Analyst coverage, accounting conservatism and the role of information asymmetry

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Contents

1. Introduction

1.1 Background and motivation

Conservatism is originally defined by Bliss (1924) as "anticipate no gains, but anticipate all losses". While this is an extreme form of conservatism, Basu (1997) adopted a slightly different and less extreme definition: he sees conservatism as an accountant's tendency to require a higher degree of verification for recognizing good news than bad news in financial statements. This is an asymmetric verifiability principle for gains and losses: losses should be reported as soon as they are expected, while gains should only be reported when the entity has a legal right on the accompanied revenues. This causes an earlier recognition of bad news in earnings than good news. This type of conservatism is also called conditional conservatism. The other type is unconditional conservatism which refers to elements of the accounting policies at the rise of assets and liabilities within a firm that result in expected unrecorded goodwill (Beaver & Ryan, 2005). Even though the definitions of Bliss (1924) and Basu (1997) are developed in the 20th century, conservatism has existed for a much longer period: for more than 500 years conservatism has been part of financial reporting (Penndorf, 1930). Conservatism should be viewed as the most fundamental and pervasive principle of valuation in the field of accounting (Sterling, 1967). He identifies various reasons why this claim is justified, such as the natural tendency within accounting to lean towards conservatism and the power that conservatism has over other principles in comparison. Whether conservatism is desirable, however, is still an ongoing discussion. The FASB excludes conservatism from the qualitative characteristics since it would bias the financial statements (FASB, 2010). Also, conservatism can also be used to smooth income (Palepu et al., 2013). Researchers, however, mostly praise the benefits of conservatism. Zhang (2008) finds that borrowers that adopt more conservative reporting get lower interest rates offered from lenders. Also, Kordlouie et al. (2014) find that conservatism leads to a higher financial reporting quality. These benefits are, however, in general not what drive firms to implement conservatism. The motivations for firms to adopt conservatism can be divided into three categories (Watts, 2003; LaFond & Watts, 2008). Conservative accounting can be used to reduce regulatory costs: Penndorf (1930) describes that in medieval times, entities adopted conservative accounting already in order to reduce taxation costs. Watts (2003a) describes that conservative accounting may also be used to reduce litigation costs. Finally, conservatism may be employed to reduce agency problems and to make it more difficult

for managers to engage in moral hazard. These motivations are beneficial for stakeholders as a reduction in these costs leads to higher firm value. Therefore, it is relevant for the stakeholders to find out which factors affect the decision of the firm to adopt conservative accounting. One general factor that has been identified to affect the level of conservatism is the amount of external monitoring that a firm experiences. Conservatism is relevant for external monitors because conservatism provides a mechanism to monitor a firm's investment decisions (Watts, 2003a). It gives an earlier signal of investments in projects with negative present values than when the firm would use aggressive reporting. Furthermore, conservatism increases the verifiability of information. Since this benefits external monitors, they may demand a higher level of accounting conservatism. Several studies have examined the relation between conservatism and various monitoring mechanisms. Ahmed & Duellman (2007) show that the independence of a board, which is more successful at monitoring managers, leads to increases in conservatism. Ramalingegowda & Yu (2012) show that when firms have a higher level of ownership by monitoring institutions, the level of accounting conservatism increases which is evidence that accounting conservatism can be used to monitor managers. An external monitoring party that has not received much attention in prior research are financial analysts. There are two channels through which financial analysts can be a monitoring mechanism (Chen et al. 2015). First, analyst look at the financial statements of firms and have direct contact with managers through conference calls in which they can question issues. Second, analysts distribute information about the firm, either rebroadcasted or analyzed by themselves to investors through reports and newspapers (Miller, 2006). According to Dyck et al. (2010), financial analysts do one of the better jobs at detecting fraud, and therefore their role in the market comes close to being a financial monitoring mechanism. Research has also shown that financial analysts are an important governance device to critically look at the behavior of managers. Chen et al. (2015) found that when analyst coverage decreases, managers make more acquisitions that destroy firm value and CEOs receive higher compensation. Yu (2008) finds that firms with higher analyst coverage manage their earnings less. Yet, to my best knowledge, only one paper has examined the monitoring role of analyst coverage on the decision to be conservative in accounting. Sun & Liu (2011) found that firms with more analyst coverage score higher on conditional and unconditional conservatism. However, these authors have used the measure of Basu (1997) which has a measurement error according to Khan & Watts (2009). Also, the study of Sun & Liu (2011) failed to incorporate a measure of information asymmetry which has led to omitted variable bias in

their study. Furthermore, this thesis is, to my best knowledge, the first study to investigate the role of information asymmetry in this relation. Therefore, the research question that is examined in this thesis is as follows:

"What is the relation between analyst coverage and accounting conservatism? How is this relation affected by information asymmetry?"

The answer to the research question is given by answering the following sub-questions:

- Which theories are related to the research question?
- What is conservatism and how does it constrain managerial behavior?
- What are the tasks of financial analysts and how do they monitor managers?
- How does analyst coverage relate to conservatism?
- What is the role of information asymmetry in this relation?

1.2 Relevance

The findings of this thesis are relevant to several parties. The findings are interesting to shareholders because it helps them understand the financial reporting decisions of the firm they invest in or potentially will invest in. It also assists them in understanding how the firm responds to analyst coverage and how much they can rely on this external party to monitor the managers of the firm. Also, this thesis shows the relevance of monitoring by parties other than financial analysts. This study has found that when there is a higher level of information asymmetry, analyst coverage is (more) negatively related to conservatism. This indicates that when there is a high level of information asymmetry and analyst coverage, monitoring by other external parties becomes more important to align the interests of management with the interests of the stakeholders. Furthermore, regulators may be interested in what drives firms' decision to be conservative in accounting. The findings of this study can help them understand how new regulations regarding financial analysts or conservatism may affect firms. Finally, research has shown that conservatism leads to a higher financial reporting quality (Kordlouie et al., 2014). The amount of financial analysts that are following a firm may explain differences in financial reporting quality across firms.

This thesis contributes to two streams of literature. First, the findings of this thesis contribute to the literature on the monitoring role of financial analysts. Related papers to this topic are e.g. Yu (2008), Dyck et al. (2010) and Chen et al. (2015). This study is contributes by exploring the relation between financial analysts and certain decisions related to financial reporting. While these previous mentioned studies show that financial analysts can serve as monitors and can constrain opportunistic behavior of management, this study shows that coverage by financial analysts do not always lead to a better alignment of stakeholders' interest and management's interests. Second, the findings of this thesis contribute to the literature on the relation between monitoring parties and accounting conservatism. Papers that have focused on this relation include Ahmed & Duellman (2007), Krishnan & Visvanathan (2008), and Ramalingegowda & Yu (2012). The relation between financial analysts and conservatism, however, has received little attention. So far, only Sun & Liu (2011) have examined this relation before. I choose to measure conditional conservatism with a different measure. Furthermore, I have incorporated a measure of information asymmetry in the research design as opposed to Sun & Liu such that I could distinguish between the effect of financial analysts and the effect of information asymmetry. Finally, to my knowledge, this is the first study to examine the role of information asymmetry in the relation between analyst coverage and accounting conservatism. By exploring the role of information asymmetry, this study contributes to a better understanding of the relation between financial analysts and conservatism.

1.3 Methodology

The relation between analyst coverage and accounting conservatism is examined with two main regressions: one measures the relation with conditional conservatism and the other measures the relation with unconditional conservatism. Prior literature often measures conditional conservatism with the model of Basu (1997). However, there is some criticism on this model. Among the criticism, one critique is that the model assumes that all firms within an industry are identical, while there can be differences between these firms. Therefore I measure conditional conservatism with the model developed by Khan & Watts (2009), which is better known as the C-score. The advantage of this measure is that it is estimated for individual companies and individual years (Ettredge et al., 2012). Unconditional conservatism is measured with the bias component of the book-to-market ratio as this measures the asymmetry and persistent undervaluation of net assets on the balance sheet (Beaver & Ryan, 2000). Analyst coverage is measured with the number of annual forecasts for the EPS of a

firm for the next year. Furthermore, I examine the role of information asymmetry in the relation between analyst coverage and conservatism. Information asymmetry is measured with the bid-ask spread. In the regression model, an interaction term between information asymmetry and number of analyst forecasts is included and the coefficient for this term is of interest.

1.4 Conclusion

There is mixed evidence that analyst coverage is related to conservatism. The first finding is that , overall, there is not a significant relation between analyst coverage and conservatism. The second finding of this study is that when there is an increase in information asymmetry, analyst coverage becomes more negatively related to conservatism. A potential explanation for this finding is that a higher level of information asymmetry indicates that there is little monitoring by external parties on the behavior of management. When there is little monitoring and a higher level of analyst coverage, management's incentive to meet the benchmarks of financial analysts is combined with an opportunity to implement practices to meet those benchmarks. This could lead management to decide not to implement conservatism in accounting as this would make it more difficult to meet the benchmarks set by financial analysts.

1.5 Structure

Chapter 2 discusses relevant theories to the topic such as the agency theory, the positive accounting theory and the efficient market hypothesis. Conservatism and the monitoring role of financial analysts are described as well and how they relate to the previous theories. In chapter 3 the prior literature related to the topic is discussed. It gives an overview of previous findings and research designs. Furthermore, the hypotheses tested in this thesis are described and explained. Chapter 4 describes the research design that is used to test the predictions and discusses certain elements of doing research such as validity and endogeneity. Chapter 5 describes the empirical results of the thesis. The descriptive statistics and correlation tables of both samples are presented and the results with regard to the hypotheses are discussed. Finally, the conclusion is given in chapter 6. An answer is given to the research question together with the implications of these findings. Finally, the limitations of this study and recommendations for future research are given.

2. Theoretical framework

This chapter provides an overview of important theories and concepts used in this thesis. Three important theories that relate to the research question are the agency theory, the positive accounting theory (PAT) and the efficient market hypothesis. Furthermore, concepts that are discussed are accounting conservatism and analyst coverage. Finally, the relation between these concepts and information asymmetry are discussed.

2.1 Agency theory

One of the theories that are related to the research question is the agency theory. The agency theory describes the contractual relationship between two parties: the principal and the agent (Jensen & Meckling, 1976). The principal hires the agent to perform a task for the principal and to do this, some authority is given to the agent. In this relation, there are agency problems that can occur because of two reasons. The interests of the agent may not be the same as the interests of the principal, and there is also information asymmetry between the agent and the principal (Eisenhardt, 1989). While the principal cannot perfectly verify the effort that the agent is putting into his work, the agent has full information about this actions. This gives rise to agency problems, because the agent has an opportunity to engage in opportunistic behavior. Two well-known agency problems are moral hazard and adverse selection. Moral hazard occurs when the principal cannot perfectly verify what the agent is actually doing which the agent uses as an opportunity to put in less effort than what was previously agreed upon. This is better known as shirking. Adverse selection occurs when the agent claims to have certain skills or abilities while he actually has not, and it is difficult for the principal to verify in the hiring process or during the contract whether these claims are true or false. The principal can try to align the interests of the agent more with his own interests by using resources to guarantee that the agent will not engage in activities that may harm the principal, and by monitoring the agent (Jensen & Meckling, 1976). In the context of the research question, the principals can be seen as the shareholders and the agent as the management. Management has more information about their own decisions than the shareholders which gives management an incentive to engage in opportunistic behavior. The shareholders can solve this problem by introducing certain contracts to constrain the managers' behavior, and by monitoring management.

2.2 Positive accounting theory

The PAT, developed by Watts & Zimmerman (1986), aims to describe empirical decision-making in accounting practice and how accounting standards are determined. The theory provides understanding of effects of standards on certain groups of stakeholders, how resources are allocated and why certain groups want to spend more on resources such that certain standards will or will not be implemented (Watts & Zimmerman, 1978). Within these descriptions of empirical behavior, the relationships between groups of people are of importance. The PAT has two perspectives: the efficiency perspective and the opportunistic perspective. Looking from the efficiency perspective, the accounting methods of firms are chosen because these decisions are the most efficient way of portraying the true economic performance of the firm. These decisions are made before contracts are written, and is therefore the ex-ante perspective. The opportunistic perspective entails that when contracts are written, managers engage in opportunistic behavior. With regard to the opportunistic perspective, the PAT entails three hypotheses that can explain decisions made by managers: the bonus plan hypothesis, debt covenant hypothesis, and political cost hypothesis (Watts & Zimmerman, 1986). Each of these hypotheses assumes that the manager will act in his own interest. The bonus plan hypothesis is based on the compensation structure a firm uses to compensate the managers. When firms implement bonus compensation plans, this gives the management an incentive to make decisions that will increase the profit for current period, regardless of the effect on the long-term. The debt covenant hypothesis describes management's behavior when lenders put debt covenants on the management. A debt covenant can be a limit on the amount of divided paid to shareholders or a limit on the issuance of debt. Since management should not violate debt covenants as this would put the firm in financial distress, they have an incentive to make decisions in such a way that the likelihood of violating debt covenants is reduced. The political cost hypothesis predicts what kind of decisions will be made when there is a probability that a firm is charged with political costs. Political costs are e.g. costs imposed by labor unions, taxation costs and increased regulation in the industry. These costs strengthen the incentive for management to reduce reported profit, because these costs tend to increase when firms have a higher profit.

2.3 Efficient market hypothesis

The efficient market hypothesis (EMH) argues that all information that is available to any market participant is fully reflected in market prices (Fama, 1970). This means that it is not possible for an investor to earn abnormal returns, since all information, both public and private information, is already reflected in prices. However, this does statement almost never holds. Therefore multiple forms of the efficient market hypothesis have been formed according to the information set. The form previously mentioned is the strong form. The semi-strong form of EMH says that current stock prices reflect historical price information plus all publicly available information relevant to a firm's stocks. With this form, abnormal returns can be earned with private information. Finally, the weak form of EMH says that information from past prices cannot be used to predict current prices. According to this form, the current price follows a 'random walk'.

2.4 Accounting conservatism

According to Penndorf (1930), conservatism already existed in the fifteenth century, meaning that this practice has influenced accounting for more than 500 years. Furthermore, the use of conservatism has increased over the past years. Basu (1997) reports an increase in conservatism in the period 1963 – 1990. He finds no evidence of the existence of conservatism prior to that period. While the first finding of Basu (1997) is confirmed by Holthausen & Watts (2001), they find contradicting evidence with regard to the second finding. In their sample, they do find evidence that conservatism already existed in 1927. Givoly & Hayn (2000) measure conservatism in four different ways and also find supporting evidence. Conservatism is formally defined as: "anticipate no profit, but anticipate all losses" (Bliss, 1924). While this is an extreme form of conservatism, Basu (1997) adopted a slightly different definition: he defines conservatism as the accountant's tendency to require a higher degree of verification for recognizing good news than bad news in financial statements. This entails that firms should not record profits until they have a legal right to the revenues needed for the profit. Losses, on the other hand, should be recorded immediately when they are expected. In other words, there exists an asymmetric verifiability requirement for profits and losses: there is a higher level of verification required for profits than for losses. The difference in required verifiability level shows the degree of conservatism a firm uses in its financial statements (Watts, 2003). The larger the difference between demanded verifiability for profits and losses, the more conservative the financial reporting is. According to Beaver & Ryan (2005), there exist two types of conservatism. The definitions given by Bliss (1924), Basu

(1997) and Watts (2003) relate to conditional conservatism. Beaver & Ryan (2005) define conditional conservatism as writing down book values under adverse circumstances but not increasing these values under favorable circumstances. An example is inventory which is written down when the market price drops below book value but is not increased when the market price rises again. The other type of conservatism is unconditional conservatism. This is related to the persistent understatement of net assets due to predetermined elements of accounting policies which leads to expected internally generated goodwill. This type of conservatism is not related to news events and is therefore the ex-ante type of conservatism, while conditional conservatism is related to news and therefore is called the ex-post type of conservatism (García Lara et al., 2009). Comparing both types, unconditional conservatism recognizes losses earlier, is easier to control because it does not depend on events, is less costly to firms to implement and leads to fewer shocks in earnings compared to conditional conservatism (Qiang, 2007). Research has also shown that conditional and unconditional conservatism are interrelated (Beaver & Ryan, 2005; Qiang, 2007; García Lara et al., 2009). For example, firm A and B both invest heavily in R&D. Firm A does not capitalize these R&D expenses while firm B does, making firm A more unconditionally conservative than firm B (García Lara et al., 2009). Firm B capitalizes these expenses and amortizes them in the future. This makes firm B more conditionally conservative in the future than firm A. This thesis examines the relation between analyst coverage and both types of conservatism, since analyst coverage is expected to affect both types of conservatism.

2.4.1 Explanations for accounting conservatism

Several studies have identified reasons for firms to adopt conservatism. The motivations to adopt conservatism can either be because of interests of the managers or because of the shareholders who conservatism to restrain the behavior of the managers. In this paragraph the motivations are linked to the agency theory and the PAT.

2.4.1.1 Litigation costs

The first explanation for conservative accounting is to reduce potential litigation costs (Watts, 2003). There is a higher risk that a firm has a lawsuit filed against it when the assets of the company are overstated than when the assets of the company are understated (Kellogg, 1984). For example: when a shareholder invests in a company and it turns out to be more profitable than initially thought, this is positive for the shareholder. However, when a shareholder invests in a company and it turns out to be less profitable than it first seemed, they feel

mislead. When they feel mislead, they may sue the firm. Since conservatism understates the net asset values, the probability of having litigation costs is reduced.

2.4.1.2 Regulatory costs

The second explanation for conservative accounting is to reduce potential regulatory costs. One of these costs are taxation costs, which are related to the political cost hypothesis of the PAT. When a firm makes a profit, it has to pay an income tax. Since these taxation costs are higher when the firm earns a higher profit, the organization has an incentive to shift this profit between periods to reduce taxation costs. Conservatism can be a tool for the manager to do this. Other regulatory costs are costs of political events. Regulators represent the constituents. Since these constituents are more concerned with overvalued assets as this would make them loose their money, regulators focus more on imposing regulatory costs on overvalued assets than on undervalued assets. This can then easily be used in a political event. This gives an incentive for firms to adopt conservative reporting, to escape the potential regulatory costs by understating asset values.

2.4.1.3 Agency problems

The third explanation for conservatism is reducing information asymmetry between management and stakeholders. Watts (2003) refers to the contracting explanation: firms adopt accounting conservatism because it is an element of the 'efficient technology' used within the firm and its contracts with external parties (Watts, 2003). Conservatism is adopted because it reduces agency problems that may occur because of asymmetry in information and loss functions between parties, and the inability for the uninformed party to verify the information that the informed party has (LaFond & Watts, 2008). The contracting explanation is relevant for manager compensation contracts, debt contracts and employment contracts. Each of them are explained below.

