MSc. Thesis

The relevance of income statement and special items on the forecast accuracy and dispersion of security analysts

Author:
Marco Groenewegen

Erasmus Supervisor:
Jaeyoon Ju

March, 2017

Abstract

This thesis investigates a potential relation between discretionary items in net income and properties of earnings forecasts. Measures for these properties are forecast accuracy and dispersion. To measure accuracy, I compare the forecasted to actual earnings per share. For dispersion, I use the range of analyst estimates. Under the assumption that discretionary income statement items contain noise and distortion, I investigate which of these items and to which extent these items influence security analysts' performance. The analysis is performed on Dutch listed firms over the period of 2004-2014 with a total sample of 996 firm year observations. Results show that forecast accuracy and forecast dispersion is affected by greater discretionary items in net income. Overall, results suggest that items in net income do not significantly influence analyst forecast performance, measured by forecast accuracy and dispersion.

Key words: Properties of earnings forecasts, forecast accuracy, forecast dispersion, earnings per share, discretionary items, special items, income statement.

Table of contents

1 Introduction

1.1 Main research question

The goal of this research is to provide insights to which extent properties of analyst forecasts(accuracy and dispersion) depend on financial statement characteristics. The thesis investigates a possible relation between discretionary financial statement items and forecast accuracy and dispersion. The factors that influence the analysts' estimates are from a financial statement characteristic point of view and contain the income statement and special items included in the financial statements. Are analysts in a better position when it comes to forecast estimation when the financial statements have certain characteristics? Forecast accuracy is important because many stakeholders rely on forecasts for future investments or issuing debt. There are many analyst and banking firms who provide future earnings estimates on which investors and other stakeholders base their decisions (Abarbanell & Bushee 1997). Showing a relation between the characteristics of the financial statements and the accuracy of these forecasts makes it that these stakeholders are able to rely more heavily on these forecast estimates and prove the utility and added value these analyst firms provide towards stakeholders. This can eventually lead to less information asymmetry and more decision usefulness between analysts and the parties who rely upon their forecasts. The research question therefore is:

Is there a relation between financial statement characteristics and analyst forecast accuracy?

With the answer to this research question insights are given into the potential effect that financial statement characteristics have on the accuracy of analysts' forecasts. Analyst have a function as information intermediaries in capital markets. Several studies find a relation where stock prices tend to move in the direction of analyst estimates and revisions, suggesting that the capital market reacts to these forecasts (Givoly & Lakonishok 1979; Lin & McNichols 1998; Kirk 2011). That stock prices tend to move in the direction of these forecasts, signals the influence these analysts have on the capital markets. Investors may want to rely more heavily on forecasts that are more precise, which can lead to less information asymmetry and more decision usefulness among investors and stakeholders and leading to overall more investments and a higher demand for analysts' services. Earlier research conducted in this field took only into consideration audit firm characteristics, and no financial statement characteristics. This

thesis will therefore also incorporate focus on the income statement and special items included in the financial statements.

1.2 Contribution to literature

The contribution of this research is to investigate and possibly provide additional factors that might be incorporated as future indicator of earnings. If this research shows that there are financial statements items that relate to forecast properties, then this will offer potential for future research. Analysts forecasting properties may be an indicator of future firm and economic performance.

Another point of interest is the value of analyst forecasting. When analyst forecasts are inaccurate and widely dispersed, it is hard for stakeholders to derive a true and fair view of analyst forecasting, implying that analysts might have other incentives than accurately estimating future earnings. As Bradshaw (2009) states in figure 1.2, analysts process their information into a forecast, but how they exactly process their information is unclear. Therefore, I want to investigate whether there is a relation between financial statement items and properties of earnings forecasts. By this, the black box of information processing becomes clearer, because I identify some factors which (positively) influences the accuracy of the forecast.

Behn et al. (2008) investigated whether forecast accuracy is related to audit quality and find that forecast accuracy is related to certain auditor characteristics such as size and specialization. Combining my research the research of Behn et al. (2008) will provide an overall insight in the effect of financial statement and auditor characteristics on the accuracy of analysts' forecasts. The dependent variable is constructed in the same way as Behn et al. (2008) in order to provide comparability between both topics.

