Leuz, & Verdi, 2008; Healy & Palepu, 2001; Lambert, Leuz, & Verrecchia, 2007) and voluntary disclosures (Barako, Hancock, & Iza, 2006; Healy & Palepu, 2001) help reduce this agency problem. While mandatory disclosures result from legislation or regulation, voluntary disclosures show a response to the demands and expectations of stakeholders for more disclosures by companies (Chandler, 1997). Companies therefore voluntarily disclose more information to lower the agency costs.

***Signalling theory.*** Accounting research has used the theory of signalling (Spence, 1973), to also explain voluntary disclosures by companies. In his work Spence (1973) using the labour market revealed that promising and good employees set themselves apart from poor employees through the costly endeavour of getting a higher education. This was simple and intuitive but also revolutionary. Accounting researchers have used signalling theory to show that companies use voluntary disclosures to signal to the market that they are better than their competition (Ross, 1977; Verrecchia, 1983). Although company insiders know the company's true value, outsiders do not. Therefore, there exists information asymmetry. Each company has an opportunity to signal its true value through more disclosure.

***Legitimacy Theory.*** Legitimacy theory has also been used to explain why companies voluntarily disclose information. The theory states that a company only exists when its values are perceived to match with those of the society around it (Dowling & Pfeffer, 1975). Companies are, therefore, bound by certain norms that they seek to maintain. These norms are not static but change with time (Deegan, 2009). Traditionally financial information was very important but now increasingly the society demands that companies disclose social and environmental impacts as well. What is very crucial from this is that it is not really the actual conduct of the company that legitimises it but rather what the community or society collectively knows (Deegan, 2009). Disclosure therefore becomes very important. Companies can use symbolic gestures to communicate a



certain image. Companies are therefore seeking to always be within the bounds or norms of their society and have to disclose more information when society demands it (Brown & Deegan, 1998). Voluntary disclosures thus help a company to legitimise itself in the eyes of the community (Neu, Warsame, & Pedwell, 1998). Researchers have used legitimacy theory to explain changes in disclosures by companies trying to legitimise themselves (Deegan & Gordon, 1996; Deegan, Rankin, & Voght, 2000; Patten, 1991).

**Stakeholder theory.** In stakeholder theory, stakeholders are defined as groups or individuals who can affect the attainment of an organisation's objectives or those who are affected by an organisation's attainment of those objectives (Freeman & Reed, 1983). This definition differentiates the ethical perspective that sympathises with both sets of stakeholders in the above definition from the managerial perspective that only considers those stakeholders who can affect the attainment of their objectives. The managerial branch of the stakeholder theory therefore only looks at groups within a society unlike the legitimacy theory that looks at the society as a whole. Companies will therefore not respond to all stakeholders in a society but only to the most powerful (Deegan, 2009). Information disclosure is therefore one of the tools used by management to manage these powerful groups. Neu et al. (1998) found that companies are more responsive to the social and environmental disclosure concerns of financiers and regulators than to environmentalists. Roberts (1992) also found that stakeholder power and the information needs of these powerful groups explained the levels of corporate and social reporting engaged by companies.

**Institutional Theory.** Institutions sometimes conform because there are rewards for conformity (Scott, 1987). These rewards can be legitimacy, resources, or opportunity to survive. Innovative ideas that help early adopters to improve on their peers are legitimised as they build a clear competitive advantage. With time, those institutions that have lagged in adopting these innovative ideas risk being delegitimised and have to adapt. These innovations might even become legal mandates. Isomorphism is this process that forces institutions to adopt new innovations, forcing them to resemble each other within a certain environment (DiMaggio & Powell, 1983). Three different isomorphic pressures are identified and these are coercive, mimetic and normative isomorphic pressures. Coercive isomorphism occurs when there is political pressure or risk of losing legitimacy (Carpenter & Feroz, 1992). Therefore, coercive isomorphism is

a forced change where organisations are forced by authorities to adopt new disclosure changes. Mimetic isomorphism occurs when organisations take after each other, like a form of fashion (Xiao, Yang, & Chow, 2004). Formal education from universities as well as the growth of professional networks bring about normative isomorphism. Therefore, isomorphism provides a rationale to explain why reporting practices or the adoption of innovative technologies like XBRL or social media tends take a similar form.

**Capital Need Theory.** Companies need access to external finance through either debt issues or equity issues. Capital need theory argues that voluntary disclosures can actually lower the cost of capital for companies (Choi, 1973). The capital needs rationale is that in the cost of capital, financiers put a risk premium for the uncertainty about the future or the publicly available information about a company. Therefore, if investors are able to assess and interpret a company's future accurately through additional voluntary disclosures, then investors will lower their risk premium.

Research has therefore tried to answer the question of what it is that motivates companies to disclose more voluntary information than is required.

**2.1.3 Disclosure determinants.** Research on voluntary disclosures has attempted predict the level of disclosures a company makes. Research has examined which characteristics are exhibited by companies that disclose information voluntarily (Chow & Wong-Boren, 1987; Cooke, 1992; Hossain, Perera, & Rahman, 1995; Mitchell & Chia, 1995). Larger firms already have complex information systems in place hence disclosure costs may be generally lower. Large companies need access to capital markets hence have to disclose more, and do not need to obsessively protect their competitive advantage compared to smaller firms (Buzby, 1975). Other researchers argue that large firms naturally attract attention (Wallace & Naser, 1995), hence will be under political pressure to disclose. However research has found mixed results for the relationship between profitability or firm performance and disclosure with some finding an association (Malone, Fries, & Jones, 1993; Patell, 1976; Penman, 1980) and others no relationship (McNally, Lee Hock, & Hasseldine, 1982). There has also been mixed results with regards to the relationship between the industry and disclosure with some finding no relationship (Patton & Zelenka, 1997) and others finding a relationship (McNally et

al., 1982). In terms of leverage as a factor for disclosure, some researchers argue that since debtholders are able to price risk, managers are obliged to disclose more information to protect shareholders (Hossain et al., 1995; Myers, 1977; Patton & Zelenka, 1997). Others however found no relationship (Chow & Wong-Boren, 1987; Wallace & Naser, 1995). Stock exchange listing is associated with disclosure as listed companies have a greater separation between managers and owners, raising agency costs, hence the need to voluntarily disclose more information (Hossain et al., 1995; Malone et al., 1993; Patton & Zelenka, 1997).

**2.1.4 Disclosure and the capital market.** Another question research has tried to answer is what effect disclosures have on the capital markets. There has been a large body of literature on the relationship between accounting information and the capital markets and from early on research has tried to understand this relationship (Ball & Brown, 1968). Hong and Stein (1999) argued that news is incorporated into the price slowly, as more and more investors become aware of it. Further investors have a limited attention span and may even neglect to process relevant aspects of a disclosure (Hirshleifer & Teoh, 2003; Prokofieva, 2015b). Also since disclosure information involves the use of quantitative and statistical data, drawing inferences from statistical data may hinder the market from fully understanding what is being revealed (Bloomfield, 2002). With thousands of stocks in the market, investors therefore resort to invest in those stocks that grab their attention (Barber & Odean, 2008).

Advancing the Investor Recognition Hypothesis (Merton, 1987) argued that investors would only hold those stocks for which they have enough information on. This implies that incomplete information within the capital markets affects the trading behaviour of investors. This has been confirmed by recent research with Bushee et al. (2010) finding that greater press coverage reduces the bid-ask spread. Buskirk (2012) found that more detailed disclosures were associated with a decrease in information asymmetry. Therefore, companies can increase investor recognition by disclosing more information. Research has found that even general information does indeed help reduce information asymmetry. Barber and Odean (2008) found that a company's visibility with investors is improved by marketing.

Voluntary disclosures have been found to reduce the cost of capital (Botosan, 1997; Sengupta, 1998). Easley and O'Hara (2004) revealed that information disclosure affects the cost of capital with investors demanding more compensation when a company holds more private information. Leuz and Verrecchia (2000) argued that increasing the levels of disclosures enabled companies to lower their cost of capital.

Information disclosure has evolved from print media disclosure and annual reports (Lang & Lundholm, 1993), to continuous disclosures, to internet disclosures and now social media disclosures. Traditional paper based disclosures have slowly become obsolete due to investor geographic dispersion however the panacea has been internet financial reporting which offers low cost, speed, wider reach and frequency (Rahman & Debreceeny, 2014).

## **2.2 Internet Financial Reporting**

**2.2.1 Background.** Accounting research in Internet Financial Reporting commenced in the mid-1990s, as the internet took hold (Gajewski & Li, 2015). In the formative stages of IFR though research was descriptive and it looked to understand the extent to which IFR was being adopted (Deller, Stubenrath, & Weber, 1999; Ettredge, Richardson, & Scholz, 2001). Research has moved to now understand both the motivations and the characteristics of companies who adopt internet financial reporting (Ashbaugh, Johnstone, & Warfield, 1999; Debreceeny, Gray, & Rahman, 2002; Ettredge, Richardson, & Scholz, 2002).

Internet Financial Reporting (IFR) is a subset of the voluntary disclosure practices available to companies in New Zealand (Oyelere, Laswad, & Fisher, 2003). Debreceeny et al. (2002) define IFR expansively as involving the dissemination of corporate financial information and performance using the World Wide Web. Other researchers have been more restrictive and define IFR as the disclosure of financial information using corporate websites (Pinto & Ng Picoto, 2016). To bring clarity other researchers have gone on to coin traditional websites as Web 1.0 and Web 2.0 as representing internet applications where users are actively engaged in creating, interacting and distributing web content (Janusz, 2009). IFR content encompasses the traditional annual reports and press

releases but also moves on to embrace multimedia tools like videos and live analyst briefings (Debreceeny et al., 2002). New media covers all forms of digital communication technologies encompassing websites, blogs and social media (Saxton, 2012).

There are a number of benefits presented by the adoption of internet financial reporting to companies. It is low cost, offers greater speed and wider reach of the intended audience (Rahman & Debreceeny, 2014). Other researchers have noted many benefits of internet financial reporting. Internet financial reporting allows users to choose which information to access through the use of hyperlinks, allows for more equitable distribution of information among stakeholders and allows companies the flexibility to present more information (Debreceeny et al., 2002; Ettredge et al., 2002; Richard Baker & Wallage, 2000; Wagenhofer, 2003). Just like voluntary disclosure adoption, companies have readily embraced internet financial reporting to lower information asymmetry (Debreceeny et al., 2002). The disclosure of information through the internet offers some advantages over the traditional paper based disclosures (Rahman & Debreceeny, 2014). Companies can increase their value by disclosing more information on their corporate websites (Garay, González, Guzmán, & Trujillo, 2013). Orens et al. (2010) found that increased disclosures on the websites leads to a decrease in the cost of capital. Cormier, Aerts, Ledoux, and Magnan (2009) looked at the impact of internet disclosures and volatility and found a negative relationship.

While research has enumerated the benefits of internet financial reporting, it has also taken note of the negatives brought about by internet financial reporting. It has been noted that a move to push all information disclosures online could disadvantage those without access or the skills for the internet (McCafferty, 1995). Possible publishing errors notwithstanding, there is a real security risk of data being altered either internally or externally (bin Au Khan & bin Ismail, 2012; Miniaoui & Oyelere, 2013). This presents a significant problem if investors are to rely on this information when making their investment decisions.

**2.2.2 Internet disclosure theory.** Accounting research has relied on agency theory (Chow & Wong-Boren, 1987; Jensen & Meckling, 1976) and the signalling theory (Healy & Palepu, 2001) to explain voluntary disclosures. Xiao et al. (2004) argue that these

economic based theories (agency theory, signalling theory, legitimacy theory) may not be able to fully explain the complex adoption of internet financial reporting. They suggest that the typical factors are not at play when companies adopt internet financial reporting and put forward the diffusion of innovations theory as an alternative theoretical framework to use. This is because with internet financial reporting the typical costs and benefits are not altogether clear as companies suffer loss of control over the interpretation and context of information when using the internet. However, other researchers have continued to use the economic based theories. Marston and Polei (2004) argue that since internet reporting has gained considerable importance in the developed world, it makes sense then to assume that it is viable, hence economic based theories can be used.

***Diffusion of Innovations Theory.*** Diffusion of Innovations Theory (Rogers, 2003) states that the adoption of new technologies within organisations succeeds if the innovation has relative advantage, has compatibility, has trialability and has observability of results. In other words, innovation adoption is dependent on the degree to which the new technology is relatively better than the existing technology (relative advantage); the degree to which the innovation is consistent with existing values (compatibility); the degree to which the innovation can be tried before adoption (trialability); and the degree to which tangible results can be seen (observability). Abrahamson (1991) questioned the premise that internal decision makers arrive at the adoption choice independent of other factors but only technical efficiency goals. He offered three perspectives – forced selection, fashion perspective and fad perspective. Forced selection occurs when the external organisations like authorities, powerful suppliers or customers dictate the adoption of a new technology. Fashion perspective occurs when adopters come on board due to the influence of fashion setting organisations like management consultants. The fad perspective is different from the fashion perspective in that with the fad perspective organisations imitate other organisations instead of the fashion setting organisations. This theory can be used to explain the adoption of internet financial reporting (Xiao et al., 2004).

**2.2.3 Internet disclosure practices.** As the internet was emerging as a viable tool for corporate disclosures, research moved in to understand the disclosure practices of

companies using internet financial disclosures (Craven & Marston, 1999; Pirchegger & Wagenhofer, 1999). The studies found that an increasing number of companies were adopting the internet to communicate financial information. These studies not only capture the growing enthusiasm of internet as a tool for disclosure but also the varied ways in which different countries were using the internet for disclosing financial information. However, these studies did not reveal evidence of innovative practice. Early adopters were engaged in the practice of internet publishing the very same information available in print-based annual reports.

**2.2.4 Determinants of internet financial reporting (IFR).** Ettredge et al. (2002) found that the factors that cause companies to voluntarily disclose applied to understanding why companies were voluntarily disclosing over the internet. However, aside from size, there has generally been no clear agreement.

**Size.** Craven and Marston (1999) found that large UK companies were more likely to disclose information on the internet, therefore size was an important factor when choosing to disclose. This was confirmed by a research by Ashbaugh et al. (1999), who looked at US companies, and Pirchegger and Wagenhofer (1999) who looked at Austrian companies. Even when a cross-country view was taken, it emerged that size is a good indicator to show whether a company would disclose or not (Debreceeny et al., 2002). Large companies suffer heavily from information asymmetry than do smaller companies since the separation between managers and shareholders is large. Consequently they suffer larger agency costs than do smaller companies and have to disclose more information to mitigate this (Chow & Wong-Boren, 1987). For size, literature has generally agreed that it affects adoption of IFR.