When the compensation of the manager is based on some accounting numbers, the manager has an incentive to undertake actions that increases the relevant accounting number (Watts, 2003). For example, since a manager has more information about future cash flows than investors, he can bias the estimates of the future cash flows in such a way that it increases the current earnings so that he receives more compensation. Without a verifiable earnings number, the manager will be overcompensated and this reduces the value that can be shared among investors. Furthermore, if managers bias the earnings, this number is less informative

to investors. Since conservatism requires a higher level of verification of gains, it provides timely incentives and deferred compensation rewards which constraints the opportunistic behavior of managers. This is also described in the bonus plan hypothesis of the PAT.

In debt contracts, debt holders have an asymmetric payoff related to the assets. When the value of assets are higher than the face value of debt, bond holders do not receive additional compensation. However, when the value of assets is lower than the face value of debt, the bond holders receive less compensation. Therefore, they want assurance that the value of assets is at least equal to the face value of the debt. Unconditional conservatism leads to an understatement of assets, which ensures that investors see what the assets at least are worth in case they are liquidated. Conditional conservatism also triggers a debt covenant violation earlier, which gives debt holders a timelier signal that the manager makes the wrong decisions and then they can decide to restrict his behavior (Ball & Shivakumar, 2005). This argument implies that the manager's incentive to make decisions that will not violate the debt covenant, as described in the debt covenant hypothesis of the PAT, may not be as strong as the investors want and therefore they will demand conservatism in reporting.

With regard to employment contracts, managers have an incentive to hide losses from investment because it may lead to them being fired (Watts, 2003). Since conservatism consists of asymmetric verifiability, losses are recognized sooner and therefore provides the investors and board with a timelier signal of the losses resulting from investment decisions made by the manager. The manager also has a stronger incentive to drop projects that will result in a loss, and he is less likely to engage in projects with a negative present value. Conservatism helps to monitor managers because it can reduce agency problems: managers feel more pressure to make the right investment decision and their incentive plus ability to manipulate earnings decrease.

Information asymmetry, however, does not only exist in case of contracting. According to LaFond & Watts (2008), the agency costs also exist in absence of contracts. Without contracts, the financial statements still affect manager's welfare such as stock price, resources under his control and the value of his stock options, and therefore he still has incentives to use his private information to make himself better off. According to the authors, conservatism can decrease the information asymmetry between managers and stakeholders in two ways. First, conservative accounting can provide the second-best "hard", verifiable, information to

uninformed investors (with stock price information being the first-best hard information). Managers have an incentive to overstate unverifiable gains. The only "hard" accounting information that is left has to be verifiable. Since conservatism implies a lower verification standard for losses, conservatism makes it possible to obtain information from managers that they would rather keep private. This suggests that the resulting information on losses is reliable. Overall, conservatism thus leads to more available information than there would be with financial reporting that is "neutral" (an equal verification standard for gains and losses). Second, this hard information provides a certain benchmark against which other "soft" information sources can be compared to make these sources credible as well on unverifiable gains. If the cash flow realizations in the income statement are verifiable, the managers are less able to manipulate the financial statements and to overstate earnings. This makes the assets on the balance sheet verifiable as well, which in turn reduces management's ability to manipulate the resources available to the firm. The cash flow realizations and assets provide evidence on the results from previous investment decisions and growth options. This can be used as a benchmark for other softer information sources, such as management. Investors can compare all sources to the hard numbers, which gives them a grip to determine the reliability of the soft sources. This also relates to how information asymmetry affects conservatism. When there is a higher level of information asymmetry, the benefits of verifiable information are greater and therefore information asymmetry would be associated with higher levels of conservatism.

2.5 Analyst coverage

The second concept that is important in this thesis is the coverage of financial analysts. Financial analysts obtain information from managers and companies, analyze this information and translate this into buy-, sell- or hold recommendations (Palepu et al., 2013). They provide extra information to investors such that they can make a better informed decision about which investment opportunity they should use. This thus suggests that the strong form of the EMH is failing. For this thesis, the monitoring characteristic of financial analysts is relevant. One of the first articles that stressed the importance of financial analysts as monitors was the article of Jensen & Meckling (1976). They mention that analysts' monitoring is important when agency problems exist. Monitoring reduces the opportunity of managers to extract benefits from the firm at the cost of the owners. There are two channels through which financial analysts monitor managers (Chen et al., 2015). First, financial analysts look at the financial statements of firms and have direct contact with managers through conference calls in which

they can question issues related to the financial statements. The analysts need to have transparent information to make accurate forecasts for the firm (Allen et al., 2016). When uncertainty is increased, it is more difficult for analysts to make good forecasts. Financial analysts could therefore demand more information which is in line with their monitoring role. Second, analysts distribute information about the firm, either rebroadcasted or analyzed by themselves, to investors through reports, recommendations and newspapers (Miller, 2006). This is also described by Allen et al. (2016) as the "investor recognition view". This also entails that analyst coverage introduces a firm's stock to greater publicity and the related practices used by the firm. This means there a higher costs (e.g. loss of reputation) involved when certain 'bad' practices become publicly known. Their distribution of information is also confirmed by the study of Miller (2006). The author examines the role of the press as an information intermediary in the identification of corporate frauds. Of all cases with malfeasances, the press was able to identify these frauds in 75 of 223 firms. In 22 articles, the press redistributed the analysis of financial analysts. This could either be due to analysts taking their issue to the press or a discussion of the firm in the press which leads to analysts covering the firm. This suggests that financial analysts serve as an information intermediary and also have a monitoring role on the behavior of managers. There are, however, also some arguments that analysts might not be that good at monitoring. Analysts might pressure management to meet or just beat the forecasts (Yu, 2008). Relating this to conservatism, managers might be hesitant to implement conservatism since this lowers the profit. Analysts also face certain incentives that reduce their monitoring role.

2.5.1 Incentives of financial analysts

Financial analysts face certain incentives to publish upward biased forecasts. First, financial analysts get paid based on the revenue generated by the brokerage house (Palepu et al., 2013). This revenue is generated by published reports of analysts. The more investments are made based on these reports, the higher the revenue of the firm. Optimistic forecasts encourage investors to buy, so this is an incentive for financial analysts to publish optimistic biased forecasts. This affects how the analysts would distribute bad information about the firm, and the manager might not feel as monitored as suggested by Miller (2006) and Allen et al. (2016). Second, financial analysts get rewarded for promoting public equity issues. Third, financial analysts also want to pleasure the managers of the companies they follow. Financial analysts make use of managers through conference calls to receive more information. The interaction helps them to understand the business better and to make more accurate

predictions. Managers prefer to have optimistically biased long-term forecasts since this results in a higher stock price. These incentives can lead analysts to publish optimistically biased forecasts, which decreases the effectiveness of their monitoring role because managers are punished less for bad behavior. This could lead managers to implement less conservative accounting. A different reasoning could be that optimistically biased forecasts could put extra pressure on management to meet or just beat these forecasts. This incentivizes management then to obtain a profit as high as possible which discourages them to implement conservatism as this decreases the profit.

2.6 Summary

In this chapter, short summaries are given of the theories related to the research question, which are the agency theory, PAT and EMH. The agency theory describes the relation between an agent and a principal, in which the principal delegates tasks to the agent. The agent, such as management, has more information about the actions it undertakes and therefore the principal, such as shareholders, will have to monitor the agent in order to align the interests of the agent with the interest of the principal. The PAT aims to describe the observed decision-making in accounting practice. The PAT has three hypotheses, related to bonus plans, debt covenants and political costs. Managers will make decisions that increase their bonus, reduce the probability of violating debt covenants and reduce the probability or amount of political costs. Finally, the EMH relates to stock prices and information sets: prices reflect all public and private information. Three different forms are discussed that include a strong, semi-strong and weak form of this EMH. Furthermore, two important concepts are explained, namely conservatism and analyst coverage. Conservatism can be divided into two forms: conditional and unconditional conservatism. The types are interrelated: when a firm adopts a high level of unconditional conservatism, the level of conditional conservatism for that firm will be lower. Various motives exist for firms to adopt conservatism. These motives can be related to the agency theory and PAT. Conservatism can be adopted to reduce moral hazard problems, to reduce the possibility of incurring shareholder litigation costs or regulatory costs (Watts, 2003). According to LaFond & Watts (2008), conservatism can also be demanded from investors to reduce information asymmetry in absence of contracts since financial statements will affect manager's wealth anyway. Information asymmetry can be reduced with conservatism through offering verifiable information that makes the information on losses reliable, and because this hard information can be used as a benchmark against which soft information sources can be compared so the reliability of soft sources is increased

as well. Finally, the concept of analyst coverage has been explained with a focus on the monitoring role of financial analysts. They monitor managers through conference calls in which they can ask relevant questions and through the public distribution of information about the firm's operations. On the other hand, analysts have incentives to not monitor managers very strictly. They face several incentives to produce optimistically biased forecasts which could lead management to be less conservative as this may help them to meet or just beat the forecasts.

3. Literature review

This chapter gives an overview of research related to the concepts discussed in the theoretical framework. This makes clear what has been examined so far, where research relating to this topic is standing today and what the contributions of this thesis are. Furthermore, the hypotheses tested in this thesis are described.

3.1 Accounting conservatism

In the theoretical framework, several explanations have been given for the use of conservative accounting. In this paragraph, an overview of the research related to these explanations is described.

3.1.1 Litigation costs

Limited studies have examined the relation between litigation costs and accounting conservatism. Huijgen & Lubberink (2005) examine the effect of cross-listing on conditional conservatism. When a firm is cross-listed, it faces more public scrutiny and liability exposure. In this research, the authors focus on UK firms that are also listed on the US stock exchange. They find that the earnings of cross-listed firms reported according to UK GAAP, are more conservative than the earnings of domestic UK firms that were not cross-listed. However, they did not find a significant difference in conservatism between UK GAAP earnings of cross-listed firms and their US GAAP earnings. While these authors only focused on conditional conservatism, Qiang (2007) examines the effect of litigation costs on both types of conservatism. She does not only look at the expected costs of lawsuits but also looks at the litigation risk of a firm's auditor: larger audit firms are expected to be more profitable and therefore more likely to be sued. The findings show that firms with higher firm and auditor litigation costs have both more conditional and unconditional conservatism.

3.1.2 Regulatory costs

Limited evidence is available on the relation between regulatory costs and accounting conservatism. Sivakumar & Waymire (2003) examine the effect of political costs on conditional conservatism. They use the Hepburn Act to measure political costs, which is an act that increased the regulation of railroad rates. The results show that when managers face more hostile rate regulation, they use a higher degree of conditional accounting conservatism. Qiang (2007), in contrast, finds no evidence of an effect of regulatory costs on conditional

conservatism. The author measures regulatory costs with the highest sales among the industry and taxation costs as the relation between book income and tax income. The study, however, does show that both regulation costs and taxation costs lead firms to adopt a higher degree of unconditional conservatism.

3.1.3 Agency problems

Various studies have examined the relation between agency problems related to debt holders and accounting conservatism. Ahmed et al. (2002) examine the effect of conflicts over dividend policies between shareholders and bondholders on the degree of accounting conservatism. Using a market-based measure and accrual-based measure of conservatism, the authors find that firms facing more severe conflicts over dividend policies use more conservative accounting. They also find that firms with a higher degree of accounting conservatism have a lower cost of debt. Qiang (2007) examines the relation between equity and debt costs and accounting conservatism. The author measures equity costs as the percentage of outsiders on the board, and debt contracting as the ratio of private long-term debt to total long-term debt. The study shows that firms with higher equity and debt contracting costs have a higher degree of conditional accounting conservatism, which suggests that agency problems are associated with a higher degree of conditional conservatism. Opposite to Ahmed et al. (2002), Qiang (2007) does not find any evidence of an effect of contracting costs, either equity or debt costs, on unconditional conservatism. Similar to the previous studies, Nikolaev (2010) examines whether firms that use more covenants in their public debt contracts use more conservative accounting. The author finds that more use of covenants leads to a higher degree of conditional conservatism. As mentioned in chapter 2, monitoring by parties to reduce agency problems are not only related to debt contracting but also to employment and compensation contracts. Ahmed & Duellman (2007) examine the effect of board independence and the strength of the outside board members' monitoring incentives on conditional accounting conservatism. A board that is more independent, has stronger incentives to monitor managers than a dependent board that is more concerned with the interests of the manager. The authors find that conditional conservatism decreases with the percentage of inside board members and increases with the percentage of shares held by outside board members, which is evidence that conservatism can be used to monitor managers. Agency problems between managers and investors also may exist when ownership and control are more separated. LaFond & Roychowdhury (2008) examine the relation between managerial ownership and conditional conservatism. They find that when managers

own more of the firm's stocks by which they are employed, the interests of management are more aligned with the interests of shareholders and there are less agency problems which then leads to a lower level of conditional conservatism. Krishnan & Visvanathan (2008) study the effect of audit committee's financial expertise on conditional and unconditional conservatism. Audit committee members with accounting financial expertise are expected to be better at monitoring because of their knowledge, job expectations and economic incentives to mitigate the risk of litigation. The authors find that the expertise increases the degree of conditional and unconditional conservatism. Garciá Lara et al. (2009) examine the effect of strong corporate governance on conditional conservatism. They argue that conservatism reduces agency costs and litigation costs, and therefore strong corporate governance parties will view the use of conservatism as desirable to protect the shareholders. Using an index of the overall strength of corporate governance, they find that a strong governance structure leads to more conditional conservative accounting. Finally, Ramalingegowda & Yu (2012) examine the relation between institutional ownership and conditional conservatism. They find that higher ownership by institutions that are more likely to monitor managers, leads firms to adopt more conservative reporting. According to the authors, institutions demand conservatism as a governance device. Overall, these studies suggest that conservatism can be used as a mechanism to monitor managers and to reduce agency problems. There is strong evidence that conditional conservatism is affected by agency and contracting costs, and mixed evidence on the influence of these costs on unconditional conservatism.

3.2 Analyst coverage

As explained in chapter 2, financial analysts can serve as a monitoring device. Dyck et al. (2010) study 216 alleged fraud cases between 1996 and 2004 and try to identify which mechanisms are most effective at identifying the fraud. While analysts only detected the fraud in 16.9% of the cases, they were more effective at detecting fraud than auditors and the SEC. More studies have examined how the need for financial analysts is related to the existence of agency problems. Moyer et al. (1989) investigate the factors that determine the monitoring role of financial analysts. Three of these factors are important: insider ownership, the amount of shareholders and the amount of debt a firm has. When there is more ownership of stocks by management, the interests of management and owners are better aligned which reduces the agency problems. This could reduce the need for financial analysts. The authors find that insider ownership is negatively related to analyst coverage, suggesting that more agency problems are associated with higher analyst coverage. Another finding of their study is that

the number of shareholders of a firm is positively related to the amount of analysts that follow that firm. There are two possible explanations for this finding. It could either be that more shareholders are associated with a higher value of the stocks, and this higher value implies that having better information is associated with larger potential gains, or it could be that a higher amount of shareholders makes ownership of stocks more dispersed which could make monitoring or control by the shareholders more difficult. Analysts can then give more information to the shareholders about opportunistic behavior of the managers. Finally, the authors also find that the debt-to-equity ratio has a negative relation with analyst coverage. More debt implies more monitoring through restrictive covenants and less need for monitoring from financial analysts. Overall, these findings suggest that financial analysts serve as a monitoring mechanism and that the need for their services increase with the existence of agency problems. Lang et al. (2004) examine the relation among ownership structure, analyst coverage, investor protection and valuation. They want to find out whether analyst coverage can be seen as an alternative governance device when the governance structure of a firm is poor. They find that when a firm's governance is poor, investors perceive this as less bad when the firm has a higher presence of analysts. According to the authors, the study is evidence that analysts can function as a monitoring device in the presence of potential agency problems due to e.g. poor governance. Chen et al. (2015) examine the effect of analyst coverage on managerial extraction of benefits from outside shareholders. The authors look at exogenous shocks to the amount of analyst coverage, and then test the difference in management's decisions related to acquisition, the compensation of the CEO and the marginal value of cash holdings within a firm. They find that when analyst coverage decreases, managers make more acquisitions that destroy firm value and CEOs receive higher compensation. They also find that the marginal value of internal cash decreases when analyst coverage decreases, which signals that investors see less analyst coverage as an incentive for managers to misuse the cash reserves. Finally, they find that with lower analyst coverage, managers tend to manage their earnings more. This last finding is in line with the study of Yu (2008). Yu (2008) examines how analyst coverage is associated with earnings management. He measures earnings management with discretionary accruals. He finds that firms with higher analyst coverage have lower discretionary accruals than firms with low analyst coverage or no analyst coverage at all. His study also shows that the distribution of earnings of firms with low analyst coverage is more discontinued around the target than the distribution of firms with high analyst coverage. Not only do these findings show that analysts are effective at reducing earnings management, it also indicates that the monitoring role of

analyst coverage is more important for managers than the pressure to manage earnings. Allen et al. (2016) show that firms with lower analyst coverage tend to use more aggressive tax policies. Aggressive tax policies entail that management is trying to reduce taxable income and thus taxation costs. The findings show that more analyst coverage leads to less tax aggressiveness. They find no evidence that analysts coverage puts pressure on managers to manage earnings.

However, even though the studies of Yu (2008) and Allen et al. (2016) do not find evidence that analyst coverage leads to earnings management activities, it has to be noted that managers do feel pressure from analyst forecasts. Graham et al. (2005) performed a study by sending surveys to 400 executives and found that 50.8% of the executives disclose more voluntary financial information to attract more financial analysts. Financial analysts also influence managerial behavior by making forecasts that the managers would like to meet or even beat. The survey of Graham et al. (2005) namely also showed that when executives report a quarterly earnings number, 73.5% reports that analysts forecasts are important to them as a benchmark. There is also some evidence that supports these findings. He & Tian (2013) investigate the effect of financial analysts on innovation. They argue that financial analysts might put too much pressure on managers to meet short-term goals which makes them forget about the long-term goals. Using exogenous shocks to analyst coverage as well as an instrumental variable approach, the authors find that analyst coverage leads to firms having less patents and patents with smaller impact. This suggests that analyst coverage has a deteriorating effect on innovation. This suggests that the effects of analyst coverage on managerial behavior are not always desirable.

