Corporate governance disclosure and information asymmetry: Evidence from South Africa

By

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DECLARATION

I, Ashleigh Vos, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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ABSTRACT

Investors globally are becoming more interested in companies' governance disclosure, in part to reduce the information asymmetry caused by the principal-agent problem. Although the association between a company's governance disclosure and its level of information asymmetry has been explored in some developed countries, there is a gap in knowledge on this in a developing country context. This study investigates this link for companies listed on the Johannesburg Stock Exchange (JSE). Using Tobin's Q and share price volatility as proxies for information asymmetry; Bloomberg governance disclosure scores as the variable of interest; and board size, board independence, audit committee size, analyst following, systematic risk, free float, the inverse of assets and profitability as control variables, panel data regression methodology is applied to a sample of 103 companies listed on the JSE from 2009 to 2021 in order to explore the relationship between governance disclosure and information asymmetry in South Africa. Random effects panel regression is used for each dependent variable (share price volatility and Tobin's Q) to gain an understanding of the relationship between corporate governance disclosure, the control variables, and the proxies for information asymmetry. The results of each regression showed that there is a negative correlation between governance disclosure and dependent variables (share price volatility and Tobins Q). This was in line with the hypothesis for the dependent variable - share price volatility, however, the Tobin's Q regression produced a negative correlation when the hypothesis stated a positive correlation. The Tobin's Q regression shows mixed results and therefore there is not sufficient evidence to confirm the hypothesis stated. Since both regression results produced negative results, it contributed to existing literature that prioritising good governance practices will allow a firm to gain the support of stakeholders and reduce information asymmetry.

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CHAPTER 1: INTRODUCTION AND BACKGROUND

Corporate governance is a structure of rules, processes and practices by which companies are controlled, and is intended to improve the alignment of interests between the shareholders and managers involved in an organisation. Corporate governance is particularly important in most modern corporations because of the separation of management and ownership control within these organisations (Marie L'Huillier, 2014). Thus, the interests of the managers could differ from the interests of the shareholders, which could cause conflict. The agency problem, also known as the principle agent problem, is an important theorical concept within corporate governance, and is reflected in the management related problems due to there being an interest differential amongst a firm's stakeholders. Firms who have weak governance to manage and direct any owner-manager problems faced by a company will incur greater agency problems. The agency problem allows managers to get more private benefits, potentially resulting in poorer company performance. Thus, firms need to improve their corporate governance for better long-term survival and growth (Kumar and Zattoni, 2017).

A significant factor in an investment decision is the ability to obtain new information that is appropriate. Information asymmetry is a condition wherein one party in a relationship, in this case company managers, has more or better information than another (in this case company owners). Thus, required information is asymmetrically distributed among parties that are involved, as well as not involved, in a firm. This could cause different views and results about a particular subject. Thus, this information is important for decision makers and the distribution of the information should be evaluated accurately and be of utmost quality. In order to solve this problem, having stronger corporate governance in general is assumed to reduce information asymmetry (Elbadry, Gounopoulos and Skinner, 2014).

Other theories, apart from the agency theory, that are relevant to corporate governance and information asymmetry are the information economics theory and stakeholder theory. The stakeholder theory states that managers involved in a firm represent a network of relationships, which include employees, suppliers and the partners of a business. This theory plays an important role in the decision making of the managers and suggests that all stakeholder interests have intrinsic value, where one stakeholder's opinion is not considered more important than another (Heath and Norman, 2004).

A company's corporate governance is highly important to investors' confidence in a business. Good corporate governance and accurate governance disclosure helps ensure that investors can trust the company they are investing in and as a result, this promotes financial viability, as it creates long term investment opportunities for participants in the market (Shank, Hill and Stang, 2013).

Financial scandals such as that recently experienced by Steinhoff show how important it is for a company to have good corporate governance. For instance, at first glance, Steinhoff had all attributes of good governance, such as an independent audit committee and an independent board. However, despite this a failure in corporate governance caused by ineffective management still resulted in massive losses for shareholders. Therefore, good governance ensures transparency and reduced information asymmetry, and can prevent economic scandals and fraud, which also allows investors to have more trust in a firm (Rossouw and Styan, 2018).

According to information economics theory, voluntary disclosure reduces information asymmetry, making a firm more transparent for investors, thus allowing them to have a better relationship with the managers of a firm (Cormier, Ledoux, Magnan and Aerts, 2010). Thus, the level of governance disclosure, board size and audit committee size may reduce information asymmetry, and could complement its governance mechanism in reducing asymmetric information (Elbadry, Gounopoulos and Skinner, 2014).

Past studies illustrate that better corporate governance mechanisms and more effective boards may increase the quality and quantity of information disclosed by firms and lead to a reduction in asymmetric information. This asymmetric information can arise through a conflict of interest among different groups of people (Morgado and Pindado, 2003). Corporate governance mechanisms are an indirect tool that exists to ensure that management act in the interest of the shareholders through following a series of procedures. If managers take certain actions that deviate from ensuring maximum firm value and act in their self-interest, these corporate governance mechanisms will also have an effect on the information that is disclosed by the firm to its shareholders. Therefore, these mechanisms make it less possible for managers acting in self-interest to disclose less credible information to shareholders (Rutherford and Buchholtz, 2007).

1.1. Research problem and question

Despite there being a substantial amount of literature on the general topic of corporate governance, to the author's knowledge, there has been no research done on the relationship between a firm's corporate governance disclosure and its degree of asymmetric information between insiders and investors in South Africa. It is worth investigating the relationship between corporate governance and information asymmetry in the South African context as South Africa is an unusual case of a developing country that possesses a highly developed financial system. There is relatively little known around the relationship between corporate governance disclosure and the degree of information asymmetry in companies, particularly in emerging markets, which makes this topic worth investigating.

In South Africa, a good base for corporate governance was established with the publication of the first King Report on corporate governance in 1994. South Africa was the first developing country to develop a good governance code (Aguilera and Cuervo-Cazurra, 2009). The purpose of this report and it three successors is to encourage a high level of corporate governance within South Africa. The King reports, which are integrated into the Johannesburg Stock Exchange's listing requirements, require firms to take the interests of a broad selection of stakeholders into account and consider more than simply the regulatory and financial aspects of corporate governance (King Committee, 1994/2002).

A study done by Kakabadse and Korac-Kakabadse (2001) documents critical concerns regarding whether a voluntary compliance and disclosure system is an effective method in an attempt to improve governance practices. Despite the uniqueness of the King Reports in the South African context, there is a lack of empirical evidence showing the compliance levels achieved. A study done by the Institute of International Finance (IIF) (2007), which examined corporate governance implementation and practices in emerging markets, indicated that no study has been done to discover the genuine levels of compliance among South African listed firms, despite the country having a well-developed corporate governance framework.

The King Code, which is continuously being revised and strengthened, was put in place in South Africa with the intention of creating an ethical culture in organisations, improving company performance and increasing shareholder value, while ensuring that adequate controls are in place. The King Code allows firms to build trust between all their stakeholders and ensure that the organisation holds a good reputation (Rossouw, van der Watt and Rossouw, 2002).

Therefore, by exploring the relationship between corporate governance disclosure and information asymmetry, this study aims to answer the following question:

- *Does better governance disclosure reduce information asymmetry between corporate insiders and shareholders?*

1.2. Novelty and contribution

This study is relevant within the South African context given that there has to date been no study of its kind focussing on the JSE specifically. South Africa follows different corporate governance rules and regulations than many of the countries who are part of The Organisation for Economic Co-operation and Development OECD. This study contributes to the literature surrounding corporate governance disclosure and information asymmetry, and is to the author's knowledge one of very few to investigate the relationship between corporate governance disclosure and information asymmetry in a developing country. The information that is provided in this study regarding corporate governance disclosure and how it may reduce information asymmetry may be of value to investors and regulatory authorities.

1.3. Thesis map

The remainder of this document is structured as follows. Chapter 2 reviews the theoretical basis of the study, as well as empirical evidence found in the literature. Chapter 3 describes the sample and methodology used to conduct the study. Thereafter, Chapter 4 discusses the results and analysis of the data. Finally, the conclusion is presented in Chapter 5.

CHAPTER 2: LITERATURE REVIEW

Chapter 2 provides an overview of the underlying theories as well as empirical evidence related to the study. It is important to gain insight on the possible relationship between corporate governance disclosure and the reduction of information asymmetry, and various conceptual frameworks can be used to understand the reasoning behind it. As previously mentioned, the most common theories used in literature surrounding corporate governance include agency theory and stakeholder theory. The key theory that plays an important role in understanding concepts related to information asymmetry is the information economics theory, which will be discussed in greater detail below.

2.1 Relevant theories

In this section, the above-mentioned theories are elaborated on in order to have a better understanding of the relationship between corporate governance and information asymmetry.

2.1.1. Agency theory

Agency theory highlights relationships between parties, where one party assigns a specific decision-making authority to the other (Muttakin, Khan and Subramaniam, 2015). In a situation like this, one party (also called the 'principal') authorises a specific responsibility to the other party (also called the 'agent') to make decisions and take actions on their behalf. In the corporate world, the shareholder (as owner) can be considered as the 'principal', and the manager is considered the 'agent'. The agent takes on some decision-making authority from the principal and has the responsibility of maximising the principal's investment in exchange for an incentive, such as a fee or salary (Glinkowska and Kaczmarek, 2015).

Agency relationships are designed with the intention of increasing value of all the parties involved. However, costs such as engaging in the relationship, monitoring the progress and implementing decisions are involved in this process. The various attitudes of the principals and the agents to risk and their different access to information could influence these costs (Angwin, 2015). Due to there being a separation between management and ownership, an assumption can be made that information asymmetry exists between agents and principles. The agent, for example, could have private information to which the principle does not have access to and thus cannot observe accurately. This could mean an increase in bargaining power for the agent in the relationship. Monitoring mechanisms should be used by the principals in order to reduce this information gap, which also comes at a cost. However, these monitoring mechanisms allow the interests of the principles and agents to align, whilst decreasing the cost of debt (Muttakin, Khan and Subramaniam, 2015).