**Profitability.** The relationship between corporate profitability and disclosure has been examined in literature but without much agreement. Most agree that disclosure is used by companies to signal profitability to investors (Singhvi & Desai, 1971). Aly, Simon, and Hussainey (2010) found a positive relationship between internet financial reporting and profitability for Egyptian companies. Others argue that because managers hold share options, it is this compensation arrangement that motivates them to disclose when profitable. However, others argue that it is not the profitability but rather the

variability in firm performance that is related to disclosure (Lang & Lundholm, 1993). Others have found no relationship at all between firm disclosures and profitability (Marston & Polei, 2004; McNally et al., 1982; Oyelere et al., 2003). Pirchegger and Wagenhofer (1999) while finding significance between profitability and internet financial reporting for Austrian companies could not find significance for German companies. There is still therefore conflicting evidence of the relationship between corporate profitability and internet financial reporting.

**Sector.** The relationship between the industry and disclosure has been explored in accounting research but there has been no agreement as well. Most researchers have found that there is a significant relationship between the sector and internet financial reporting (Debreceeny et al., 2002; Lymer, 1999; Oyelere et al., 2003; Xiao et al., 2004). However other researchers found no association between the industry and internet financial reporting (Craven & Marston, 1999; Marston & Polei, 2004). Some researchers have used the signalling theory to explain the association between the sector and internet financial reporting. They argue that within the same industry, companies have to move to the same disclosure level as the rest, otherwise a bad signal would be received by investors that they are hiding some bad news (Craven & Marston, 1999). Debreceeny et al. (2002) singled out technology within a sector as the driver of the association. They argued that high technology companies are engaged in complex accounting due to intellectual capital and R&D programs among other things. Therefore, the higher the technology within a sector the more they have to disclose as the earnings by themselves fail to capture the whole picture.

**Leverage.** The relationship between leverage and internet financial reporting has been found inconclusive by researchers. Others have found that there is a significant relationship between internet financial reporting and leverage (Aly et al., 2010; Ettredge et al., 2002; Xiao et al., 2004). Other researchers have found no significant relationship between the two (Debreceeny et al., 2002; Miniaoui & Oyelere, 2013; Oyelere et al., 2003). Using agency theory, (Debreceeny et al., 2002) argue that leverage creates agency costs, as creditors need to assess the company's ability to meet their obligations on time. Therefore, management has to disclose more information on the internet to help lower the agency costs.



**Foreign listings.** Most studies have found that there is a positive association between foreign listings and internet financial reporting (Aly et al., 2010; Xiao et al., 2004). Debreceeny et al. (2002) looked particularly at the US listings and found that there was a significant association between US listings and internet financial reporting. Still others could not find any significance (Oyelere et al., 2003). Marston and Polei (2004) found mixed results when testing for foreign listings. Foreign listings occur because companies want access to a wider market for their products as well as capital among other reasons. Since they have investors straddling a wider geographical region and time, information asymmetry arises (Debreceeny et al., 2002). These companies face more disclosure requirements than domestic companies and so will have to disclose more information. Internet financial reporting, because it offers an immediate and wider reach to stakeholders, can be used by these companies (Debreceeny et al., 2002).

**Liquidity.** The liquidity of a company is important not only for its viability and going concern but it also gives the company flexibility to take advantage of opportunities in the market. Therefore, stakeholders are always looking to understand the issues around liquidity. This may then motivate highly liquid companies to make sure that the liquidity reserves they hold are known to the stakeholders (Wallace & Naser, 1995). This can be done through voluntary internet financial disclosures. This act can be an expression of confidence by management in the solvency of the company signalling that the company has good future prospects (Oyelere et al., 2003). Studies have examined the relationship between liquidity and internet financial disclosures but the results have been mixed. Other researchers have found no significant association between the two (Aly et al., 2010). Both the signalling theory and the agency theory have been used by researchers to explain the relationship between liquidity and internet financial disclosures. With the signalling theory, companies with high liquidity disclose more to set themselves apart from those with low liquidity ratios. Using the agency theory, companies with low liquidity ratios will have to disclose more to shareholders to lower the agency costs (Aly et al., 2010).

**2.2.5 IFR disclosure quality.** While the literature has looked at internet financial reporting extensively from a quantitative point of view, there has also been efforts to measure the qualitative aspect of internet financial disclosure. Cheng, Lawrence, and

Coy (2000) measured the quality of internet disclosures by New Zealand's Top 40 companies by devising a benchmark index. They found that 80% of the companies had a website and that 70% of them disclosed financial information on their websites. Davey and Homkajohn (2004) came up with a qualitative index covering content, timeliness, technology and user support. Their study looked at the top 40 Thai companies and they found that Thailand companies provide financial information to complement that provided in print-based annual reports.

### **2.3 Continuous Disclosures**

Continuous disclosure is a system that ensures that the market is informed of all relevant information at all times (NZX Limited, 2014). This system is designed to ensure that all market participants have fair access to information to enable them to make informed investment decisions. In New Zealand the general requirement is for the company to post all material information as soon as they are aware through the NZX Material Announcements Platform (MAP) (NZX Limited, 2014). The NZX is the central repository for all material public information. This measure then ensures that all investors have fair access to information that may materially affect their investments. This corporate information on the NZX MAP is easily accessible and lowers the information search costs for investors (Rahman & Debreceeny, 2010). In Countries like Australia, Canada, Germany, Hong Kong, Singapore, UK and the USA their stock exchange regulators also require listed companies to follow continuous disclosure requirements. The aim of the regulators is to reduce information asymmetry within their markets. The consequences of increased information asymmetry are the negative outcomes of adverse selection and insider trading (Verrecchia, 2001). Therefore, literature has examined the effects of the continuous disclosure regime on information asymmetry, but there remains no consensus. Russell (2015) examined whether continuous disclosure lowered information asymmetry. They found that for companies with high information asymmetry continuous disclosure led to an increase in information asymmetry. While most studies looked at the material disclosures when examining the relationship between information asymmetry and continuous disclosures Rahman and Debreceeny (2010) looked at the frequency of the material disclosures. They examined the effect of

continuous disclosure frequency on information asymmetry. They found that continuous disclosures had a positive impact on market efficiency by reducing information asymmetry. Huang, Marsden, and Poskitt (2009) studied the impact of continuous disclosure on the New Zealand market. Using analyst forecasts, they found that continuous disclosure improved the informational efficiency of the New Zealand market.

## **2.4 The XBRL Disclosures**

XBRL is an emerging technology tool that tags disclosure data, both financial and non-financial into machine searchable data. As a result, XBRL is better suited for analysis of the vast financial and non-financial disclosure data (Debreceeny et al., 2005; Geiger, North, & Selby, 2014).

The primary purpose for XBRL adoption was to improve the quality of financial and non-financial information released to the public, thereby improving the efficiency of analysis of the corporate disclosures (Debreceeny et al., 2005). Information asymmetry would then be reduced in the capital markets. However, Debreceeny et al. (2005) cautioned that the adoption of XBRL may involve a learning curve and it could actually increase information asymmetry if only sophisticated investors can use.

XBRL research started off by looking at the nature and background of XBRL (Debreceeny et al., 2005; Debreceeny et al., 2011; Plumlee & Plumlee, 2008). These early studies revealed some teething problems with the XBRL implementation. Bartley, Chen, and Taylor (2011) examined the 2006 and 2008 filings of 22 early adopters of XBRL and found that all of them had substantial coding errors. There has even been calls for external assurances on the XBRL disclosures, with concerns that if the quality of the XBRL disclosures is inadequate then the objectives of XBRL implementation to reduce information asymmetry may not be reached.

Researchers have also tried to assess the impact of XBRL on the stock market. Research on the adoption of XBRL and its effect on information asymmetry has been mixed. Looking at Korean stocks Yoon, Zo, and Ciganek (2011) found that adopting XBRL technology reduced information asymmetry. Kim, Jee-Hae, and Won Gyun (2012) also

found that XBRL reduces information asymmetry. Other studies however have found that information asymmetry actually increases for those companies who have adopted XBRL (Blankespoor, Miller, & White, 2014a). Currently, a full understanding of the impact of XBRL on market efficiency in other countries is hampered by the slow adoption process, with companies still implementing XBRL.

## **2.5 Social Media Disclosures**

**2.5.1 Background.** Social media has revolutionised corporate disclosure practices. Whereas traditionally firms would need to go through the media outlets to disseminate their disclosures, with social media channels like Twitter, firms can push their disclosure content directly to the public (Blankespoor et al., 2014b).

Further, Blankespoor et al. (2014b) found that firms using Twitter hyperlink their disclosure content like annual reports, or interim financial results unchanged. With traditional media outlets, the media puts a spin on the disclosure by adding a discussion of the results. With social media, firms therefore have an opportunity to give out unaltered content direct to their stakeholders.

Traditional media is biased towards disclosure content that sells papers and increase readership (Miller, 2006). With the advent of social media all firms have an opportunity to freely and efficiently disclose to the public. Reactions can be viewed in real time with social media (Hooper, 2013), allowing companies to take corrective actions.

Companies are using social media to reach new communities they would not otherwise reach. A study by Juheng (2015) found that investment in social media by companies is justified. He found that firms that have high adoption levels of social media attract more investors than companies with low adoption levels.

Institutional investors are using social media in their investment decision making (Meyer Alexander & Gentry, 2014). Research has shown that social media sentiment has more impact on share price than conventional media (Yang, Wenjing, & Qing, 2013). This is because social media content is considered more credible, is low cost and is easily accessible than conventional media.

**2.5.2 Social media practices.** Early research into social media disclosure mainly focused on Twitter and looked at how it was being used in business (Case & King, 2011). Feng and MacKenzie (2015) looked at 100 ASX listed companies and found that businesses were using Twitter for varied purposes like disseminate news, corporate promotions and handle customer service enquiries.

Mi et al. (2015) in their study of 9861 publicly listed companies using Twitter and Facebook found that companies were increasing their adoption of these platforms and using them for corporate disclosures.

Accounting research on social media has rapidly moved to explore the outcomes of social media adoption. Lee et al. (2015) looked at how firms use different forms of social media, Facebook and Twitter to manage product recalls. They note that in such a crisis social media offers two offsetting effects. Using social media offers the opportunity to quickly inform the public, stemming misinformation and rumours. However, using social media could actually exacerbate the situation by spreading the bad news to a wider audience since there is no control over who sees the post. The interactive nature of social media would make things even worse as disgruntled customers comment. However, their results suggest that the net effect is to soften the blow of a product recall.

Trinkle, Crossler, and Bélanger (2015) looked at the effect social media comments have on perceptions. They found that comments made through social media influence user perception to the disseminated news.

Cole, Daigle, and Van Ness (2015) looked at 215 S&P500 companies that had a Twitter account. This study found that both the daily tweets as well as the number of months a firm tweets had a significant and positive association with excess returns. This indicated that tweeting had positive effects on shareholders.

Blankespoor et al. (2014b) examined US information technology firms and how their Twitter use affected information asymmetry. They found that dissemination of company disclosures through Twitter is associated with a reduction in information asymmetry.

Prokofieva (2015b) extended the study by Blankespoor et al. (2014b) by using ASX listed companies, to examine if the association between Twitter dissemination and information asymmetry would hold in an environment where material information has to pass through ASX Material Announcement Platform (MAP). The study found that dissemination of news through Twitter lowers information asymmetry even in an environment where material information has to pass through a centralised repository like ASX MAP.

Social media literature is still evolving as social media adoption grows. However, literature suggests that social media does improve the informational efficiency of companies (Blankespoor et al., 2014c; Prokofieva, 2015b). There however has been very little literature touching on social media disclosure quality and this could be explored by future research.

## **2.6 Summary**

Disclosure technology has been evolving from the print-based disclosures, to continuous disclosure, to internet disclosure, to XBRL disclosures and now the emerging social media disclosure. Inevitably, this has changed the way accounting information is prepared, disseminated and used by stakeholders. Literature on disclosures has also been evolving as the technology evolves. Disclosure literature has moved from studying the print-based disclosures of annual reports, to the online-based disclosures of the corporate websites, XBRL technology and now social media. Research has tried to shed light on the motivations for the adoption of these trends and their outcomes on the companies, investors and the capital market.

Literature has moved to use the theories covering the print based offline disclosures to explain internet financial disclosures. Therefore, voluntary disclosure theories like economic based theories (agency theory, signalling theory, capital needs theory and legitimacy theory) have been used by literature. There is, however, an attempt by researchers to use other theories to explain social media like the innovation diffusion theory and investor recognition theory.

While research has extensively covered quality issues of traditional disclosures, there is still more ground to be covered concerning internet financial reporting quality and social media disclosure quality.

The literature on voluntary disclosure looked at annual reports as the primary disclosure vehicle, existing literature on internet financial reporting has looked at the website as the primary disclosure vehicle. The existing literature on social media disclosures has now singled out Twitter as the disclosure vehicle of choice.

There is therefore an opportunity for research to explore not only other theories to explain social media but also to look at other social media channels and forms of usage. This research aims to extend the social media research in this direction.

## CHAPTER THREE

### HYPOTHESIS DEVELOPMENT

#### 3.0 Introduction

This chapter presents three hypotheses for this study. The first hypothesis tests whether social media lowers information asymmetry. This hypothesis is motivated by studies by Blankespoor et al. (2014b) and Prokofieva (2015b). They both looked at the effect of Twitter on information asymmetry in their studies of both the US and Australia respectively. While Blankespoor et al. (2014b) only looked at the IT sector, Prokofieva (2015b) looked at all sectors in Australia. This hypothesis will look to examine all social media and all sectors. The second hypothesis seeks to examine how the type of social media used affects information asymmetry. This hypothesis is motivated by Mi et al. (2015) who looked to examine whether the type of social media used had any effect on the value of the company. The third hypothesis examines whether increasing the number of social media platforms lowers information asymmetry. The theoretical framework used in this study is the Investor Recognition Hypothesis. The chapter starts with the background explaining key issues around social media dissemination. The chapter then moves to explain the hypotheses of the study.

#### 3.1 Background

In New Zealand, the authorities have taken on social media disclosures with much caution unlike in the US. In New Zealand, the SEC has been cautious and has allowed companies to release information on social media only after releasing it first on the NZX Market Announcements Platform (MAP). The NZX then becomes the central repository of all material announcements. Companies can then afterwards disseminate this information through the internet if they so wish.

Listed companies in New Zealand issue both annual and semi-annual reports on their performance. This periodic reporting by firms in New Zealand is meant to supplement



the continuous disclosure regime (NZX Limited, 2014) that firms are expected to observe.