1.3 Findings and implications

Results of this study show that income statement items such as income taxes, non-controlling interests, net income and interest expenses significantly influence forecast accuracy and dispersion but other income statement items do not. I expect that when discretionary income statement items are larger, it is harder for security analysts to increase accuracy. Special items are non-recurring items in the financial statements, such as costs incurred during a reorganization. Special items in the financial statements do not influence properties of earnings forecasts. When answering the research question: "Is there a relation between financial statement characteristics and analyst forecast accuracy?", the overall conclusion is no. Only certain income statement items affect forecast accuracy and forecast dispersion. Special items do not significantly influence forecast accuracy. The effect of special items on dispersion shows that special items

do not influence forecast dispersion. This might indicate that special items are processed in a similar way by analysts. Overall results implicate that successful analysts are more likely to incorporate other variables in their analysis than income taxes, non-controlling interests, net income and interest expenses. From a regulatory point of view, results implicate that inaccurate investors rely more on these significant items. Regulators may implement a certain compaction(i.e. breakdown of these components to persistent and not-persistent parts) so stakeholders have a better starting point to estimate which parts are recurring and which not, on which they can base their decision on.

1.4 Research structure

The thesis is structured in seven sections. In section two, I will elaborate on the theoretical framework and existing literature. From this literature and theory review, certain expectations will arise on which my hypotheses will be developed, which are stated in section three. Section four will explain the research design. As research design a regression is used to estimate the influence of the selected income statement items on properties of analyst forecasts. Data is directly available from Compustat Global and the I/B/E/S/ database. Section five will describe the statistical analysis and empirical results. Section six will provide and overall conclusion. In section seven I include the limitations, implications and suggestions for future research.

2 Theoretical background & Key related literature

In this section I will elaborate on existing theories that are applicable to this research. I will start with the flow of capital between capital providers and capital users to show how security analysts are positioned in the capital market. During this process, I will use the theories of information asymmetry and agency theory in order to gain an understanding which role security analysts have and how they can decrease information asymmetry problems. Subsequently, existing research that lies in the same field as this research will be discussed.

2.1 Theoretical background

2.1.1 Flow of information

To sustain wealth and growth in an economy, it is important that businesses can sustain growth and wealth by sufficient funding from capital markets. This funding starts at the households, which are the prime supplier of investment capital for new and existing businesses (Healy & Palepu 2001). When savings are allocated to investment ideas, wealth and growth arises, assuming that these investments produce positive returns. If these savings are being used for poor investments, returns might be lower or even negative. This will diminish the invested capital, resulting in lower total wealth and growth. Households are thus the prime supplier of capital which is subsequently used to invest in order to obtain a sufficient return, depending on the risk-willingness of the individual. Savings can be distributed on the capital markets in two ways, as shown in figure 1.1:

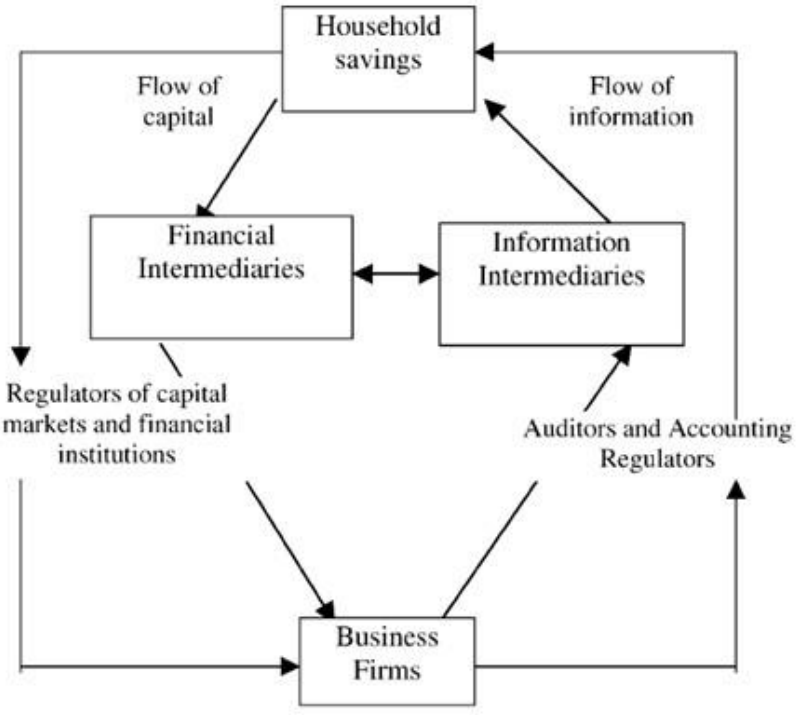


Figure 1.1 (Healy & Palepu 2001. P. 408)

In the first way, savings flow to businesses directly. Another way is to deploy financial intermediaries, who invest on behalf of the households. These can be, among others, institutional banks, pension funds and insurance companies. The right half of the figure explains the flow of information from companies to households. This can either be done directly to households via financial statements or press releases. The other way is to communicate through financial intermediaries such as auditors and security analysts, who subsequently communicate their findings to investors and financial intermediaries. The findings provide information about the quality of investment opportunities, and which investments may be yielding good or bad returns or are under- or overvalued (Healy & Palepu 2001).