3.3 Hypothesis 1

As previously described, increased monitoring by outside parties, such as monitoring institutions and independent boards, has been proven to increase the degree of accounting conservatism. The parties want to monitor the managers to see if the managers behave in the interest of the investors. These parties may demand a higher degree of accounting conservatism as this constraints opportunistic behavior of management and thus reduces agency costs. Financial analysts are also a monitoring party but they do not exist to protect the interests of shareholders. However, (potential) shareholders depend on the reports of financial analysts to decide whether to buy, sell or hold a firm's stock. Since financial analysts use conference calls and try to obtain transparent information from management, the reports may

contain information that indicates that management is not acting in the interests of the shareholders but more in the interests of the management itself. For example, bad investments are, because of the financial analysts, sooner publicly known and may give a timelier signal to the shareholders that they should monitor the behavior of management. More financial reports may give more information about agency problems and therefore increase the incentive for shareholders to demand conservatism in accounting.

Furthermore, analyst coverage could affect accounting conservatism through the explanation of litigation costs. Since analysts distribute information about the firm and publicly display this information, the possibility of litigation costs is expected to increase in case of mistakes or bad practices (such as overstated assets) when there is more analyst coverage. In this case, firms with a higher amount of analyst coverage may use more conservative accounting to reduce the possibility of litigation costs.

However, analyst coverage could also be negatively related to accounting conservatism. As financial analysts have an incentive to produce optimistically biased forecasts, increased analyst coverage could result in more forecasts that managers would like to meet or just beat. Since these optimistically biased forecasts are easier to meet or just beat with a higher profit, there might be a decrease in accounting conservatism as it is easier for a firm to report a higher profit if they adopt less accounting conservatism. Furthermore, studies have shown that agency problems are positively related to analyst coverage: when there are more agency problems, the reports of financial analysts are more valuable and can be used to monitor the behavior of management. These reports and conservatism may therefore be substitutes: both can be used to monitor management. Shareholders may feel when they have more reports of financial analysts to monitor, the need for conservative accounting becomes less necessary as monitoring tool. This would then lead to a decrease in conservatism when there is a higher level of analyst coverage.

The effect of analyst coverage on conservatism has been examined by Sun & Liu (2011). Their study is, to my best knowledge, the first and only study to examine the effect of analyst coverage on both types of accounting conservatism. They measure analyst coverage as the number of analysts who forecast firm's earnings for the next year. Conditional conservatism is measured with a model developed by Basu (1997), and unconditional conservatism is measured with a firm-specific bias component of the book-to-market ratio. They find

evidence that analyst coverage increases both conditional and unconditional conservatism. I measure unconditional conservatism with the same bias component of the book-to-market ratio but I use a different measure of conditional conservatism, which is the C-score. I expect an effect of analyst coverage on the C-score and bias component of the book-to-market ratio, while the direction is unknown as there are two possible effects of analyst coverage on accounting conservatism. I therefore put the hypothesis in both directions:

H1a: Analyst coverage is positively related to accounting conservatism.
H1b: Analyst coverage is negatively related to accounting conservatism.

3.4 Information asymmetry

Information asymmetry is related to both analyst coverage and accounting conservatism.

3.4.1 Analyst coverage and information asymmetry

Multiple studies have investigated the relation between information asymmetry and analyst coverage. Some studies have focused on whether financial analysts reduce information asymmetry. Yohn (1998) investigates the relation between public information and information asymmetry around earnings announcements. To proxy for public information, he uses analyst following. Information asymmetry is measured with the bid-ask spread. The author finds that around earnings announcements, the bid-ask spread decreases when analyst following is higher. This suggests that financial analysts supply information that decreases information asymmetry. Frankel & Li (2004) investigate the relation between analyst following and information asymmetry with the use of insider trading. Information asymmetry is negatively related to insider trading and insider purchases. The authors find that increased analyst coverage is associated with lower profitability of insider trading and less purchases by insiders. Multiple studies have also examined how information asymmetry affects the demand for financial analysts. Barth et al. (2001) examine the relation between analyst coverage and R&D expenditures. R&D expenses increase information asymmetry because these investments are unique to a firm which makes it difficult for investors to derive information about the value from observing the R&D of other firms. Furthermore, there are no organized markets for R&D. The authors find that analyst coverage is higher for firms with high R&D expenditure than for firms with low R&D expenditure. The explanation for this finding, according to the authors, is that the private information from analysts has more value when the firm invests more in R&D. Their finding is evidence that information asymmetry

increases the demand for financial analysts as the value of their services increases. Lehavy et al. (2011) show that there is an increasing demand for the work of analysts when firms have a less readable annual report. Annual report readability could be used as a proxy for information asymmetry: a less readable annual report may signal that a manager is withholding information for its shareholders. This increases the demand for analyst services. Lobo et al. (2012) measure the relation between information asymmetry and financial analysts with accruals quality as a proxy for information asymmetry. They find that analyst coverage is associated with decreasing accruals quality. Since low accruals quality increases information asymmetry, their findings suggest that analyst coverage increases as information asymmetry increases. This suggests that there is a higher demand from investors for services of financial analysts when there is more information asymmetry. Another part of the explanation might be that their services have more value to investors when there is a higher level of information asymmetry. Their final finding is in line with this last explanation as their results show that firms with more information asymmetry are related to forecasts that contain more private information. Hassan & Skinner (2016) examine the effect of listings on certain markets on analyst coverage. They find that listing on markets with more dispersed ownership, and thus more information asymmetry and agency problems, leads to increases in analyst coverage. The findings of these papers are in line with the view of Jensen & Meckling (1976) that analysts are more important when there is separation between ownership and control, thus when more information asymmetry exists.

3.4.2 Accounting conservatism and information asymmetry

Several researchers have directly examined the relation between conservatism and information asymmetry. Ball & Shivakumar (2005) examine the difference in conditional conservatism for public and private firms. Private companies communicate more privately with their shareholders, while this would be inefficient for public companies since they have a lot more shareholders with an identity that keeps changing over time. Public firms try to reduce information asymmetry more through public dissemination of information such as their financial statements. Therefore, their financial statements are expected to be more conservative. This is in line with their findings. LaFond & Watts (2008) examine the relation between information asymmetry and conservatism. They focus on information asymmetry between managers and equity investors. Information asymmetry is measured with the PIN-score and the bid-ask spread. The authors find that increases in information asymmetry in year *t* lead to more conservative accounting in year t and t+1. This leads to a reduction in

information asymmetry. Similar to that study, Khan & Watts (2009) examine the effect of information asymmetry on conditional conservatism. The difference with LaFond & Watts (2008) is that they measure conditional conservatism with a measure they developed themselves, the C-score. They find that an increase in information asymmetry leads to a significant increase in conditional conservatism in the next year. Wittenberg-Moerman (2008) examines the effect of conditional conservatism on the bid-ask spread that exists on the trading of loans. She finds that conditional conservatism reduces the information asymmetry. Finally, Ramalingegowda & Yu (2012) investigate the role of information asymmetry with the use of an interaction effect. They find that ownership by monitoring institutions leads to more conservatism and this effect is increasing in the level of information asymmetry. This suggests that information asymmetry increases the need for accounting conservatism.

3.5 Hypothesis 2

Investors of firms with higher levels of information asymmetry between its management and its investors have more difficulty with directly monitoring the managers. This will give rise to more agency problems. To these investors, it is expected that the reports issued by financial analysts are more valuable and they will depend on these reports more. When there is more information asymmetry, the information in analysts' reports will sooner lead to a demand for conservatism by shareholders than when there is less information asymmetry since these shareholders have less other sources they can use to monitor the managers. Furthermore, if management takes into account that investors depend more heavily on these reports, management is expected to have a stronger incentive to make sure the information in these reports is desirable and contains little information that could lead to litigation costs. This could lead management to be more conservative in accounting. Since information asymmetry is a concept and cannot be directly measured, I use the bid-ask spread to measure the information asymmetry between managers and investors. A higher bid-ask spread is then expected to lead to a (more) positive relation between analyst coverage and conservatism. This leads to the following hypothesis:

H_{2a}: When there is a higher level of information asymmetry, analyst coverage is (more) positively related to accounting conservatism.

On the other hand, a higher level of information asymmetry could indicate that there is less monitoring from outside parties on the manager's behavior. When this is combined with a

higher level of analyst coverage, management may feel pressure to meet or just beat analyst forecasts and knowing that they are not being strictly monitored, they have the opportunity to choose for policies that make it more likely to meet or just beat the forecasts. This could lead to a decrease in accounting conservatism as conservatism would make it more difficult tomeet or just beat the forecasts. If this is the case, I expect a (more) negative relation between analyst coverage and accounting conservatism when there is more information asymmetry.

H_{2b}: When there is a higher level of information asymmetry, analyst coverage is (more) negatively related to accounting conservatism.

3.6 Summary

In this chapter, prior research has been summarized. An overview of the prior literature is presented in table 1 and 2 (see Appendix). Studies have proven that the possibility of litigation costs increases the degree of conditional and unconditional conservatism. Evidence on the relation between possible regulatory costs and conservatism is mixed. While Sivakumar & Waymire (2003) find that regulatory costs increase conditional conservatism, Qiang (2007) only finds that regulatory costs increase unconditional conservatism. Finally, multiple studies have proven that conservatism is able to decrease agency problems and information asymmetry. Analyst coverage serves as an information intermediary and therefore it is not unexpected that studies have found that analyst coverage reduces information asymmetry. Furthermore, research has shown that financial analysts are able to serve as a monitoring mechanism which constraints the possibility for managers to behave opportunistically. Since conservatism can also be used as a tool to constrain opportunistic behavior, there could be a substitution effect between analyst coverage and conservatism and therefore there might be a negative relation between analyst coverage and conservatism. Also, analysts issue optimistically biased forecasts which are easier to meet or just beat when there is less conservatism in accounting. However, financial analysts' reports may also be valuable to shareholders by publicly displaying information, which could signal to shareholders that the management is behaving opportunistically and therefore they may demand more conservatism based on these reports. Furthermore, the public display of information increases the possibility of litigation costs and could therefore also lead to increases in conservatism. The relation between analyst coverage and accounting conservatism may be affected by information asymmetry. Investors want to monitor managers. When there is information asymmetry and they cannot directly monitor, they rely on other sources such as analyst

reports. When there is more information asymmetry, the information in analysts' reports will sooner lead to a demand for conservatism by shareholders than when there is less information asymmetry since these shareholders have less other sources to depend on. However, information asymmetry could also indicate that management is not monitored intensively. If this is combined with a high level of analyst coverage, management may feel the pressure to meet or just beat the forecasts, and have the space and opportunity to actually do so. If this is the case, a higher level of information asymmetry should lead to a more negative relation between analyst coverage and conservatism.

4. Research design

In this chapter, the measures of the concepts in the research question are explained. Also, relevant control variables are identified. Next, the regressions used to test the hypotheses are discussed. Furthermore, the sample and sample selection are discussed. Finally, the concept of validity and endogeneity problems are discussed with the presentation of the predictive validity framework.

4.1 Measures

In this paragraph is discussed how conditional conservatism, unconditional conservatism, analyst coverage and information asymmetry are measured.

4.1.1 Conditional conservatism

As discussed in chapter 3, prior literature often measures conditional conservatism with a model developed by Basu (1997). That model is as follows:

$$E_{it}/P_{it-1} = \beta_0 + \beta_1*NEG_{it} + \beta_2*RET_{it} + \beta_3*RET_{it}*NEG_{it} + b'*X + b'*NEG_{it}*X + b'*RET_{it}*X + b'*RET_{it}*NEG_{it}*X + \varepsilon, \quad (1)$$

with E measuring earnings per share of firm i in fiscal year t, P measuring the stock price at the beginning of fiscal year t, RET measuring buy-and-hold stock returns of firm i over year *t*, NEG is a dummy variable that takes value 1 if RET_{it} is negative and 0 otherwise and X is a vector with control variables. If β_3 is significant and negative, this indicates that a firm uses conservative accounting.

While this measure is often used, some researchers have expressed their criticism on this measure. Among these limitations, one limitation is addressed by Khan & Watts (2009). The criticism is that the model of Basu (1997) cannot make firm-specific measurements. It assumes that all firms within one industry are identical. Khan & Watts (2009) therefore have developed a new measure of conditional conservatism, the C-score, in which they incorporate these firm-specific characteristics. The advantage of using this measure over Basu (1997) is that it is estimated for individual companies and individual years (Ettredge et al., 2012). The firm-specific characteristics that are incorporated are based on the explanations of Watts (2003). The explanations for conservatism all vary with a firm's investment opportunity set

(IOS) and therefore Khan & Watts (2009) choose variables that are commonly used as a proxy for a firm's IOS: firm size, the market-to-book ratio (MTB) and leverage. To obtain the C-score, there are two steps that need to be taken. First, the following regression has to be run for every year:

$$X_i = \beta_0 + \beta_1 D_{it} + \mu_0 {}_C RET_{it} + \mu_1 {}_C RET_{it} * SIZE_{it} + \mu_2 {}_C RET_{it} * MTB_{it} + \mu_3 {}_C RET_{it} * LEV_{it} + \delta_1 * D_{it} * SIZE_{it} + \delta_2 * D_{it} * MTB_{it} + \delta_3 * D_{it} * LEV_{it} + \lambda_0 * D_{it} {}_C RET_{it} + \lambda_1 * D_{it} {}_C RET_{it} * SIZE_{it} + \lambda_2 * D_{it} {}_C RET_{it} * MTB_{it} + \lambda_3 * D_{it} {}_C RET_{it} * LEV_{it} + \delta_4 * SIZE_{it} + \delta_5 * MTB_{it} + \delta_6 * LEV_{it} + \varepsilon_{i,t} \quad (2)$$

where X is net income before extraordinary items divided by the lagged market value of equity, ${}_C RET$ is the return on firm i from 9 months before the end of the fiscal year to 3 months after the end of the fiscal year, D is a dummy variable that equals 1 if RET for firm i is negative and 0 otherwise, SIZE is the natural logarithm of the market value of equity at the end of year, MTB is market-to-book ratio and LEV measures leverage as the sum of short-term and long-term debt divided by the market value of equity. I obtain estimates for all coefficients for every year that is included in the sample by running this annual regression. Next, I only use the estimates for the coefficients λ_0, λ_1, λ_2 and λ_3. These coefficients are used to calculate the C-score with the following formula (which is not a regression):

$$C\_SCORE_{it} = \lambda_0 + \lambda_1 * SIZE_{it} + \lambda_2 * MTB_{it} + \lambda_3 * LEV_{it} \quad (3)$$

For each firm-year, the values for SIZE, MTB and LEV are filled in. This gives the final variable, C_SCORE, which is a firm-specific yearly measure of conditional conservatism. This is the dependent variable in the main regressions (5) and (7) which are discussed in section 4.3.

4.1.2 Unconditional conservatism

Unconditional conservatism is often measured with the market-to-book ratio (MTB). As mentioned earlier, unconditional conservatism refers to ex-ante conservatism which leads to persistent undervaluation of net assets on the balance sheet. This is related to e.g. the immediate expensing of R&D. This leads to a lower book value of equity while the market value does take these R&D expenses into account. This leads to a larger gap between the market and book value of equity. The MTB shows the asymmetry between these values. Thus, a higher MTB indicates a higher degree of unconditional conservatism. Beaver & Ryan

(2000), however, argue that the book-to-market ratio can be divided into a bias and a lag component. They find that only the bias component is associated with conservatism. I therefore use their model that measures unconditional conservatism with the bias component. To obtain the bias component, the following regression is estimated:

$$BTM_{it} = \alpha + \alpha_i + \alpha_t + \sum_{k=0}^{6} \beta_k \, {}_U RET_{it-k} + e_{it} \, , \tag{4}$$

with BTM as the book-to-market ratio for firm i at the end of fiscal year t, α_i as the firm-specific bias component that can be obtained with firm fixed effects, α_t the year-specific component of book-to-market ratio across all firms that can be obtained with time fixed effects, and ${}_U$RET as the stock return for firm i in year t. α_i is the measure of conservatism: a higher bias coefficient reflects a less conservative accounting approach from firm i. This model is estimated as a fixed effects panel regression with robust standard errors, similar to Beaver & Ryan (2000). For matter of interpretation, I multiply α_i with -1, for the matter of interpretation and name it UNCON. A higher UNCON means a higher level of unconditional conservatism.

4.1.3 Analyst coverage

I measure analyst coverage with the number of EPS forecasts that are issued in year t for the EPS at t+1 by financial analysts. After calculating the number of annual forecasts, I center the variable by subtracting the mean from all the observations. This is necessary as there is an interaction term between analyst coverage and information asymmetry included in the regression to test hypothesis 2. If I would not center these variables, there would be a multicollinearity problem between the interaction term and the separate variables. The multicollinearity problem is explained in 4.4.5.

4.1.4 Information asymmetry

As mentioned in hypothesis 2, the role of information asymmetry in the relation between analyst coverage and conservatism is tested. Information asymmetry is measured with the bid-ask spread. The bid-ask spread is the difference between the highest price that a buyer wants to pay for a stock and the lowest price that a seller is willing to accept to sell its stock. Market makers make losses on the trades they make with informed traders (Chung & Charoenwong, 1998). To compensate for these losses, they need to profit from uninformed traders. According

to this information asymmetry between the types of traders, the market makers set the spread on the stock. The more private information there is, the more information asymmetry between inside and outside investors and thus the higher the bid-ask spread. The bid-ask spread is scaled by the midpoint of the bid-ask spread, which is the average of the bid price and ask price for firm i at time t. After calculating the bid-ask spread and scaling it by the midpoint of the spread, I center BID_ASK by subtracting the mean from all the observations.

4.2 Control variables

Control variables are included in the main regressions to reduce the bias that exists in the estimation of the relation between analyst coverage and conservatism. The control variables differ for conditional and unconditional conservatism, and are explained below.