Social media has been defined as information technologies that supports interpersonal communication and collaboration over internet technologies (Kane, Alavi, Labianca, & Borgatti, 2014). Social media therefore enables users to interact with information disclosures in real time. The types of social media used for corporate disclosures in New Zealand are Twitter, Facebook, LinkedIn, YouTube, Google+, Pinterest, Instagram, Vimeo, Snapchat and Tumblr. Twitter is a social networking site that utilises instant messaging. Users post tweets that consists of videos, photos, hyperlinks and text of up to 140 characters. Facebook is also a networking platform that connects friends through the sharing of videos and photos. Users can post comments and links to news, live chat, play games and stream live videos. LinkedIn is another networking tool that builds connections between job seekers and professionals. The social media site is designed specifically for the business community. YouTube is a social networking site that is centred around user generated videos. Users can make comments and rate these user generated videos. Ranking of internet sites by traffic in New Zealand shows that YouTube is ranked second, Facebook is the fourth most popular site, LinkedIn is ranked fourteenth and Twitter is ranked nineteenth (Alexa.com, 2016).

**3.1.1 Material information.** The use of social media for corporate disclosures brings with it the timeless debate on what is new material information. Material information is defined as information in relation to the company that a reasonable person would deem if it were released to have a material effect on price (NZX Limited, 2014). The NZX does not identify specific information events, but allows for a reasonable issuer to exercise judgement. There are therefore no bright lines to guide the definition of material disclosures. Deciding on whether a particular piece of news event is material information is the most difficult decision for the issuer, especially when engaged in social media.

Literature has identified certain disclosure classification as significant market moving events. Ryan and Taffler (2004) identified specific information events that had a significant effect on price. They found that specific news categories like analyst

recommendations, interim results, directors share dealings, management appointments and financing issues had significant effect on both trading volume and share price. They argue that price is not a result of random movements but a result of specific information events that enable investors to update their views on a specific company.

**3.1.2 Information asymmetry.** The information “Lemons” problem is used to explain why companies are motivated to engage in voluntary disclosures. If the investors cannot distinguish between a bad “lemon” company and a good company those with bad companies will try and claim them as good (Akerlof, 1970). Therefore it is incumbent upon those with good investments to voluntarily disclose more information to distinguish themselves from the bad (Healy & Palepu, 2001). His basic argument was that in any market, a buyer has a basic knowledge of the average price of the item they want to buy, based on the average price of similar items but the seller has intimate knowledge of the item in question. Akerlof (1970) argues that it is this information asymmetry that allows the seller to pass off items of less than the average market quality. In the capital markets, the investor has less information than the managers do. When investors have less information than the managers they put in a higher risk premium and therefore demand a higher required rate of return. In response total trading volume decreases (Chae, 2005a). A company can therefore release more information to mitigate against adverse selection, allowing investors to have a better assessment of the company’s prospects.

**3.1.3 The investor recognition hypothesis.** Miller (1977) first suggested the idea of the investor recognition hypothesis when he pointed out that the probability of a stock being picked for inclusion in a portfolio depends first on the visibility of the stock and then the attractiveness of the stock. A stock’s visibility is linked to various factors like price, publicity and popularity of the firm’s products. Merton (1987), however, proved that when a stock is popular and widely recognised then its cost of capital will decrease. Empirical studies have supported the investor recognition hypothesis, with Bushee and Miller (2012) finding evidence that investor relations activities improve the visibility of companies, improving investor following and market values as well.

Therefore, Merton's argument is that investors would only hold stocks for which they have enough or complete information on. Incomplete information within the capital markets affects the trading behaviour of investors, towards those companies for which they have information on.

There are competing factors that vie for the attention of the investors, and with thousands of stocks from which to choose from investors choose those stocks they are familiar with. Therefore to increase visibility companies can disclose more detailed information Buskirk (2012), decreasing their information asymmetry. This is the part that the literature has extensively looked at when dealing with corporate disclosures. However, companies can also increase visibility through wider dissemination (Blankespoor et al., 2014b; Prokofieva, 2015b). These studies argue that dissemination mechanisms determine the speed with which disclosures reach the intended users. Prokofieva (2015b) argue that the traditional assumption that corporate disclosures once released are quickly assimilated may not hold. Studies show evidence that corporate disclosures are gradually assimilated into stock prices (Bloomfield, 2002; Hong & Stein, 1999). This study looks at social media dissemination mechanisms, one tool in the toolbox for managers to use to disseminate widely their corporate disclosures, helping them increase corporate visibility, hence lowering information asymmetry.

## **3.2 Hypothesis Development**

**3.2.1 Hypothesis 1: General use of social media.** Literature has been very consistent in that corporate disclosures reduce information asymmetry. Mandatory disclosures have been shown to reduce information asymmetry (Greenstein & Sami, 1994; Hagerman & Healy, 1992; Leuz & Verrecchia, 2000). With regards to voluntary disclosures literature has also shown that increased voluntary disclosures reduce information asymmetry (Healy, Hutton, & Palepu, 1999; Heflin, Shaw, & Wild, 2005). Therefore releasing more information about a company helps the company improve their information environment.

Recent studies have looked at the social media dissemination mechanisms and how they help companies improve their information environments. These studies argue that the vessel is just as important as the contents of the vessel. Using the Investor Recognition

Hypothesis, it can be argued that social media is a dissemination mechanism that enables corporate disclosures to be disseminated to a wider audience (Prokofieva, 2015b). Therefore more uninformed investors can be reached (Blankespoor et al., 2014c), increasing the visibility of the company and lowering information asymmetry. A study by Blankespoor et al. (2014b) looking at Twitter also found evidence that corporate disclosures disseminated through Twitter had significant effect on information asymmetry. Prokofieva (2015b) extending the research by Blankespoor et al. (2014b) looked at the dissemination of disclosures through Twitter and found significant effect on information asymmetry. Prokofieva (2015a) extended on the study by Blankespoor et al. (2014b), by looking at social media within the Australian context, which is different from the US. In Australia as in New Zealand, authorities have decreed that disclosures have to be made through the ASX Market Announcements Platform before being released through social media. This study found that even in an environment where only secondary information makes it through to social media, dissemination through social media lowers information asymmetry. Both researches used event studies to study the effect of social media dissemination on information asymmetry.

To observe the effects of social media dissemination on information asymmetry, the study seeks to capture this relationship over a period and not capture the short-term fluctuations. It has been observed that in the short term information asymmetry can sometimes increase due to increased uncertainty caused by the disclosure and also the arising divergent views (Bamber et al., 2011; Krinsky & Lee, 1996).

This study will also look to extend the work by (Prokofieva, 2015b) and Blankespoor et al. (2014b) by looking at other social media in New Zealand in addition to Twitter. Most research has concentrated around Twitter since data is readily available (Lyon & Montgomery, 2013).

While in New Zealand material information can only pass first through the NZX MAP, it is however expected that the adoption of social media disclosures would improve dissemination. This is because using Investor Recognition Hypothesis, social media allows information to reach uninformed investors. Even in this context, where information is expected to pass through the NZX MAP, social media helps this publicly available information to be transmitted to a wider audience, reaching more uninformed

investors hence lowering information asymmetry. The following hypothesis is therefore stated:

**H1:** The use of social media is negatively associated with information asymmetry.

**3.2.2 Hypothesis 2: Type of social media platforms used.** Existing literature in studying social media has extensively looked at Twitter (Blankespoor et al., 2014b; Case & King, 2011; Cole et al., 2015; Feng & MacKenzie, 2015; Lyon & Montgomery, 2013; Prokofieva, 2015b). Its popularity in literature has not been without reason. Twitter allows for archival data to be easily retrieved for study unlike emails or RSS feeds (Prokofieva, 2015b). Anecdotal evidence suggests Twitter is more favoured by Investor Relations professionals for disseminating corporate disclosure in real time (Blankespoor et al., 2014b).

However, evidence is emerging to challenge the existing notion that social media platforms are generic and therefore Twitter represents all the other platforms or that Twitter is more important as a social media platform. Mi et al. (2015) in their study looked at Facebook and Twitter for 10,000 US companies. Significantly, they found out that these two social media sites were being used differently for disclosures. They found that financial disclosures were 7% of the total messages on Facebook and only 3.45% for Twitter. Users responded quicker to released corporate disclosures on Twitter (13 minutes) than on Facebook (25 minutes). Further engagement with released disclosures on Facebook was longer (427 minutes) than on Twitter (10 minutes).

Hui and Wei (2015) examined a sample of 1500 S&P firms in the US. They looked at Twitter, Facebook, LinkedIn, YouTube, Blogs and forums. The study found that firms with a social media presence are more valued than those without. More pertinently, they found that Facebook was significantly related to firm performance and Twitter was not. This is surprising given that Twitter has been the focus of most research in social media.

While literature has continued to highlight the differences in social media platforms, literature has not yet moved to show how this difference affects the companies using these platforms. For instance, research has found that an increasing number of users

now use Facebook or Twitter (Müller et al., 2016; Soo Jung & Hadley, 2014) as a primary source of information, but this difference with other social media platforms has not been explored by examining its impact on the information environment of companies. There is evidence that in the US, Facebook is by far the most accessed social media platform for news and users spend more time engaged with content on Twitter (Mitchell et al., 2016). These differences highlight that the way in which users engage with the social media platforms is different. Literature now needs to move the next step by examining the impact of this difference on the information environment of companies using these different kinds of social media.

Literature has shown that it is not entirely true to assume that a social media platform with a large audience brings in the most benefits to a company (Hui & Wei, 2015). This is because users sometimes simply stop using social media platforms and therefore audiences may reflect inactive members. In considering the value of social media to a company there is need to also take into account the interconnectedness which locks users to a platform (Gneiser, Heidemann, Klier, Landherr, & Probst, 2012).

Using the Investor Recognition Hypothesis, it is expected that the social media with more engagement and interconnectedness will allow uninformed investors to engage with the corporate disclosures. This will then consequently raise company visibility as more investors become informed, lowering information asymmetry. The following hypothesis is then stated:

**H2:** The impact on information asymmetry differs according to the type of social media platform used.

**3.2.3 Hypothesis 3: Number of social media platforms.** This hypothesis is about the breadth of social media dissemination. Literature is in agreement that dissemination plays an important role in the capital markets. Li, Ramesh, and Shen (2011) examined the role newswires as an information intermediary play in conveying market moving information. They used the Dow Jones Newswire, a service that extracts market moving SEC filings and sends them to investors and other market participants. Given that this information is already publicly available, their results interestingly found that alerts from the Dow Jones Newswires resulted in significant price movements. Bushee et al. (2010)

examined the role the business press plays as an information intermediary in conveying corporate disclosures. They found that greater dissemination had a greater impact than the quality and quantity of the information. Twedt (2016) examined also the role the Dow Jones Newswire as an information intermediary plays on the price of US companies. The study found that newswire dissemination is associated with higher initial price reactions and an increase in the speed at which the news is incorporated into the price. These studies reveal very important points with regards to information dissemination and information disclosures. While it was assumed that information when it is disclosed is instantly incorporated into the market, research has argued otherwise. Information slowly diffuses across the market, as more people become aware of it (Bloomfield, 2002; Hong & Stein, 1999). Disclosures have to overcome the limited attention span and lack of ability to process some disclosures by investors as some neglect relevant aspects of a disclosure (Hirshleifer & Teoh, 2003). Further, the new digital age has now presented a new challenge of information overload (Li et al., 2011). Even publicly available information if disseminated widely is able to lower information asymmetry. This is because there are acquisition costs investors incur like searching and gathering information (Blankespoor et al., 2014b) that limit access to publicly available information disclosures.

Therefore, using the Investor Recognition Hypothesis, it can be argued that broader dissemination would be able to help information reach uninformed investors. A lack of awareness can persist even when information has been publicly disseminated through traditional channels (Blankespoor et al., 2014b; Li et al., 2011). Public disclosures may therefore need further dissemination to reach the attention of investors. This study argues that another useful way to reach uninformed investors is to broaden the social media presence through using a number of social media platforms. Further complementarities arise through the use of multiple social media platforms. For example Twitter posts may reference a YouTube video, potentially improving the social media system as a whole (Hui & Wei, 2015). Information can therefore be reinforced by channelling it through different social media platforms. This then means more uninformed investors are reached, lowering information asymmetry.

Using a number of social media platforms therefore enables the company to reach different demographics in the investor community, consistent with the Investor

Recognition Hypothesis reaching more uninformed investors, increasing visibility and lowering information asymmetry.

While the company could use other disclosure mechanisms to disseminate their disclosure information, the argument pushed by this study is that wider dissemination of information through utilising more than one social media platform could actually help lower information asymmetry. Literature has shown that dissemination through Twitter does reduce information asymmetry (Blankespoor et al., 2014b; Prokofieva, 2015b), it remains unknown whether increasing the number of social media platforms is better. This study therefore utilising the framework established by Hui and Wei (2015), Prokofieva (2015b) and Blankespoor et al. (2014b) state the following hypothesis.

**H3:** There is a negative association between information asymmetry and the increasing number of social media platforms a company uses.

### **3.3 Summary**

This chapter presented the three hypotheses that are examined in this study. Recently literature has moved to show that social media as a dissemination mechanism can effectively lower information asymmetry (Blankespoor et al., 2014c; Prokofieva, 2015b). This study looks to extend on the work done by these studies by examining all social media platforms used in New Zealand by NZSX including Twitter.

Further, the studies on social media disclosures and its impact on information asymmetry have mainly used event study designs. This study looked to study the impact all the social media platforms have on information asymmetry. Information asymmetry is, therefore, examined over a period of one year and not around information events. This would overcome the problem that literature has raised concerning a rise in information asymmetry caused by a divergence of views around disclosures or attendant uncertainties arising from disclosures (Bamber et al., 2011; Krinsky & Lee, 1996).



While the relationship between social media and Twitter has been examined and differences in social media platforms have been highlighted, literature has not yet moved to show how this difference affects the companies using these platforms. For instance, research has found that an increasing number of users now use Facebook or Twitter (Müller et al., 2016; Soo Jung & Hadley, 2014) as a primary source of information. It has also been found that Facebook is by far the most accessed social media platform for news and users spend more time engaged with content on Twitter (Mitchell et al., 2016). Therefore, a social media platform which interconnects users (Gneiser et al., 2012) and allows the most engagement would significantly lower information asymmetry. This is because, using Investor Recognition Hypothesis, it would allow disclosure information to spread, allowing uninformed investors to be updated.

A large number of social media platforms allow a company to reach more users (Hui & Wei, 2015). Literature has not yet moved to show how utilising more than one social media platform affects a company's information environment. The study argues using the Investor Recognition Hypothesis that since different social media platforms appeal to different demographics, increasing the number of social media platforms is expected to decrease information asymmetry. Therefore, the study seeks to examine the following hypotheses in this study:

- The study examines whether social media disclosures lower information asymmetry for companies in New Zealand.
- The study examines whether the type of social media platform a company uses has a variable impact on information asymmetry.
- Finally, the study seeks to examine whether the number of social media platforms used has a significant effect on information asymmetry.