On the capital market, there is a constant play between supply and demand where investors are constantly looking for investments, while businesses are looking for funds by which they can stimulate their businesses to grow. However, making the right investment decision is accompanied by uncertainties regarding the quality of the investment (Akerlof 1970). In general, when making an investment decision, investors do not know which investment yields a good return. This implies that investors will face agency problems and cope with information asymmetry. Additional to this problem, the positive accounting theory elaborates on how managers make decisions regarding their business' accounting policy, and the reasons behind these decisions (Watts & Zimmerman 1986). Combining these problems and theory, I will explain how security analysts can add value by comprising all this information and facilitate a future outlook for investors.

2.1.2 Efficient Market Hypotheses

The efficient market hypothesis (EMH) knows three forms a market can have when there is a securities market and investors who buy those securities. The EMH assumes a world where there are two variables: price and information. A market would be efficient when all available information is included in stock prices. The weak form of the EMH suggests that stock prices reflect historical information and prices and that there is no way to obtain a competitive advantage because stock prices will follow a random walk.

The semi-strong form of the EMH asserts that the stock price contains information that consists of information that is publicly available and historical stock prices. It would be impossible for an investor who bases his investments on an analysis of the financial statements in combination with all publicly available data to gain a competitive advantage due to the fact

that these two sources of information are already incorporated in stock prices, suggesting that no competitive advantage can be obtained by only using these resources.

The strong form of the EMH states that all the information that is available, to any participant in the market, is fully reflected in the market price of a security. This also means that all private information is reflected in the stock price, and that by no means any participant in the stock market –even an insider– can obtain a competitive advantage and hereby earning abnormal returns (Fama 1998).

2.1.3 Information asymmetry

The information asymmetry problem is also called the lemons problem and was elaborated by Akerlof (1970). This theory assumes that the market can be divided into two parts regarding the quality of investments. One part is considered a good investment, while the other part is considered a bad investment by the market. Both investments will claim that their investment is good. Investors will anticipate on this given, in the way that they will value both bad and good investments at an average level. This implies that investors are willing to pay a price that is below the price of good investments, and above the price of bad investments. Good investments will thus leave the market and only bad investments will remain. Because of the fact that bad investments dominate the market, investors will lose confidence and eventually leave the market, breaking down the whole market. Another aspect of information asymmetry is that investors do not have enough skills and knowledge to completely understand financial statements. This expertise asymmetry makes it that individual investors are not able to fully distinguish between good and bad investments, which leads to a non-optimal allocation of capital (Palepu et al. 2013).

2.1.4 Special items

There are items in the financial statements that are less frequently occurring compared to the regularly items such as assets and liabilities. Two irregular items have to be reported in financial statements: Discontinued operations and extraordinary items. Discontinued operations occur when a company disposes a certain line of business or activity. Extraordinary items have to meet up to two types of criteria. First, they have to be unusual in nature. Second, they have to be infrequent in occurrence. An item is unusual when it occurs only incidentally and is not part of daily business activities. An item is infrequent when there is no reasonable expectation that it will occur in the foreseeable future again. (Kimmel et al. 2009). When the above stated has to be summarized while minding the General Accepted Accounting Principles(GAAP), special items can be described as follows (Revsine 2005).:

“Material events that arise from a firm’s ongoing, continuing activities, but are either unusual in nature or infrequent in occurrence –but not both– and must be disclosed as a separate line item as part of income from continuing operations, or in footnotes to the financial statements”.

Discontinued operations are a part of income that are disaggregated from the continuing operations and showing that these operations are non-recurring in nature. The essential part is that investors see that the gain or loss from such operations are non-recurring and therefore these investors may adjust their expectations. Special items can contain a loss or a profit. The nature however, can be widely dispersed. Special items consist among others of adjustments applicable to prior years, nonrecurring items, bad debt expenses and nonrecurring profit or loss on the sale of assets, investments and securities (Fairfield 2009).