The separation between ownership and control is regarded as one of the main reasons of conflict between firm owners and managers. Jensen and Meckling (1976) argue that the separation of interests will lead to managers engaging in self-serving activities and therefore they have incentives to hold back any information in order to hide private benefits from outsiders. It is for this reason that share ownership by management can reduce these agency conflicts and agency costs. Managers who have greater ownership in a company have less incentive to expropriate shareholders and do not have as many diversionary activities in an attempt to hide their private benefits. Therefore, this lowers their cost of voluntary disclosure and advantages from retaining information. Managers are more inclined to align their actions with the best interests of shareholders when they have greater levels of personal ownership in the company. Thus, they are inclined to release greater levels of information, which will reduce shareholders' monitoring costs, and prevent agency problems.

Within the agency theory, information asymmetry constitutes a substantial amount of risk and interferes with principle-agent relationships. Therefore, businesses must address information asymmetry to avoid jeopardising the principal-agent relationship, which results in the principal-agent problem. With regards to this, compliance is crucial to ensure that principals' interests are protected and are taken care of by the agents (Shleifer and Wolfenzon, 2002).

Insiders have an incentive to minimise all forms of external communication, which decreases outside scrutiny and increases information asymmetry. This often happens when governance and investor (principle) protection is inadequate or weak (Klein, Shapiro and Young, 2005). A mechanism within the governance framework used to reduce the information asymmetry issue stemming from agency problems is transparency in financial reporting, which reduces agency costs. Mandated disclosure allows for contracting with agents to be highly efficient because it allows for detailed and more frequent future disclosures. It is essential to have adequate controls, transparent financial information for investors and effective monitoring mechanisms to mitigate the information asymmetry problem. If companies do not do this, investors will protect against expected agency costs by reducing the price they are willing to pay for shares in the company (Leung and Ilsever, 2013).

Implementing the agency theory is useful to provide an explanation on how a board with high quality would be more accountable and transparent through greater voluntary disclosure. Thus, this will allow for a reduction in asymmetric information that would arise due to the differences in management and ownership (Bonazzi and Islam, 2007).

2.1.2. Stakeholder theory

Freeman (1984) introduced the stakeholder theory, which has since become one of the most widely adopted theories used in corporate governance practices. In terms of stakeholder theory, any person that is affected by the corporation or its operation is considered a stakeholder. Stakeholder theory considers how a firm manages various difficult and complex relationships between external stakeholders (including employees, customers, board of directors, etc.) and its shareholders (Capasso, 2004).

Given the above, stakeholder theory states that the maximisation of shareholder wealth should not be the sole focus and objective of a firm. Rather, it suggests that balancing the interests of all these stakeholders will lead to the organisation achieving lasting success. In addition, these stakeholders are more likely to reveal valuable information which can lead to greater efficiency (Phillips, Barney, Freeman and Harrison, 2022).

Harrison (2010) extended this thinking by mentioning that fair treatment can result in superior information from stakeholders which could be used as a competitive advantage. Stakeholder theory suggests that in the presence of asymmetric information, producing the greatest economic well-being for the firm by share price maximisation may lead to management violating the interests of the stakeholders, which may result in unethical business practices. From the perspective of the stakeholder theory, there is more motivation for companies to disclose better quality information. By doing this, society and stakeholders will have a better perception of the firm and information asymmetry will be reduced (Hahn and Kühnen, 2013).

The stakeholder theory implies that disclosing good-quality information enhances a firm's legitimacy with various stakeholder groups by satisfying their specific requirements and addressing their regulatory expectations. Araya et al. (2014) argued that disclosing governance information reinforces stakeholders' trust. Along these lines, firms who increase their disclosure are the ones who are better social performers, as they are more transparent and evenly allocate information disclosure between all stakeholders (Vurro and Perrini, 2011).

2.1.3. Information economics theory

Information economics theory focuses on information asymmetry, as opposed to the theories above, which focus more on the topic of corporate governance. Information economic theory suggests that voluntarily disclosing more information should reduce asymmetric information between managers and investors, as well as lower a firm's cost of capital (Cormier, Lapointe-Antunes and Magnan, 2014).

Economists have tended to focus more on situations where market failures may arise, rather than addressing the benefits and costs associated with mandatory disclosure. These market failures result from absence of information where there are misaligned incentives between those with greater and lesser access to information. (Spencer, 1973).

Akerlof (1970) elaborated on this topic by noting that information may have more social value and less private value. When there are significant private costs associated with the disclosure of information but the benefits are spread across a large population, there is no incentive to obtain or supply this information. Thus, it can be seen that mandatory disclosure may be valuable to promote the distribution of valuable information.

In that regard, this theory attempts to address a key challenge in the relationship between managers and investors, which is the difference in information between principals and their agents. In this scenario, the agent typically has the advantage. The outcome of voluntary disclosure and the reduction in a firm's cost of capital occurs because greater transparency will enhance stock market liquidity and reduce transaction costs for a firm's shares (Sciubba, 2005).

2.2. Theoretical link between agency conflict, corporate governance, information asymmetry and disclosure

This issue of separation means that company management has access to certain information which the owners do not have. Hence, there is a conflict of interest between management and owners. Managers are supposed to be the agents of the owners. However, often their interests do not match the owners' interests. It is for this reason that the agency theory is used as the underlying theoretical basis of this study. It is in the interest of the owners to reduce these agency issues, and a way in which to do this would be to have less information asymmetry between the two parties. Better corporate governance practices, as well as good corporate governance disclosure within a company, helps reduce information asymmetry and, in turn, this addresses the issues of agency conflict. Voluntary disclosure of governance issues can lead to the improvement of a firm's overall governance (Craighead, Magnan and Thorne, 2004).

This study explores the various determinants of governance disclosure and the impact that these factors have on information asymmetry. Companies who implement good corporate governance should always be transparent, meaning they provide information to the various parties in a clear, adequate and timely manner. By adopting these principles and having an effective corporate governance framework will assist in providing a high level of trust that will benefit an organisation. This framework can increase the level of disclosure in an organisation and the level of confidence in investing (Cormier, Lapointe-Antunes and Magnan, 2014).
As a result of past corporate scandals, voluntary governance disclosure, which is an important component of capital market dynamics, has received significantly more attention. Many improved governance mechanisms have been introduced worldwide to encourage transparency and restore confidence in financial markets across various economies (Levi, 2007).

Bauwhede and Willekens (2008) argue that in order to improve investor confidence and resolve the issue of separation between ownership and control, firms should voluntarily disclose corporate governance information. By doing this, it will help firms reduce information asymmetry, as well as agency costs. For example, a study done by Chen, Chen and Wei (2003) regarding the disclosure of corporate governance practices find that, on average, the cost of capital is reduced by 0.47 percent when firms voluntarily disclose necessary information. Bauwhede and Willekens (2008) also found that when a firm has a good corporate governance ranking, its cost of capital is reduced by 1.26 percent. However, a study done by Li Clarkson, Richardson and Vasvari (2006) found that, in emerging markets, governance disclosure plays a weaker role in reducing the cost of capital due to the lack of effective governance mechanisms. Thus, it is important for countries to have an effective governance framework, such as the King code in South Africa, in order to avoid a higher cost of capital for a firm. This empirical evidence highlights the significance voluntary disclosure has on a firm's cost of capital, resulting in more value being created for shareholders and less risk associated with a firm's operations being signalled (Reverte, 2009).

The disclosure of financial statements is a method used to convey the information included in the financial statements to all parties who require it. The main objective of disclosure is to present all of the relevant information so that companies can benefit from the purpose of reporting, that is, to serve all of the parties who have different interests in the company (Van Buskirk, 2011). According to Sihombing and Pangaribuan (2017), the implementation of relevant disclosure and governance principles make managers less likely to act in their own interest and rather disclose the necessary information to shareholders. This allows shareholders to have access to the same information and not information that is of lesser quality than that of management. By doing this, the quality of information disclosed is improved and market discipline created.

In circumstances where requirements regarding disclosure are present, there is often considerable freedom provided to managers relative to the standard and quantity of disclosure on governance practices that are specific to a firm (Labelle, 2002). This is supported by empirical evidence by Sauer (1996), who found that 43% of the top 100 listed companies in Australia did not make any particular disclosures relating to corporate governance. Some of the companies in the sample disclosing governance information stated that there was a substantial amount of diversity in the nature and degree of the disclosures that were made. Similarly, Bujaki and McConomy (2002) analysed the guidelines on corporate governance practices and disclosure procedures on the Toronto Stock Exchange (TSE). Results found that a substantial amount of firms had not entirely embraced the guidelines and there was dissimilarity in the degree of disclosure on issues related to corporate governance across different firms.

When corporate performance is below standard, voluntary disclosures can be used by managers in attempt to increase the value of a firm reduce the risks of job losses within management. Companies provide various incentives to reduce information asymmetry by encouraging voluntary disclosure. This reduction in information risk results in external financing costs being reduced.

Academics worldwide have continually emphasised how important the quality of disclosure is in an attempt to minimise information asymmetry. In their seminal work Jensen and Meckling (1976) suggested that a high quality disclosure policy will reduce agency costs and mitigate asymmetric information between managers and shareholders involved in a firm. In relation to this, Diamond and Verrecchia (1991) stated that the quantity of information communicated by larger transactions would be substantially less for firms that distribute more details regarding their activities. This implies that information asymmetry between investors is reduced by greater voluntary disclosure. Empirical evidence supports this by showing that voluntary disclosure by companies is connected with improved share liquidity, lower cost of capital and a larger following of analysts (Haggard, Martin and Pereira, 2008).

Information asymmetry and voluntary disclosure is also related to favourable capital market consequences. If governance strategies were developed in response to investor confidence concerns related to corporate failures and the globalisation of capital markets, then disclosure of governance information is said to have positive capital market consequences for the discloser. Consistent with this capital market theory, empirical evidence indicate that generally, voluntary disclosure is associated with positive capital market outcomes. For example, Richardson and Welker (2001) report that there is an inverse relationship between quantity of disclosure and cost of equity for firms with a lower analyst following.

Comparing voluntary disclosure and its impact on information asymmetry amongst various countries show that the level of disclosure and transparency is vastly different between different firms across various emerging markets. For example, a study done by Patel et al. (2002), using the Standard & Poor's corporate governance disclosure index and a sample 354 listed firms from 19 emerging markets, which included 12 South African firms from 1998 to 2000, investigated the relationship between the level of transparency and disclosure. The results suggest that South Africa has a significantly higher transparency and disclosure practices as opposed to other countries in the study.