## CHAPTER FOUR

### METHODOLOGY

#### 4.0 Introduction

In the previous chapter, three hypotheses were identified. Firstly, the study seeks to confirm whether social media dissemination significantly lowers information asymmetry within a New Zealand context where disclosures are only allowed on social media platforms after disclosure through the NZX MAP. Secondly, the study explores whether the type of social media platform used to disseminate disclosures on social media has a significant effect on information asymmetry. Finally, the study examines whether the breadth of social media presence used as signified by the number of social media platforms has a significant effect on information asymmetry. In this chapter, the research design, data collection, model and variable definitions and data analysis techniques used to test the hypotheses developed in Chapter Three are discussed. The Methodology Chapter begins with a discussion and rationale for the research design adopted and moves on to the data collection and sample selection for the study. Then variable definitions are presented and finally the data analysis is discussed.

#### 4.1 Research Design and Data Collection

**4.1.1 Research Design Rationale.** Considering the need for a logical design for this research and to enable unambiguous conclusions to be reached for this study a mixed methods approach was taken. Capturing the New Zealand context was a very important factor in approaching this research. New Zealand has different regulations on social media usage by companies with NZX requiring that listed companies first inform it before disclosing material information on social media (NZX Limited, 2016). Further, the way companies use social media in New Zealand could be different to how other countries use social media and this was very important to capture.

Content analysis, the quantitative analysis of words which are expressed in text (Schwartz & Ungar, 2015), was therefore incorporated into the study to extract this

qualitative context. Content analysis is a technique which involves codifying both qualitative and quantitative data into categories to enable patterns to be derived (James & Indra, 2006). It is by no means the only technique that can be used for text analysis. Other techniques delve deeper into text analysis and as such would be inappropriate for use in analysing a large volume of text data. For example, semiotics scrutinises the construction and structure as well as the relationships between words within a text. Ethnography interrogates the behaviour of actors interacting with text. They were therefore inappropriate for the purposes of this study.

Content analysis is widely used and popular in studies on social and environmental reporting (Parker, 2011; Vourvachis & Woodward, 2015) due to its flexibility. It can be used to analyse other reports besides annual reports (Craig & Amernic, 2008; de Villiers & van Staden, 2011; Hooks & van Staden, 2011; Mäkelä & Laine, 2011).

Event studies are very popular in social media research. However researchers have struggled to identify an accurate timing of events (MacKinlay, 1997). Further event study researchers focus on one specific type of news event i.e. earnings announcements (Sprenger, Sandner, Tumasjan, & Welpe, 2014), but it is the breadth of information dissemination that is important (Fang & Peress, 2009) for this study. It was also important to capture information asymmetry over a period, and not around information events as some literature has argued that in fact in the short-term information asymmetry could actually increase information asymmetry. This is because disclosures may be costly for investors to process in the short term or induce either added uncertainty or a divergence of views (Bamber et al., 2011; Krinsky & Lee, 1996). Therefore, in this study no one news event was focused on but the whole totality of information disclosures hence a period of one year, 01 September 2015 to 30 September 2016 was the focus of this study. This period allowed capture of new social media trends.

**4.1.2 Data collection.** Use of social media data were gathered by reading through the websites of all the companies on the NZX Main Board (NZSX) from the period 01 September 2015 to 30 September 2016. The NZSX was chosen as it lists the largest NZX companies. These companies are expected to use social media. Other researchers have looked at the technology sector (Blankespoor et al., 2014b), but this study sought to cover all sectors, ensuring good representation. The period 01 September 2015 to 30 September 2016 was chosen as it represented the latest period from which social media data could be extracted for a year. From this, all companies that had no data covering the selected period were omitted. In the end, 150 companies were selected, with 92 using social media and 58 not using social media acting as controls.

To identify the official social media sites, the initial process was to look at the relevant company websites identified through the NZX company profile page. In cases where no social media handles were identified on the website, a google search was then done.

Once the social media platforms were identified then the NCapture tool from NVivo was used to scrap all the data for the required period. All the social media data were then gathered in pdf form by NCapture for analysis in NVivo. The process of extracting social media data through NCapture is shown in Appendix 1.

The next stage of the process required extracting disclosure categories from the dataset. Identification of disclosure categories from the extracted dataset was then done. Disclosure categories were identified using prior literature.

Starting from the disclosure classification used by Rahman and Debreceeny (2010) of Accounting and Finance, Prospective, Governance and Share Transactions the classifications are as shown in Table 1. To facilitate NVivo text search there was need to establish a dictionary of words and phrases to capture the context of disclosure information in New Zealand.

To establish a dictionary of common words used by companies in New Zealand the general approach taken was as used by Antweiler and Frank (2004) in their text classification. Firstly, a manual coding of a sample of 10 companies, each company drawn from a sector, was done to establish what common words and phrases would be relevant. Therefore, a sample of 10 NZSX companies representing all sectors was

chosen and manually coded. The words from this process were augmented by words from prior literature which could be relevant (Sprenger et al., 2014) in the New Zealand context. The results of this process, created a dictionary of words and phrases as shown in Table 1. Encoding was then done using NVivo for all social media users.

Finally, the study established two major umbrella categories from all these information categories; material disclosure category and then other disclosures to help trace whether material information was being channelled through social media. To help build a material disclosure category, NZX material disclosure categories were used. The NZX maintains a database NZX Company Research and it classifies all the material announcements which go through NZX MAP into several material announcement classifications. Using these classifications, the disclosures were put under an umbrella category of “Material Announcements” (Table 1).

Further, using news events established by Ryan and Taffler (2004) to have a significant effect on market price and trading volume, the classification was checked for consistency. Otherwise, all the other categories not identified by the classification system used by NZX were classified as “Other Announcements”.

The number of followers on each social media platform were also recorded as at 30 September 2016. Where no official figures were found on the site then a value of 1 was assigned.

Table 1

*Dictionary of Common Words Used in Classifying Disclosures*

<b>Disclosure Types</b>	<b>Common Words or Phrases Used</b>
<b>Material Information</b>	
<b>Governance</b>	
Management Changes	"New CEO" OR "New CFO" OR "New COO" "New board" OR "new board member"
<b>Accounting and Finance</b>	
Earnings Announcements	"Annual report", "financial report", results, profits, dividends, "full year result", "interim result", "half year report", earnings, FY15, FY16, "fiscal year", "pre-tax profits".
Sustainability Reporting	"Sustainability reports", "integrated reporting"
Profit Warnings	"profit warnings", "trading update"
Mergers and Acquisitions	Merger, buy, acquire, deal, acquisition, buy-out, partnership, "joint venture", divest,
Analyst Presentations	"Company presentations", presentation
AGM Announcements	AGM OR "Annual General meeting" OR "Annual Meeting"
<b>Other Information</b>	
Community Involvement	Sponsored OR raised OR foundation OR community OR LGBT OR volunteer OR "raise funds" OR scholarship OR "pride parade" OR Cancer OR "KidsCanNZ" OR Starship
Marketing	Win, store, customer, free, deal, enter, promotions, save, "buy two for the price of one", draw, book, OFF, offers, new solution, find out more, visit our, https, www, instore
Recruitment	Hiring, seek.com, career, join, team, job opportunities, apply, role.
Notices	Faults OR "scam alert" OR fixed
General	"Happy Christmas", "Happy Easter", congratulations, "Happy New Year", "Anzac Day", "Remembrance Day", "Waitangi Day", "Valentine's Day", "Mother's Day", "Father's Day", "St Patrick's Day", Halloween, "Youth Week", "daylight savings", "happy Diwali"

## 4.2 The Research Models

**4.2.1 The research model for hypothesis 1.** To explore whether social media disclosures reduce information asymmetry, social media users (N = 92) are compared with non-social media users (N = 58). Therefore, a dummy variable *Social Media* was created with social media users coded with a value of 1 and non-social media users given a code of 0 in SPSS.

Prior literature has focused on the use of Twitter in social media dissemination arguing that Twitter is the technology of choice (Blankespoor et al., 2014b; Jung, Naughton, Tahoun, & Wang, 2015). This approach ignores the fact that some companies are extensively using other social media sites to widely disseminate their earnings information. Further the use of social media is different to other countries (Dabner, 2012; Nielsen Media Research, 2012). This study therefore seeks to explore the entirety of social media technology to gain more insights.

The following regression model was used to test the hypothesis in the study:

### The Negative Binomial Regression Model – H1

$$\begin{aligned} \ln (\text{INFORMATION\_ASSYMETRY}_{ip}) \\ = \\ [\beta_0 + \beta_{1i}\text{Social\_Media} + \sum \beta_{pi} \text{Covariates} + \varepsilon] \end{aligned}$$

Where:

$\ln (\text{INFORMATION\_ASSYMETRY})$  = Natural log of (Volume of Trades per year).

*Social Media* = Dummy variable with Social media users coded as 1 and non-social media users coded as 0, for the period 01 Sept 2015 – 30 Sept 2016.

*COVARIATES* = Control variables for liquidity, share price volatility, traditional press coverage, technology sector and size.

$\varepsilon$  = the error term.

**4.2.2 The research model for hypothesis 2.** To compare whether there is a significant difference between each type of social media only data for social media users was analysed. The types of social media were identified as Twitter, Facebook, LinkedIn and YouTube, since they are the widely used platforms in New Zealand and dummy variables were created for each social media platform. A dummy variable was coded 1 if a company uses one of Twitter, Facebook, LinkedIn and YouTube, otherwise it was coded, 0. This coding ensured that each social media platform would be compared to the rest of the social media platforms.

Due to multicollinearity (see the data analysis section), the dummy variables for Twitter, Facebook, LinkedIn and YouTube were entered into the model one at a time.

### The Negative Binomial Regression Model – H2

$$\begin{aligned} \text{Ln (INFORMATION\_ASSYMETRY}_{ip}) \\ = \\ [ \beta_{0i} \textit{Type of Social Media} + \sum \beta_{pi} \textit{Covariates} + \varepsilon ] \end{aligned}$$

Where:

*Ln (INFORMATION\_ASSYMETRY)* = Natural log of (The Volume of Trades in a year)

*Type of Social Media* = Coded, 1 for example when the company uses Twitter, otherwise, coded 0.

*COVARIATES* = Control variables for liquidity, share price volatility, traditional press coverage, technology sector and size.

$\varepsilon$  = error term.

**4.2.3 The research model for hypothesis 3.** To investigate whether spreading a company's social media presence by using more social media sites significantly reduces information asymmetry, dummy variables were created for the number of social media sites a company utilises. With the maximum number of social media sites used by the



sampled companies being 8, therefore dummy variables *One, Two, Three, Four, Five, Six, Seven* and *Eight* were created. Therefore, for instance *Two* would represent those companies with two social media platforms and was coded 1 if a company had two social media platforms otherwise it was coded, 0.

Again due to multicollinearity (see the data analysis section), the dummy variables for *One, Two, Three, Four, Five, Six, Seven* and *Eight* were entered into the model one at a time.

The following regression model was used to test the hypothesis in the study:

### **The Negative Binomial Regression Model – H3**

$$\begin{aligned} & \text{Ln (INFORMATION\_ASSYMETRY}_{ip}) \\ & = \\ & [ \beta_{0i} \text{Number of Social Media} + \sum \beta_{pi} \text{Covariates} + \varepsilon ] \end{aligned}$$

Where:

$\text{Ln (INFORMATION\_ASSYMETRY)}$  = Ln (The Volume of Trades per year).

*Number of Social Media* = Coded, 1 when the firm has for example one social media site, otherwise, coded 0.

*COVARIATES* = Control variables for liquidity, share price volatility, traditional press coverage, technology sector and size.

$\varepsilon$  = the error term

### 4.3 Variable Definitions

**4.3.1 The dependent variable definition.** Most research studies in social media have used event studies and the bid-ask spread has been commonly used by researchers to measure information asymmetry (Blankespoor et al., 2014b; Prokofieva, 2015a). With the focus of the study on the breadth of information disclosure and not on any particular information event, *Trading Volume* was used to measure information asymmetry. Frequently traded stocks generally have more information available on them. There is therefore an inverse relationship between trading volume and information asymmetry (Bharath, Pasquariello, & Guojun, 2009). The *Trading Volume* for the period 01 September 2015 to 30 September 2016 were collected from the NZX Company Research database. Since *Trading Volume* is count data and would not follow a normal distribution, as the integer values are not expected to be negative, instead count data models were used as they match the data better (Sturman, 1999). There also would be no need to transform the data to normalise it, avoiding problems of taking logs of zero numbers.

**4.3.2 Independent variable definitions.** In this study, several independent variables established from literature were used as controls. As the study sought to isolate the effect of social media dissemination on information asymmetry, control for the amount of traditional media disclosures other than social media was done (Blankespoor et al., 2014b; Prokofieva, 2015a).

***Traditional Coverage*** was measured as the average number of articles on a firm. It covered local publications, web news and newswires and analyst reports about a firm for the period 01 September 2015 to 30 September 2016. Factiva was used to extract this data. Traditional intermediaries include press and analyst coverage (Blankespoor et al., 2014b) and their attention has been found to influence a company's information environment. It is expected that the more traditional media coverage a company receives the less information asymmetry the company has. Therefore, the effects of traditional media must be controlled.

**Share Turnover** is used as a measure of a share's liquidity. It is calculated by dividing the total number of shares traded over a period divided by average number of shares outstanding for the period. The higher the share turnover the more liquidity the shares of a company are. When information is readily available, information asymmetry decreases and liquidity increases (Cohen, 2008). Information asymmetry introduces adverse selection costs between a buyer and a seller and this adverse selection manifests itself through reduced liquidity as uninformed investors hold back on trading fearing trading loss to informed investors (Leuz & Verrecchia, 2000). DataStream was used to get the required data.

$$\text{Share Turnover} = \left[ \sum_{n=i}^y \left( \frac{\text{Daily Volume}}{\text{Shares Outstanding}_i} \right) \right] \frac{1}{n}$$

Where:

$n$  = trading days for the period 01 September 2015 to 30 September 2016.

*Daily Volume* = Daily traded volume multiplied by closing price for day  $i$ .

*Shares Outstanding* = Market value of the shares outstanding end of period.

**Size** is measured as the average market capitalisation of the company (Chae, 2005b; Lafond & Lang, 2007) for the period 01 September 2015 to 30 September 2016. Prior studies have found that large firms usually release more information than smaller firms (Chae, 2005b; Demsetz, 1986). Another argument is that smaller firms are less visible (Udayasankar, 2008) and therefore receive less traditional media coverage than bigger companies and consequently less interest from investors (Blankespoor et al., 2014b; Miller, 2006). DataStream was used to extract the market capitalisation data. Where no information was found, the NZX Company Research was used to collect the data.