The first impression of positive special items is that these inflate current income, resulting in higher earnings per share. However, the disposal of these items may implicate that future outlook is less favorable for these items, and that profitability of the firm will decrease, implying lower net income for future years. At the other hand, negative special items will negatively influence net income and might raise awareness about the future profitability of the firm.

The nature of special items is highly important when judging the future economic outlook of a firm incurring such costs. Restructuring charges might be related to a department which is not competetive anymore and has to be shut down. In the year of restructuring, net income will be lower due to the costs incurred during restrcuturing. However, these restructuring might imply a better future outlook including less costs of the incompetetive department, implying that future income will be higher and raising earnings per share (Dechow & Ge 2006).

Another point of interest here is managerial discretion and big bath accounting. Managers have the ability to provide discretion in restructuring charges, implicating that the provisional costs a of restructuring might be estimated too low or too high. When these estimates are too high or too low, the future effect will be that this excess share of the estimate will be added back to profit(equity) or loss, which eventually affects earnings per share again (Levitt 1998).
These are all factors that security analysts face on a daily basis and gain experience with over time. In addition to this, security analysts will gain industry knowledge (Bradshaw 2011). Based on this knowledge and experience, analysts should be able to mitigate noise and distortion in this information. However, the expectation is that, the bigger the special item is, whether negative or positive, the amount of distortion is proportionally big (Mikhail et al. 1997).

When investors include the gain or loss from discontinued operations into their future outlook for the company, the future outlook may be too high or too low, and therefore they

should adjust for these discontinued operations (Curtis et al. 2014). Special items thus influence the future stock price of a firm due to the fact that different investors have different perceptions about the future implications of special items in the financial statements now. While there is a year between reporting the special items and the stock price, the market underreacts to the effect of special items on security prices. Special items influence the future stock price and along with this, affects the forecasts of analysts (Burgstahler et al. 2002). Positive special items are associated with a small positive effect in earnings for the next period, while special items that carry a loss, are also associated with a positive effect in future earnings. This can (partly) be explained by the expenses that are incurred while facing a loss on a special items. These expenses are perceived as shifted expenses from future periods to current period. This will lead to lower future expenses, and thus higher future income (Burgstahler et al. 2002). Another issue with special items is that the reasoning behind the processing of the special item is more complicated than it seems. Managers can shift future expenses in order to increase future earnings(i.e. taking a 'bath'). Another property of special items is the underlying economic substance of them. Special items can occur while ending a certain business line, but also occur when inventory faces a big write off. And the nature of such a big write off can lie in the fact that the inventory is outdated, but also might be that the demand for this inventory is increasing rapidly, which affects future outlook for the firm and its growth. For an outside investor, it is thus hard to define the nature of special items and how they affect earnings (Levitt 1998).

2.2 Prior research

In this part I will discuss prior research which investigates the properties of earnings forecasts and how these are affected. Analyst related literature will be discussed per subject to show what affects analysts' choices to follow firms and how they develop and process information they include in their reports and recommendations. This will create a literature framework on which, in combination with my theoretical framework, will base my expectations and hypotheses on, which I will discuss in section three.

2.2.1 How analysts work

A security analyst is an information intermediary who uses the information of managers and financial statements to process forecasts that are used by investors who do not have the ability or time that analysts do have (Bradshaw 2011). Financial intermediaries have an effect on the process of disclosure and overall market efficiency. A higher analyst following can have an effect on how fast information is incorporated into prices. Healy and Palepu (2001) review literature regarding the role of disclosure on capital markets and find that stock prices of firms

that are followed by a large amount of analysts tend to incorporate information about cash flows and accruals faster than firms that have less coverage of analysts.

Security analysts have a role in capital markets as information intermediaries within the market and have the function to fore spell the firms' future performance. Analysts use financial statements to recommend certain companies, along with a buy, hold or sell advice (Schipper 1991). They use the financial statement information to base their judgment on as well as to support their recommendations. The financial statements also create an opportunity to compare companies based on the same items. All items on the balance sheet give a snapshot of the assets and liabilities a company has on a certain date. These quantitative financial statement characteristics can be used to derive ratios, which then again can be used to judge a firm's health, efficiency and it's continuity (Barnes 1987). Understanding the way how and which information is processed by analysts gives insights in the information that is impounded in stock prices (Bradshaw 2011).