2.2.1. Governance disclosure and the agency theory

The management of a company has an obligation to maximise shareholder welfare as well as meet the interests of the shareholders involved in the organisation (Chang, D'Anna, Watson and Wee, 2008). According to the agency theory, the difference of interest between parties that have control in a company (management as an agent) and the shareholders if a company (the principal) could cause conflicts of interest (agency conflict). Agents who have access to a greater amount of information about the current environment a company is in, as well as the plans for the future, will choose not to provide this information to the principal for various reasons. However, principals require this information to have more insight on the overall performance of a company which raises the issue of information asymmetry (Pellisserry, 2012).

Knowing the importance of information to minimise information asymmetry, the disclosure of financial and non-financial information is essential.

The difference in the interests between agents and principles cause agency problems. These agency problems cannot be resolved due to the information asymmetry issue related to the actions of the agents. Agency problems are therefore left unresolved due to the fact that the principles are not able to monitor and measure the agents' behaviour. Corporate governance mechanisms and voluntary disclosure are used as an indirect tool in an attempt to manage agency problems by altering the behaviour of managers, who are the shareholders' agents (Elbadry, Gounopoulos and Skinner, 2014).

2.2.2. Governance disclosure and the stakeholder theory

According to Mallin (2002), having more transparency between the principles and their agents, will highlight important aspects of the stakeholder theory. Prioritising good governance practices and governance disclosure will give a firm the opportunity to gain the support of the stakeholders and ultimately reduce information asymmetry. The stakeholder theory suggests that there is a greater incentive with regards to accurate information disclosure. The better quality it is, the better the company will be perceived by its various stakeholders.

According to Chiu and Wang (2014), if a company wants to survive in the long-term, it requires the support of its stakeholders. A principle function of a manager within a firm is to identify who these stakeholders are and address their various needs whilst ensuring their demands are met. Brower and Mahajan (2012) found evidence that firms are sensitive to diverse stakeholder demands and tend to be exposed to substantial scrutiny or risk of actions from the stakeholders involved in their corporation. Taking the above into consideration, as well as including good governance disclosure, will reinforce stakeholders' trust and address the issues relating to information asymmetry (Perotti and von Thadden, 2003). Further, stakeholder theory suggests that a manager of a company may not perceive all stakeholders as the same level of importance when addressing the needs of these different stakeholder groups (Chiu and Wang, 2014).

This theory is significant because it focusses on gaining support for corporate actions and decisions by stakeholders whose support is needed for an organisation to reach its goals, and lead to overall success (Ching and Gerab, 2017). Taking the above theoretical aspect into consideration, the effect of asymmetric information between the management of a firm and its various stakeholders is important to note when addressing the well-being of the parties involved in an organisation (Vurro and Perrini, 2011).

Transmission of accurate and relevant information to stakeholders should be a key focus within an organisation in order to avoid situations such as the collapse of Enron, Worldcom and various other global cases. A reason for many scandals such as the above are related to the agency problem. In many cases, reporting within a company was eroded because of the lack of confidence among management. These disasters that occurred in the financial system, which lead to the failure of companies, highlight the importance of high quality information among stakeholders (Jensen and Meckling, 1998).

2.3. Determinants of shareholder *vs.* insider information asymmetry

The following section provides an overview of the variables used in both regressions.

2.3.1. Board size

Board size refers to the number of directors that are a part of a corporate board. Larger boards tend to represent greater diversity in terms of financial expertise, experience amongst the members, as well as the ability to problem solve (Ntim, 2013). These characteristics can improve a firm's image and reputation, as well as the efficiency of its board in detecting any opportunistic behaviours amongst managers.

According to Ye (2018) board size is positively and significantly related to governance disclosure as it is positively associated with the level of reporting. An argument can be made that larger boards are more inclined to be more transparent with disclosure, as there is more chance that the larger board will include more members with high ethical standards, who would encourage greater disclosure, leading to less information asymmetry (Samaha et al., 2012). However, a study done by Ciampi (2015) points out that larger boards have more communication and monitoring problems than smaller boards, which can have a negative impact on disclosure. Therefore, there is a chance that a company will not disclose information about governance if there is a higher number of directorships held by board members. Thus, there is no consensus in the literature on the impact of board size on voluntary disclosure and hence information asymmetry.

Kanagaretnam, Lobo and Whalen (2007) found that larger boards can exert more pressure on management to optimise good governance, as well as to provide better governance disclosure.

Additional literature supports this by fidning a positive relationship between board size and governance disclosure. A study done by Becker-Blease and Irani (2007) confirm that firms performed best when they had more diverse boards, as well as that larger boards of directors are more likely to disclose governance information.

Similarly, a study by Orozco, Vargas and Galindo-Dorado (2018), using the top 200 publicly traded Fortune 500 firms, found that as board size increases, monitoring increases and results in a decrease of information asymmetry. This leads to an increase in liquidity and a decrease in a firm's cost of capital. Holder-Webb, Cohen, Nath and Wood (2007) also observed that larger firms with larger boards provide more disclosure about the various independence standards, selection procedures within the board, audit committee matters and management control systems. Smaller boards, on the other hand, were found to have few disclosures pertaining to these variables.

Therefore, having a larger board will likely cause firms to disclose more information, resulting in less information asymmetry.

2.3.2. Board independence

Good corporate governance procedures can prevent problems that arise from the agency theory by increasing the effectiveness of various aspects associated with monitoring systems -for example, increasing the number of independent directors on the board. Chen and Jaggi (2000) documented in a study that a board comprised mostly of independent non-executive directors is more likely to be related to thorough financial disclosure. They also noted that the size of the board and how large a firm is will have an effect on disclosure. In their study, Cheng and Courtenay (2006) argued that when there is a structured regulatory environment, the relation between governance and disclosure is enhanced. Because independent directors are associated with comprehensive financial disclosure, it will be beneficial for a firm to increase the number of independent directors on the board, whether it be small or large.

The previously mentioned literature proposes that larger boards with more independent directors could help facilitate the interests of the stakeholders and shareholders of a firm. This concept is supported by the findings of Francis, Hasan and Wu (2012), who argued that more independent directors on a firm's board improves the quality and monitoring of disclosure as well as it reduces the advantages of withholding information. More empirical evidence was found by Abdullah (2004), who concluded that there is a significantly positive relationship between board independence and governance disclosure.

Board independence is regarded as a key aspect of good corporate governance across firms. According to the agency theory, independent directors improve the monitoring and controlling of possibly opportunistic behaviour of dependent directors and management (Jensen and Meckling, 1976). Further, stakeholder theory supports the significance of the presence of independent directors in the composition of a board to protect investor interests (Araissi et al., 2016). Therefore, the number of independent directors on the board of a company enhances value for shareholders by decreasing agency conflicts as well as enhances legitimacy by representing various stakeholder groups (Chau and Gray, 2010).

According to Young (2000), independent directors are likely to result in greater board diversity, as well as additional knowledge, abilities and skills. Findings by Lehn et al. (2003) show that there is a positive association between board independence and disclosure on corporate governance practices. However, a study done by Raheja (2005) reported that when independent directors are present on a board, there is a significant but negative association with the quality of governance disclosure, confirming that these directors do not enhance disclosure which could lead to information asymmetry.

Empirical evidence found by Holm and Scholer (2012) involving 160 companies over the years 2008 to 2010 suggest that board independence has an inverse relationship with information asymmetry. Chen and Nowland (2010) suggest in their findings that if firms increase board independence, it will advance the interest of minority investors. The study highlights the importance of the form of executive compensation in mitigating information asymmetry and reducing agency problems. Related studies conducted by Ajinkya et al. (2005) and Karamanou and Vafeas (2005) both show that more independent directors on a board increases the frequency, issuance and accuracy of disclosures, improves the accuracy of analyst forecasts and lastly, ensures that the information is fairly distributed.

2.3.3. Audit committee size

A key contribution that the audit committee makes is to assist the board of directors in monitoring a firm's corporate reporting policy. Khlif and Samaha (2016) note that an audit committee plays a significant role in satisfying investors needs for relevant and complete information. An audit committee guarantees that there will be an increase in voluntary disclosure in order to allow for a better evaluation of the decisions made by top management, as well as aligning the interests of management and shareholders (Abdullah, Ismail and Smith, 2018). The audit committee fulfils a vital function in monitoring the various activities on the board by improving the standard of the information disclosed. By doing this, it ensures that shareholders' interests are protected through the availability of price-sensitive information Allegrini and Greco (2011).

An important role of an audit committee is to facilitate the board of directors in monitoring a firm's corporate governance policy (Pincus et al. 1989). Arcay and Vázquez (2005) and Khlif and Samaha (2013) suggested that an audit committee plays a significant and critical part in satisfying investors' needs for relevant, transparent and complete information. An audit committee is seen as a mechanism to control top management and ensures better evaluation of top management decisions and behaviours by ensuring that there is increased voluntary disclosure in order to align management and shareholder interests. An audit committee plays a significant role in observing the activities of a board by improving the quality of information disclosed and ensures that shareholders' interests are protected through better information disclosure. Thus, an audit committee is presumed to improve a firm's corporate reporting policy (Chiu et al. 2017).

Empirical evidence is supportive and suggests that there is a positive relationship between the characteristics of the audit committee and voluntary disclosure (see, for example, Al-Shammari and Al-Sultan, 2010; Barako, Hancock and Izan, 2006 and Ho and Shun Wong, 2001). However, other studies do not find any association (see, for example, Allegrini and Greco, 2011 and Mangena and Pike, 2005). A study with a sample size consisting of 72 listed firms on the Amman stock exchange over the time period 2013 to 2016 found that the existence of an audit committee is notably associated with the degree of voluntary disclosures such as board structure and the interests of shareholders (Yuen, Steven, Morris and Lu, 2010). Having an audit committee is one of the best monitoring mechanisms if a firm wants to improve the quality of disclosure and an internal control system has been found to reduce agency costs (Forker, 1992). Therefore, audit committee effectiveness is a crucial determinant of voluntary disclosure and hence, of a reduction in information asymmetry.