4.2.1 Conditional conservatism

In the regressions that are estimated to examine the relation between analyst coverage and conditional conservatism, I add the following control variables. Information asymmetry (BID_ASK) is included because research has proven that information asymmetry increases conditional accounting conservatism (LaFond & Watts, 2008). Return on assets (ROA), calculated as firm i's net income before extraordinary items divided by its total assets, is included because a higher profit may give more room for conservative accounting (Ahmed et al., 2002). However, other studies have found that ROA is negatively associated with the conditional conservatism (Khan & Watts, 2009; Sun & Liu, 2011). Therefore, the expectation for the sign of the coefficient is in both directions. DIV, calculated as a firm's dividends divided by its total assets, and DEBT, calculated as a firm's long-term debt divided by its total assets, are included to control for conflicts over dividend policy as these are expected to lead to increases in accounting conservatism (Ahmed et al., 2002). If a firm pays a high amount of dividend, bondholders may be concerned that too much money goes to the shareholders and too little money is left to pay the bondholders. This increases the conflict of interest between both parties and raises the need for conservatism. Furthermore, a higher debt-to-asset ratio implies a larger claim on assets by bondholders which also raises the concern of bondholders about the distribution of money, which is also expected to increase conservatism. Investment uncertainty (INVCYC), proxied for with the length of the investment cycle, is included as this uncertainty leads to increases in agency costs as future gains are more difficult to verify (Khan & Watts, 2009). Firms with more investment uncertainty are also more likely to have adverse outcomes. It is therefore expected that a longer investment cycle leads to more

conservatism. INVCYC is calculated as depreciation divided by lagged total assets, and is decreasing in the length of an investment cycle. Furthermore, the C-score incorporates the explanations of Watts (2003) in its estimation. Khan & Watts (2009) recommend to use SIZE, LEV and MTB in the main regression as control variables as well because the coefficients may otherwise be biased. SIZE is included as a control variable as it is expected to affect accounting conservatism. It could either lead to increases in accounting conservatism as larger firms are expected to face higher litigation costs (Khan & Watts, 2009). However, larger firms are also expected to have better information environments and thus to have less information asymmetry between its management and its shareholders, which could lead to decreases in accounting conservatism. LEV is included as it is expected that more levered firms have more financial distress and therefore their debt covenants are more strict, which increases the need for conservatism (Watts, 2003a; Khan & Watts, 2009). MTB is included as firms with a higher MTB have more growth opportunities which are positively related to agency costs, which would lead to increases in accounting conservatism (Watts, 2003a; Khan & Watts, 2009). Finally, the regressions includes industry fixed effects because there might be differences between industries that affect accounting conservatism (e.g. regulation), and time fixed effects because the financial crisis took place during the sample period and this likely has impacted the level of accounting conservatism.

4.2.2 Unconditional conservatism

I add the following control variables in the regressions with UNCON as dependent variable. BID_ASK is included to control for information asymmetry. While research has shown that information asymmetry increases conditional conservatism, the effect on unconditional conservatism has not been explored yet. However, based on the literature review, information asymmetry is expected to lead to increases in conservatism, and therefore I predict a positive effect of information asymmetry on unconditional conservatism as well. ROA is expected to be positively associated with unconditional conservatism as it is expected that a firm has more room to be conservative when the profit is higher than when the profit is low, which has been confirmed by prior research (Ahmed et al., 2002; Sun & Liu, 2011). The percentage of change in sales of firm i over year t (SALES_GRW) is included as it has been proven to negatively affect unconditional conservatism (Ahmed et al., 2002; Sun & Liu, 2011). The negative effect is expected because of the relation between growth and BTM. When a firm is experiencing more sales growth, it accumulates more assets and the ratio of new to old assets increases. This increases the book value of equity and decreases the BTM, and thus also UNCON. The

research and development expenses divided by total assets (RD) are included as a control variable as R&D expenses are reflected in the BTM and are therefore also expect to affect UNCON. This is also found by Ahmed et al. (2002), who find a positive effect of R&D expenses on unconditional conservatism. Furthermore, DIV, DEBT, SIZE, LEV and MTB are included with the same reasoning as for conditional conservatism. However, for LEV the effect is unknown. While leverage indicates financial distress which should lead to increases in conservatism, Qiang (2007) found that financially distressed firms show a lower level of unconditional conservatism. Finally, industry and time fixed effects are also included in the regressions. The measurements of all variables included in the regressions are summarized in table 3, Appendix.

4.3 Regressions

I examine the relation between analyst coverage and accounting conservatism. Since conservatism might also influence the amount of analyst coverage, I choose to measure the independent variables at t-1. To test hypothesis 1, the following regressions are estimated:

$$C\_SCORE_{it} = \beta_0 + \beta_1*NUM\_FOR_{it-1} + \beta_2*BID\_ASK_{it-1} + \beta_3*ROA_{it-1} + \beta_4*DIV_{it-1} + \beta_5*DEBT_{it-1} + \beta_6*INVCYC_{it-1} + \beta_7*SIZE_{it-1} + \beta_8*LEV_{it-1} + \beta_9*MTB_{it-1} + \beta_{10}*INDUSTRY + \beta_{11}*TIME + \varepsilon_{it} \quad (5)$$

$$UNCON_{it} = \beta_0 + \beta_1*NUM\_FOR_{it-1} + \beta_2*BID\_ASK_{it-1} + \beta_3*ROA_{it-1} + \beta_4*DIV_{it-1} + \beta_5*DEBT_{it-1} + \beta_6*RD_{it-1} + \beta_7*SALES\_GRW_{it-1} + \beta_8*SIZE_{it-1} + \beta_9*LEV_{it-1} + \beta_{10}*MTB_{it-1} + \beta_{11}*INDUSTRY + \beta_{12}*TIME + \varepsilon_{it} \quad (6)$$

Regression (5) focuses on conditional conservatism and regression (6) focuses on unconditional conservatism. In both regressions, the coefficient of interest is β_1. If β_1 is significant and larger than 0, it is an indication that analyst coverage is positively related to accounting conservatism. If β_1 is significant and smaller than 0, it is an indication that analyst coverage is negatively related to accounting conservatism.

To test hypothesis 2, the following regressions are estimated:

$$C\_SCORE_{it} = \beta_0 + \beta_1*NUM\_FOR_{it-1} + \beta_2*BID\_ASK_{it-1} + \beta_3*NUM\_FOR_{it-1}*BID\_ASK_{it-1} + \beta_4*ROA_{it-1} + \beta_5*DIV_{it-1} + \beta_6*DEBT_{it-1} + \beta_7*INVCYC_{it-1} + \beta_8*SIZE_{it-1} + \beta_9*LEV_{it-1} + \beta_{10}*MTB_{it-1} + \beta_{11}*INDUSTRY + \beta_{12}*TIME + \varepsilon_{it} \quad (7)$$

$$UNCON_{it} = \beta_0 + \beta_1*NUM\_FOR_{it-1} + \beta_2*BID\_ASK_{it-1} + \beta_3*NUM\_FOR_{it-1}*BID\_ASK_{it-1} + \beta_4*ROA_{it-1} + \beta_5*DIV_{it-1} + \beta_6*DEBT_{it-1} + \beta_7*RD_{it-1} + \beta_8*SALES\_GRW_{it-1} + \beta_9*SIZE_{it-1} + \beta_{10}*LEV_{it-1} + \beta_{11}*MTB_{it-1} + \beta_{12}*INDUSTRY + \beta_{13}*TIME + \varepsilon_{it} \quad (8)$$

In both regressions, the coefficient of interest is β_3. If β_3 is significant and larger than 0, it is an indication that analyst coverage is (more) positively related to accounting conservatism when there is a higher level of information asymmetry. If β_3 is significant and smaller than 0, it is an indication that analyst coverage is (more) negatively related to accounting conservatism when there is a higher level of information asymmetry.

4.4 OLS assumptions

There are several assumptions, the Gauss-Markov assumptions, that have to be met to make Ordinary Least Squares (OLS) the best method to estimate the regression models. In this paragraph I test whether the samples meet these assumptions.

4.4.1 Variance of the error term

The first assumption that has to be met is that all error terms have a constant variance, also known as homoskedasticity. When the error terms do not have a constant variance, it is called heteroskedasticity. Heteroskedasticity does not lead to biased estimates of OLS, but the standard errors become less efficient. The hypothesis tests and confidence intervals then cannot be relied on. So, if heteroskedasticity is present, this problem needs to be solved with robust standard errors. To see if the error terms have a constant variance, the residual-versus-fitted plot can first be used. The plot of sample 1, figure 1, shows that residuals around the fitted value of 0 are further away from the red line than the residuals at the fitted value of 0.3. This suggests that the variances in the sample are heteroskedastic. Homoskedasticity can formally be tested with the Breusch-Pagan test. This test has the null hypothesis that the residuals are homoscedastic, and the alternative hypothesis is that the error terms are heteroskedastic. The X^2-statistic for this sample is 407.80 with a p-value of 0.000, so the null hypothesis has to be rejected. From this, I conclude that there is heteroskedasticity present in sample 1.

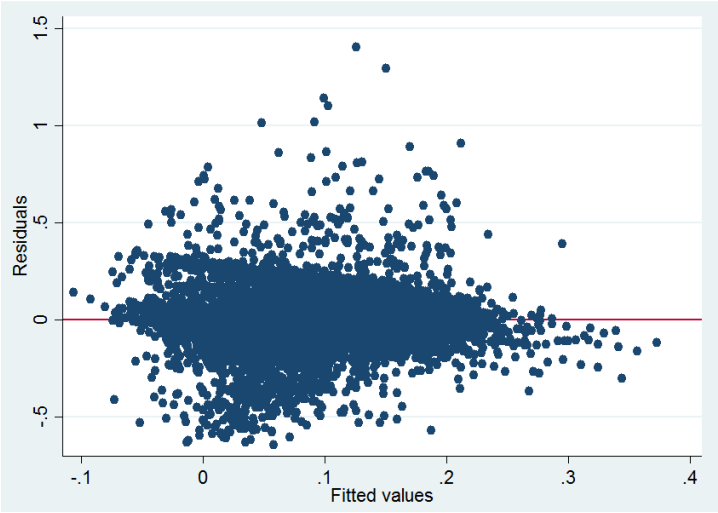

Figure 1. Residual-versus-fitted plot sample 1

For sample 2, the plot shows that the residuals show a larger variance as the fitted values become higher, see figure 2. This suggests that sample 2 shows heteroskedasticity as well. The Breusch-Pagan test for sample 2 gives a X^2-statistic of 24.01 with a p-value of 0.000, the null hypothesis has to be rejected so there is also heteroskedasticity present in sample 2. In both samples, therefore, robust standard errors are necessary.

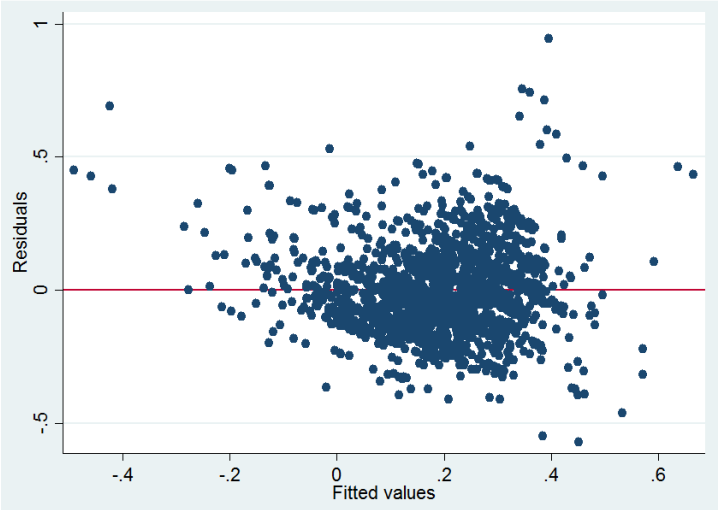

Figure 2. Residual-versus-fitted plot sample 2

4.4.2 Correlation of the residuals

The second assumption that has to be met is that the error terms are independently distributed and not correlated between observations. There could be factors that influence accounting conservatism that are not included in the regressions. These factors are then captured in the

residuals. As the samples include panel data, these effects are captured in the residuals over multiple years. This leads to a correlation between error terms over time, also named serial correlation or autocorrelation, which violates the assumption. Autocorrelation can be tested for with the Durbin-Watson test. The null hypothesis of this test is that there is no serial correlation. The Durbin-Watson test in Stata depends heavily on the assumption that the error term is normally distributed (Stata, 2017). Since the error terms in both samples are not normally distributed, it is better to use Durbin's alternative test. For sample 1, the p-value of this test is 0.002, and for sample 2 the p-value is 0.000. In both cases, the null hypothesis has to be rejected, thus serial correlation is present in both samples.

4.4.3 Panel data

The third assumption of OLS I test for is that the independent variable is uncorrelated with the error term. If this assumption is not met, there can be endogeneity problems such as omitted variable bias and reverse causality. This is further discussed in 4.7. For this reason, control variables are included in the regression. However, there is something particular about the use of panel data. Since firms are included multiple times in the sample, there might be firm-specific characteristics that are correlated with the independent variables that I have not controlled for. Panel data regressions take these firm-specific characteristics into account. A frequently used panel data model assumes:

$$y = \beta_0 + x_{it}'\beta + \varepsilon_{it} \text{ with } \varepsilon_{it} = \alpha_i + u_{it},$$

where u is assumed to be homoskedastic and not correlated over time (Verbeek, 2012). The component α does not change over time is and homoscedastic across individuals. This is the random effects (RE) model. This model assumes that the independent variables are uncorrelated with the unobservable characteristics in α and u. This means the explanatory variables are exogenous. However, this might not always be the case. This problem is addressed in a fixed effects (FE) model by including individual-specific intercept terms in the model:

$$y = \alpha_i + x_{it}'\beta + u_{it},$$

where α are fixed unknown constants and where u is typically assumed to be independent and identically distributed over individuals and time. α are the fixed individual effects. These

capture all (un)observable time-invariant differences across individuals. With this model, α_i can be correlated with x_{it}. The FE model is also called the within estimator as it only looks at variation within subjects, while the RE model looks at both within and between variation.

There also exists a between effects (BE) model that only looks at the variation between subjects. This model uses the means of variables for each panel over time. This type of model is used in this thesis to examine the relation between analyst coverage and unconditional conservatism as the firm-specific component of BTM is used as the dependent variable. Since these effects are time-invariant, there is no difference of the dependent variable within a firm over time. A fixed or random effects model is therefore not appropriate. There is only variation in unconditional conservatism between firms and therefore I consider the BE model appropriate.

However, for conditional conservatism, there does exist within-variation. The Hausman test can be used to determine whether a FE or RE model is appropriate. The null hypothesis is that the independent variables and α are uncorrelated. If the null hypothesis is accepted, the RE model should be used. If the null hypothesis is rejected, the FE model should be used. The Hausman statistic gives a value of 105.77 with a p-value of 0.006. The null hypothesis is rejected, so a FE model is appropriate to examine the relation between analyst coverage and conditional conservatism. The standard FE model does not allow for serial correlation or heteroskedasticity. Since previous tests have shown that there is serial correlation and heteroskedasticity present in the sample, I use robust standard errors in the regression.

4.4.4 Normality of the error term

A normal distribution of the residuals is not an assumption that has to be met to make OLS the best linear unbiased estimator. However, when the error terms are not normally distributed, it may give problems for the p-values and confidence intervals. First, I look at the histogram of the residuals. Sample 1 has a very high peak and does not seem completely asymmetric as seen in figure 3. The Shapiro-Wilk test can also be used to test for normality. The null hypothesis of this test is that the variable is normally distributed. I perform this test on the residuals and obtain a p-value of 0.000. The null hypothesis has to be rejected thus the error terms of sample 1 are not normally distributed. Another test related to the normal distribution is the Jacque-Bera test which tests for skewness and kurtosis. Skewness exists when the residuals are asymmetrically distributed. For sample 1, the p-values for skewness is 0.000,

which suggests that the error terms are skewed. Looking at figure 3, it seems like the error terms are right-skewed. Kurtosis means that the tails of the distribution differ from the tails it would have when it would be normally distributed. The p-value for kurtosis is 0.000, which suggests that the dataset suffers from kurtosis. The distribution of the error term seems to be 'leptokurtic', which means that the peak of the distribution is higher than in a normal distribution.

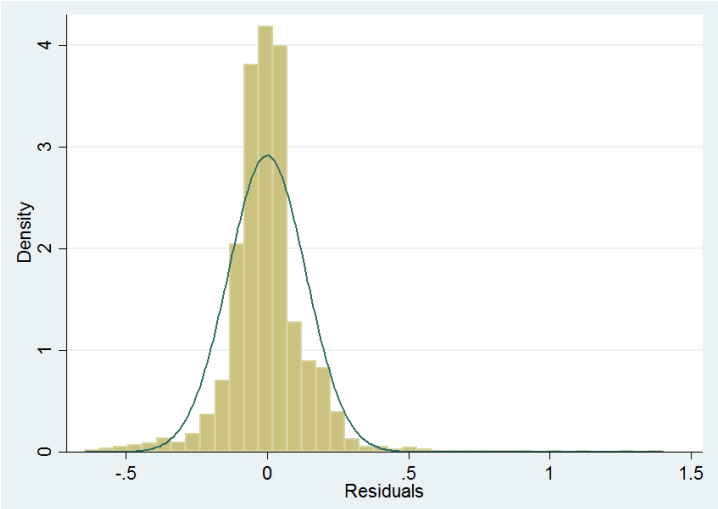

Figure 3. Distribution of residuals sample 1

The histogram of the residuals of sample 2 is shown in figure 4. The distribution of the residuals looks right-skewed, and thus not normally distributed. The Shapiro-Wilk test gives a p-value of 0.000, so the alternative hypothesis is accepted that the error terms of sample 2 are not normally distributed. The Jacque-Bera test gives p-values for skewness and kurtosis of 0.000, so the null hypothesis for both factors has to be rejected. The error terms are skewed and suffer from kurtosis. While the peak is lower than the peak of the residuals in sample 1, this distribution also seems to be leptokurtic as the peak is higher than would have been with a normal distribution. While both samples have error terms that are not normally distributed, the samples are fortunately large enough such that this will not influence the results too much (Minitab, 2014).

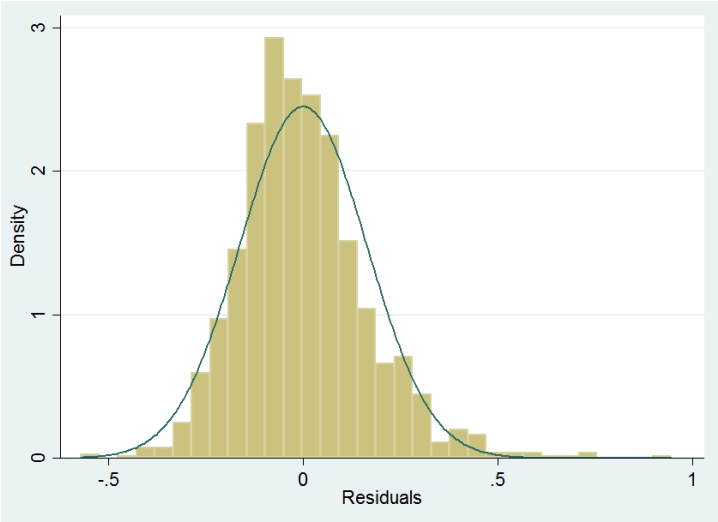

Figure 4. Distribution of residuals sample 2

4.4.5 Multicollinearity

While it is not an assumption of OLS that there is no multicollinearity in the research design, it is still problematic if it exists. Multicollinearity exists when two variables measure almost the same thing. This is problematic since it becomes difficult to estimate the separate effects of both variables. Multicollinearity can be detected with Variance Inflation Factor (VIF) values. A VIF value of 8 or higher would indicate that there is a multicollinearity problem in the dataset. As the highest VIF value in sample 1 is 3.56 and in sample 2 is 3.88, as shown in table 4 and 5, I conclude that there is no multicollinearity issue in the research design.