Beyer et al. (2010) investigate the recent literature regarding the use of accounting information in capital markets. They describe the role of accounting information and its components and the effect of this on the stock return variance. Accounting information has two main functions. It provides its users with information regarding the future potential and valuation of investment opportunities, which is called the valuation role of accounting. Second, accounting information gives investors and capital providers insights into the allocation of the capital they provided, which is called the stewardship role of accounting information.

Security analysts are frequent users of financial statements and evaluate the quality of this information by assessing the usefulness of the information included in the financial statements. They assess the usefulness of information by determining to which extent the provided information contains noise and distortion. Under the assumption that a security analyst wants to estimate future earnings as precise as possible, this analyst will try to cancel out noise and distortion in the financial statements to eventually arrive at a clear earnings number, free of noise, distortion and discretion (Athanasakou et al. 2007). While there is no single definition of earnings quality, it can relate to the behavior of earnings over time and its predictability, or the predictive value of earnings, whereby high quality earnings are earnings that lead to better forecasting of future firm performance. By cancelling out noise and distortion, analysts try to raise earnings quality in order to compose forecasts with the highest accuracy possible. Higher quality earnings should thus imply that analysts could make more accurate forecasts than when earnings quality is low (Barker & Imam 2008).

Related to earnings quality is audit quality. Behn et al. (2008) are the first who investigated the relation between audit quality characteristics and forecast accuracy and dispersion. Their expectation is that higher audit quality increases the quality of financial statements, by which analysts can obtain more and better information. Subsequently, this leads to analyst forecasts which are more accurate and less dispersed. How accurate an analysts' forecast is, can be deducted from its forecast accuracy. Forecast dispersion shows how analysts' opinions are divided regarding their forecasts. Forecast dispersion is a reflection of information uncertainty among security analysts. If the expectation of future earnings by analysts widely varies, it shows that these analysts don't have a single view on the firm's future performance. This can be due to the fact that some analysts could have a better ability to judge financial information, or that they somehow gather more information than others. Analysts with the same set of information will most likely forecast in a similar way, which subsequently decreases forecast dispersion. These sets of information come from the financial statements, and thus dispersion is expected to be negatively related to audit quality. Behn et al. (2008) provide evidence of an association between audit quality and forecast accuracy and dispersion and show that the quality of services provided by an auditor affect the accuracy of analysts in a positive way. This can be seen as evidence that analysts are capable of successfully deducing information from the financial statements (Behn et al. 2008).

Bradshaw (2011) investigates the role and activities of analysts in capital markets and state the problem that the analyzing part of the analyst is not being researched. Analysts obtain information, which is then analyzed and processed into a forecast report. The part of obtaining information and communicating this in the form of a report are clear, but how analysts process the information and which parts they use in their analysis is unclear. The process of an analysis is described as follows: "Analysis encompasses the process through which the analyst considers a company's strategy, accounting policies, historical financial performance, future prospects for sales and earnings growth, and ultimately a valuation and purchase or sell recommendation". Bradshaw describes the process of information as a black box that is undiscovered (Bradshaw, 2009):

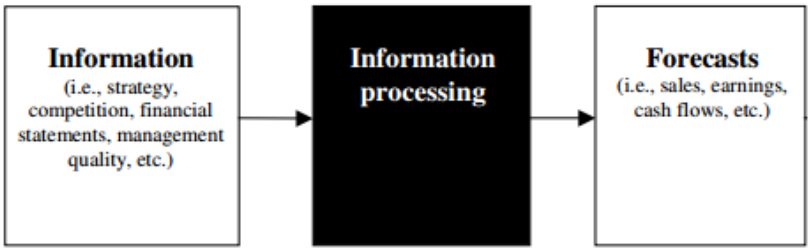


Figure 1.2 (Adapted from Bradshaw 2009. P.1076)

Another point in analyst reports is that they can be biased. Beyer et al. (2010) investigate voluntary and mandatory disclosure and the effect on analyst reports. Analysts reports can be distorted in two ways. The first is that subsequent information affects the report but not the actual information in the report itself. The second way is that analysts add noise into their reports by which not all private information of the analyst is reflected in its report. Analysts distort their reports in order to strengthen their bonds with management to obtain current and future private information. Investors know that analysts distort their reports, but the incentive behind the distortion is not publicly available which makes it hard for investors to infer the true content of the report (Beyer et al. 2010).