2.3.4. Free float

The free float of a listed firm refers to the proportion of the shares that are freely traded (Grossman and Hart, 1980). If a firm's shareholders are relatively dispersed (i.e., a large free float), the individual shareholders will not have motive to oversee the behaviour of the various top management. The reason for this is that they will only receive a small part of the the rewards that are acquired from such supervision (Gandía, 2008). Leuz and Verrecchia (2000) state that a low percentage free float means that there is strong stockholding concentration. This could lead to a company providing less information to the public which causes an increase in information asymmetry.

The higher the percentage of free float, the more likely a company will disclose information. The lower the percentage of free float indicates that shareholders with large closely held stakes may have better access to corporate information. The level of monitoring and the extent of disclosure can be determined by ownership structure (Eng and Mak, 2003). Empirically, a negative association was found between the size of internal ownerships, such as by managers and board members, and the disclosure of governance practices of a Canadian sample of companies covering the period 2000 to 2006 (Amar and Boujenoui, 2008)

A study done by Hassan and Power (2009) shows that the majority of investors in companies with large free floats generally lower in size may not depend on voluntary disclosures to obtain information on a firm. This is because they could have access to this information due to their insider status as a large shareholder or as owner-managers. The regulators of a firm usually tend to focus on the voluntary disclosures of companies to ensure that minority shareholders are not put at a disadvantage because of the difference in information access within a firm (Ahmed and Courtis, 1999). Mardani (2018) found, based on a sample of 63 firms in Iran between the years 2005 and 2009, that there is a positive association between free float and governance disclosure.

2.3.5. Systematic risk

Systematic risk, also known as market risk, affects an entire market and cannot be eliminated with the use of asset portfolios. A beta coefficient is used to measure the magnitude of systematic risk (Sharpe, 1964). If a firm's systematic risk is high, it is more difficult for investors to accurately assess the value of a firm. Thus, a firm will more likely experience an unexpected occurrence of information costs to assess the risk drivers (Hail and Leuz, 2006).

Research done by Botosan and Plumlee (2005), based on a sample consisting of 122 manufacturing firms in 1990, show that investors tend to apply a higher cost of equity for companies that have higher systematic risk. Another study done by Barry and Brown (1985) theoretically shows that when firms provide significantly less information, they will have higher systematic risk. It is more difficult for an investor to precisely determine the value of a firm when a firm's systematic risk is high. Because of this, there is a higher chance that the firm will incur information costs to assess its risk drivers. Investors tend to charge a higher cost of equity for companies with higher systematic risk (Hail and Leuz, 2004), as this also implies higher information asymmetry.

2.3.6. Analyst following

Analyst following, the number of analysts who observe a certain stock or security, is often used as a proxy to observe how informative a firm's information environment is (Ayers and Freeman, 2001; and Bushman, Piotroski and Smith, 2003).

Financial analysts from banks, brokerage houses and independent research services analyse information on a wide variety of firms across the globe. The high demand for the information being collected by the financial analysts is presumed to have a positive relationship to the potential economic value of the information being generated. As soon as an analyst recognises a useful piece of information, he or she will usually first use it for their company or share it with their favoured clients before putting it into a newsletter to subscribers. Only after those steps, will he/she disclose it publicly. An analyst will have very little incentive to follow a certain firm if there is little economic benefit to their company and/or their client expected from the information on a company.

Results found by Lang, Lins and Miller (2002) on banks in India over the period from 1985 to 1989, suggest that analyst following has a positive association regarding the informativeness of a firm's disclosure policy. Analysts have the potential to alleviate the effects of bad governance by serving as further monitoring mechanisms (Debreceny and Rahman, 2005). Companies that provide better governance disclosure are followed by more analysts because they are provided with significantly more information (including more corporate governance information), which assist to improve the accuracy of their predictions and recommendations (Botosan, 2000). A study done by Roulstone (2003) for the period 2014 to 2018, in the context of Asia, established a relationship between analyst following and information asymmetry, and suggested that more analysts following a firm will lead to there being more information available to outsiders, which means less information asymmetry.

2.4. Proxies for information asymmetry

There are various proxies that exist for the purpose of assessing the level of information asymmetry between firm outsiders and insiders. Francis, Khurana and Pereira (2005) and Healy, Hutton and Palepu (1999) argue that disclosure quality lowers information asymmetry when the latter is proxied by share price volatility. Other studies done by Aerts, Cormier and Magnan (2007) and Clarkson, Li, Richardson and Vasvari (2008), rely on Tobin’s Q for assessing the effect that voluntary disclosure has on information asymmetry. Based on the above literature, Tobin’s Q and share price volatility were used as proxies for information asymmetry in this study. Share price volatility, is measured by the standard deviation of percentage changes in daily stock price and Tobin’s Q is measured by the total value of the prices of stocks with the replacement cost of the underlying assets for those same stocks.

This study investigates whether better governance disclosure by a company is correlated with reduced information asymmetry based on the two proxies. The more information asymmetry there is, the more the shareholders and investors will be uncertain about the value of a company. This will lead to the share price becoming more volatile. Thus, higher information asymmetry will lead to higher share price volatility (He et al., 2016).

With regards to Tobin's Q, a higher value of Tobin's Q indicates that the market value is more relevant to the replacement value and if the market value is very high relative to the replacement value, this means the market is deemed overvalued. If the market value is lower than the replacement value, investors can obtain the assets at a cheaper rate. This indicates lower information asymmetry as investors are willing to pay more per unit of assets if information asymmetry is low. Thus, a higher Tobin's Q reflects lower information asymmetry, all else equal. Disclosure of information leads to increase in a firms Tobin’s Q ratio and therefore it issued as a proxy within this study (Mehr, 2020).

Given the above discussion, two hypotheses are developed based on the existing academic literature. These hypotheses, as well as the data and methodology for this study, are discussed in the chapter that follows.

CHAPTER 3: SAMPLE, DATA AND METHODOLOGY

This chapter focusses on the data and sample that as used in this study, and also gives a detailed outline of the methodology that was followed. This study made use of two different models, each using one of the two information asymmetry proxies (share price volatility and Tobin's Q) as discussed in Chapter 2 as a dependent variable. The models are discussed in Section 3.1.

The hypothesis tested in this study flows from the literature review in Chapter 2 and are as follows:

H_1: *There is a negative correlation between corporate governance disclosure and share price volatility (as proxy for information asymmetry).*

H_2*: There is a positive correlation between corporate governance disclosure and Tobin's Q (as proxy for information asymmetry).*

3.1. Data and sample

The sample that is used in this study comprises of all the companies that were listed on the JSE for the period 2009 to 2021 for which Bloomberg governance disclosure scores are available. Bloomberg disclosure scores were only made available from 2009, so it is for that reason that the study begins in that year. All of the data obtained for this study is annual data and came from the Bloomberg database. Unlisted companies and companies without any ESG data were not included in this study.

The FTSE/JSE Africa All Share Index was used to make sure that the sample was fully representative of the majority of the JSE, measured by market capitalisation.

Missing governance data significantly reduced the size of the sample from roughly 400 companies to 238 companies. Company years without governance disclosure data were excluded, resulting in a final unbalanced data panel consisting of 103 companies and 1154 company year observations.

The nature of the complete and final sample is provided in the table below. The companies have been divided in terms of size. The final observation shows that the majority of the sample is made up of medium size companies, indicating a broad selection of companies present in the FTSE/JSE Africa All Share Index.

TABLE 3-1: SAMPLE BY COMPANY SIZE DISTRIBUTION

Index	Number of companies	Percentage (%)
FTSE/JSE Top 40	24	23%
FTSE/JSE Mid cap	56	55%
FTSE/JSE Small cap	23	22%
Total sample	**103**	**100%**

The sample in this study is shown below categorised by different industry sectors. The Global Industry Classification Standards (GICS) categorises companies into eleven economic groups, starting in 2016 (MSCI, 2016). The sample consists of GICS sectors as follows: Consumer, Energy, Health Care, Materials, IT, Finance, Telecommunication, Industrials and Real Estate.

TABLE 3-2: SAMPLE BY INDUSTRY CLASSIFICATION

Sectors	Number of companies	Percentage (%)
Consumer	30	29%
Energy	2	2%
Health Care	7	7%
Materials	23	22%
IT	5	5%
Financials	19	18%
Telecommunication	3	3%
Industrials	8	8%
Real Estate	6	6%
TOTAL		**100%**

3.2. Measurement of variables

The following section provides a summary of how the control, dependent, and independent variables were measured.

3.2.1. Dependent variables

As mentioned previously, this study uses share price volatility and Tobin's Q as proxies for information asymmetry. Therefore, the two dependent variables used in the two different models were share price volatility and Tobin's Q.

Share price volatility is used because companies who participate in better governance disclosure have increased institutional ownership, better stock liquidity and improved stock performance (Lim and Sek, 2014). Various literature inform this statement by arguing that increasing disclosure beyond a determined level could generate more market volatility in stock prices. Increased disclosure of information relies on an interpretation of investors within a certain context. Thus, having a higher level of disclosure may drive market volatility and reduce information asymmetry (Allenspach, 2009). Systematic risk, free float and analyst following are market variables and are therefore used as unique control variables for information asymmetry in the share price volatility equation and regression model. This is presented further down in Equation 1 in Section 3.3.

Tobin's Q is the market value of a company divided by the replacement cost of its assets. When Tobin's Q is below 1, meaning the price is less than the replacement book value, it implies that a firm earns less than the required rate of return (Li, Gong, Zhang and Koh, 2018). The inverse of assets and profitability are used as unique control variables for information asymmetry in the Tobin's Q equation, as they are company specific variables. This is presented in Equation 2 in Section 3.3.

3.2.2. Variable of interest

Governance disclosure is the variable of interest in this study. Bloomberg's governance disclosure scores are useful in this study because they reflect information disclosure of company-specific aspects including board diversity, corruption within a company, executive compensation, shareholders' rights, staggered boards, and takeover defence. The score is a percentage and represents the aggregated level of a firms' disclosure against quantitative data points which are drawn from various global standards that are regarded relevant to a firm's industry (Ştefãnescu, 2012). Investors are constantly considering governance factors as a key part of their decision making and engagement process with a company. The disclosure scores build on this support by providing issuers with a mechanism that can better assess their current levels of quantitative disclosure that is relative to the industry sector average and can help create a clearer picture for investors by disclosing additional metrics. However, these scores do not represent any indication of the nature of the disclosure, but merely on its extent (Lim et al., 2007).