Table 2  
*Variable Definitions*

<b>Variable</b>	<b>Measurement</b>	<b>Source</b>
<i>Trading Volume</i>	The volume of trades for the period 01 September 2015 to 30 September 2016.	NZX Company Research database
<i>Press Coverage</i>	Was measured as the number of articles on a firm covering local publications, web news and newswires and analyst reports about a firm for the period 01 September 2015 to 30 September 2016.	Factiva
<i>Liquidity</i>	It is calculated by dividing the total number of shares traded over a period of time divided by average number of shares outstanding for the period.	Datastream
<i>Volatility</i>	Was measured as annualised daily stock price volatility for the period 01 September 2015 to 30 September 2016.	Datastream
<i>Size</i>	<i>Size</i> is measured as the average market capitalisation of the company.	Datastream
<i>Technology Sector</i>	Dummy variable coded 1 for technology companies and 0 otherwise.	Datastream
<i>Social Media</i>	Dummy variable coded 1 for social media companies and 0 otherwise.	NVivo
<i>Twitter, Facebook, LinkedIn, YouTube</i>	Four Dummy variables coded 1 if particular platform is used, otherwise 0.	NVivo
<i>One, Two, Three, Four, Five, Six, Seven, Eight</i>	Eight Dummy variables coded 1 for the number of platforms, otherwise 0.	NVivo

**Volatility** of the stock price was measured as annualised daily stock price volatility for the period 01 September 2015 to 30 September 2016. DataStream was used to get the volatility data. Wyart, Bouchaud, Kockelkoren, Potters, and Vettorazzo (2008) found that there was a positive relationship between volatility and information asymmetry. It is expected that high volatility would result in high adverse selection, indicating high information asymmetry (Halov & Heider, 2011; Silva Martins & Paulo, 2014). However, Bushee and Noe (2000) found that increased disclosures actually attracted short term investors hence increased the stock price volatility.

$$Volatility = \sqrt{252} \times \sqrt{\left[ \frac{\sum_{n=i}^y (Ri - Ravg)^2}{n - 1} \right]}$$

Where:

$n$  = trading days for the period 01 September 2015 to 30 September 2016.

$Ri$  = change in daily price  $\left( \frac{price_t - price_{t-1}}{price_{t-1}} \right)$

$Ravg$  = Average daily returns for the period 01 September 2015 to 30 September 2016.

**Technology Sector** companies were identified using Datastream. Debreceny et al. (2002) argued that it is the technology within a sector that is the driver of the association between disclosure and the sector. They argued that high technology companies are involved in complex accounting (Kasznik & Lev, 1995) due to the amount of intellectual capital and R&D programs among other things. They therefore disclose more than other sectors (Bollen, Hassink, de Lange, & Buijl, 2008). Just like Prokofieva (2015b), this study will control for this.

#### 4.4 Data Analysis

**4.4.1 Rationale for using negative binomial regression.** In this study, the Negative Binomial regression was used to test the hypotheses. Since volume traded is count data, count data models were considered. However, an analysis of the data showed that the data was over-dispersed, showing greater variability than predicted

by the Generalised Linear Models under count data. Therefore, the alternative was to use Negative Binomial Regression which handles over-dispersion (Hoef & Boveng, 2007; Shi & Valdez, 2014).

While data transformation was an option when dealing with regression, to address skewed data, it is only helpful when dealing with data that approximates a lognormal distribution (Feng et al., 2014). It is however better to select a statistical measure that works with a Poisson distribution (as the study has count data, volume of shares traded) in-order to keep the original data (Zuur, Leno, & Elphick, 2010).

The other issue data analysis had to overcome was the issue of multicollinearity. Since companies use different combinations of social media platforms, multicollinearity would be an issue if a regression model was estimated. For instance, nearly 30% of the sampled companies used all the four main social media platforms of Twitter, Facebook, LinkedIn and YouTube. To overcome the issue of multicollinearity, different negative binomial regression models were run, each using one of the independent variables measuring social media type and social media number (Chavent, Ding, Fu, Stolowy, & Wang, 2006; Cooke, 1989a, 1989b; Depoers, 2000).

SPSS software was used for data analysis in this study. The steps followed for the Negative Binomial regression are as outlined in Appendix 2.

Data exploration was done searching for outliers using the Cook's Distance to reveal the influence of outliers on the whole model. Residual analysis was also done to test for homogeneity of variance.

#### **4.5 Summary**

This chapter presented a research design that moved away from the traditional event studies used in social media research. There was an effort to extract context through the use of content analysis of social media data. This data was then analysed in the next chapter and the results are as shown -under the Descriptive section. In analysing data there was an effort to match the data to the distribution hence a negative binomial regression was done, the results of which will be presented in the next chapter.

## CHAPTER FIVE

### RESULTS

#### 5.0 Introduction

The results of the tests on the hypotheses laid out in Chapter Three are outlined in this chapter. One aim of the study was to confirm that social media use within New Zealand reduces information asymmetry. The study wanted to also examine whether the type of social media (Facebook, Twitter, YouTube or LinkedIn), a company uses significantly affects information asymmetry. Finally, the study examines whether the amount of social media spread (the number of social media sites used) the company employs significantly lowers information asymmetry. The Chapter starts with general descriptive statistics of the data used in this study. The chapter then moves to look at each particular hypothesis outlining both the descriptive univariate analysis and the main multivariate analysis done for each hypothesis.

#### 5.1 General Descriptive Analyses

**5.1.1 Social media types used in New Zealand.** The entire NZX Main Board (NZSX) was sampled for the period 01 September 2015 to 30 September 2016. Through this 93 companies were identified as using social media for this entire period. An analysis of the data revealed that in New Zealand there are predominantly four social media sites used by companies namely Twitter, Facebook, LinkedIn and YouTube (Figure 1). Recent research has focused on Twitter as it is very popular (Blankespoor et al., 2014b; Prokofieva, 2015b). For the sampled companies, LinkedIn is the most popular social media site with Twitter only coming third. If ranked according to the number of followers on each social media platform the picture is different. YouTube becomes the most popular social media site and LinkedIn ranks a lowly sixth (Figure 2). However, Twitter does not feature among the top social media sites for the companies listed on the main NZX board.

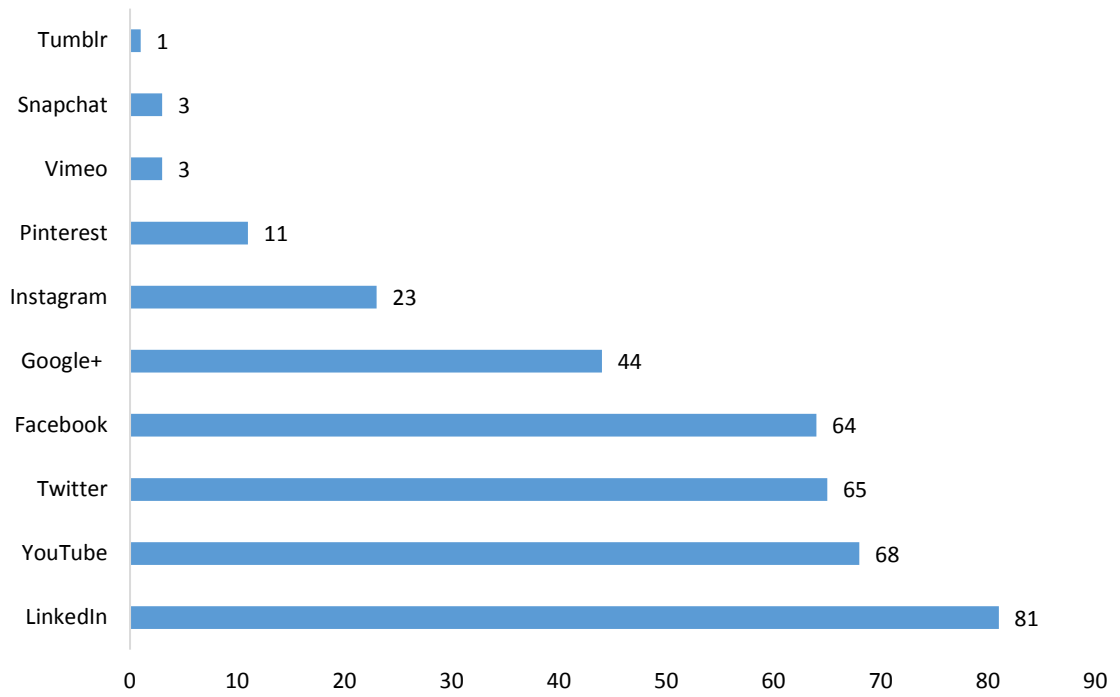


Figure 1. Number of companies using each type of social media for the period 01 Sept 2015 – 30 Sept 2016

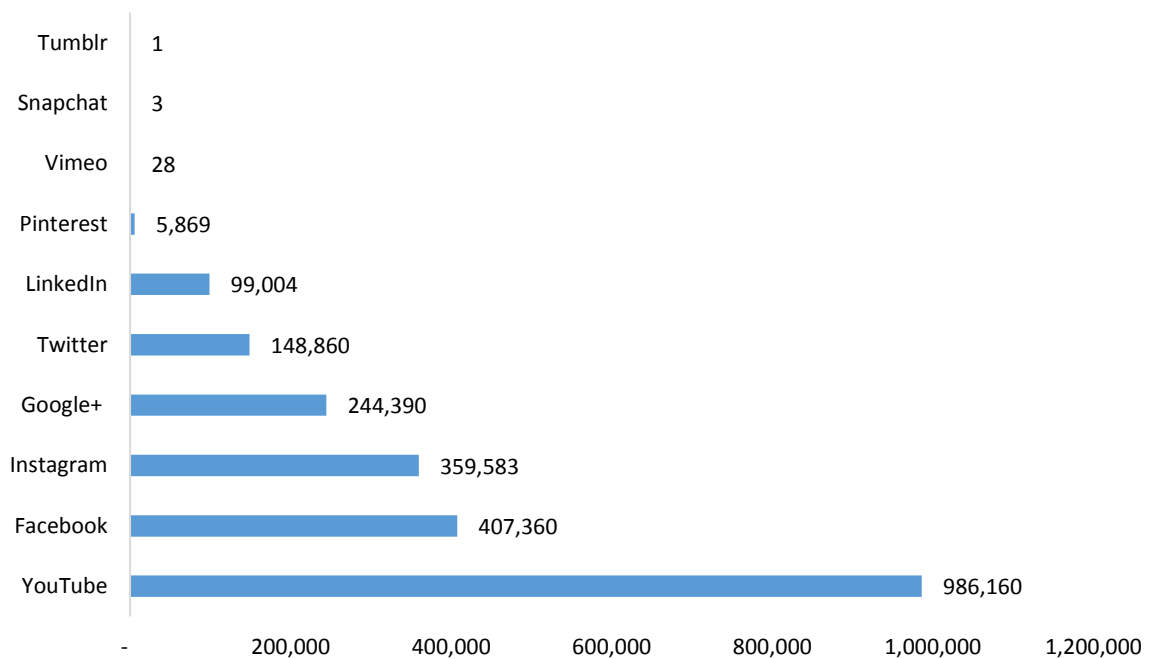


Figure 2. The number of followers on each social media for all 93 NZSX companies using social media



Of the companies sampled from the NZSX after data cleaning, 61% have adopted social media. This shows a major move by companies to adopt social media. An analysis of social media adoption within sectors shows overall that New Zealand companies have embraced the major social media sites, Twitter, LinkedIn, YouTube, Facebook and Google+. The Healthcare and Financial Services sectors seem to lag behind others however in adopting social media. For the Financial Services sector whilst the major international banks in particular have adopted social media the rest within this sector have not. Further from this analysis, it was revealed that YouTube was a popular choice within the various sectors with most companies adopting it (Table 3).

Table 3

*A Breakdown of Companies Using Social Media by Sector*

	YouTube	LinkedIn	Twitter	Facebook	Google+	Instagram	Pinterest	Vimeo	Snapchat	Tumblr
Conglomerates	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%
Telecommunications	67%	67%	67%	67%	33%	0%	0%	0%	0%	0%
Basic Materials	100%	40%	60%	40%	20%	0%	0%	0%	0%	0%
Healthcare	42%	33%	25%	33%	17%	0%	8%	8%	0%	0%
Industrials	60%	40%	40%	30%	20%	10%	0%	0%	0%	0%
Utilities	57%	43%	57%	43%	43%	29%	29%	0%	0%	0%
Consumer Goods	69%	44%	63%	44%	31%	13%	13%	0%	0%	6%
Technology	71%	59%	59%	76%	47%	41%	12%	0%	6%	0%
Consumer Services	58%	38%	46%	38%	35%	19%	4%	8%	4%	0%
Financial Services	38%	40%	36%	38%	25%	11%	6%	0%	2%	0%

N = 151 companies

**5.1.2 Type of disclosure information.** This study also captures how social media is used in New Zealand. Most companies sampled used social media for marketing and public relations purposes like community involvement and general announcements (Table 4). The companies sampled revealed a reluctance to announce material information over social media after announcing it over the NZX Material Announcement Platform (MAP). Further, as shown in Table 4 LinkedIn, Twitter and Facebook appeared more similar in terms of the type of information disclosed than they did with YouTube.

Table 4  
*Percentage of Companies using Social Media Classified by Information Disclosure Type*

	Twitter	LinkedIn	Facebook	YouTube
<b>Material Announcements</b>				
Analyst Presentations	15%	19%	16%	3%
Earnings Announcement	39%	48%	39%	9%
Management Changes	18%	22%	16%	0%
Profit Warnings	1%	1%	2%	0%
Mergers & Acquisitions	32%	34%	42%	3%
Sustainability Reporting	1%	1%	1%	0%
AGM Announcements	9%	9%	3%	8%
<b>Other Announcements</b>				
Community Involvement	48%	86%	60%	10%
Marketing	66%	78%	63%	39%
Recruitment	58%	74%	54%	5%
Fault Notices	16%	16%	26%	0%
General	68%	80%	69%	71%

N.B: N = 93 social media users

## 5.2 Main Analyses

**5.2.1 Nature of data.** *Trading Volume* is count data and would be a discrete integer that is non-zero. Therefore, count data models were used. The mean,  $M$ , was smaller than the variance,  $SD^2$ , ( $M = 9271.67$ ,  $SD^2 = 1558.90^2$ ). Therefore, there was over-dispersion and negative binomial regression was deemed suitable for this study.

**5.2.2 Descriptive statistics – Hypothesis 1.** To test the hypothesis that social media disclosures lower information asymmetry, *Trading Volume*, was used to measure information asymmetry while controlling for traditional *Press Coverage* and *Technology Sector* and individual characteristics like *Volatility*, *Liquidity* and *Size*. A dummy variable *Social Media* was coded 1 for social media users and 0 for non-social media users (Table 5). Out of 151 companies from the NZX main exchange 93 were identified as social media users and 58 companies were identified as not using social media for disclosures.

The Cook's Distance was used to look at the influence of outliers on the overall model and one case from the original 151 cases was eliminated. Therefore, only 92 social media users remained in the sample.