Ramnath et al. (2008) summarize literature that handles questions on how analysts make their decisions and how they process information. They find that certain factors play a key role in the analyst developing forecasts. Earnings related information is most important. They support heavily on disclosure beyond annual reports by management. Conference calls affect forecast accuracy and dispersion due to the fact that information in conference calls is only provided to those permitted to the conference call. Hereby, management seems to be selective in choosing who is allowed to the calls. Analysts' information is eventually transformed in a report or recommendation. In this transformation, cash flow and earnings seem to be more important than dividends and book value. Analysts heavily rely on Price-to-Earnings ratios adjusted for growth potential and use their own forecasts in issuing stock recommendations. For the earnings part, analysts have to identify themselves which parts are transitory and how persistent these are (Ramnath et al. 2008).

Bradshaw (2011) elaborates on the fact that most research only focusses on forecast accuracy, while there are other factors such as incentives from the analyst itself that affect this forecast accuracy. Examples are to curry favor with management, or when the analyst is working for an investment bank that also provides other services to the firm that is being analyzed. Studies now tend to lean more towards how analysts come to a conclusion or recommendation, but there is no clear evidence how they actually do this. Analyst interviews show that analysts focus more on the long-run, rather than short-term results like quarterly earnings. Bradshaw (2011) emphasizes that analysts face different interests while forecasting a firm's future outlook. Based on the amount of literature, Bradshaw reveals six influencing factors that affect analysts' reports: investment banking fees, currying favor with management, trade generation incentives, institutional investor relationships, firms that hire analysts themselves and in last place the analysts themselves. All these factors can raise biased reports

by the analysts, out of interest of the analyzed firm, the firm the analyst is working for or the analyst himself (Bradshaw 2011).

Analysts face several factors when they issue a forecast rapport. Analysts will have to take into account that their forecasts have to be accurate. Otherwise they will lose credibility and eventually customers who trade at the analysts' brokerage houses. Analysts working for brokerage houses also cope with the fact that they have to stimulate trading on the basis of their reports. Their remuneration could be tied to the amount of volume traded in the stocks they follow and issue reports on. Second is the moment of reporting. Analysts' forecasts are more positive for firms that they just recently started to follow than for firms that they already been following. For analysts who work for brokerage houses that also might have an investment banking department(affiliated analysts), good news is published relatively quicker than bad news. This is because of the upside potential of trading volume and gaining inside information when news and reports are positive in comparison to negative news. Affiliated analysts might be more biased in order to generate trading volume for their firm, this does not mean that their forecasts are less accurate. In general, brokerage houses attract the more skilled analysts which in turn have greater access to the private information given by management (Beyer et al., 2010).

2.2.2 Following firms

Analysts tend to specialize in a certain industry, and within that industry opt to follow firms that are of relatively larger size (Bradshaw 2011). The choice of an analyst to follow a firm could depend on whether its remuneration is tied to the trading volume generated by the analysts' report. In such case, the analyst will follow firms who are likely to cause such volumes because those forecasts generate trading of that firm's stocks. Beyer at al. (2010) also state that coverage of analysts is strongest for firms that are expected to perform good. Another point of interest is the capability of an analyst to extract the right information and to publish this information. The analyst also needs the opportunity to make his information public and the trust of investors (Beyer et al. 2010). Analysts are constantly adding new firms to their portfolios. During the period 1983-2000, 26% of the analyst portfolios consist of newly added companies. Firms can profit from these increased analyst following because an increase in analyst following will increase the stock's liquidity. Analyst following is related to firm size, return variability, institutional holdings and the association between a firm's return and the market return. Negatively related is the number of business lines and insider holdings. Literature doesn't provide clear insights in what actually triggers an analyst to follow a certain firm. Analysts have greater potential at firms where there is more information asymmetry, because they are able to

close this gap with their forecast intervention. This eventually leads to more profitable recommendations and increased trading volume. It is thus unclear what actually triggers analysts to follow a firm, but there are some factors –both internal and external– that influence analysts in their behavior(Beyer et al. 2010).

Why analyst opt to choose to report on a firm has many factors, but no clear answer. Among these factors is that analyst are more likely to follow firms that smooth earnings, have high quality earnings, provide more disclosure, have greater amount of segment reporting and have higher R&D and advertising expenses than their industry peers. Furthermore, analysts will follow firms for which they think that future performance will be good (Ramnath et al. 2008).