Thus, the score simply reflects that all relevant data is being disclosed, providing an indication of how transparent a firm is to investors. The score ranges from 0 to 100, with anything above 70 considered a good rating and 50 and below considered a bad rating. These disclosure scores are based on a wide variety of information that firms disclose in their annual reports to shareholders (Meek et al., 1995).

The final score that is assigned to each company every year is determined by how transparent a firms reporting is. It is measured as the number of measured metrics a company is accurately disclosing (Eccles et al., 2011; Mueller, 2014). A firm that discloses more accurate and applicable information is given a higher disclosure score, whilst firms that disclose less accurate and relevant information are given lower disclosure scores.

In this sample, many companies showed a positive change in disclosure scores between 2009 and 2020. Firms improving their disclosure scores are consistent with the findings of Patel et al. (2002) that levels of disclosure and transparency improve across economies over time.

Governance scores were obtained from Bloomberg for all companies listed on the JSE index for which they were available over the sample period.

3.2.3. Control variables

The control variables chosen for this study are board size, board independence, audit committee size, free float, systematic risk and analyst following. The data for these were obtained on the Bloomberg data base for these control variables for the period 2009 to 2021.

Board Size (BS) is measured by how many full-time directors the company's board comprises of. Okeahalam (2004) argue that a larger board size is more favourable. However, others, such as Lehn et al. (2003) and Guest (2008), show that the level of disclosure within a firm is strengthened by a reduced number of directors. Based on the agency theory, smaller boards are more successful in monitoring and taking into consideration the fact that most codes of good governance often advise limitations to the size of the board. Board size is expected to have a negative association with share price volatility and a positive association with Tobin's Q.

Board Independence (BI) is calculated as the percentage of independent directors on the board of a company. It is assumed that an independent board is a key governance mechanism and that greater board independence results in better disclosure. However, studies have found a negative association between the percentage of independent directors and firms' voluntary disclosure. However, both Chau and Gray (2010) and Samaha et al. (2015) did not find any association between board independence and accurate disclosure. A negative relationship is expected between board independence and share price volatility and a positive relationship is expected between board independence and Tobin's Q.

Audit Committee Size (ACS) is determined by the number of audit committee members on the board of directors of a company. In general, studies find empirical evidence of a positive relationship between the characteristics of an audit committee and voluntary disclosure, as measured by Tobin's Q and Share price volatility (Al-Shammari and Al-Sultan, 2010; Barako et al, 2006 and Wong, 2001). However, various studies such as that of Allegrini and Greco (2011) and Mangena and Pike (2005) did not find a significant association. A negative relationship is expected between audit committee size and share price volatility, and a positive relationship is expected between audit committee size and Tobin's Q.

Free Float (FF) is defined as the number of shares that are restricted from trading subtracted from the number of outstanding shares. It refers to the number of shares that can be publicly/freely traded. Ding et al. (2016) study the relationship between free float and governance disclosure across 55 countries over the period 2003 to 2011 and found that higher free float levels are associated with increased voluntary disclosure. A negative relationship is expected between free float and share price volatility.

Systematic Risk (SR) refers to the risk inherent to an entire market (or market segment) and is measured by a Beta coefficient. By reducing systematic risk, this can be used to strengthen the effect of corporate governance resulting in less information asymmetry within a firm. A positive relationship is expected between systematic risk and share price volatility.

Analyst Following (AF) refers to the number of analysts who observe a stock or other security. A greater number of financial analysts will follow a firm with a larger degree of information asymmetry as long as the value of private information will increase the degree of information asymmetry regarding the future prospects of the firm (Das, 2020). A negative relationship is expected between analyst following and share price volatility. A positive relationship is expected between analyst following and share price volatility.

Variables such as systematic risk cannot be used in the Tobin's Q equation as they are market variables that only affect share price volatility. The variables used as a replacement in the Tobin's Q equation are the inverse of assets and profitability, which is measured by return of assets (ROA). Both variables are expected to have a positive relationship with Tobin's Q. Table 3-3 summarises the above-mentioned variables in the regression that follow.

TABLE 3-3:REGRESSION VARIABLES

Variable	**Definition**	**Variable name used in the regression**
Share price volatility	Standard deviation of percentage changes in daily stock prices.	SPV
Tobin's Q	Market capitalisation divided by book value of equity	TOBINQ
Board size	Number of full-time directors on the board	BSIZE
Board independence	Percentage of independent directors on the board	PERC_ID
Audit committee size	Number of audit committee members on the board	SIZE_AC
Analyst following	Number of analysts who observe a stock	A_FOLLOW
Free float	Number of shares restricted from trading as percentage of number of shares outstanding	FREEFLOAT
Systematic risk	The beta of the company's share	BETA
Profitability	Return on assets	PROF
Inverse of Assets	Inverse of total assets	INVERSE_ASSET
Governance score	(Bloomberg) score indicating level of governance disclosure	GOV_DISC

3.3. Model and estimation method

3.3.1. Model

Equation 1 below indicates the share price volatility model adopted in the empirical analysis and is used to analyse the relationship between the independent variables and information asymmetry proxied by share price volatility, as per the study by Cormier, Ledoux, Magnan and Aerts (2010):

Share price volatility = f (β_0 + β_1 systematic risk + β_2 analyst following + β_3 free float + β_4 board independence + β_5 board size + β_6 audit committee size + β_7 governance disclosure).

(Equation 1)

Equation 2 below indicates the Tobin's Q model adopted in the empirical analysis and is used to analyse the relationship between the independent variables and information asymmetry proxied by Tobin's Q, following the work of Cormier, Ledoux, Magnan and Aerts (2010):

Tobin's Q = f (β_0 + β_1 inverse of assets + β_2 profitability + β_3 board independence + β_4 board size + β_5 audit committee size + β_6 governance disclosure).

(Equation 2)

3.3.2. Use of Panel data

This study makes use of panel data. Creating a data panel can be used in order to compensate for insufficient time-series depth available in data. Panel data refers to a data set that consists of data that posesses both a time-series and a cross-sectional element. The datasets used in this study made observations on the same unit of analysis (i.e., company governance disclosure scores) over the time period 2009 to 2021. Greene (2008) argues that the main advantage of panel data is that heterogeneity can be formally modelled across groups that are present in panel data. A great benefit of panel data is that it controls for individual heterogeneity. Cross-sectional studies done in the past fail to control for unobserved firm heterogeneity and this causes the relations to be spurious. Using a panel approach allows for better control for firm effects that are time-invariant, as well as other endogeneity problems (Park, 2011).

The panel regression models that are considered in this study are the fixed effects regression model and random effects regression model. In determining which approach is appropriate for this study, a Hausman test is conducted as a first step.

3.4. Determining which regression model to use (random effects or fixed effects)

3.4.1. Random Effects test

The random effects regression model states that the unobserved heterogeneity is not correlated with the independent variables in the regression. If there are any differences between the individual units of analysis, these differences will be captured in the error term (Park, 2011).

The random effects approach is relevant when a study would like to draw random samples from a large population in order to make conclusions about the various characteristics of the population. While the random effects regression captures differences in the error term, the fixed effects regression assumption captures differences in the intercept term. Thus, in the random effects model, the intercept and slope will be constant whereas the error variance will be randomly distributed (Baltagi, 2009).

$\gamma_{it} = \alpha + X'_{it}\beta + (\epsilon_{it} + \mu_{it})$ (where i =1,...,N and t = 1,...,T)

(Equation 3)

Where:

- γ_{it} represents the dependent variable
- α represents the intercept
- $X'_{it}\beta$ represents the independent variables
- β represents the slope of the independent variables
- ϵ_{it} represents the error term
- μ_{it} represents the unobservable individual fixed effect
- i represents the cross-sectional unit of analysis

3.4.2. Fixed effects regression model

The fixed effects approach assumes that variations across cross-sections can be represented in differences in the constant term. A fixed group effect model analyses the individual differences in intercepts, assuming that they have the same slope and constant variance across individuals. Therefore, individual differences should be accounted for in the intercept term. A major drawback of the fixed regression model is that estimates of the slope of the individual variables (β) are heavily sample dependent (Park, 2011).

$\gamma_{it} = (\alpha + \mu_{it}) + X'_{it}\beta + \epsilon_{it.}$ where i =1,...,N and t = 1,...,T)

(Equation 4)

Where:

- γ_{it} represents the dependent variable
- α represents the intercept
- μ_{it} represents the unobservable individual fixed effect
- $X'_{it}\beta$ represents the independent variables
- β represents the slope of the independent variables

- ϵ_{it} represents the error term
- *i* represents the cross-sectional unit of analysis
- *t* represents the time series

3.4.3. Hausman Specification Test

A Hausman specification test was performed in order to determine whether the random effects model or the fixed effects model was more appropriate for the dataset used in this study. This test is used in order to differentiate between fixed and random effects model in panel analysis. The Hausman test detects endogenous regressors (predictor variables) in any regression model (Holly, 1982).

This test comprises of the null hypothesis that the regression errors of the independent variables are not correlated with the individual-specific effects. This implies that the Random Effects model is more appropriate than the Fixed Effects model based on the regression (Petersen, 2004). Thus, the Fixed Effects model is found to be more appropriate in this study if there is a statistically significant rejection of the hypothesis.

The test was conducted on Stata in order to determine which regression model to use. The null hypothesis for this test is that random effects should be used in the regression analysis and that if the p-value is less than the significance level (0.05) then the null hypothesis is rejected, which will favour a fixed effect specification. If the p-value is larger than 0.05, it fails to reject the null hypothesis, meaning that there is not strong enough evidence that random effects and fixed effects yield different results, thus it favours random effects specification given it is more efficient (Srinivasjois, 2021).

The p-values were evaluated for both dependent variable models (using share price volatility and Tobin's Q) and the results are shown in Tables A-1 and A-2 of Appendix A. The results of the Hausman Test show that the random effects model is more appropriate for both regressions based on the p-values: 0.99 and 0.06 for the share price volatility and Tobin's Q models, respectively.

3.5. Model diagnostics

Model diagnostic tests were performed to confirm that the data used in the study meets the relevant model assumptions. Violations of the assumptions would indicate that there are Type I or Type II errors, which could cause a reduction in the credibility of the results in the regression (Osborne, 2002).