Tests of multicollinearity revealed an acceptable level of multicollinearity within the dataset (Variance Inflation Factor (VIF) = 1.20 for *Press Coverage*, 1.14 for *Volatility*, 1.10 for *Liquidity*, 1.19 for *Technology Sector*, 1.23 for *Size* and 1.14 for *Social Media*).

Table 5

*Regression Descriptives for Social Media Model*

Variable	<i>M</i>	<i>SD</i>	<i>Skew</i>	<i>Kurt</i>
Trading Volume	9271.67	19092.52	3.76	17.03
Press Coverage	199.29	376.22	6.60	55.58
Volatility	.32	.25	1.77	2.05
Liquidity	.16	.15	2.98	12.57
Technology Sector	.11	.32	2.46	4.13
Size	.48	.50	.08	-2.02
Social Media	.61	.49	-.47	-1.80

N.B: Skew = Skewness, Kurt = Kurtosis,  $M$  = mean,  $SD$  = Standard Deviation,  $N = 150$

**5.2.3 Negative binomial regression.** Given the nature of the dependent variable (count data) and that there was evidence of over-dispersion (the mean,  $M$ , of the count data was smaller than the variance,  $SD^2$ ), a negative binomial regression was estimated. The multiple linear regression was performed as a comparison to test whether the use of social media reduces information asymmetry and it showed that the overall model fit was,  $R^2 = 27.10\%$ . *Social Media* explained 31% of the outcome *Trading Volume* (Table 6), holding all other variables constant. Using simple multiple regression, the analysis also showed that social media significantly predicted information asymmetry (trading volume), ( $\beta = .31$ ,  $t(150) = 4.11$ ,  $p < .01$ ).

Testing the null hypothesis that the data followed a negative binomial distribution, using a chi-square goodness of fit test, non-significance was found, ( $\chi^2(143) = 150.85$ ,  $p > .05$ ). This meant that the data was closely modelled by the negative binomial distribution.

Using the Negative Binomial regression showed that there is a significant difference between social media users and non-social media users in terms of information asymmetry while controlling for traditional *Press Coverage*, individual characteristics *Volatility*, *Liquidity*, *Technology Sector* and *Size* (Table 6). The exponential beta,  $e^b$  showed that *Social Media* users' expected mean *Trading Volume* was predicted to be 4.07 times more than that of *Non-Social Media* Users. For instance, for a 1-unit increase in *Social Media* use, the expected mean *Trading Volume* increased by a factor of  $e^{(1.4)} = 4.07$  times. This then meant that social media use led to increased trading volume therefore a decrease in information asymmetry. These findings are consistent with the findings of current research that indeed social media can reduce information asymmetry (Blankespoor et al., 2014b; Prokofieva, 2015b).

Table 6

*OLS and Negative Binomial Regression comparing Social Media Users with Non-Social Media Users.*

Variable	OLS			Negative Binomial Regression		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$e^b$
(Intercept)	-5268.66	3119.42		6.91	.26	999.25*
Press Coverage	13.06	3.98	.26**	.00	.00	1.00
Volatility	1400.00	5836.75	.02	.58	.39	1.79
Liquidity	37070.67	9404.87	.30**	4.08	1.16	59.07**
Technology Sector	-13466.59	4666.51	-.22*	.00	.00	1.00
Size	-.16	.12	-.11	-1.50	.36	.22**
Social Media	12233.89	2980.51	.31**	1.40	.25	4.07**

Dependent Variable = Trading Volume.

\*.01< $p$ <.05. \*\* $p$ <.01

a. Set to zero because this parameter is redundant. It is the comparable variable.

N.B: *B* = Unstandardised Beta, *SE B* = the standard error for the unstandardized beta,  $\beta$  = Standardised Beta,  $e^b$  = Exponential Beta or Incident Rate Ratio (IRR)

**5.2.4 Residuals analysis.** A residual analysis was done to test for the fitness of the Negative Binomial Regression model on the data. The results of the residual plot showed that there were no systematic trends (Figure 3). The Levene's Test using residuals showed no significance therefore there was constant variance of the error terms and the homoscedasticity assumption was met,  $F(1,148)=.96, p>.05$ .

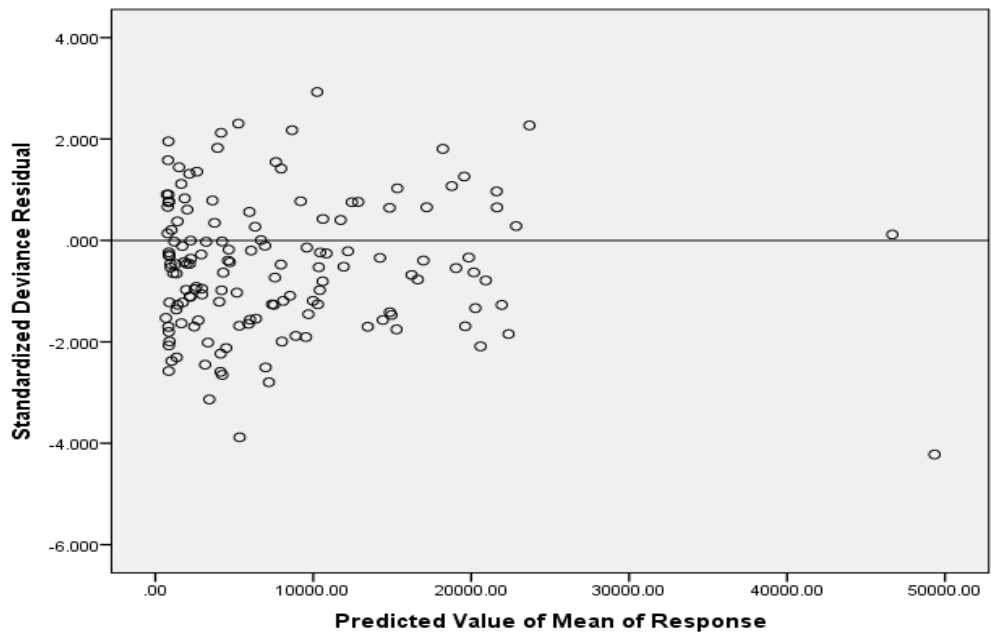


Figure 3. Plot of Deviance Residuals Vs Predicted Trading Volume

**5.2.5 Descriptive statistics – Hypothesis 2.** To test the null hypothesis that the type of social media used for disclosures does not affect information asymmetry differently, *Trading Volume* was used to measure information asymmetry while controlling for traditional *Press Coverage* and individual characteristics like *Volatility*, *Liquidity*, *Technology Sector* and *Size*. Dummy variables *Twitter*, *Facebook*, *LinkedIn* and *YouTube* were created and coded 1 if that particular platform was found and 0 otherwise.

This dummy coding meant that each particular platform would be compared to the rest in a regression. To overcome the issue of multicollinearity concerning the dummy variables *Twitter*, *Facebook*, *LinkedIn* and *YouTube* the model was run four times, each time using one of the dummy variables *Twitter*, *Facebook*, *LinkedIn* and *YouTube* measuring social media type (Chavent et al., 2006; Cooke, 1989a, 1989b; Depoers, 2000).

The Cook's Distance was used to look at the influence of outliers on the overall model and all the cases were fine as they were below 1.

Table 7

*Regression Descriptives for Social Media Types*

Variable	<i>M</i>	<i>SD</i>	<i>Skew</i>	<i>Kurt</i>
Trading Volume	9271.67	19092.52	3.76	17.03
Press Coverage	199.29	376.22	6.60	55.58
Volatility	.32	.25	1.77	2.05
Liquidity	.16	.15	2.98	12.57
Technology Sector	.11	.32	2.46	4.13
Size	.48	.50	.08	-2.02
Twitter	.43	.50	.27	-1.95
Facebook	.43	.50	.30	-1.94
LinkedIn	.54	.50	-.16	-2.00
YouTube	.45	.50	.19	-1.99

N.B: Skew = Skewness, Kurt = Kurtosis, M = mean, SD = Standard Deviation, N = 150

**5.2.6 Negative binomial regression.** Given that there was evidence of over-dispersion (Table 7), as the variance is greater than the mean, a negative binomial regression was performed. Separate multiple regressions on the model were all not significant for the variables *Twitter*, *Facebook*, *LinkedIn* and *YouTube*.

Using the Negative Binomial regression, the study found evidence to support the argument that LinkedIn was significantly different (Table 8), while controlling for traditional *Press Coverage*, individual characteristics *Volatility*, *Liquidity*, *Technology Sector* and *Size*.

The study found that for a 1-unit increase in *LinkedIn* use, the expected mean *Trading Volume* increased by a factor of 3.22 times, (Table 8), signifying a decrease in information asymmetry. LinkedIn appears more effective as a communication medium than all the rest of the social media platforms.

Hui and Wei (2015) argued that different social media platforms differ in how they benefit an organisation. This study looked at information asymmetry and found support for this.

Table 8

*Exponential Betas of the Negative Binomial Regression of Trading Volume on Social Media Types*

Variable	$e^b$			
	(1)	(2)	(3)	(4)
(Intercept)	2087.40**	2079.03**	1290.2**	1929.60
Press Coverage	1*	1*	1.00	1*
Daily Price Volatility	1.46	1.59	1.85	1.73
Liquidity	79.19**	51.84**	59.28**	61.19**
Technology Sector	.27**	.31**	.25**	.29**
Size	1	1	1	1
Twitter (1)	1.43	-	-	-
Facebook (2)	-	1.69	-	-
LinkedIn (3)	-	-	3.22**	-
YouTube (4)	-	-	-	1.68

N.B: \* $0.01 < p < .05$ . \*\* $p < .01$

N = 150,  $e^b$  = Exponential Beta.

**5.2.7 Residual analysis.** Residuals for all the four models involving *Twitter*, *Facebook*, *LinkedIn* and *YouTube* were plotted individually and analysed. The residuals were plotted against predicted Trading Volume. It revealed no pervasive systematic trends in all the plots (Figure 4). Levene's Tests were conducted using residuals and showed no significance (Table 9). Therefore, the homoscedasticity assumption was met.

Table 9

*Results of Levene's Tests Using Residuals*

Model	F
Twitter	1.24
Facebook	1.49
LinkedIn	1.35
YouTube	.61

N=150

\* $.01 < p < .05$ . \*\* $p < .01$



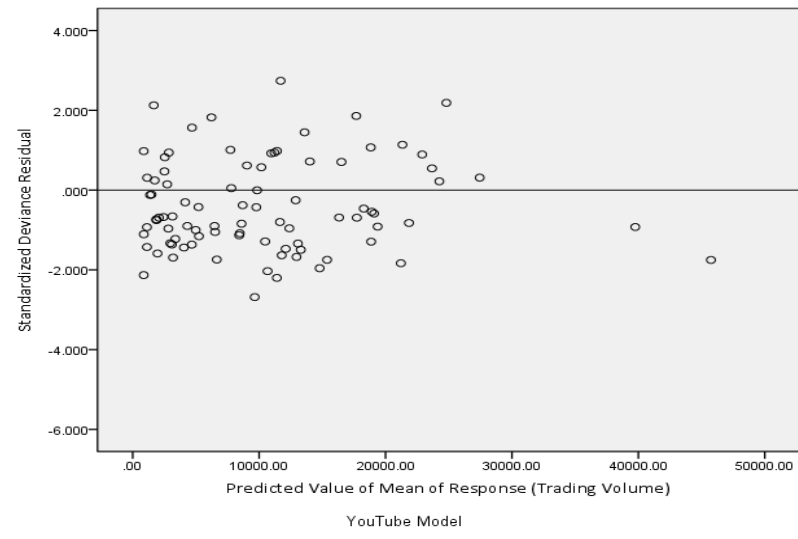
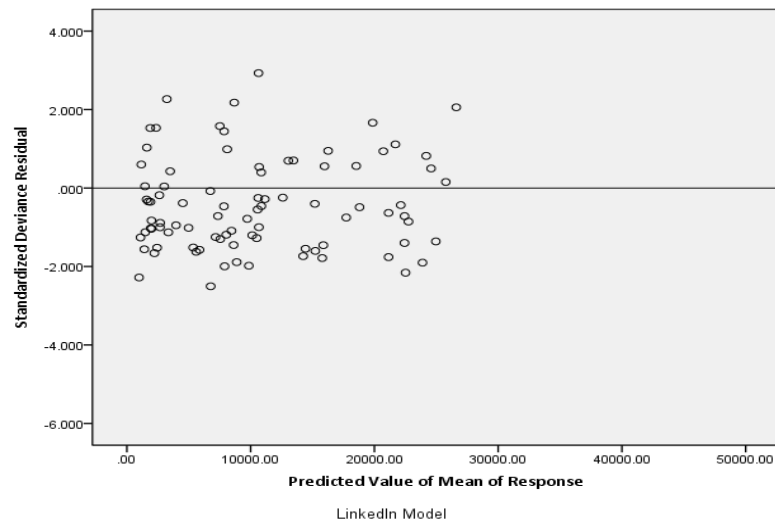
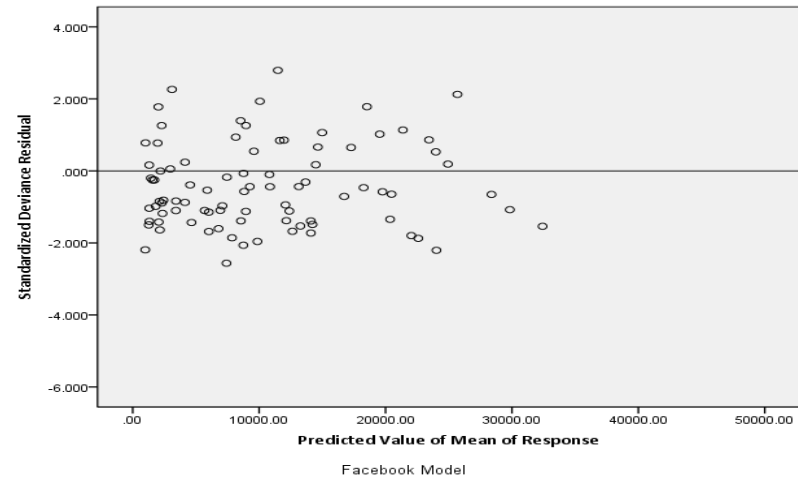
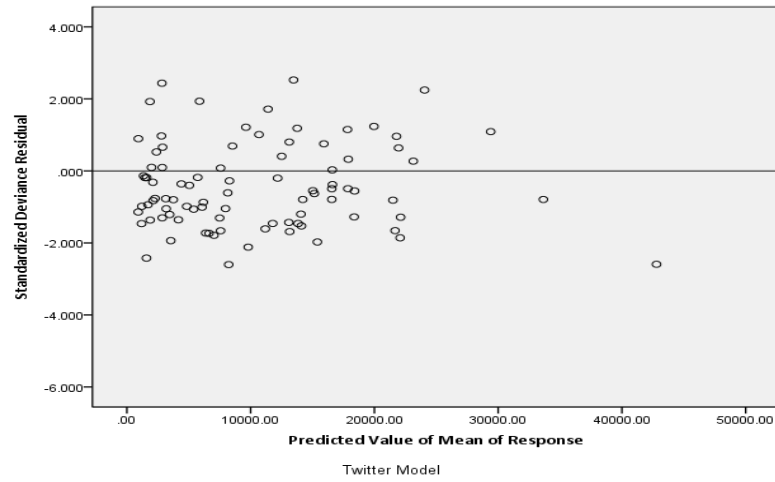


Figure 4. Plots of Twitter, Facebook, LinkedIn and YouTube Model Residuals Vs Predicted Trading Volume

**5.2.8 Descriptive statistics – Hypothesis 3.** To investigate whether spreading a company’s social media presence by using more social media sites significantly reduces information asymmetry, social media dummy variables *One, Two, Three, Four, Five, Six, Seven* and *Eight* were created. These would represent those companies with one right up to eight social media sites respectively. It proxies for social media spread. Then for instance, *One*, represented those companies with one social media presence and was coded 1 if the company used one social media platform, otherwise coded 0.