2.2.3 Managers and analysts

For managers it is important to know which financial information is useful and how the analyst processes it, in order to communicate private information through analyst reports to (potential) investors (Bradshaw 2011). In general, managers have more information than external parties, which creates information asymmetry. A manager is in a better position to judge firm performance because of its insider knowledge. Investors also know that managers have different incentives. The agent's(manager's) incentives could not be in line with that of the principal(investor), creating an agency problem. Beyer et al. (2010) explain that investors can't assess the profitability and future prospects of a firm due to this information asymmetry. Firms that have high profitability will be overpriced and the firms that have a low profitability will be underpriced. Eventually, this will lead to market failure as explained by Akerlof (1970). Among other things, management takes into account the sophistication of investors in relation to providing voluntary disclosures. Sophisticated investors have the ability to fully understand disclosure provided by management, while unsophisticated investors don't have the capability to dissect disclosures in the right manner to assess the right amount of value to the firm based on the disclosure. Firms opt not to disclose voluntarily when it is likely that there are more unsophisticated investors than sophisticated because on average, investors won't acknowledge the right value to the disclosure. Management also delays bad news relative to good news in order to maintain the stock price and to have a higher exercise price on their stock options (Beyer et al. 2010).

The reports and recommendations also affect the managers and firms on which the analysts are reporting on. Analysts' recommendations may affect the stock price of a firm and by this affect managements' remuneration and bonuses. Attached to the effect analysts' reports can have on management, they might also bias their reports in order to obtain private

information from managers of these firms. Analysts who set the target price low will make it look like that a firms' management is performing better than expected. In return, management will provide the analyst private information by which the analyst can better estimate future earnings and prospects (Beyer et al. 2010). Healy and Palepu (2001) also look at the decision making of management regarding the positive accounting theory, and find that small , highly leveraged firms tend to accelerate earnings to meet up to the different aspects of the positive accounting theory, such as not violating contracts, increasing their bonuses or to decrease the amount of tax payable.

2.2.4 Accounting information and accuracy

The effect of disclosure on analyst services is two-sided. More disclosure may help analysts to identify the items that contribute to the persistent earnings number of a company on which they can make more accurate forecasts of future performance (Athanasakou et al. 2007). More voluntary disclosures by a firm may lead to more precise forecasting and less information asymmetry between the firm and its investors. At the other hand, providing more disclosure will decrease the demand for analysts. Firms face three consequences when providing voluntary disclosure. The first one is improved stock liquidity. Providing more disclosure will decrease the information gap between a firm and its investors. The effect of this is that investors trade the stock at what they think is a fair price. This increases trading volume, which is also supported by literature. The second one is reduced cost of capital. Firms that provide more information will have investors that face less risk regarding potential information asymmetry. Cost of capital will be lower than when the risk of missing or incomplete information is higher. The third consequence of providing more information is higher analyst coverage. More information will decrease the information asymmetry between firms and analysts. Investors will also receive this disclosure, with the chance that the demand for analyst forecasts will decrease. Evidence however, shows that firms providing more informative disclosures face higher analyst coverage and less dispersion (Healy & Palepu 2001).

Bradshaw elaborates on the journey research took regarding the key aspects being investigated since the 1960's and now. First, researchers showed that analysts are more accurate than time-series models. Subsequently, analysts were compared against each other, showing that there are analysts who are more accurate than others, and that this is due to more experience, more informational resources and the complexity of information and the analysis (Bradshaw 2011). Research then investigated the relation between earnings forecast properties and stock prices, which subsequently raised the question if analysts were processing information

efficiently. Analysts are inefficient regarding the information they have. Analyst forecasts provide 22% of the accounting information. Analysts overestimate the target price 35% of the time and only 24% and 45% of the time is the analysts expectation met or beaten at the end of the period (Beyer et al. 2010).

What determines forecast accuracy can be useful for both capital markets and standard setters. Clement (1998) and Mikhail et al. (1997), find that when analysts follow a stock or a company, their experience increases as well as their forecast accuracy. Peek (2005) shows that analysts' accuracy deteriorates when firms apply changes in their accounting policy that have a material effect on earnings. Whereas other policies lead to improvement: i.e. from current cost accounting to historical cost accounting or from expensing to capitalization.

3 Hypotheses

Based on the theory regarding the accounting system and information asymmetry, certain expectations arise regarding the research question whether there is a relation between financial statement characteristics and analyst forecast properties. This section will set up the hypotheses by which the research question will be answered and focusses on the effect of financial statement characteristics on properties of earnings forecasts. When defining my hypotheses, there are multiple independent and two dependent variables incorporated. These variables are discretionary income statement items, infrequent items, forecast accuracy and forecast dispersion. For all of these – in total four – combinations, I have set a certain expectation based on the incorporated theory and literature.