3.5.1. Multicollinearity

A correlation analysis is useful to help a researcher establish an understanding of the association between variables in an analysis. The Pearson Correlation Matric is a powerful correlation analysis method which is used to provide important insights on the magnitude and direction of the linear association between variables in a regression analysis. The correlation coefficient can range from -1 to +1, with -1 representing perfect negative correlation, +1 representing a perfect positive correlation and 0 indicating that no correlation is present. The analysis is used to help researchers understand and distinguish any correlation that could potentially exist amongst variables in a study (Weeks, 2009)

Multicollinearity occurs when there is a correlation between the independent variables. This could lead to the impact of the independent variables on the dependent variables not to be truly reflected by the regression model results (Wooldridge, 2009). The Pearson Correlation test was performed in order to check the correlation coefficients between the independent variables in the sample data. According to Cohen et al (2013), the Pearson correlation test is one of the most widely used measure of multicollinearity because it is based on the method of covariance and gives an indication of the magnitude of the correlation, as well as the direction of this relationship.

The results are displayed in Chapter 4. Based on the correlation results, all of the correlation coefficients presented in the table were below 85% (eighty five percent), which suggests that there is a low risk of a negative impact due to multicollinearity (Schroeder et al., 1990). This applied to both regression models.

The variance inflation factor (VIF) test was also performed to assess multicollinearity in a regression analysis. Multicollinearity exists when there is a correlation between more than one independent variable in a regression model and this could negatively affect the regression results. Thus, using the variance inflation factor test can help estimate how much the variance of a regression coefficient increased due to multicollinearity (Guerard, 2012). Multicollinearity exists when the VIF test result is high. As shown in Table B-1 for the share price volatility regression and Table B-2 for the Tobin's Q regression in Appendix B, the VIF test results for the two models were 1.21 and 1.19, respectively. This indicates that the variables in both regressions are not correlated. For reference, the general rule is that a VIF number below 3 is of no concern (Potters, 2005).

3.5.2. Autocorrelation

In order to test for autocorrelation, the Durbin-Watson test was performed on both dependent variables to investigate the effect of serial correlation. The Durbin Watson statistic is a test for autocorrelation in the output of a regression model. Based on the results presented in Tables B-3 and B-4 in Appendix B, the null hypothesis for both the share price volatility and Tobin's Q models is that there is no serial correlation.

A key assumption in any linear regression is that there is no correlation between the residuals. Regressions are based on the assumption that errors within the regression are independent (Chatterjee and Hadi, 2013). When the error terms are correlated, this assumption is then violated and autocorrelation occurs. Autocorrelation leads to there being an inefficient estimation of the regression coefficients which results in biased estimates of the standard errors and significance levels (Kurkiewicz, 2013).

In addition to the Durbin Watson test, the Breusch-Godfrey test was used to investigate if there is autocorrelation present. This test utilises the residuals from both models considered in the regression analysis and a test statistic is derived from these. After evaluating the p-values, the null hypotheses for both dependent variables (share price volatility and Tobin's Q) were rejected, thus concluding that serial correlation is not a problem. This is presented in Table B-5 and Table B-6 in Appendix B.

The reason both autocorrelation tests were performed is due to the fact that the Durbin-Watson test is restricted when detecting first-order autoregression, whereas the Breusch-Godfrey test supports a wider class of regressors and can detect autocorrelation up until any predesignate order P (White, 1992).

3.5.3. Heteroscedasticity

A method used to understand the association amongst various explanatory variables and a response variable is multiple linear regression. However, a problem that arises in regression is known as heteroscedasticity. This occurs when there is a systematic change in the variance of residuals over a wide range of measured values (Schwert and Seguin, 1989). The Breusch-Pagan test is used to determine whether or not heteroscedasticity is present.

The Breusch-Pagan test was performed to test for heteroscedasticity in the regression models. Homoskedasticity is assumed by the null hypothesis. This implies constant variance of all of the error terms (Torres-Reyna, 2007: 35). It refers to the variance of the error terms in a regression model in an independent variable. If heteroscedasticity is present in the data, the variance differs across the values of the explanatory variables and violates the assumption (Rigobon, 2003).

Based on the results presented in Table B-7 and Table B-8 in Appendix B, both dependent variables displayed p-values of less than 0.05. The Breusch-Pagan test produces a chi squared test statistic with 7 and 6 degrees of freedom for share price volatility and Tobin's Q respectively when the null hypothesis of no heteroscedasticity is satisfied. The test statistic in this study is 636.27 and 1390.33 for share price volatility and Tobin's Q respectively, indicating a rejection of the null hypothesis.

Chapter 4 that follows discusses and analyses the results of this study.

CHAPTER 4: DATA ANALYSIS AND RESULTS

The following section presents the descriptive statistics as well as an analysis of the results.

4.1. Descriptive statistics

This section illustrates the descriptive statistics from the final sample used in this study to provide a clear summary of the research data, and to analyse and compare the quantitative characteristics of the distribution of each of the variables associated with the sample. Table 4-1 illustrates the descriptive statistics for this research study.

TABLE 4-1: DESCRIPTIVE STATISTICS

STATS	GOV_DISC (%)	INV_ASSETS (1/R MN)	PROF (%)	BSIZE (#)	SIZE_AC (#)	BETA (#)	A_FOLLOW (#)	PERC_ID (%)	FREE FLOAT (%)	TOBINQ (RATIO)	SPV (%)
N	1158	1154	1154	1158	1158	1015	1015	1158	1015	1154	1015
MEAN	81.054	0.0001	7.467	11.965	3.7504	0.0498	8.9881	59.4236	64.6182	1.6975	0.0269
MEDIAN	83.0223	0.000049	5.601	12	4	1.045	8	60	69.2134	1.3076	0.0185
SD	9.304	0.000469	8.495	3.1847	0.8970	13.972	6.0228	14.7961	22.6202	1.0304	0.0375
MIN	24.6538	0.0000003	-32.279	5	2	-19.496	0	18.182	4.63	0.4479	0.0076
MAX	99.3076	0.0072641	77.9867	24	8	83.2488	34	92.857	109.3258	8.836	0.3871

PERC_ID = Percentage of independent directors
SIZE_AC = Size of the audit committee
BSIZE = Board size
A_FOLLOW = Total analyst following
TOBINQ = Tobin's Q
PROF = Profitability
INV_ASSETS = Inverse of assets
GOV DISC = Governance disclosure
SPV = Share price volatility

Looking at the variable of interest in the study, governance disclosure, it can be seen that there is significant variance within the data with a minimum of 24.65 and a maximum of 99.31. This indicates that some firms have a very low level of governance disclosure, which could impact the trust between a company management and investors. Investors globally are attempting to look below the bottom line to gain an understanding of a company's value and long-term sustainability (Ball et al., 2000). They would prefer strong governance disclosure to be able to assess how well a company is at managing its risks. This is important for an investor wanting to gain a better understanding of a company's long-term potential. Companies striving to increase their governance scores will likely attract more investors and reduce the risk of information asymmetry (Healy and Palepu, 2001). For example, the minimum disclosure score of 24.65 in Table 4-1 above, was for Hosken Consolidated Investments (HCI SJ Equity) in 2014. This company increased its score to 71 the following year and to 83 the year after that. The mean governance score of 81 indicates that the average firm in this sample has a fairly high governance disclosure score, which is not surprising given that the King governance codes are partially embedded in the JSE listing requirements. Although this can be classified as a good governance score, a standard deviation of 9.3 indicates that there is some variability in governance disclosure within the sample.

Tobin's Q data shows that the data is clustered around the mean. The mean for Tobin's Q is 1.69 with a minimum of 0.48 and a maximum of 8.83. If Tobin's Q is greater than 1, this indicates that the market value is greater than the value of the recorded assets within a company. It also indicates that the company is earning well and shows good returns, which has a positive influence on investors. A high Tobin's Q ratio (greater than 1) could indicate that a stock is overvalued, whereas a low Tobin's Q ratio (between 0 and 1) could imply that a stock is undervalued. This measure of stock valuation is an important driving factor behind decisions regarding investments in Tobin's Q ratio (Lee et al., 2014).

Variables such as board independence and free float displayed a higher standard deviation, 22.62 and 14.79, respectively, than variables such as board size and analyst following, 3.18 and 6.02 respectively. Referring to Table 4-1, variables in the Tobin's Q equation tend to show less variance in the data with a minimum (0.45) and maximum (8.83) which are closer together and a lower SD (1.03) than variables in the share price volatility equation (Chung and Pruitt, 1994).

4.2. Pearson correlation matrix

Table 4-2 presented below shows the correlation between the independent variables and the dependent variables - share price volatility and Tobin's Q. This section discusses and interprets unconditional correlation between the variables, for both the share price volatility and Tobin's Q models.

TABLE 4-2: PEARSON CORRELATION MATRIX

	PERC_ID	SPV	TOBINQ	BETA	SIZE_AC	BSIZE	FREE FLOAT	A_FOLLOW	PROF	INV_ ASSET	GOV_ DISC
PERC_ID	1.0000										
SPV	0.1592	1.0000									
TOBINQ	-0.1146	-0.3064	1.0000								
BETA	-0.0236	-0.0074**	0.0759	1.0000							
SIZE_AC	0.2930	0.0352	-0.1594***	-0.0268	1.0000						
BSIZE	-0.0756**	0.0735***	-0.1006	0.0080	0.4091****	1.0000					
FREE FLOAT	0.4321****	-0.0177	-0.0603	0.0344	0.0429	-0.0145	1.0000				
A_FOLLOW	0.1470****	-0.1427	0.1690****	-0.0515	0.1819	0.1809****	0.1647****	1.0000			
PROF	-0.0060	0.0472**	0.6174	0.0668**	-0.0949***	-0.1839****	-0.1115****	0.0062	1.0000		
INV_ASSET	-1.439****	0.0470	0.0667***	-0.0024	-0.1629****	-0.2580****	0.0655**	-0.1436****	0.1650****	1.0000	
GOV_DISC	0.0691**	-0.0019	-0.0231	-0.0015	0.0428	0.0125	0.0607*	0.0991***	0.0153	-0.0209	1.0000

Correlation significance for (2-tailed)
P<0.10 * P<0.05 ** P<0.01*** P<0.001 ****

PERC_ID = Percentage of independent directors
SIZE_AC = Size of the audit committee
BSIZE = Board size
A_FOLLOW = Total analyst following
TOBINQ = Tobin's Q

PROF = Profitability
INV_ASSETS = Inverse of assets
GOV DISC = Governance disclosure
SPV = Share price volatility

As seen in Table 4-2 above, the majority of independent variables used in this study are not highly correlated. When two independent variables are seen to be highly correlated, this can result in multicollinearity which will have an effect on the interpretation of the regression results.