Table 4. VIF values sample 1

	(1)	(2)
VARIABLES	VIF	1/VIF
NUM_FOR_{it-1}	2.74	0.365
BID_ASK_{it-1}	2.39	0.419
$INFO\_ANALYST_{it-1}$	1.13	0.883
ROA_{it-1}	1.29	0.776
DIV_{it-1}	1.44	0.694
$DEBT_{it-1}$	2.45	0.408
$INVCYC_{it-1}$	1.87	0.535
$SIZE_{it-1}$	3.56	0.281
MTB_{it-1}	1.39	0.720
LEV_{it-1}	2.48	0.403

Table 5. VIF values sample 2

	(1)	(2)
VARIABLES	VIF	1/VIF
NUM_FOR_{it-1}	2.62	0.381
BID_ASK_{it-1}	2.72	0.367
$INFO\_ANALYST_{it-1}$	1.10	0.905
ROA_{it-1}	1.79	0.559
DIV_{it-1}	1.64	0.608
$DEBT_{it-1}$	2.99	0.334
RD_{it-1}	1.68	0.596
$SALES\_GRW_{it-1}$	1.34	0.744
$SIZE_{it-1}$	3.88	0.258
MTB_{it-1}	1.69	0.593
LEV_{it-1}	2.95	0.340

4.5 Sample and sample selection

As a sample period, I choose 2002-2016. This period is chosen because in 2002, the Sarbanes-Oxley Act (SOX) was introduced. Since the SOX has led to an increase in the level of accounting conservatism adopted by firms (Lobo & Zhou, 2006), I choose a sample period after the SOX introduction to control for the effect of this act. During the sample period, the financial crisis also happened. To control for the influence of this event, I use time fixed effects in the regressions. The samples include firms based in the U.S. Data on these firms and the variables needed can be retrieved from the WRDS database. To obtain data on analyst coverage, I use the I/B/E/S database. The CRSP database is used to obtain data on stock returns and bid-ask spreads. The other variables can be retrieved from the Compustat.

The sample selection is summarized in table 6, Appendix. Panel A, B and C all represent different datasets as I had to use multiple databases from WRDS. The Compustat dataset is filtered on firms that have their fiscal year-end in December, such that all firms have a similar fiscal year. Furthermore, observations with negative values for the book value of equity, total assets or paid dividend are deleted from the sample as this is not realistic. For I/B/E/S and CRSP, observations with missing values were also dropped. For both these datasets, the initial data contained observations per month. From these monthly observations, I calculated the

yearly information. After that, I collapsed the files to end up with a file that contained firm-year observations. Finally, I merged all three files and 15,632 matched. Then I calculated C_SCORE and UNCON. Next, I deleted outliers at the 1% and 99% percentile. I also used the histograms to see if any more observations had to be deleted. The histograms of each variable that is used in the regressions are presented in figure 5 (Appendix), with the histograms before and after dropping observations. There were also outliers dropped from variables that are not included in the final regressions but were needed to calculate C_SCORE and UNCON. Finally, sample 1, used to examine the relation between analyst coverage and conditional conservatism, contains 13,699 observations and runs from 2002 and 2015. 2016 is dropped as the yearly returns are calculated from 9 months before fiscal year end and 3 months after fiscal year end, and the three months after the end of December were not available yet. Sample 2, used to examine the relation between analyst coverage and unconditional conservatism, contains 2,171 observations and runs from 2007 to 2016 as UNCON is calculated with the stock returns of 5 prior years and the current year.

4.6 Validity and endogeneity

A concept that needs extra attention in doing research is validity. Validity is important in doing research as this checks whether the test that a researcher is conducting, is actually measuring what the researcher wants to measure. There are three types of validity that can be explained with the predictive validity framework (Libby et al., 2002). The predictive validity frameworks, or 'libby boxes', are presented for both hypotheses in figure 6 and 7 in the Appendix. The first type of validity is construct validity: this type indicates to what extent the measure that you are using is captures the underlying construct. It focuses on whether the research design is measuring the relation that the researcher is intended to measure with his research question. In figure 6 and 7, this type of validity is presented with arrow 2 and 3. I measure analyst coverage with the number of forecasts issued by analysts for firm i at time t. Conditional conservatism is measured with the C-score and unconditional conservatism is measured with the bias component of the BTM. Finally, information asymmetry is measured with the bid-ask spread. These variables are specifically measuring the concepts mentioned in the hypotheses and are not used in other studies to measure other concepts. The second type of validity focuses on whether the results of the study can be generalized to other settings besides the setting used in the current study. According to Libby et al. (2002), external validity also refers to readers believing that the theoretical concepts and relations between these concepts capture important elements of the target environment. This refers to the

hypotheses presented with arrow 1. The external validity in my research design is not that high as I only use U.S. firms. The litigation and regulation setting of firms in other parts of the world are different and therefore the results cannot be easily generalized. The third type of validity is internal validity. This focuses on the relation between two variables and how the study is effective in ruling out other potential explanations for the found association. The relation between the independent and dependent variable are presented with arrow 4. A researcher can add control variables in the regression such that the possibility that the researcher finds a spurious correlation is reduced. Finding a spurious correlation is a form of omitted variable bias. This problem entails that a variable is not included in the regression that is related to the dependent and independent variable. By not including this variable, the estimate for the effect of the independent variable is biased. The control variables I have identified to be relevant are presented with arrow 5. By including many control variables I have tried to increase the internal validity of my study and to rule out other potential explanations. While I try to incorporate relevant control variables, I acknowledge that I am not able to control for every factor and therefore will possibly have omitted variable bias. Omitted variable bias is one form of an endogeneity problem. The other form is reversed causality: the independent variable could influence the dependent variable, but the dependent variable could influence the independent variable at the same time. To prevent this from happening, I decide to use lagged independent variables since it is not possible for a dependent variable measured at time t to influence independent variables measured at t-1.

5. Empirical results

This chapter describes the results of the estimated regressions. First, the descriptive statistics and correlation tables for both samples are presented. After that, the results are discussed with regard to the hypotheses.

5.1 Descriptive statistics

Table 7 shows the descriptive statistics of the sample 1. This sample includes 13,699 observations which represent 1,684 U.S. firms. The firms in this sample, on average, have a C-score of 0.097 with a minimum of -0.644 and a maximum of 1.537. These firms have, on average, 8.595 analysts following their firm and an average bid-ask spread of 0.138. However, NUM_FOR and BID_ASK have been centered by subtracting the mean and therefore the mean of the final variables is 0. The average ROA in this sample is 0.020. The firms pay an average dividend of 10,000$ per year. The average firm has a long-term debt-to-asset ratio of 0.177 and an investment cycle of 0.038. Firms generally have a size of 7.123 million dollars, a leverage of 0.412 and a market-to-book ratio of 2.950.

Table 7. Descriptive statistics sample 1

	(1) N	(2) Mean	(3) Sd	(4) Min	(5) p25	(6) Median	(7) p75	(8) Max
C_SCORE	13,699	0.097	0.149	-0.644	0.024	0.960	0.169	1.537
NUM_FOR	13,699	0	6.132	-7.518	-4.762	-1.777	3.488	20.072
BID_ASK	13,699	0	0.063	-0.089	-0.047	-0.013	0.032	0.356
ROA	13,699	0.020	0.116	-1.202	0.008	0.034	0.071	0.282
DIV	13,699	0.010	0.017	0	0	0.002	0.014	0.100
DEBT	13,699	0.177	0.167	0	0.017	0.144	0.291	0.905
INVCYC	13,699	0.038	0.029	0	0.019	0.034	0.051	0.181
SIZE	13,699	7.123	1.572	2.119	5.996	7.030	8.145	11.374
LEV	13,699	0.412	0.516	0	0.042	0.228	0.577	2.992
MTB	13,699	2.950	2.585	0.226	1.410	0.121	3.482	19.973

This table contains the descriptive statistics of the sample used to test the relation between analyst coverage and conditional conservatism. The descriptive statistics present variations among variables, and the largest deviations from the means.

Table 8 shows the descriptive statistics of sample 2. This sample includes 2,171 observations that represent 352 U.S. firms. The average value for the firm-specific bias component of the book-to-market ratio is -0.195 with a minimum of -1.340 and a maximum of 0.409. The firms in the sample have, on average, 9.200 analysts following their firm which is slightly higher than in the other sample. The average bid-ask spread is 0.133. Again, these have been centered and become 0 at the mean. The average ROA in this sample is 0.037. The firms pay an average dividend of 11,000$ per year. The average long-term debt-to-asset ratio of 0.178. The average firm invests 8,7% of their assets in research and development, and has a sales growth of 8,1% per year. The firms generally have a size of 7.334 million dollars, a leverage of 0.215 and a market-to-book ratio of 3.081.

Table 8. Descriptive statistics sample 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	N	Mean	Sd	Min	p25	Median	p75	Max
UNCON	2,171	-0.195	0.216	-1.340	-0.331	-0.168	-0.046	0.409
NUM_FOR	2,171	0	5.774	-8.123	-4.662	-1.450	3.633	19.467
BID_ASK	2,171	0	0.054	-0.082	-0.041	-0.011	0.029	0.248
ROA	2,171	0.037	0.099	-1.202	0.017	0.053	0.085	0.277
DIV	2,171	0.011	0.016	0	0	0	0.018	0.095
DEBT	2,171	0.178	0.154	0	0.001	0.143	0.255	0.756
RD	2,171	0.087	0.190	0	0.007	0.029	0.097	2.010
SALES_GRW	2,171	0.081	0.206	-0.775	-0.009	0.067	0.145	1.597
SIZE	2,171	7.334	1.388	3.193	6.382	7.383	8.300	11.370
LEV	2,171	0.215	0.315	0	0.010	0.122	0.275	2.875
MTB	2,171	3.081	2.340	0.278	1.638	2.447	3.715	18.81

This table contains the descriptive statistics of the sample used to test the relation between analyst coverage and unconditional conservatism. The descriptive statistics present variations among variables, and the largest deviations from the means.

5.2 Correlation tables

Table 9 presents the correlation matrix of sample 1. C_SCORE is negatively correlated with NUM_FOR, which suggests that firms with a higher degree of conditional conservatism have less analyst coverage. With regard to the control variables, C_SCORE is positively correlated with BID_ASK and MTB. C_SCORE is negatively correlated with ROA, DIV, DEBT and SIZE. All these correlations are significant at the 1% level. Two variables, INVCYC and LEV, are not significantly correlated with C_SCORE. The highest correlation in this sample is between SIZE and NUM_FOR: it has a value of 0.739. This correlation indicates that larger firms are covered by more analysts which makes sense.

Table 10 presents the correlation matrix of sample 2. UNCON is positively correlated with NUM_FOR, which suggests that firms with a higher degree of unconditional conservatism have more analyst coverage. With regard to the control variables, UNCON is positively correlated with ROA, DIV, DEBT, SIZE and MTB. UNCON is negatively correlated with BID_ASK and LEV. Most of these correlations are significant at the 1% level, only the correlation between UNCON and LEV is significant at the 5% level. One variable, SALES_GRW, is not significantly correlated with UNCON. Also in this sample, there is a high correlation between SIZE and NUM_FOR, namely 0.692. Another correlation that is also high in this sample is between DEBT and LEV, it has a value of 0.691. This is not surprising as firms with more debt also have a higher leverage.

Table 9: Correlation matrix sample 1

	C_SCORE	NUM_FOR	BID_ASK	ROA	DIV	DEBT	INVCYC	SIZE	LEV	MTB
C_SCORE	1.000									
NUM_FOR	-.255***	1.000								
BID_ASK	.028***	-.186***	1.000							
ROA	-.146***	.180***	-.341***	1.000						
DIV	-.082***	.105***	-.246***	.213***	1.000					
DEBT	-.040***	.118***	-.098***	.048***	.194***	1.000				
INVCYC	-.001	.102***	.156***	.063***	.050***	.208***	1.000			
SIZE	-.331***	.739***	-.424***	.316***	.283***	.243***	.010	1.000		
LEV	-.007	-.051***	-.025***	-.046***	-.029***	.516***	-0.116***	-.015*	1.000	
MTB	.119***	.173***	.022***	-.036**	.123***	.069***	.097***	0.206***	-0.262***	1.000

Table 9 shows the Pearson correlations for 13,699 firm-years between 2002 and 2015 for conditional conservatism. C_SCORE is calculated with the model of Khan & Watts (2009) and measures conditional accounting conservatism. NUM_FOR are the number of analyst forecasts issued in year t to forecast EPS at t+1. BID_ASK is the bid-ask spread scaled by the midpoint of the spread. ROA is measured as net income before extraordinary items divided by total assets. DIV is total dividend paid divided by total assets. DEBT is the long-term debt divided by total assets. INVCYC is depreciation expense divided by lagged total assets. SIZE is the natural logarithm of the market value of equity. LEV is total debt divided by the market value of equity. MTB is the market value of equity divided by the book value of equity. *,**,*** represent significance at the 10%, 5% and 1% significance level respectively.

Table 10: Correlation matrix sample 2

	UNCON	NUM_FOR	BID_ASK	ROA	DIV	DEBT	RD	SALES_GRW	SIZE	LEV	MTB
UNCON	1.000										
NUM_FOR	.280***	1.000									
BID_ASK	-.207***	-.213***	1.000								
ROA	.145***	.241***	-.363***	1.000							
DIV	.267***	.095***	-.239***	.247***	1.000						
DEBT	.120***	.185***	-.162***	-.006	.111***	1.000					
RD	.163***	-.066***	.244***	-.448***	-.165***	-.159***	1.000				
SALES_GRW	.008	.070***	-.014	.157***	-.110***	-.024	.089***	1.000			
SIZE	.408***	.692***	-.464***	.424***	.322***	.292***	-.153***	.079***	1.000		
LEV	-.152**	.030	.093***	-.118***	-.046**	.691***	-.169***	-.061**	.382	1.000	
MTB	.501***	.293***	-.169***	.142***	.173***	.115***	.187***	.154***	.380***	-.169***	1.000

Table 10 shows the Pearson correlations for 2,171 firm-years between 2007 and 2016 for unconditional conservatism. UNCON is the firm-specific bias measure of unconditional conservatism, calculated with the model of Beaver & Ryan (2000). NUM_FOR are the number of analyst forecasts issued in year t to forecast EPS at t+1. BID_ASK is the bid-ask spread scaled by the midpoint of the spread. ROA is measured as net income before extraordinary items divided by total assets. DIV is total dividend divided by total assets. DEBT is the long-term debt divided by total assets. RD is the ratio of R&D expenses to total assets. SALES_GRW is the annual percentage growth in total sales. SIZE is the natural logarithm of the market value of equity. LEV is total debt divided by the market value of equity. MTB is the market value of equity divided by the book value of equity. *,**,*** represent significance at the 10%, 5% and 1% significance level respectively.

5.3 Hypotheses testing

5.3.1 Results hypothesis 1

Table 11 presents the relation between analyst coverage and conditional conservatism. The regressions presented in this table are based on 10,668 observations. This amount differs from the 13,669 as described in the descriptive statistics because I use the lagged variables of the main independent and control variables. In column (1) the relation between analyst coverage and conditional conservatism is tested without control variables, in column (2) control variables are added, and in column (3) the regression is re-estimated with industry and time fixed effects. Column E shows the expectations for the sign of the coefficients. In column 1, there is a significantly positive relation between NUM_FOR and C_SCORE (0.001, p=0.051). This suggests that conditional conservatism increases with analyst coverage. The R^2 of the overall regression is 0.001 which is very low. When the control variables are added to the regression, as seen in column 2, the relation between NUM_FOR and C_SCORE still holds becomes significant at the 1% level. However, when the time and industry fixed effects are added in column 3, the association diminishes and there is no longer a significant relation (-0.000, p=0.877) between analyst coverage and conditional conservatism. Thus, I find no supporting evidence for H1a or H1b. This is contradicting evidence compared to Sun & Liu (2011) who find that analyst coverage is positively associated with conditional conservatism. Consistent with the general demand for conservatism when there is more information asymmetry, I find a positive relation between BID_ASK and C_SCORE (0.081, p=0.096) (LaFond & Watts, 2008; Khan & Watts, 2009). I find no significant relation between ROA and C_SCORE (-0.039, p=0.281) which suggests that there is no significant relation between a firm's profitability and the decisions of a firm to apply conditional conservative accounting. Related to agency conflicts between bondholders and shareholders over dividend policies, DIV (0.401, p=0.012) and DEBT (0.041, p=0.047) are significantly positively related to C_SCORE. I find no significant relation between INVCYC and C_SCORE (0.004, p=0.977) which is not in line with prior research (Khan & Watts, 2009). This may be explained by the control variables in my regression that are not present in the regression of Khan & Watts (2009). The last control variables are according to the explanations of Watts (2003). SIZE has a significant negative relation (-0.030, p=0.000) with C_SCORE, which can potentially be explained by larger firms having less information asymmetry and therefore less need for conditional conservatism (Khan & Watts, 2009). This explanation is in line with the negative correlation between SIZE and BID_ASK in table 9. LEV is not significantly associated with C_SCORE (0.009, p=0.247) which is not line with the expectations. This may be explained

by DEBT that measures partially the same relation as LEV. This is in line with the correlation between DEBT and LEV in table 9 with a value of 0.516. Finally, MTB is significantly positively associated with C_SCORE (0.007, p=0.000), consistent with higher MTB firms having more growth opportunities that increase agency costs. The full regression in column 3 has an adjusted R^2 of 0.382, which means that 38.2% of the variation in the dependent variable is explained by the model. The p-value of the F-statistic is 0.000, which suggests that this model fits the data better than a model with just an intercept.