To overcome the issue of multicollinearity concerning the dummy variables *One, Two, Three, Four, Five, Six, Seven* and *Eight* the model was run eight times, each time using one of the dummy variables (Chavent et al., 2006; Cooke, 1989a, 1989b; Depoers, 2000).

Table 10

*Regression Descriptives for Number of Social Media Platforms*

Variable	<i>M</i>	<i>SD</i>	<i>Skew</i>	<i>Kurt</i>
Trading Volume	9271.67	19092.52	3.76	17.03
Press Coverage	199.29	376.22	6.60	55.58
Volatility	.32	.25	1.77	2.05
Liquidity	.16	.15	2.98	12.57
Technology Sector	.11	.32	2.46	4.13
Size	.48	.50	.08	-2.02
One	.10	.30	2.69	5.33
Two	.07	.25	3.51	10.46
Three	.07	.25	3.51	10.45
Four	.12	.33	2.36	3.63
Five	.12	.33	2.36	3.63
Six	.08	.27	3.13	7.89
Seven	.05	.23	4.02	14.32
Eight	.01	.08	12.25	150.00

N.B: Skew = Skewness, Kurt = Kurtosis, M = mean, SD = Standard Deviation, N = 150

The influence of outliers on the overall model was examined using The Cook’s Distance and all the cases were below 1, therefore fine.

**5.2.9 Negative binomial regression.** Given that there was evidence of over-dispersion, (Table 10), with mean less than the variance for the data, a negative binomial regression was performed.

Using the Negative Binomial regression, it was found that having only one social media site made significant difference, while controlling for traditional *Press Coverage*, individual characteristics *Volatility*, *Liquidity*, *Technology Sector* and *Size* (Table 12). Having *One* social media platform made a significant difference in information asymmetry. However surprisingly having Two or more social media platforms did not significantly increase trading volume and therefore did not significantly reduce information asymmetry. There is therefore evidence that increasing the number of social media platforms used by a company does not significantly impact on information asymmetry.

**5.2.10 Residual analysis.** All the eight separate models had their residuals plotted and analysed. There were no pervasive systematic trends observed (Figure 5 and 6). Levene's Tests were conducted on the residuals and confirmed that there was no heteroscedasticity in the model (Table 11)

Table 11

*Results of Levene's Tests Using Residuals*

<b>Model</b>	<b>F</b>
<i>One</i>	.28
<i>Two</i>	.46
<i>Three</i>	.39
<i>Four</i>	.12
<i>Five</i>	.25
<i>Six</i>	1.24
<i>Seven</i>	.63
<i>Eight</i>	1.51

N=150

\*.01<p<.05. \*\*p<.01

Table 12

*Exponential Betas of the Negative Binomial Regression of Trading Volume on Number of Social Media Platforms*

Variable	$e^b$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	1586.59**	2282.83**	2242.94**	1969.06**	2276.80**	2175.43**	2218.34**	2171.06**
Press Coverage	1**	1**	1**	1*	1*	1**	1**	1**
Volatility	1.14	1.32	1.44	1.49	1.42	1.41	1.37	1.44
Liquidity	219.47**	119.69**	112.85**	144.56**	84.97**	108.93**	121.3**	121.9**
Technology Sector	.4*	.35**	.33**	.3**	.32**	.34**	.35**	.34**
Size	1	1	1	1	1	1	1	1
One (1)	3.25**	-	-	-	-	-	-	-
Two (2)	-	.69	-	-	-	-	-	-
Three (3)	-	-	.68	-	-	-	-	-
Four (4)	-	-	-	1.85	-	-	-	-
Five (5)	-	-	-	-	1.44	-	-	-
Six (6)	-	-	-	-	-	1.29	-	-
Seven (7)	-	-	-	-	-	-	.77	-
Eight (8)	-	-	-	-	-	-	-	.28

N.B: \* $0.01 < p < .05$ . \*\* $p < .01$ N = 150,  $e^b$  = Exponential Beta.

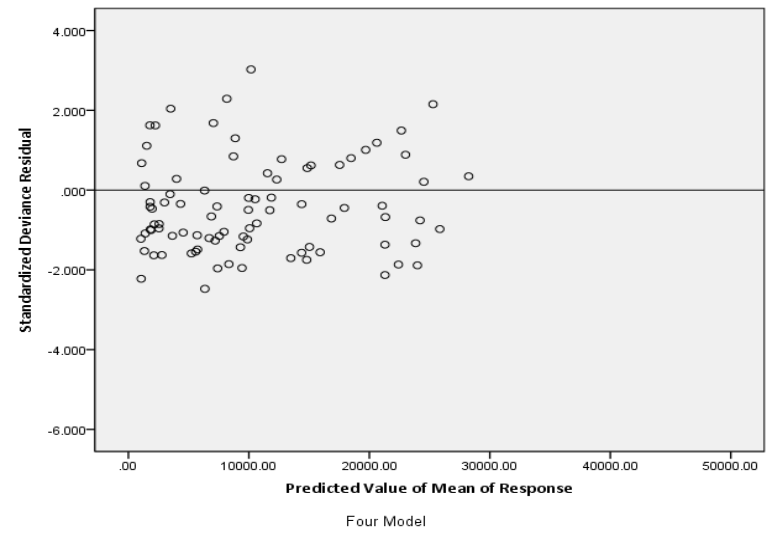
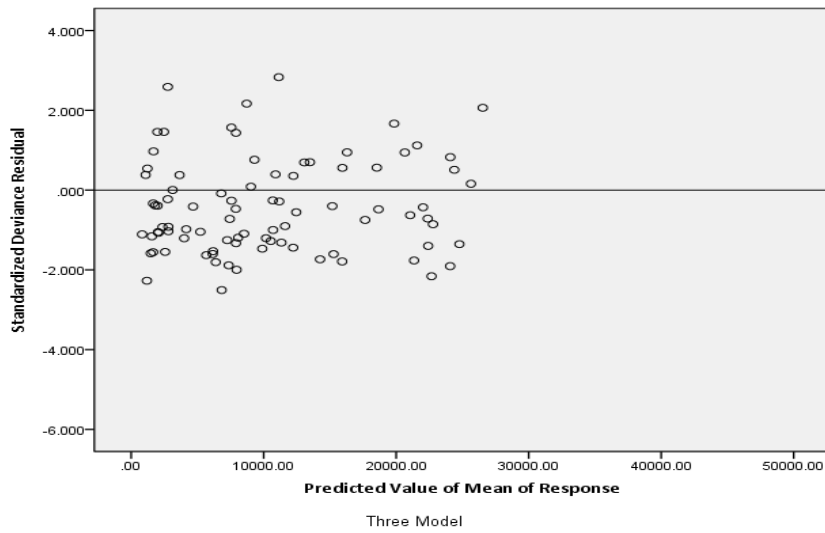
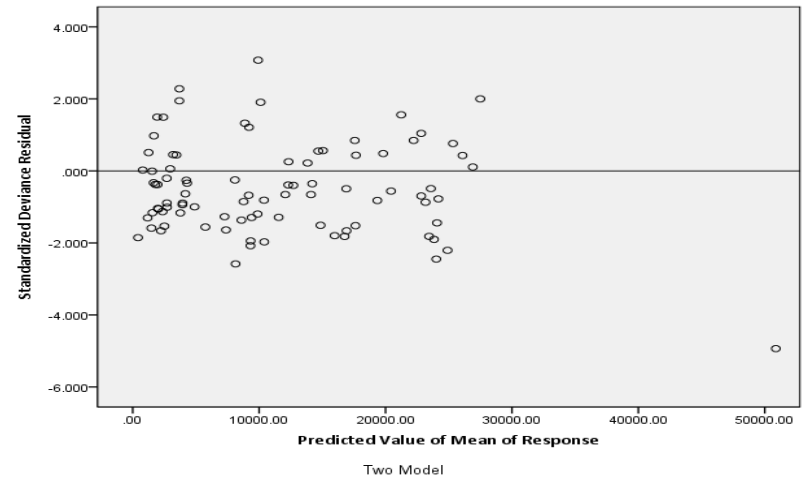
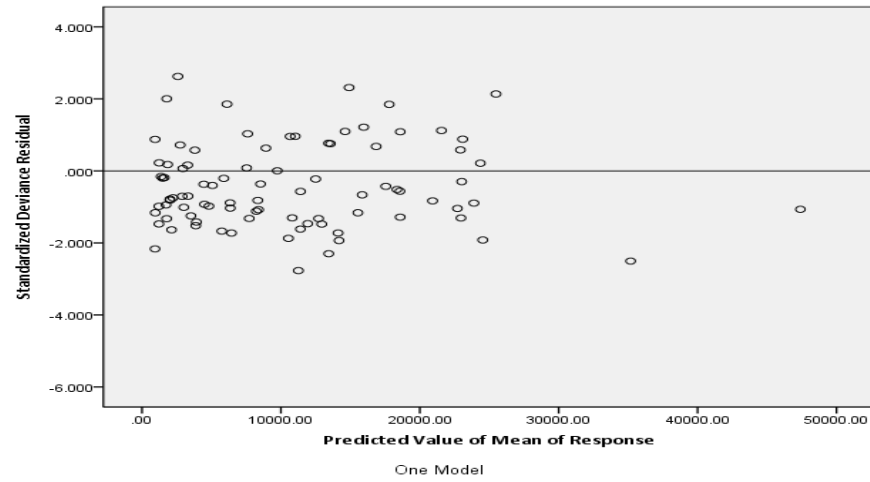


Figure 5. Plots of the One Site, Two Sites, Three Sites and Four Sites Model Residuals Vs Predicted Trading Volume

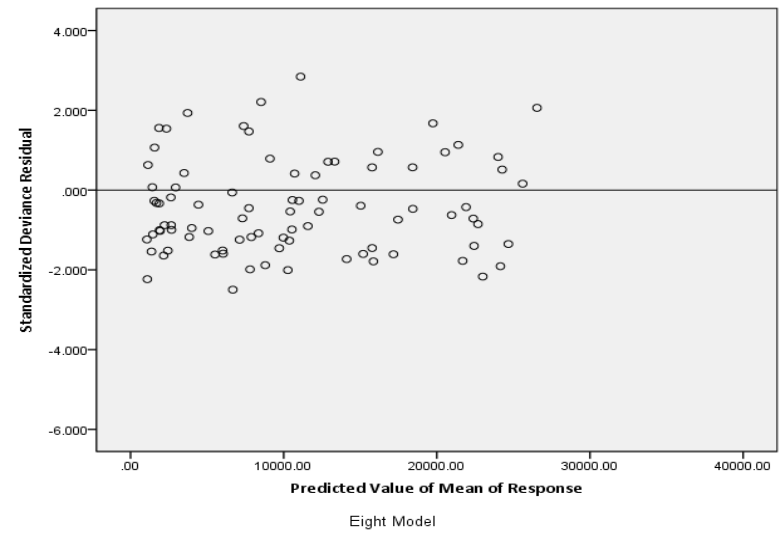
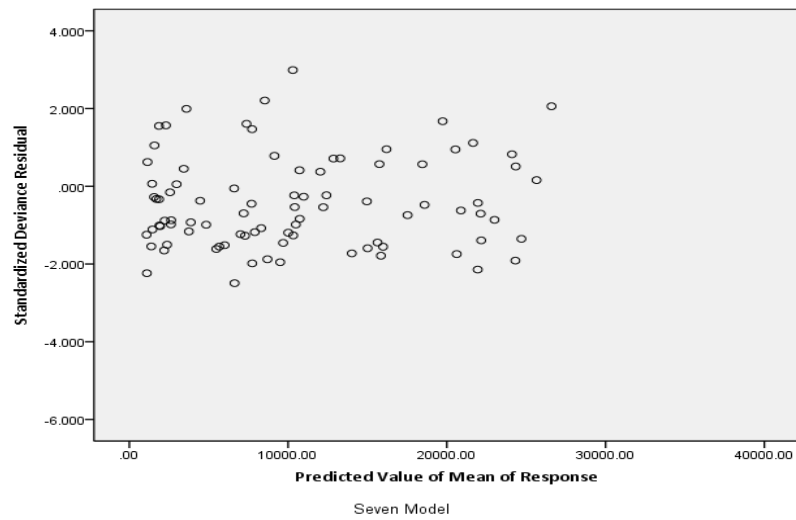
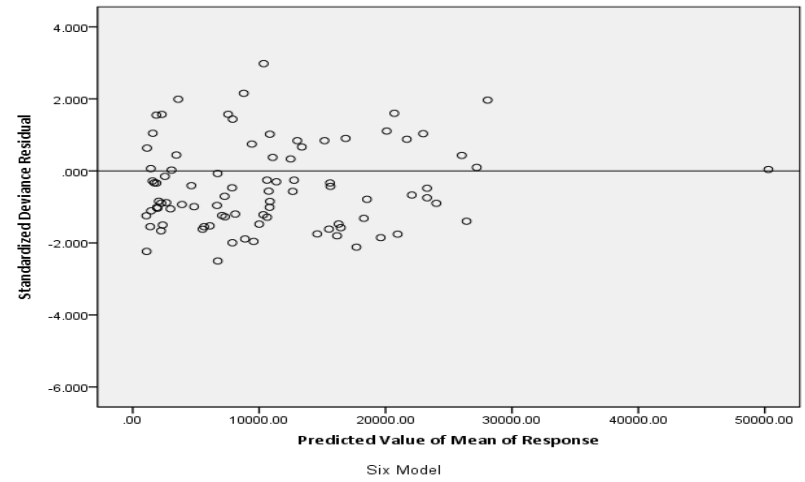
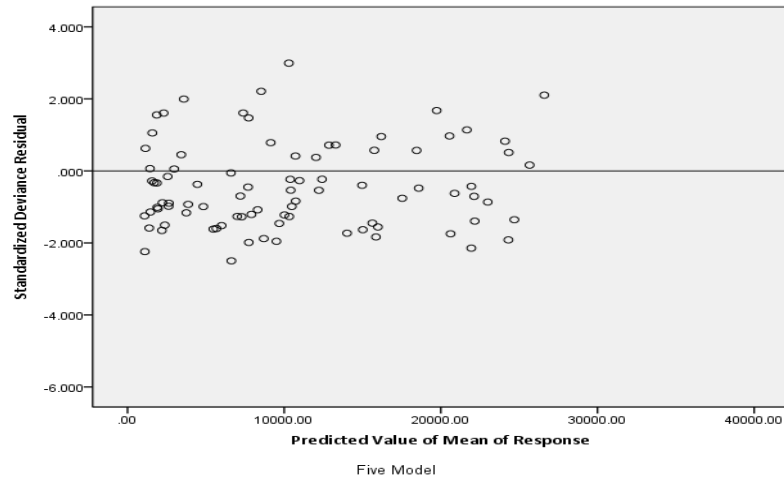


Figure 6. Plots of the Five Sites, Six Sites, Seven Sites and Eight Sites Model Residuals Vs Predicted Trading Volume

### **5.3 Summary**

In this chapter, all the three hypotheses in the study were tested. A study of the data showed that 61% of the sampled companies were using social media for their dissemination of corporate disclosures. It was also revealed that the sector of Healthcare and Financial Services were lagging in the adoption of social media in New Zealand.