Variables such as the size of the audit committee and board size are positively correlated (+0.40) meaning that as the size of the board increases, so does the size of the audit committee. The board of directors plays a vital role in the level of disclosure within a company, as it is responsible for hiring and firing top level decision managers and its aim is to minimise agency problems. Thus, the size of the board plays a crucial role in influencing the disclosure process of a company to ultimately minimise information asymmetry (Al-Bassam et al., 2015).

Board size has a negative correlation with profitability. Larger boards can improve access to information, as well as the quality of opinions within firms. Specifically, in developing countries, this is significant due to the conditions of economic volatility and the uncertainty experienced, which may lead to larger boards having better relationships with its managers and stakeholders (Alhazaimeh et al., 2014). A board may not comprise of only strong members and the quality of the board can influence profitability. Boards with weak members can lead to a decline in a firms profits due to a number of members not having a positive influence on the board (Guest, 2009). This was supported by research from Bermig and Frick (2010), who stated that although larger boards initially encourage key board responsibilities, a point will be reached when a board comprising of more members will suffer from communication and coordination problems and this will result in a decline in the firm's profits.

On average, looking at the data, there was an upwards trend in the size of the board of directors within each company over the sample period, which could result in more conflict amongst members, causing information asymmetry (Orozco et al., 2018).

Observing the variable of interest in this study - governance disclosure, it can be seen that it is most correlated with analyst following among all the variables in the correlation test. Disclosing more corporate governance information will attract more financial analysts, improving a firm's information availability and reducing the risk of asymmetry. When analysts share information about governance related matters provided by a firm, the variance should be reduced within their forecasts and therefore there will be a negative association between analyst recommendations and governance disclosure (Yu, 2010). Theoretically, more governance disclosure may cause either more or less analysts to follow he firm, depending on the supply and demand of analyst service. More disclosure has been found to reduce the demand for analyst services as they tend to decrease the personal benefits that are due to analysts for their forecasts (Bhat et al., 2006).

Governance practices have a considerable impact on the quality as well as the quantity of information provided by the firm, and information about these practices will assist analysts following a firm, and to effectively assess the amount of information available to base their forecasts on to evaluate the credibility of corporate disclosures. This will generate a more accurate forecast, leading to less information asymmetry. Thus, an observation can be made based on the correlation test that governance disclosure is positively correlated to analyst recommendations and that the disclosure can help analysts determine how available information is because companies that are better governed voluntarily provide more frequent information (Eng and Mak, 2003).

Lastly, looking at one of the dependent variables of this study - share price volatility, it can be seen that it is most correlated with board size.

When looking at the association between board size and share price volatility, there are few studies to draw on. Many prior studies have focused their attention on investigating the role of board size and the negative effect large board have on firm performance (e.g., Yermack, 1996; Eisenberg et al., 1998). Empirically, Cheng (2008) and Wang (2011) found evidence that boards larger in size tend to lead to a reduction in the variability of corporate performance and that increasing communication problems, as discussed previously, will lead to a reduction in volatility. This gives the impression that larger boards are less able to function to their full potential and that the reduced volatility can be seen as a result of decision making that is less efficient. Consequently, lower volatility is seen as a negative outcome (Merz and Trabert, 2020).

4.3. Regression results

Following the methodology outlined in Chapter 3, this study investigating the relationship between governance disclosure and information asymmetry based on the results of the regressions using share price volatility and Tobin's Q as proxies for information asymmetry.

Two regression models were tested in order to check the validity of the hypothesis stated in Chapter 2. The results based on the regressions for share price volatility and Tobin's Q are discussed in detail and presented separately in the sections below.

4.3.1. Regression results for share price volatility.

Previous literature (see Sihombing and Pangaribuan, 2017) emphasised the importance of governance disclosure and its impact on information asymmetry, finding that poor governance disclosure has a negative impact on information asymmetry within a firm. Based on the results of the Hausman specification test discussed in Chapter 3, the random effects model was chosen as the more appropriate model for investigating the relationship between share price volatility and governance disclosure. Table 4-3 below presents the random effects model regression results for each variable linked to share price volatility.

TABLE 4-3: SHARE PRICE VOLATILITY: RANDOM EFFECTS REGRESSION

Number of observations = 1015

Number of groups = 103

$P > chi^2$ = 0.9613

	Coefficient (std error)	*Z statistic*	*P-value*
PERC_ID	0.0000469 *(0.0003262)*	0.14	0.886
BETA	0.0001923 *(0.0001785)*	1.08	0.281
SIZE_AC	-0.0016887 *(0.0041841)*	-0.40	0.687
BSIZE	-0.0000536 *(0.0017796)*	0.03	0.976
FREE FLOAT	0.0000907 *(0.0001976)*	0.46	0.646
A_FOLLOW	0.0007078 *(0.0012329)*	0.57	0.566
GOV_DISC	-0.0000078 *(0.0000411)*	-0.19	0.849

Looking at the results in Table 4-3 above, it can be noted that no variables are statistically significant in this regression, even at the 10% significance level. This could be due to the fact that the random variation is relatively large to find a clear significant effect even if an effect does exist (Fouta and Hennig, 1969).

Referring back to the variables discussed in Chapter 3, board size was expected to have a negative association with share price volatility according to the past literature. Based on the table above, support is found for this hypothesis with the coefficient for board size indeed being found to be negative in the regression for share price volatility. A study done by Guldiken and Darendeli (2016) with similar results found that volatility tends to decrease at first when the size of the board increases. However, it will increase if a certain number of directors on the board has been surpassed. They found that based on their models used, the minimum would likely be reached at around twelve directors and this would lead to a reduction in share price volatility of around fifty-seven percent (57%). An increase further than this point is not very likely. However, if the reduction in volatility was due to factors such as communication problems which could affect group decision making, it is expected that the relationship will continue to be negative.

As mentioned previously there tends to be a negative effect on profitability and performance if board is larger in size. Based on the descriptive statistic results in Table 4-1, the average board size for this study is relatively large with a mean of 12 and a maximum of 24. A paper by Cheng (2008) concluded that larger boards are associated with lower volatility, which explains the negative coefficient produced in the regression results above.

Board independence has a positive coefficient meaning that it has a positive relationship with share price volatility. This is not in line with the hypothesis stated in Chapter 3 and could be due to the sample size used in this study being different to others. This is different to the results found by Bathala (2006), who states that independent directors contribute to the reduction in share price volatility. They stated that a higher ratio of independent directors is expected to have a positive association with the disclosure and corporate performance of a company, which is consistent with the findings presented in Table 4-3 above. Huang and Wang (2015) investigated the relationship between board independence and share price volatility and found that share price volatility was lower in firms with more independent directors than ones without. The share price volatility in their study was measured as the standard deviation of the stock returns, with is the same method used in this study. They also found that independent directors are highly capable of monitoring managers which could help improve the confidence of investors within a firm.

The results suggest that share price volatility is elastic on independent directors and that an increase in the percentage of independent directors will indicate an increase the volatility of a firm's share prices (Gagnon and Jeanneret, 2017).

Beta, analyst following and free float, which are variables only included in the share price volatility equation, all show a positive coefficient in the regression above. With regards to beta, increased volatility of a share price indicates more risk to an investor and the higher the beta, the more volatile the return. Conversely, less volatility is expected with betas that are less than one, indicating low risk and low returns. This indicates that an increase in beta will result in an increase in share price volatility and vice versa (Koutmos, 2014). Thus, these findings are partially consistent with the results displayed in Table 4-3, indicating a positive coefficient and a positive relationship between the two variables. The same positive relationship is consistent with the hypothesis stated in Chapter 3 for free float, but not for analyst following. More analysts following and observing a stock is expected to reduce information asymmetry, and hence to reduce share price volatility, but the opposite (albeit not statistically significant) was found in this study. More restricted shares (a lower free float) was expected to result in higher volatility of share prices, and therefore the results again do not support the stated hypothesis (although again not being statistically significant).

The hypothesis of this study is that there exists a negative correlation between governance disclosure and information asymmetry. As mentioned previously, share price volatility is a proxy for information asymmetry. A negative coefficient can be seen for governance disclosure in Table 4-3, which is consistent with the hypothesis.

Many studies are not consistent with these results and find that an increase in disclosure may increase share price volatility. First, Azrak et al. (2020) found that an increase in disclosure implies that a firm will release more information which could shift the prove and increase volatility (Ross, 1989). Second, they found that if the disclosure of information is increased, it means that firms rely on investors to interpret and put the disclosed information into context. This encourages more disclosures and thus more disclosure can inject more volatility into the market (Institute of International Finance, 2003). On the other hand, Sowerbutts (2001) find in a study which made use of a data set comprising of 600 firms across thirty-one companies over the period 1993 to 2000, that firms with higher disclosure scores are associated with lower volatility, with the reason being that they both attract investors globally. This is because institutional investors tend to hold larger and diversified portfolios and do not trade very frequently. These investors are inclined to invest more in firms with higher disclosure. Other reasons include that disclosure could reduce the impact of news regarding the performance of a firm which could reduce share price volatility (Yu and Wang, 2016).

By increasing the amount of public information, firm disclosure could reduce information asymmetries that occur within the market that result in noticeable price changes in response to the changes in demand for a certain stock. Thus, an increase in disclosure should lead to a reduction in share price volatility (Diamond and Verrecchia, 1991).