Table 12 presents the relation between analyst coverage and unconditional conservatism. The regressions presented in this table are based on 1,705 observations. This amount differs from the 2,171 as described in the descriptive statistics because I use the lagged variables of the main independent and control variables. In column (1), the relation between NUM_FOR and UNCON is shown without control variables. This regression shows a significantly positive association between NUM_FOR and UNCON (0.013, p=0.000). This suggests that unconditional conservatism increases with analyst coverage. However, when the fixed effects and control variables are added, this effect diminishes (0.000, p=0.918). This suggests that there is no relation between analyst coverage and unconditional conservatism. Again, I find no supporting evidence for H1a or H1b. Unexpectedly, as opposed to conditional conservatism, I find a significant negative relation (-0.864, p=0.010) between BID_ASK and UNCON. This suggests that more information asymmetry is negatively associated with unconditional conservatism. This coefficient is potentially biased because the regression does not include control variables related to other monitoring parties. It might be that a party monitors the managers by demanding conservatism, while also decreasing the information asymmetry between shareholders and management. Inconsistent with the expectations, ROA is not significantly related with UNCON (-0.123, p=0.489), which suggests that there is no relation between profitability and unconditional conservatism. Consistent with the expectations, DIV (2.066, p=0.003) and DEBT (0.437, p=0.001) are significantly positively related to UNCON. Consistent with the expectation that UNCON also represents growth opportunities, RD is significantly positively related to UNCON (0.115, p=0.056) and SALES_GRW is significantly negatively related to UNCON (-0.291, p=0.000). SIZE has a significant positive relation with UNCON (0.023, p=0.090), consistent with the explanation that larger firms have higher litigation costs and are therefore more conservative accounting. There is a significant negative relation between LEV and UNCON (-0.284, p=0.000), which suggests that a higher leverage leads to less unconditional accounting conservatism, consistent

with the findings of Qiang (2007). Finally, MTB is significantly positively related to UNCON (0.049, p=0.000), which is in line with the expectations. The full regression in column 3 has an adjusted R^2 of 0.583, which means that 58.3% of the variation in the dependent variable is explained by the model. The p-value of the F-statistic is 0.000, which suggests that this model fits the data better than a model with just an intercept.

Table 11. Results H1 conditional conservatism

	E	(1) C_SCORE	(2) C_SCORE	(3) C_SCORE
NUM_FOR_{it-1}	?	0.001*	0.004***	-0.000
		(0.051)	(0.000)	(0.877)
BID_ASK_{it-1}	+		-0.676***	0.081*
			(0.000)	(0.096)
ROA_{it-1}	?		-0.051	-0.039
			(0.192)	(0.281)
DIV_{it-1}	+		0.659***	0.401**
			(0.001)	(0.012)
$DEBT_{it-1}$	+		0.086***	0.041**
			(0.001)	(0.047)
$INVCYC_{it-1}$	-		0.030	0.004
			(0.844)	(0.977)
$SIZE_{it-1}$	?		-0.043***	-0.030***
			(0.000)	(0.000)
LEV_{it-1}	+		-0.008	0.009
			(0.321)	(0.247)
MTB_{it-1}	+		0.006***	0.007***
			(0.000)	(0.000)
Constant		0.084***	0.417***	0.326***
		(0.000)	(0.000)	(0.000)
Industry fixed effects		No	No	Yes
Time fixed effects		No	No	Yes
R^2		0.001	0.050	0.387
Adjusted R^2		0.001	0.049	0.382
F-statistic p-value		0.051	0.000	0.000
Observations		10,668	10,668	10,668

FE models with robust standard errors are estimated with C_SCORE as the dependent variable. The regressions are based on 10,668 observations that represent 1,684 firms. The coefficient of interest is $NUM\_FOR_{it+1.}$ Column (1) estimates the relation between analyst coverage and conditional conservatism without control variables, column (2) adds control variables and column (3) adds industry and time fixed effects. ***, **, * represent statistical significance of the coefficients at 0.01, 0.05 and 0.1 confidence level, respectively. The p-values are in parentheses.

Table 12. Results H1 unconditional conservatism

	E	(1) UNCON	(2) UNCON	(3) UNCON
NUM_FOR_{it-1}	?	0.013***	0.000	0.000
		(0.000)	(0.985)	(0.918)
BID_ASK_{it-1}	+		-0.489*	-0.864***
			(0.095)	(0.010)
ROA_{it-1}	+		0.106	-0.123
			(0.552)	(0.489)
DIV_{it-1}	+		1.747***	2.066***
			(0.010)	(0.003)
$DEBT_{it-1}$	+		0.325***	0.437***
			(0.009)	(0.001)
RD_{it-1}	+		0.276***	0.115*
			(0.000)	(0.056)
$SALES\_GRW_{it-1}$	-		-0.298***	-0.291***
			(0.000)	(0.000)
$SIZE_{it-1}$	?		0.032***	0.023*
			(0.007)	(0.090)
LEV_{it-1}	?		-0.223***	-0.284***
			(0.001)	(0.000)
MTB_{it-1}	+		0.047***	0.049***
			(0.000)	(0.000)
Constant		-0.311***	-0.536***	-0.395*
		(0.000)	(0.000)	(0.066)
Industry fixed effects		No	No	Yes
Time fixed effects		No	No	Yes
R^2		0.092	0.503	0.647
Adjusted R^2		0.090	0.488	0.583
F-statistic p-value		0.000	0.000	0.000
Observations		1,705	1,705	1,705

BE models are estimated with UNCON as the dependent variable. The regressions are based on 1,705 observations which represent 352 firms. The coefficient of interest is NUM_FOR_{it+1}. Column (1) estimates the relation between analyst coverage and unconditional conservatism without control variables, column (2) adds control variables and column (3) adds industry and time fixed effects. ***, **, * represent statistical significance of the coefficients at 0.01, 0.05 and 0.1 confidence level, respectively. The p-values are in parentheses.

5.3.2 Results hypothesis 2

Table 13 presents the results for hypothesis 2 related to conditional conservatism. The coefficient of interest is NUM_FOR_{it-1}*BID_ASK_{it-1}. In column (1), I find a significant negative relation between NUM_FOR_{it-1}*BID_ASK_{it-1} and C_SCORE (-0.034, p=0.000): when there is a higher level of information asymmetry, analyst coverage becomes more negatively related to conditional conservatism. The coefficient becomes remains almost the same and becomes more significant after adding control variables and fixed effects (-0.031, p=0.000). This suggests that $H2_b$ can be accepted. The interpretation of the role of NUM_FOR and BID_ASK is different now. The role of NUM_FOR should now be interpreted as the role of NUM_FOR on conservatism for a firm with value 0 for BID_ASK: this means that the estimated coefficient of NUM_FOR is the association with conservatism for a firm with an average amount of information asymmetry. So, for a firm with an average amount of information asymmetry, NUM_FOR is not significantly related to conditional conservatism (-0.001, p=0.387). Looking at the control variables, I find that the relation between BID_ASK and C_SCORE has diminished after introducing the interaction term (0.047, p=0.336). For firms with an average amount of analyst coverage, there is no significant relation between information asymmetry and conservatism. The other control variables have the same effects as in table 11. The full regression in column 3 has an adjusted R^2 of 0.386, which is a slight increase compared to the R^2 in table 11. The p-value of the F-statistic is 0.000, so the variables in the model are jointly significant.

Table 14 presents the results for hypothesis 2 related to unconditional conservatism. In column(1), there is a significant negative relation between NUM_FOR_{it-1}*BID_ASK_{it-1} (-0.140, p=0.016) and UNCON. As information asymmetry increases, analyst coverage becomes more negatively related to unconditional conservatism. This relation still holds after adding control variables and fixed effects (-0.088, p=0.057). This suggests that $H2_b$ can be accepted. The coefficient for NUM_FOR_{it-1} is positive and significant in column 1 (0.009, p=0.000). This suggests that, for firms with an average level of information asymmetry, analyst coverage is positively related to unconditional conservatism. However, this result does not hold after introducing control variables and fixed effects (0.000, p=0.891). The results for the other control variables remain the same compared to table 12. The adjusted R^2 is 0.587, which is an increase of 0.004 compared to table 12: an additional 0.4% of variation in unconditional conservatism is explained by the interaction term. The p-value of the F-statistic is 0.000, so the variables in the model are jointly significant.

Table 13. Results hypothesis 2 conditional conservatism

	E	(1) C_SCORE	(2) C_SCORE	(3) C_SCORE
NUM_FOR_{it-1}	?	0.000	0.003***	-0.001
		(0.907)	(0.000)	(0.387)
NUM_FOR_{it-1}*BID_ASK_{it-1}	?	-0.034***	-0.030***	-0.031***
		(0.000)	(0.000)	(0.000)
BID_ASK_{it-1}	+	-0.543***	-0.700***	0.047
		(0.000)	(0.000)	(0.336)
ROA_{it-1}	?		-0.048	-0.038
			(0.215)	(0.280)
DIV_{it-1}	+		0.616***	0.373**
			(0.003)	(0.018)
$DEBT_{it-1}$	+		0.085***	0.042**
			(0.001)	(0.041)
$INVCYC_{it-1}$	-		0.024	-0.003
			(0.876)	(0.980)
$SIZE_{it-1}$	?		-0.042***	-0.028***
			(0.000)	(0.000)
LEV_{it-1}	+		0.009	0.010
			(0.295)	(0.196)
MTB_{it-1}	+		0.006***	0.007***
			(0.000)	(0.000)
Constant		0.092***	0.381***	0.324***
		(0.000)	(0.000)	(0.000)
Industry fixed effects		No	No	Yes
Time fixed effects		No	No	Yes
R^2		0.033	0.053	0.390
Adjusted R^2		0.033	0.052	0.386
F-statistic p-value		0.000	0.000	0.000
Observations		10,668	10,668	10,668

FE models with robust standard errors are estimated with C_SCORE as the dependent variable. The regressions are based on 10,668 observations that represent 1,684 firms. The coefficient of interest is NUM_FOR_{it-1}*BID_ASK_{it-1}. Column (1) estimates the relation between analyst coverage, information asymmetry and conditional conservatism without control variables, column (2) adds control variables and column (3) adds industry and time fixed effects. ***, **, * represent statistical significance of the coefficients at 0.01, 0.05 and 0.1 confidence level, respectively. The p-values are in parentheses.

Table 14. Results hypothesis 2 unconditional conservatism

	E	(1) UNCON	(2) UNCON	(3) UNCON
NUM_FOR_{it-1}	?	0.009***	-0.001	0.000
		(0.000)	(0.748)	(0.891)
$NUM\_FOR_{it-1}*BID\_ASK_{it-1}$	?	-0.140**	-0.094**	-0.088*
		(0.016)	(0.035)	(0.057)
BID_ASK_{it-1}	+	-1.202***	-0.580**	-0.934**
		(0.000)	(0.049)	(0.006)
ROA_{it-1}	+		0.098	-0.118
			(0.581)	(0.503)
DIV_{it-1}	+		1.684**	2.031***
			(0.013)	(0.003)
$DEBT_{it-1}$	+		0.333***	0.430***
			(0.007)	(0.001)
RD_{it-1}	+		0.269***	0.113*
			(0.000)	(0.059)
$SALES\_GRW_{it-1}$	-		-0.294***	-0.278***
			(0.000)	(0.000)
$SIZE_{it-1}$	?		0.031***	0.022
			(0.008)	(0.103)
LEV_{it-1}	?		-0.222***	-0.273***
			(0.001)	(0.000)
MTB_{it-1}	+		0.047***	0.049***
			(0.000)	(0.000)
Constant		-0.206***	-0.600***	-0.557***
		(0.000)	(0.000)	(0.007)
Industry fixed effects		No	No	Yes
Time fixed effects		No	No	Yes
R^2		0.139	0.509	0.652
Adjusted R^2		0.132	0.493	0.587
F-statistic p-value		0.000	0.000	0.000
Observations		1,705	1,705	1,705

BE models are estimated with UNCON as the dependent variable. The regressions are based on 1,705 observations which represent 352 firms. The coefficient of interest is $NUM\_FOR_{it-1}*BID\_ASK_{it-1}$. Column (1) estimates the relation between analyst coverage, information asymmetry and unconditional conservatism without control variables, column (2) adds control variables and column (3) adds industry and time fixed effects. ***, **, * represent statistical significance of the coefficients at 0.01, 0.05 and 0.1 confidence level, respectively. The p-values are in parentheses.

6. Conclusion

In this chapter, an answer is given to the research question and implications of the findings are discussed. Furthermore, the limitations of this study are mentioned and recommendations for future research are given.

6.1 Findings

Conservatism can result in benefits for stakeholders through the reduction of possible regulation costs, litigation costs and agency costs. Therefore, it is useful for stakeholders to know which factors affect the management's decision to adopt conservative accounting. One factor that received attention in prior literature is the amount of monitoring by external parties on the behavior of management. To these parties, conservatism is a useful monitoring device as it gives earlier signals of unprofitable investment decisions. A monitoring party that has not been examined extensively are financial analysts. Financial analysts can also function as a monitoring device on the behavior of management through the public display of a firm's information and through direct contact with management. Therefore, I have examined the relation between analyst coverage and accounting conservatism. Furthermore, I have examined the role of information asymmetry in this relation.

The first finding is that, overall, analyst coverage is not significantly related to conservatism. This could be because the incentives to be more conservative in accounting and the incentives to be less conservative in accounting are equally strong: shareholders could be demanding more conservatism based on the analysts' reports and management may have an incentive to be conservative in accounting to decrease potential litigation costs, but simultaneously the financial analysts could be pressuring the managers to meet or just beat the forecasts and therefore incentivizing them to not be conservative in accounting. This finding has several implications. First, it contributes to the understanding of the monitoring role of financial analysts. Papers that have previously examined the monitoring role of financial analysts (e.g. Yu (2008), Dyck et al. (2010) and Chen et al. (2015)) concluded that analysts are successful in monitoring the behavior of management. This study shows that the monitoring role of analysts is not so strong that management is more conservative, but it does outweigh the pressure of financial analysts' forecasts to change the level of conservatism. Furthermore, the finding shows that the incentive for management to be more conservative and to be less conservative keep each other in balance such that overall, there is no relation between analyst

coverage and conservatism. This is relevant to policy makers that focus on any of the incentives of management related to financial analysts, to keep in mind when they develop new regulations: if the new policies affect one of these incentives, it could be that the incentives do not keep each other balanced anymore, and the regulation will then have an effect on the level of accounting conservatism. Also, the finding is important to shareholders: shareholders benefit from conservatism and are therefore interested in how firms decide to be more conservative in accounting. From this study, they can conclude that they cannot depend on analyst coverage to make management more conservative in accounting. However, on the other hand, the shareholders do not have to worry that management becomes less conservative due to pressure of optimistically biased analysts' forecasts. Finally, this study shows evidence on the relation between monitoring parties and conservatism. Multiple studies (e.g. Ahmed & Duellman (2007), Krishnan & Visvanathan (2008), and Ramalingegowda & Yu (2012)) have shown that monitoring parties lead to more conservatism, but this study shows that for financial analysts, this is not the case. This is also contradicting evidence to the study of Sun & Liu (2011) who concluded that financial analysts lead to more conservatism in accounting.

The second finding is that as information asymmetry increases, the relation between analyst coverage and conservatism becomes more negative. So when there is a higher level of information asymmetry, accounting conservatism is lower when analyst coverage increases. This is evidence for hypothesis H_{2b}. An explanation for this finding is that the higher level of information asymmetry indicates that management is not being monitored intensively. When this is combined with analyst coverage, management has a lower incentive to implement conservatism and a stronger incentive to implement practices that helps them to meet the forecasts. This combination of information asymmetry and analyst coverage then leads to a negative relation with conservatism. This suggests that when there is more information asymmetry, the role of financial analysts as setting a benchmark for management's performance becomes larger than their role as monitoring party. This finding is a new insight in the relation between analyst coverage and conservatism. The finding implicates that in cases of high information asymmetry, financial analysts cannot be depended on as a monitoring mechanism on the behavior of management. When there are increases in information asymmetry, the monitoring of other parties besides financial analysts become more important as firms experience more analyst coverage. This is relevant for shareholders of firms with higher levels of analyst coverage and stresses the importance of e.g. an independent board and strong corporate governance in case of high levels of information

asymmetry. Regulators may also be interested in these findings when they evaluate the importance of certain monitoring mechanisms such as independent boards. Furthermore, regulators should be cautious of the influence that financial analysts may have on firms regarding financial reporting policies.

6.2 Limitations and recommendations

My thesis, however, suffers from some limitations. The samples do not include any firms with zero analyst coverage. This is because WRDS records zero forecasts the same way as missing values. Using firms with zero analyst coverage in the sample as well could give better results. Also, I have used U.S. firms as the sample. This study could give different results in Europe or other settings as these have different litigation systems which may influence the relation between analyst coverage and conservatism. Finally, I explore the monitoring role of analyst coverage. As control variables, however, I have no other variables that represent other monitoring parties, such as board independence and institutional ownership. I did not include these measures because I have no access to data on monitoring institutions. Furthermore, data on board independence is available from 2007-2015 and only available for a limited amount of companies. As sample 1 runs from 2002-2016 and sample 2 is already quite small without this variable, I have decided not to include this variable in the research design. Future research could re-use my research design with additional control variables related to monitoring by external parties. This leads to more truthful estimates and a better view on the role of financial analysts. A second recommendation would be to explore the causal effect of analyst coverage on conservatism by using an exogenous shock in analyst coverage. This can be done by looking at the merger of brokerage houses. This will give true evidence whether analyst coverage leads to higher levels of conservatism. The third recommendation is to see if the type of financial analyst matters: large brokerage houses give stronger incentives to be more (less) conservative in accounting than smaller unknown brokerage houses. This could influence the relation between analyst coverage and accounting conservatism.