Sampled companies were using social media for marketing and public relations and were refraining from using social media for material disclosures.

The results of the negative binomial regression showed that social media dissemination improves the information environment of companies by reducing information asymmetry.

There was evidence that the impact on social media environment is different depending on the type of social media used. LinkedIn significantly reduced information asymmetry compared to the others.

Finally, there was evidence that having more than one social media platform does not significantly reduce information asymmetry. The model for companies using one social media was the only one which significantly reduced information asymmetry

## CHAPTER SIX

### DISCUSSION AND CONCLUSION

#### 6.0 Discussion

Earlier studies on social media disclosures assumed that social media platforms are inherently the same, and focused on Twitter to study social media disclosures (Blankespoor et al., 2014b; Luo, Zhang, & Duan, 2013; Prokofieva, 2015a; Stephen & Galak, 2010). Recent research has moved to highlight the uniqueness of different social media platforms and that users engage with them differently (Hui & Wei, 2015; Mi et al., 2015). This study therefore used the major social media platforms used by the companies to announce their disclosures in New Zealand.

A univariate analysis of social media uses and adoption showed that Facebook, YouTube, Twitter, LinkedIn and Google+ were the most used social media platforms in New Zealand. Google+, however, had mostly pictures and no evidence of interaction within the social media and was therefore dropped. Therefore, Twitter, LinkedIn, YouTube and Facebook were used in this study.

Another departure with prior studies which needs to be taken into account when looking at the results is the research design. Prior studies have used event studies or case studies to study social media disclosures (Blankespoor et al., 2014b; Prokofieva, 2015a; Schaupp & Bélanger, 2014). This study examined information asymmetry over a period, 01 September 2015 to 30 September 2016. The emphasis was placed on the long term effect of information asymmetry and not on any particular information event.

The study also looked at the entire NZSX and had 150 out of 175 companies after data cleaning, therefore all company sectors were covered in this research, ensuring good representation.

Prior research measured bid-ask spread before and around an announcement event. Therefore, these prior studies used abnormal spread. This is measured as event period average daily spread minus the pre-period average daily spread (Blankespoor et al.,



2014b). However, this study took on a different approach by using an alternative measure, *Trading Volume*.

The study found that 61% of the sampled companies were using social media for the period 01 September 2015 to 30 September 2016 showing significant progress in adopting social media in New Zealand. However, looking at the usage of social media by the sampled companies showed that companies were using social media mostly for marketing and public relations. The analysis showed a reluctance to use social media to disclose material disclosures revealed through NZX MAP.

The study also has a number of important findings. It confirms that social media dissemination does indeed lower information asymmetry. This is consistent with other prior studies (Blankespoor et al., 2014b; Mi et al., 2015; Prokofieva, 2015a), which conclude that corporate announcements through social media courts the attention of investors hence lower information asymmetry (Prokofieva, 2015a). Even in the New Zealand context where financial disclosures have to first go through the NZX MAP platform before they can reach investors, using social media does indeed help.

This is because using the Investor Recognition Hypothesis (IRH) investors do have limited time and would be unaware of all disclosures available in any market (Merton, 1987). Using social media therefore will help companies reach a wider pool of investors, attract their attention and thereby lower information asymmetry.

The study had two other main aims. The study sought to examine whether various social media platforms were different in how they affect information asymmetry. The study also wanted to find out whether spreading social media presence over more than one social media platform had any significant effect on information asymmetry.

On the first aim, the study found that the type of social media used had a significant effect on the trading volume. LinkedIn was found to be significantly different from the rest with LinkedIn having an exponential beta of 3.22. Twitter, Facebook and YouTube were found to have no significant effect on information asymmetry. Therefore, companies using LinkedIn were all factors being constant, likely to have higher trading volumes of 3.22 times compared to the rest of the social media platforms. This was significantly different from the other social media platforms. Therefore, there is evidence that companies have been able to significantly reduce information asymmetry

using LinkedIn than any other social media platform. This could be because LinkedIn encourages interconnections among business professionals, a good target market which is likely to process the disclosure information when informed. Using the Investor Recognition Hypothesis, disclosure information is able to reach and attract the attention of more uninformed investors through LinkedIn than any other social media platform. This then broadens a firm's investor recognition (Prokofieva, 2015b), raising visibility and consequently increasing trading volume and lowering information asymmetry.

Mi et al. (2015) found that users engaged with content in a different way in their study of Facebook and Twitter. The study, therefore, found that the type of social media used could significantly affect trading volume or information asymmetry. Further companies have been more willing to release material information over LinkedIn (see Table 4), especially earnings announcements.

Finally, the study found that spreading a company's social media presence can significantly affect information asymmetry as measured by trading volume. Using one social media platform significantly increased trading volume by 3.25 times (Table 12), all other factors held constant. Using two or more social media platforms however did not significantly lower information asymmetry. The results were surprising suggesting that having more than one social media platform does not significantly make a huge difference.

Using IRH, more social media platforms used should enable companies to reach more uninformed investors. Since different social media sites appeal to different demographics they enable companies to catch more uninformed investors on their platform of choice, thereby lowering information asymmetry. Therefore, this lack of significance when using two or more social media platforms could point to a lack of efficiency in social media by companies in New Zealand. The univariate analysis pointed to companies not fully utilising social media to disseminate material information. If companies are not fully utilising their social media platforms, then it would make no difference how many social media platforms they have since the needed information is not being disclosed. There is, therefore, an opportunity for New Zealand companies to increase their information disclosure content within social media.

Whilst this study has not looked at the level of interactions within the social media platforms in New Zealand, the level of interactions could also help explain the lack of significance when looking at the effect of the breadth of social media on information asymmetry. There could be a lack of depth within social media in New Zealand with companies not fully engaging with the social media audience.

The study also highlights that there is a point beyond which adding more additional social media platforms is not productive. Beyond this point, the benefits of having more social media platforms are outweighed by the negatives. In this study it was found that having more than one social media platform did not significantly reduce information asymmetry.

## **6.1 Conclusion**

The study examines social media dissemination platforms within a New Zealand context. There has been evidence that corporate disclosures diffuse through the market and social media, as a dissemination tool helps move the information along (Prokofieva, 2015b).

Using a sample of 150 NZSX listed companies representing all sectors on the NZX and comparing 92 social media users with 58 non users of social media, the study finds that there is a significant association between, total trading volume for the period 01 September 2015 to 01 September 2016 and the social media. This confirms the findings of other studies, (Blankespoor et al., 2014b; Prokofieva, 2015b), who had only looked at Twitter disclosures. The results are consistent with the Investor Recognition Hypothesis. They suggest that using social media to disseminate corporate disclosures allows the companies to reach more uninformed investors. This then contributes to a reduction in information asymmetry consequently pushing up trading volume over the long term.

Comparing the major platforms used in New Zealand (Twitter, Facebook, LinkedIn and YouTube), it was found that LinkedIn was significantly different from the other social media platforms. This is consistent with the other findings in the literature (Hui & Wei, 2015; Mi et al., 2015). Therefore, there is evidence that the type of social media platform used is important when a company wants to effectively reduce information asymmetry.

Examining the effect of using more than one social media platform, it was found that using only one social media platform was significantly better than using more than one social media platform. This was not consistent with the Investor Recognition Hypothesis. This, however, might indicate that at this stage in this adoption process of social media in New Zealand, companies are not efficiently using social media platforms but merely establishing presence. The results also highlight that there is a point beyond which additional social media platforms do not significantly make a difference on information asymmetry. In this study it was one.

Therefore, this study contributes to the growing literature on dissemination of disclosures. The study confirms findings that social media dissemination improves the information environment of companies (Blankespoor et al., 2014b; Prokofieva, 2015b). The study also adds to existing literature on social media disclosures by looking at the impact the type of social media used has on information asymmetry. The results give assurance to policy makers, regulators and companies in New Zealand that social media dissemination of corporate announcements works.

The study has several limitations. Since social media adoption is still underway in New Zealand, it captures early adopters and the results may not be easily generalised. For instance, the study had to focus on the major social media sites when it examined the types of social media and their effects on the information environment as very few companies have adopted other social media sites yet. Related to this, the study has been limited to only one year, as the social media phenomena is relatively new and evolving.

This study looked at information asymmetry within the New Zealand context. Therefore, generalisability to some other countries may be limited. This is because New Zealand requires information to be disclosed through social media only after being disclosed through the NZX MAP. Other countries may not have a similar disclosure setting. Further, the way countries engage with social media may be different from some other countries. Twitter is very popular in some countries (Prokofieva, 2015b), but in New Zealand LinkedIn is more popular. While the study used a mixed methods methodology, it has not captured sentiment, which future research could look at. Future research could also look at the issues around security and quality in social media disclosures.

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## APPENDICES

### Appendix 1. Instructions on NCapture Usage

The following are the sequence generally used to capture the social media data used in this study:

1. NCapture is an add-on therefore using Google Chrome or Internet Explorer (IE) web browsers is possible. Download and install NCapture. Once installed the researcher surfs to the desired website. It is important to scroll through to the section you want captured as NCapture only capture what is on screen.
2. Click on the NCapture icon at the top right hand corner of the browser of your choice.
3. NCapture will ask for authorisation if using for the first time. Click agree and move on.
4. Choose source type (used pdf), enter description.
5. Then, click Capture to allow NCapture to extract the data.
6. The file (pdf) is then downloaded and saved to a chosen location on the computer. By default, NCapture dumps all the files in the Downloads folder.
7. NCapture will prompt you once it has finished downloading. Once downloaded, open the NVivo project. Navigate to External Data tab - > From Other Sources - > From NCapture.
8. All the downloaded files will be populated on the window. Choose the files you need and click import.
9. Once that import is done, the files can be seen in NVivo.
10. Code the files as appropriate.

## Appendix 2. The steps for conducting negative binomial regression in SPSS

1. Go to Analyze - Generalised Linear Models.
2. Click on Negative binomial with log link.
3. Click Response tab – choose Trading Volume.
4. Click the Predictors tab – choose the control variables and the predictor variables as required.
5. Click the Statistics tab – choose the exponential betas.
6. Click the Model tab and move all the variables into the model.
7. Click the Save tab and choose the Predicted value of mean of response and the Standardized deviance residual.
8. Click OK.

### Interpretations

1. In the Goodness of Fit table:

	Value	df	Value/df
Deviance	189.188	142	1.332
Scaled Deviance	189.188	142	
Pearson Chi-Square	178.759	142	1.259
Scaled Pearson Chi-Square	178.759	142	
Log Likelihood <sup>b</sup>	-1438.913		
Akaike's Information Criterion (AIC)	2893.827		
Finite Sample Corrected AIC (AICC)	2894.848		
Bayesian Information Criterion (BIC)	2917.912		
Consistent AIC (CAIC)	2925.912		

If Value/df column for the Pearson Chi-Square the value is:

- LESS THAN .05, the model does not fit the data well and should be discarded.
- MORE THAN .05, then the model fits the data well.

2. Look in the Omnibus Test table, under the Sig. column.

**Omnibus Test<sup>a</sup>**

Likelihood Ratio Chi-Square	df	Sig.
48.870	6	.000

If the p-value is LESS THAN .05, the model is statistically significant therefore interpreting the results can go ahead.

If the p-value is MORE THAN .05, then the model is not significant.

3. Look in the Tests of Model Effects table, under the Sig., Exp(B).

**Parameter Estimates**

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	df	Sig.		Lower	Upper
(Intercept)	7.683	.2733	7.147	8.219	790.256	1	.000	2171.062	1270.679	3709.442
PressCoverage	.002	.0007	.001	.003	7.698	1	.006	1.002	1.001	1.003
DailyPriceVolatility	.363	.4367	-.493	1.219	.690	1	.406	1.437	.611	3.383
ShareTurnoverLiquidity	4.803	1.2212	2.410	7.197	15.471	1	.000	121.903	11.131	1334.997
TechnologySector	-1.086	.3666	-1.805	-.368	8.781	1	.003	.338	.165	.692
SizeCapitalisation	-7.388E-6	1.3667E-5	-3.417E-5	1.940E-5	.292	1	.589	1.000	1.000	1.000
Eight (Scale)	-1.288	1.4220	-4.075	1.499	.820	1	.365	.276	.017	4.478
(Negative binomial)	1.930	.1849	1.600	2.329						

If the p-value is LESS THAN .05, the model is statistically significant. Look at the Exp(B). If less than 1 then it means the variable in question causes a decrease when all factors remain constant. If more than 1 then it means the variable causes an increase when all factors remain constant.

If the p-value is MORE THAN .05, then the model is not significant.

### Residual Analysis for Model Fit

The following are the steps to conduct the residual analysis in SPSS:

1. In Data View. Pick the predicted value of the mean of response - MeanPredicted.
2. Then pick the standardized Deviance residuals - StdDevianceResidual.
3. Go to Graphs – Legacy Dialogs – Scatter Graphs.
4. Click on Simple Scatter – Define.
5. Click StdDevianceResidual and move it to Y Axis.



6. Click the MeanPredicted and move it to X Axis.
7. Click OK.

### **How to interpret SPSS scatterplot Output**

1. Look to see whether there are no significant deviations away from 0.
2. Check to see whether 95% of the residuals are under absolute value of 2.0.
3. If so, then the model fits the data.

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