4.3.2. Regression results for Tobin's Q.

TABLE 4-4: TOBIN'S Q RESULTS: RANDOM EFFECTS REGRESSION

Number of observations = 1116

Number of groups = 103

P > chi^2 = 0.000

	Coefficient (std error)	***Z***	***P-value***
PERC_ID	-0.0054279 *** *(0.0017446)*	-3.11	0.002
SIZE_AC	-0.0276495 *(0.237814)*	-1.16	0.245
BSIZE	-0.0059243 *(0.0096058)*	-0.62	0.537
PROF	0.04170881 *** *(0.0027349)*	15.28	0.000
INV_ASSETS	0.00854734 *(0.0620789)*	1.37	0.171
GOV_DISC	-0.0000238 *(0.0002465)*	-0.10	0.923

Compared to the results in Table 4-3, the Tobin's Q regression results presented in Table 4-4 have two variables which are statistically significant. Board independence, which is measured by the percentage of independent directors, is significant at the 1% significance level, and profitability, which is a company specific variable only included in the Tobin's Q equation, is similarly significant at the 1% significance level. Board independence was indicated in Chapter 3 as having a positive association with Tobin's Q. However, the regression results above show a negative association. Sarbah et al. (2016) found a positive association between the percentage of independent directors and Tobin's Q, arguing that more independent directors on a board will benefit the monitoring functions on behalf of the shareholders of a firm.

However, a study by Kallamu (2016) using 193 firms listed on the Ho Chi Minh Stock Exchange during the period 2009 to 2017, found that the percentage of independent directors is negatively related to Tobin's Q. This was confirmed by Hermalin and Weisbach (1988) who used the approach of Tobin's Q being a performance measure as it reflects ‘value added’ of factors such as governance and found that the percentage of independent directors are likely to increase when a company performed badly. This is consistent with the findings in this study as a negative association was found between the percentage of independent directors and Tobin's Q with a coefficient value of (-0.0054).

The size of the audit committee and board size are also consistent with the hypotheses mentioned in Chapter 3, stating a negative association between board size and Tobin's Q and audit committee size and Tobin's Q. These findings are consistent with those in a study conducted by Yermack (1996), which reported a negative relationship between board size and Tobin's Q. Jensen (1993) suggested in their paper that seven or eight directors is an optimal number of members on a board, as beyond this number the board can be less effective and more costly. Since a large board of directors may not be the most effective in carrying out an efficient monitoring role, having more directors on a board has a negative impact on performance, which causes a negative impact on Tobin's Q. Jensen (1993) also provided empirical support stating that it is easier for a CEO to control boards smaller in size and that a negative correlation was found between Tobin's Q and board size for large public firms.

Profitability had a significant and positive relationship with Tobin's Q. This is consistent with the hypothesis stated in Chapter 3. These results are also similar to those of Jonnius and Marsudi (2012), who found a significant positive relationship between profitability (measured as ROA) and Tobin's Q. Several studies find that profitability has an effect on Tobin's Q (see, for example, Dang et al., 2019, and Zuhroh, 2019) and some show no effect (see, for example, Amidu, 2007; and Medyawati et al., 2021).

Research done by Ahmed (2015), using Tobin's Q as a dependent variable, found that profitability had a positive effect on Tobin's Q. The results displayed in Table 4-4 similarly show a positive and significant result which is consistent with past literature.

Lastly, looking at the variable of interest in this study - governance disclosure, the findings presented in Table 4-4 are not consistent with the hypothesis presented in Chapter 2 stating that there is a positive correlation between governance disclosure and Tobin's Q (a proxy of information asymmetry). This is not in line with the expectations of this study. However, this finding is not statistically significant. The Tobin's Q regression shows mixed results and therefore there is not sufficient evidence to confirm the hypothesis stated.

According to Yang and Baasandori (2017), in order to determine what effect disclosure scores have on a company's financial performance, Tobin's Q should be considered as a main indicator of company performance. Looking at the regression results in Table 4-4, because Tobin's Q is negatively correlated with governance disclosure, this should encourage firms to improve overall disclosure in order to improve performance with respect to Tobin's Q.

Governance disclosure has a strong and universal measure on Tobin's Q and encourages firms with low disclosure scores to improve their level of disclosure in order to increase performance and firm value, and reduce information asymmetry. This will result in better disclosure scores and investors gaining more trust within a company, leading to overall firm success (Minutolo et al., 2019).

Chapter 5, which follows, concludes this study.

CHAPTER 5: CONCLUSION

This study aimed to investigate the relationship between governance disclosure and information asymmetry in an emerging economy (South Africa) by using a sample of 103 firms listed on the JSE All Share Index over the period 2009 to 2021.

Information asymmetry has been recognised as a major challenge faced investors in companies, especially in emerging economies. The impact of asymmetric information on the value of a firm has been analysed in great detail in the finance literature. It has a profound impact on a firm's investment performance, as well as managerial incentive. Therefore, information asymmetry has become a major topic in modern financial research.

The problems faced by financial institutions with regards to information asymmetry have received a significant amount of attention in the empirical corporate finance literature. The degree of information is not directly detectable, and researchers therefore have to rely on proxy variables. In this study, the two chosen proxy variables were share price volatility and Tobin's Q. Based on regressions using each of the above variables as dependent variable, a negative association is found between governance disclosure and information asymmetry as measured by the two proxies. This is consistent with the hypothesis of the study stated in Chapter 2.

The research question on which this study is based was: Does better governance disclosure reduce information asymmetry between corporate insiders and shareholders? The finding of this study are consistent with a conclusion that better governance disclosure does reduce information asymmetry between corporate insiders and shareholders. Thus, as per the existing academic literature, voluntary disclosure reduces information asymmetry, making a firm more transparent to investors, and potentially allowing for a better relationship with its managers.

While this study focuses on South Africa, the results obtained are useful to other jurisdictions where investor protection is strong. Managers should take costs and benefits to various stakeholders into account when determining the extent of governance disclosure. Documenting governance procedures only may be insufficient for investors to assess how well a firm is performing, and therefore this study aimed to build upon the stream of research that investigates the impact of corporate governance and voluntary disclosure on firm value and information asymmetry.

By focussing solely on governance disclosure, this study extends the literature on voluntary disclosure. The majority of prior research has focussed on contrasting environmental and social disclosure scores with governance attributes, which tends to avoid the issue of governance disclosure as an independent issue. This paper contributes to the literature showing that voluntary governance disclosure provides additional understanding of how a firm creates value, which is information that is deemed significantly useful by investors.

The findings within this study have some implications for corporate governance and investors involved in a firm. Investors should aim to look beyond the typical standardised attributes of governance and attempt to investigate the process behind it, as displayed by voluntary disclosure. The size of the board is an important variable within this study as the board of directors are incentivised to provide more disclosure on the process and methods they follow. Further, regulators should focus on expanding the extent of mandatory disclosure regarding issues regarding governance to include additional information regarding decisions and practices.

The limitations of the study include the sample size having to be reduced because of insufficient data within the sample period. Many companies were either delisted or only listed halfway through the sample period and missing information resulted in using only some years for those specific companies. Thus, this resulted in not having a fully representative sample.

Potential areas for future research include investigating the impact of governance disclosure within a multi-country setting. Exploring this relationship could help stakeholders gain knowledge of how governance disclosure affects information asymmetry globally. This could also be useful to gain understanding of how the results differ between emerging and developed economies and help investors make informed judgements regarding their investment decisions.

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APPENDIX A: MODEL SELECTION TESTS

Appendix A includes two tables showing the results of the Hausman specification test for the two dependent variables in this study - share price volatility and Tobin's Q.

TABLE A-1: HAUSMAN SPECIFICATION TEST FOR FIXED VS RANDOM EFFECTS REGRESSION FOR SHARE PRICE VOLATILITY

***Chi²* (7)**	0.89
Prob > chi²	0.9964

P-value of 0.9964 indicates that random effects is appropriate.

TABLE A-2: HAUSMAN SPECIFICATION TEST FOR FIXED VS RANDOM EFFECTS REGRESSION FOR TOBIN'S Q

Chi²(2)	5.74
Prob > chi²	0.0567

P-value of 0.0567 indicates that random effects is appropriate.

APPENDIX B: MODEL DIAGNOSTIC TESTS

Appendix B includes eight tables presenting the results of the various model diagnostic tests, namely - VIF test, Durbin-Watson test for autocorrelation, Breusch-Godfrey test for autocorrelation and the Breusch-Pagan test for homoskedasticity for both of the dependent variables used in this study.

TABLE B-1: VIF TEST - SHARE PRICE VOLATILITY

Variable	***VIF***
SIZE_AC	1.38
BSIZE	1.31
PERC_ID	1.43
A_FOLLOW	1.10
FREE FLOAT	1.27
BETA	1.01
GOV_DISC	1.01
MEAN VIF	**1.21**

TABLE B-2: VIF TEST - TOBIN'S Q

Variable	***VIF***
SIZE_AC	1.38
BSIZE	1.37
PERC_ID	1.18
INV_ASSETS	1.12
PROF	1.05
GOV_DISC	1.01
MEAN VIF	**1.19**

TABLE B-3: DURBIN-WATSON TEST FOR SERIAL CORRELATION (AUTOCORRELATION) - SHARE PRICE VOLATILITY

Number of gaps in sample	83
Durbin-Watson d-statistic (8,1015)*	0.0385676**

H0: the autocorrelation of the disturbances is 0

**Number of variables: 8*
*** P-Value*
Number of observations: 1015

TABLE B-4: DURBIN-WATSON TEST FOR SERIAL CORRELATION (AUTOCORRELATION) - TOBIN'S Q

Number of gaps in sample	47
Durbin-Watson d-statistic (7,1116)*	0.3634787**

H0: the autocorrelation of the disturbances is 0

**Number of variables: 7*
*** P-Value*
Number of observations: 1116

TABLE B-5: BREUSCH-GODFREY TEST FOR SERIAL CORRELATION (AUTOCORRELATION) - SHARE PRICE VOLATILITY

Lags (p)	***Chi^2***	***df***	***Prob > chi^2***
1	919.783	1	0.000

H0: no serial correlation

TABLE B-6: BREUSCH-GODFREY TEST FOR SERIAL CORRELATION (AUTOCORRELATION) - TOBIN'S Q

Lags (p)	***Chi^2***	***df***	***Prob > chi^2***
1	739.408	1	0.000

H0: no serial correlation

TABLE B-7: BREUSCH-PAGAN FOR HOMOSKEDASTICITY - SHARE PRICE VOLATILITY

Chi² (7)	636.27
Prob > chi²	0.0000

H0: The null is homoscedasticity

TABLE B-8: BREUSCH-PAGAN FOR HOMOSKEDASTICITY - TOBIN'S Q

Chi² (6)	1390.33
Prob > chi²	0.0000

H0: The null is homoscedasticity