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Appendix

Table 1: Research related to accounting conservatism

Authors	Research question	Methodology	Results
Ahmed et al. (2002)	Do firms that face more severe conflicts over dividend policies use more conservative accounting? How does conservatism relate to the cost of debt?	Conflicts over dividend policy are measured with operating uncertainty, dividends as a percentage of assets and leverage. Conservatism is measured with a market-based measure and an accrual-based measure.	Firms that face more severe conflicts over dividend policy use more conservative accounting, both conditional and unconditional. Accounting conservatism is also associated with a lower cost of debt.
Sivakumar & Waymire (2003)	How do political costs affect conditional accounting conservatism?	They compare the period before and after the Hepburn Act. The act entailed increased regulation of railroad rates. The authors compare conservatism, measured with the Basu (1997) model before and after the Act.	When managers face more hostile rate regulation, there is a higher degree of conditional accounting conservatism.
Ball & Shivakumar (2005)	Are public firms more conservative in accounting than private firms?	They use the model of Basu (1997) and a model based on accruals developed by themselves. A dummy variable is added to the regression to indicate whether a firm is a public or private company.	Public companies are more conservative in accounting than private companies.
Huijgen & Lubberink (2005)	What is the effect of cross-listing on conditional conservatism?	The authors use UK firms that are also listed on the US stock exchange, and compare these to UK firms that are only listed on the	The earnings of cross-listed firms reported according to UK GAAP, are more conservative than the earnings of domestic UK firms that

		UK stock exchange. They measure conservatism with the Basu (1997) model.	were not cross-listed. No significant difference was found between UK GAAP earnings of cross-listed firms and their US GAAP earnings.
Ahmed & Duellman (2007)	What is the effect of board independence and outside directors' monitoring incentives on conditional conservatism?	They use the percentage of inside board members as a measure of board independence, and the percentage of shares held by outside directors as a measure of monitoring incentives. They measure conservatism with the model of Basu (1997).	They find that conditional conservatism decreases with the percentage of inside board members and increases with the percentage of shares held by outside board members.
Qiang (2007)	How do the explanations for conservatism affect conditional and unconditional conservatism?	The author estimates two regressions for conditional and unconditional conservatism and incorporates all explanations described by Watts (2003) as independent variables.	Contracting costs increase conditional conservatism, litigation costs lead to both higher conditional and unconditional conservatism and taxation costs lead to higher unconditional conservatism.
LaFond & Roychowdury (2008)	What is the relation between managerial ownership and conditional conservatism?	Managerial ownership is measured as stocks owned by the CEO, and as stocks owned by the top five highest compensated managers. Conditional conservatism is measured with the model of Basu (1997).	When ownership and control are more aligned, there is a lower level of conservatism.

LaFond & Watts (2008)	What is the relation between information asymmetry and conditional conservatism?	Information asymmetry is measured with the PIN score and bid-ask spread. Conservatism is measured with the model of Basu (1997).	Higher information asymmetry leads to more conservative accounting, in the same year and in the next year, which reduces the information asymmetry level that existed previously.
Krishnan & Visvanathan (2008)	What is the effect of audit committee members' accounting financial expertise on conservatism?	They measure conservatism with two accrual-based measure, one measure based on the book-to-market ratio and a score that captures unrecorded assets on the balance sheet.	Audit committees with accounting financial expertise increase conditional and unconditional conservatism in accounting.
Wittenberg-Moerman (2008)	What is the effect of conservatism on the information asymmetry in debt markets?	Conservatism is measured with the Basu (1997) model and the model of Khan & Watts (2007). Information asymmetry is measured with the bid-ask spread of loans. The authors include control variables such that they capture the adverse selection component of the bid-ask spread.	Timely loss recognition, thus conditional conservatism, reduces the bid-ask spread at which loans are traded.
García Lara et al. (2009)	What is the effect of strong corporate governance on conditional conservatism?	Strong corporate governance is defined as having a low level of antitakeover protection and a low influence of the CEO on the board. Conservatism is measured with the model of Basu (1997).	Strong corporate governance leads to a higher degree of conditional conservatism.

Khan & Watts (2009)	How can we measure conservatism on a firm-level? What is the effect of litigation, stock return volatility and information asymmetry on conditional conservatism?	The authors measure conditional conservatism with their own developed conservatism score, the C-score. Information asymmetry is measured with the bid-ask spread.	Conditional conservatism increases after significant changes in information asymmetry and return volatility. The probability of litigation increases at the same time conservatism increases.
Nikolaev (2010)	Does more extensive use of debt covenants lead to a more conservative accounting?	The extensive use of debt covenants is measured by determining the amounts of covenants within contracts. Conservatism is measured with the model of Basu (1997).	Using more covenants in public debt contracting leads to a higher degree of conditional conservatism.
Sun & Liu (2011)	What is the relation between analyst coverage and conservatism?	Analyst coverage is measured as the total number of analysts who issue forecasts of year t+1's earnings per share for a firm during year t. Conservatism is measured with the model of Basu (1997) and a firm-specific bias component of the book-to-market ratio.	Analyst coverage leads to increases in conditional and unconditional conservatism.
Ramalingegowda & Yu (2012)	What is relation between institutional ownership and conditional conservatism?	They classify institutions into monitoring and non-monitoring institutions based on investment horizons, concentration of holdings and independence from management. Conservatism is measured	More ownership by institutions that are more likely to monitor managers, leads firms to adopt more conservative accounting.

		with the model of Basu (1997).	

Table 2: Research related to analyst coverage

Authors	Research question	Methodology	Results
Moyer et al. (1989)	What are the determinants of monitoring by security analysts?	The authors use the number of analyst forecasts as the dependent variable, and as independent variables insider stock ownership, debt-to-equity ratio, number of owners, market value of stocks, institutional ownership and earnings volatility.	Analyst coverage increases with the number of shareholders, the market value of stocks and institutional ownership. Analyst coverage decreases with insider ownership and the debt-to-equity ratio. Volatility had no significant relation with analyst coverage.
Yohn (1998)	What is relation between earnings announcements and information asymmetry?	The author investigates the bid-ask spread around earnings announcements. He incorporates several other independent variables such as analyst following.	Bid-ask spreads reduce when there is more public information. Bid-ask spreads increase when there is a stronger market reaction to unexpected earnings. Bid-ask spreads also increase in the days before and the day of the earnings announcements.
Barth et al. (2001)	What is the relation between analyst coverage and the size of a firm's intangible assets?	The authors measure analyst coverage as the number of analysts with earnings forecasts for the current fiscal year in the month closest to the annual earnings announcement and examine whether this increases with larger research and development and advertising expenses.	Intangible assets are associated with higher analyst coverage. Analyst effort is also greater for firms with more intangible assets.
Frankel & Li (2004)	What is the relation between a	They measure the information environment	Informativeness of financial statements is

	firm's information environment and information asymmetry between insiders and outsiders?	with financial statement informativeness, news and analyst coverage. To measure information asymmetry, they use the profit insiders make on their trades and the intensity of insider trading.	associated with less insider purchases. News is associated with more insider purchases. Analyst coverage reduces the profit insiders make on their trades, and it reduces the amount of insider purchases.
Lang et al. (2004)	What is the relation among ownership structure, analyst coverage, investor protection and valuation?	As dependent variables the authors use analyst following and Tobin's Q. As independent variables, they use ownership variables. Furthermore, they split the sample into firms with high and low shareholder protection.	Analysts are more likely to follow firms that have fewer incentives to manipulate information. They also find that the relation between analyst following and firm value is stronger for firms with poor corporate governance. Investors perceive firms with poor corporate governance as less bad when analysts are present.
Graham et al. (2005)	What factors drive decisions about earnings reporting and disclosure?	The authors sent out a survey to more than 400 executives and interviewed them.	The most relevant findings were that 50.8% of the CEOs disclosed more voluntary information to attract financial analysts, and that 73.5% of the executives see analysts forecasts as an important benchmark when they report quarterly earnings numbers.

Yu (2008)	What is the relation between analyst coverage and earnings management?	The number of analyst forecasts is regressed upon determinants. The residual is the measure of analyst coverage. Earnings management is measured with discretionary accruals. This is regressed upon the residual. Finally, it is retested with an IV approach.	Firms with higher analyst coverage engage less in earnings management. This effect was stronger for analysts from top brokers and analysts with more experience.
Dyck et al. (2010)	What are the most effective mechanisms to detect fraud?	They examined all reported fraud cases between 1996 and 2004 in the United States.	Analysts only detected the fraud in 16.9% of the cases but were more effective at detecting fraud than auditors and the SEC.
Lehavy et al. (2011)	What is the effect of the readability of 10-K filings on analysts' behavior?	Readability is measured with the Fog-index. Analysts' behavior is measured with analyst following (the number of forecasts) and informativeness of their reports. Dispersion, accuracy and uncertainty in the analysts' forecasts are also examined.	Higher readability is related to less analyst following and less informative reports. Higher readability leads to less dispersion, higher accuracy and less uncertainty in forecasts.
Lobo et al. (2012)	What is the relation between analyst coverage and information asymmetry?	Analyst coverage is measured as the logarithm of the number of forecasts. They regress this and analysts' private information on lagged accruals quality (the proxy for information asymmetry) and control variables.	Analyst coverage increases as accruals quality decreases. Forecasts for firms with lower accruals quality contain more private information.

He & Tian (2013)	What is the effect of financial analysts on innovation?	They use an exogenous shocks in analyst coverage, and an instrumental variable approach. Innovation is measured as the number of patents and the impact of patents.	Analyst coverage has a negative effect on firm innovation. The firms generate fewer patents and patents with lower impact.
Chen et al. (2015)	What is the effect of analyst coverage on reducing expropriation of outside shareholders by management?	They use two exogenous shocks to analyst coverage. Expropriation is measured with excess compensation of the CEO, value-destroying acquisitions and earnings management.	When there is an exogenous decrease in analyst coverage, the firm's CEO receives more compensation, there are more value-destroying acquisitions and managers are more likely to engage in earnings management.
Allen et al. (2016)	What is the effect of analyst coverage on corporate tax aggressiveness?	They use exogenous decreases in analyst coverage. Tax aggressiveness is measured with the tax shelter prediction score and the discretionary component of difference between financial and taxable income.	More analyst coverage leads to less tax aggressiveness.
Hassan & Skinner (2016)	What is the relation between listing location and analyst coverage?	Analyst coverage is measured with the number of forecasts issued. Listing location is measured with listing on the main market which results in more dispersed ownership for firms.	Listings on markets with more dispersed ownership, and thus more information asymmetry and agency problems, leads to increases in analyst coverage.

Table 3. Variable definitions

Conditional conservatism	
C_SCORE	Measure of conditional conservatism
$_{C}$RET	Return on firm i from 9 months before the end of the fiscal year to 3 months after the end of the fiscal year
D	A dummy variable that equals 1 if $_{C}$RET for firm i is negative and 0 otherwise
X	Net income before extraordinary items scaled by lagged market value of equity
MTB	Market-to-book ratio
LEV	Short-term plus long-term debt divided by the market value of equity
SIZE	The natural logarithm of the market value of equity at the end of year
Unconditional conservatism	
UNCON	The bias component of book-to-market ratio
$_{U}$RET	Return on firm i over year t
Independent variables	
NUM_FOR	The number of annual EPS forecasts for firm i issued by financial analysts in year t
Control variables	
BID_ASK	The bid-ask spread on the stock of firm i scaled by the midpoint of the bid-ask spread
ROA	Firm i's net income before extraordinary items divided by total assets
SALES_GRW	The annual percentage change in sales of firm i
DIV	Firm i's common dividends divided by its total assets
DEBT	Firm i's long-term debt divided by its total assets
RD	Research & development expenses divided by total sales
INVCYC	Firm i's depreciation expense divided by lagged total assets
INDUSTRY	Categorical variable with two-digit SIC codes
TIME	Time fixed effects

Table 6. Sample selection

Panel A: COMPUSTAT

Start observations		100,920
Drop if a firm's fiscal year does not end in December	27,435	
Drop if cusip is missing	111	
Drop if book value of equity, total assets or paid dividend is less than 0	7,027	
Drop missing observations	33,206	
Final sample		33,141

Panel B: I/B/E/S

Start observations		788,373
Collapse to obtain the mean per firm-year		74,726

Panel C: CRSP

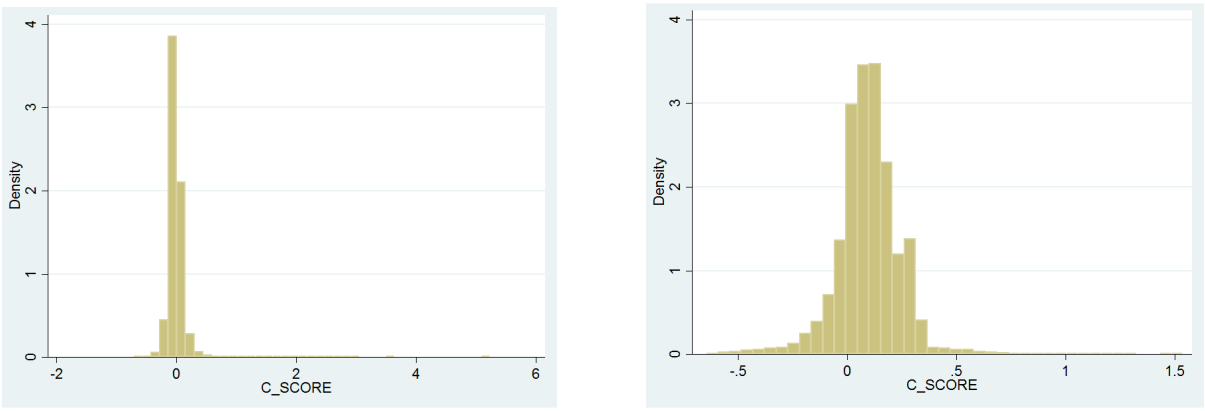
Start observations		1,269,010
Drop observations with missing data on returns and bid-ask spread	15,152	
Firms-month observations in CRSP		1,253,858
Final sample with firm-years		119,254

Panel D: Merge datasets

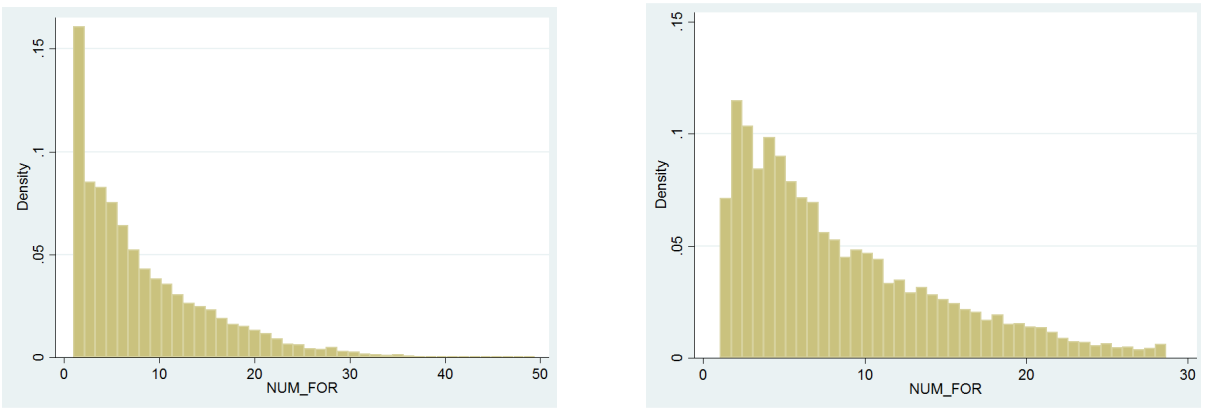
Number of matches after merging Compustat with IBES		15,973
Number of matches after merging Compustat/IBES with CRSP		15,632
Drop outliers of final variables and variables needed to calculate UNCON and C_SCORE	1,933	
Observations sample 1 (final)		13,699
Drop if a firm does not have 6 subsequent years with stock returns available	9,382	
Drop if RD is missing	2,129	
Drop outliers for UNCON, RD and SALES_GRW	17	
Observations sample 2 (final)		2,171

Figure 5. Outlier removal (before and after)

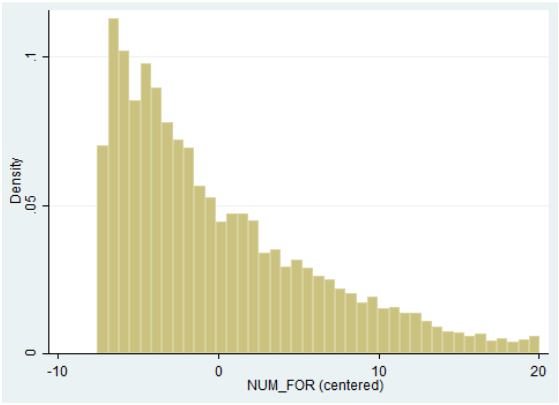
C_SCORE



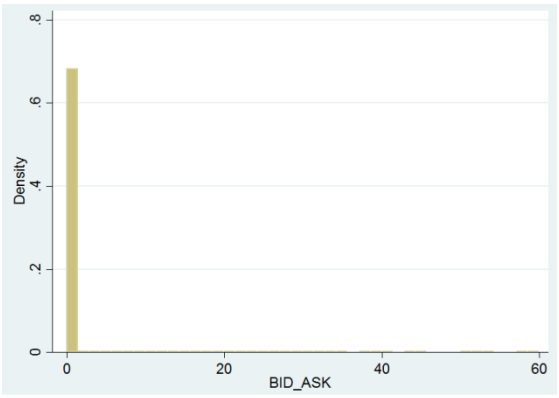
NUM_FOR

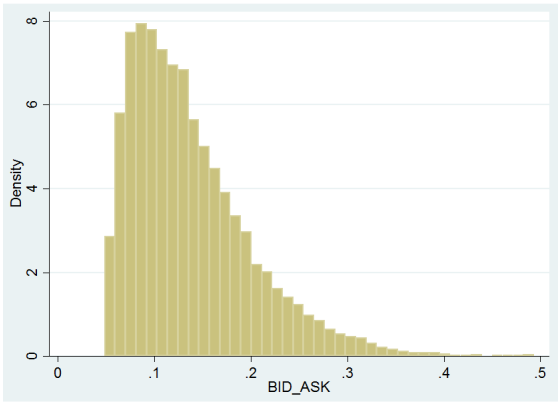


NUM_FOR (centered)



BID_ASK





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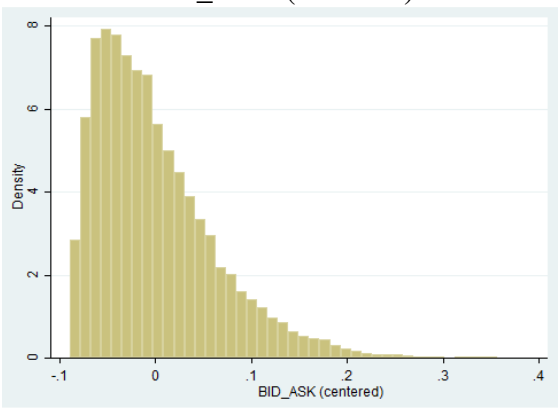

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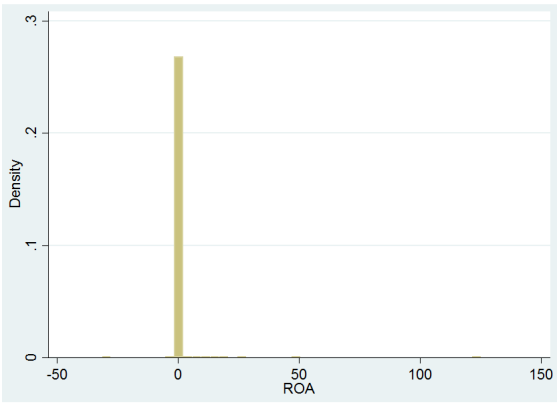
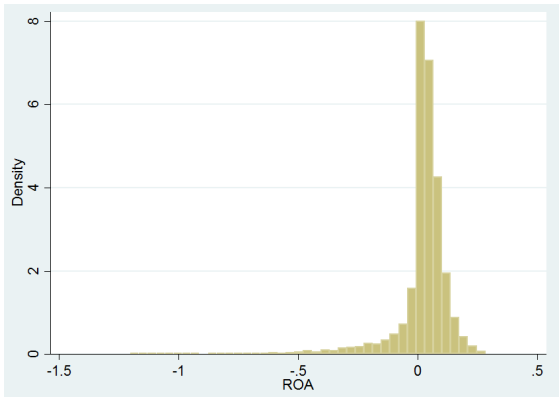
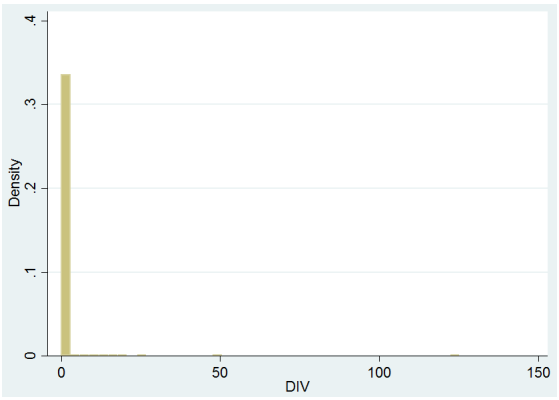
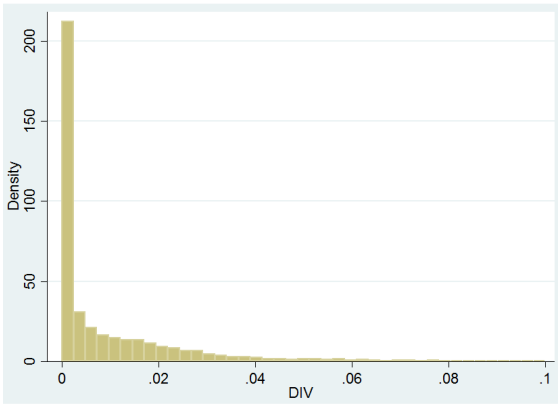




DIV





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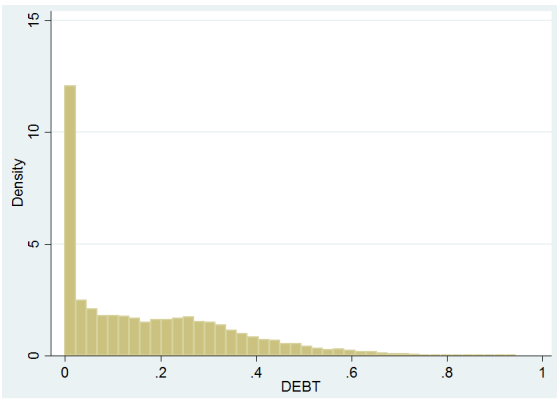
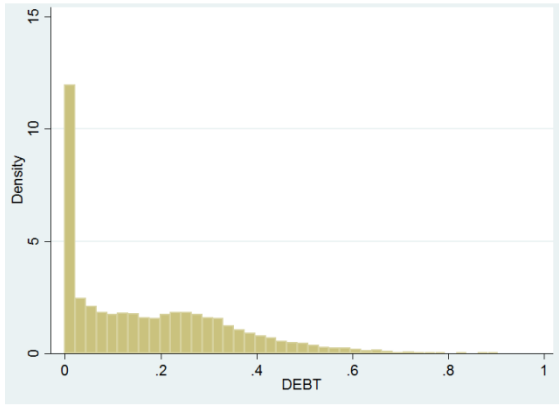
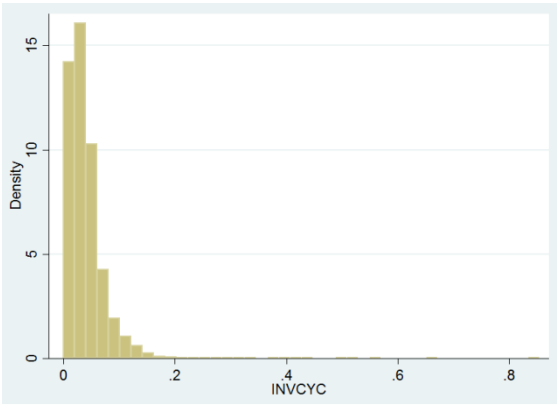
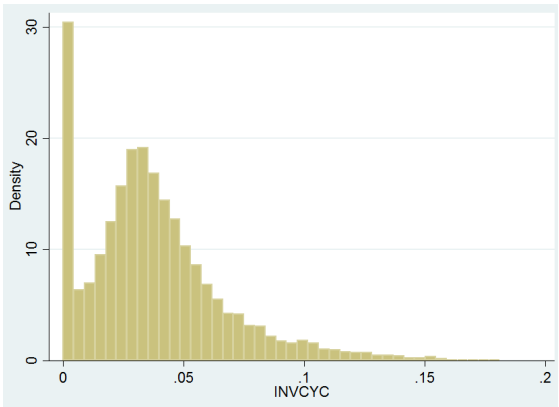




INVCYC





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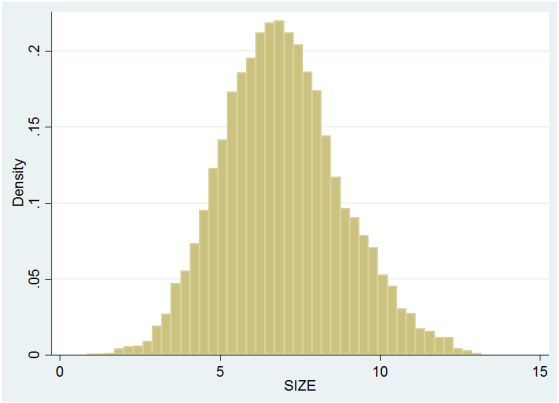
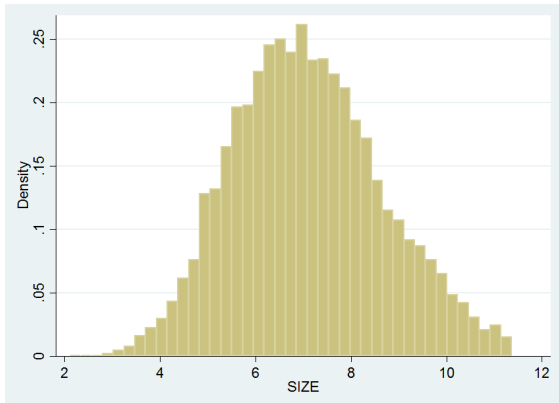
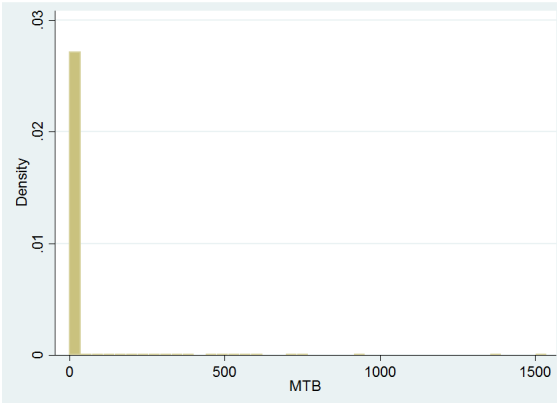
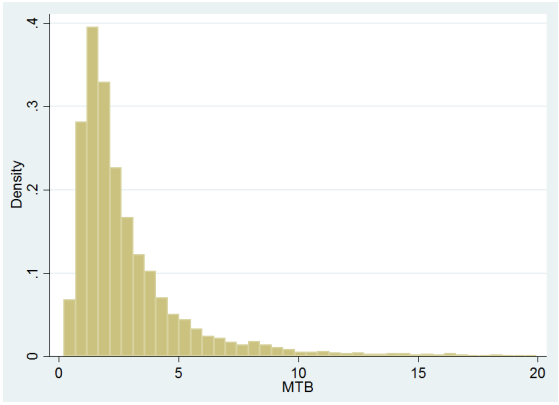




MTB





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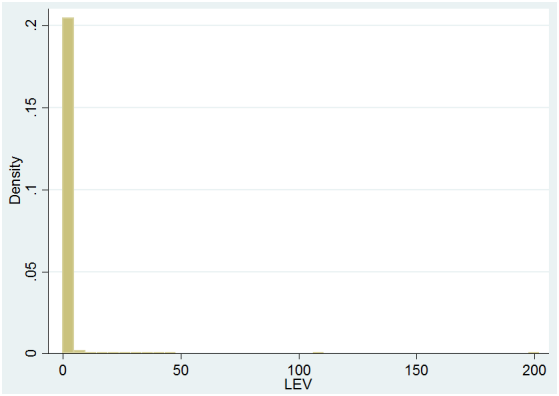
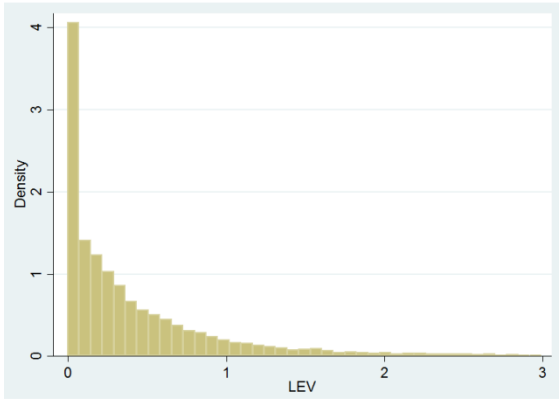
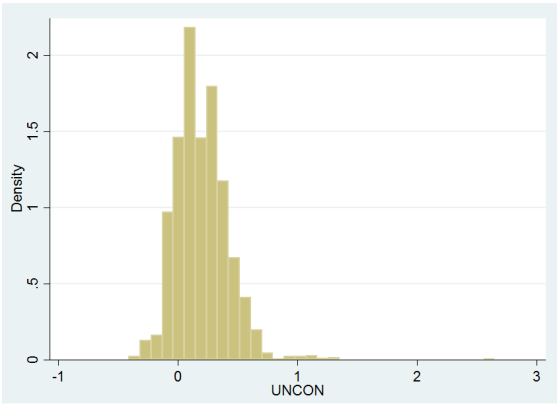
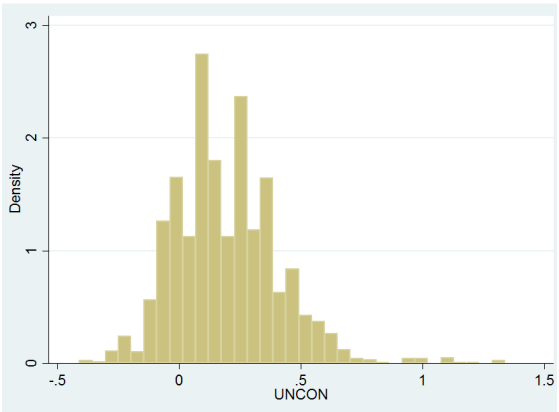


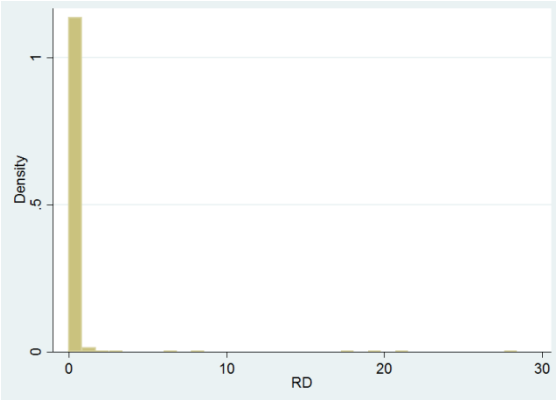


UNCON





RD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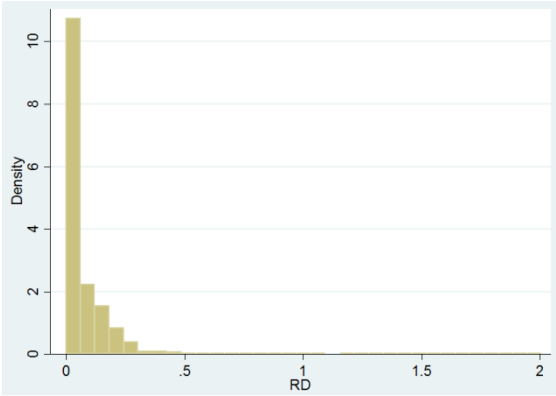
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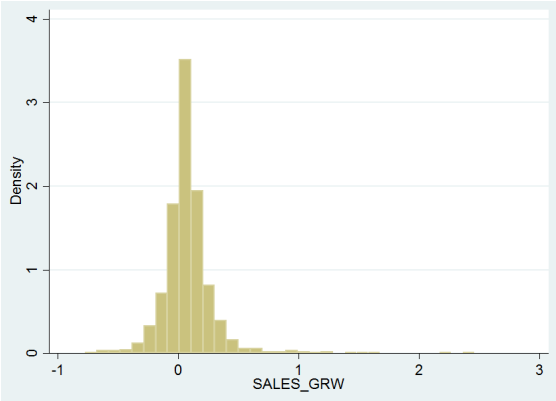
SALES_GRW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3
SALES_GRW

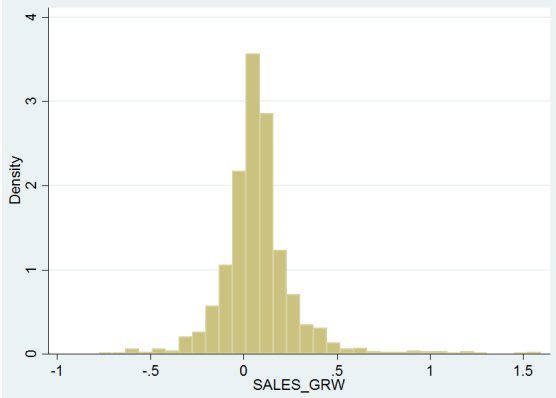
Density
0
1
2
3
4
-1
-.5
0
.5
1
1.5
SALES_GRW

Figure 6. Libby boxes H1

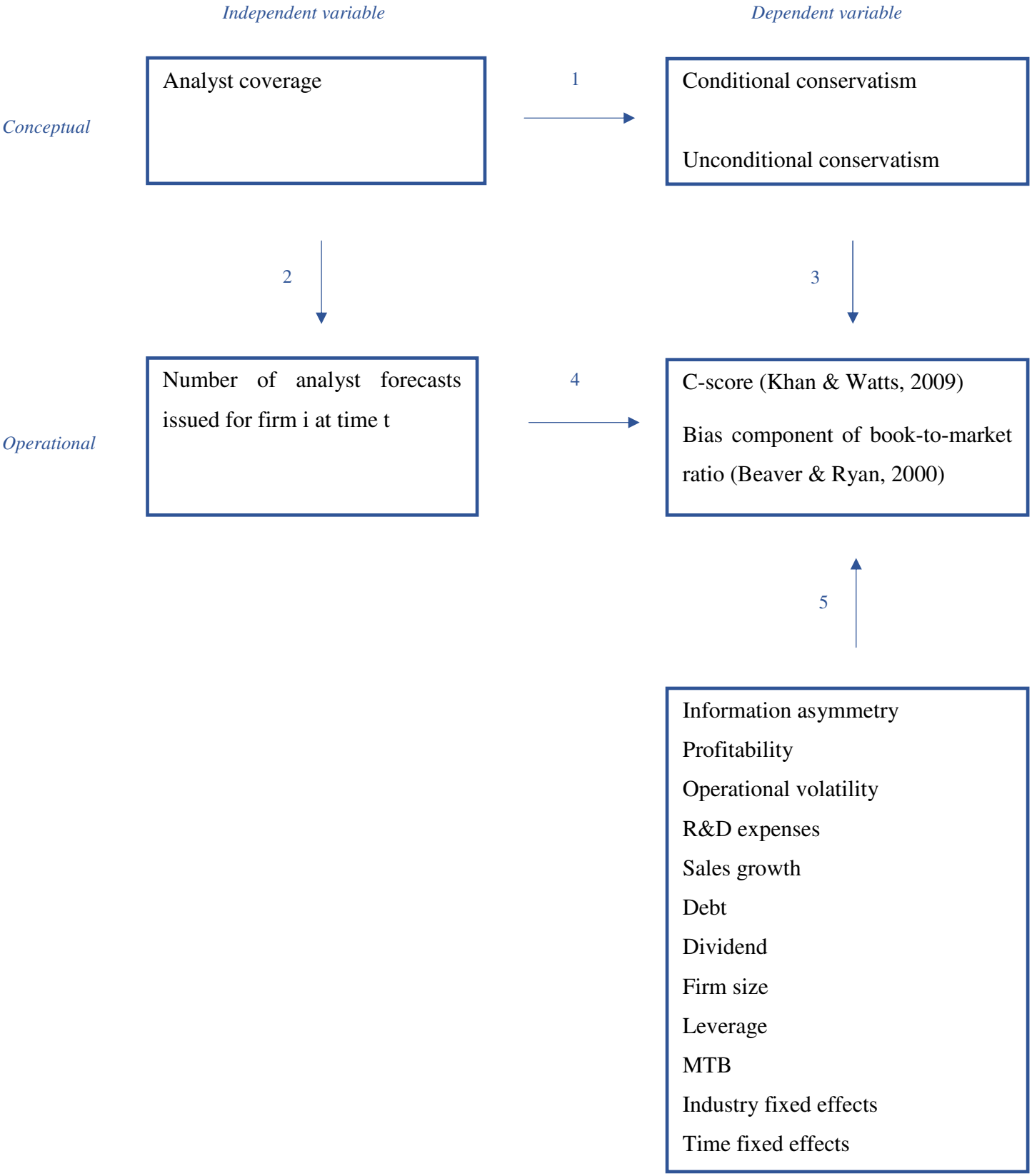

Figure 7. Libby boxes H2