3.1 Hypothesis development

If the semi-strong form of the EMH is assumed, then prices would reflect all publicly available and historical information. For an investor, it would then be impossible to obtain a competitive advantage because all of this public information is incorporated in stock prices. However, analyst forecasts may not be completely accurate all the time, showing that they lack information or that firms and management may withhold information that is useful to investors, but may be costly to disclose due to inattentive investors who misperceive the value of this information. This misperception eventually leads to information asymmetry (Fama 1998).

Analysts have more skills regarding analyzing and interpreting financial statements and information due to their experience and knowledge about firms and industries (Mikhail et al. 1997). Analyzing the financial statements and maintaining close relationships with management may elicit underlying information that is useful to value the information in the financial statements and finding underlying competitive advantages or implicit firm information, which may give a competitive advantage. However, this information might be biased when taking the positive accounting theory into consideration. Managers tend to make accounting decisions that work in favor of their company or themselves. Choosing a reporting strategy in order to construct favorable results reporting wise, can result in financial statements that do not reflect the underlying economic substance of the company (Watts & Zimmerman 1986). Analysts thus have to be capable of understanding and interpreting the applied accounting system and the potential effect of this on the financial statements.

Most financial statements are prepared using accrual accounting, which helps to give a more complete view about the economic performance because matching of revenue and costs takes place (Dechow 1994). Managers can apply discretion when preparing the financial

statements using accrual accounting. Due to the fact that they can shift current revenue to the future, and future revenue to the current period. This might add noise and distortion, which affects financial statement quality (Dechow & Dichev 2002). Noise and distortion may be added to hide, for instance, poor performance. If analysts are capable of reducing the noise and distortion in the financial statements and are able to reveal the actual economic underlying substance of the company, they are more likely to accurately estimate future earnings and prospects of a firm. This would increase the demand for analysts' services by investors who do not have these capabilities and opportunities, and therefore use the guidance of analysts.

Analysts services are used by households to allocate their savings in order to maximize their return on capital (Healy & Palepu 2001). Research shows that analysts are experiencing a learning curve and that their forecasting accuracy gets higher over time (Mikhail et al. 1997). Analysts use the financial statements in order to derive the persistent earnings incorporated in these financial statement which are composed using accrual accounting. However, the persistent income number is subject to managerial discretion. This is made possible by accounting laws and regulation in order to match the economic substance to the right period, instead of only looking at the receipt or outflow of cash (Dechow 1994). The positive accounting theory shows that managerial discretion can be used for other purposes than matching revenues and costs to the right period, which adds noise and distortion and eventually impairing the quality of financial statements (Watts & Zimmerman 1986). Due to the fact that management is able to apply noise an distortion in all income statement items, I expect that greater discretionary items will decrease forecast accuracy and increase forecast dispersion.

3.2 Hypotheses

My first expectation is based on the fact that greater discretionary items in the income statement will make it difficult for analysts to mitigate noise and distortion included in these items. When mitigating gets more difficult, the expectation is that forecast accuracy will be lower. My first hypothesis therefore is:

$$H1_a = Greater\ discretionary\ items\ in\ net\ income\ will\ decrease\ forecast\ accuracy$$

Greater discretionary items in the income statement will make it harder for analysts to mitigate noise and distortion included in these items. When mitigating gets harder, the expectation is that the analysts will not have a uniform opinion about the forecast, leading to higher forecast dispersion. The second hypothesis therefore is:

$$H2_a = Greater\ discretionary\ items\ in\ net\ income\ will\ increase\ forecast\ dispersion$$

Due to the nature of infrequent items, analysts have less experience in accurately estimating the effect of these items on the earnings per share number. Therefore, greater infrequent items in the income statement will make it harder for analysts to accurately estimate the future value of these items. When estimating gets harder and therefore less accurate, the expectation is that forecast accuracy will be lower. My third hypothesis therefore is:

$$H3_a = Greater\ infrequent\ items\ in\ net\ income\ will\ decrease\ forecast\ accuracy$$

Due to the nature of infrequent items, analysts have less experience in accurately estimating the effect of these items on the earnings per share number. Therefore, greater infrequent items in the income statement will make it harder for analysts to accurately estimate the future value of these items. When estimating gets harder and therefore less accurate, the expectation is that the analysts will not have a uniform opinion about the forecast, which will lead to larger forecast dispersion. My fourth hypothesis therefore is:

$$H4_a = Greater\ infrequent\ items\ in\ net\ income\ will\ increase\ forecast\ dispersion$$

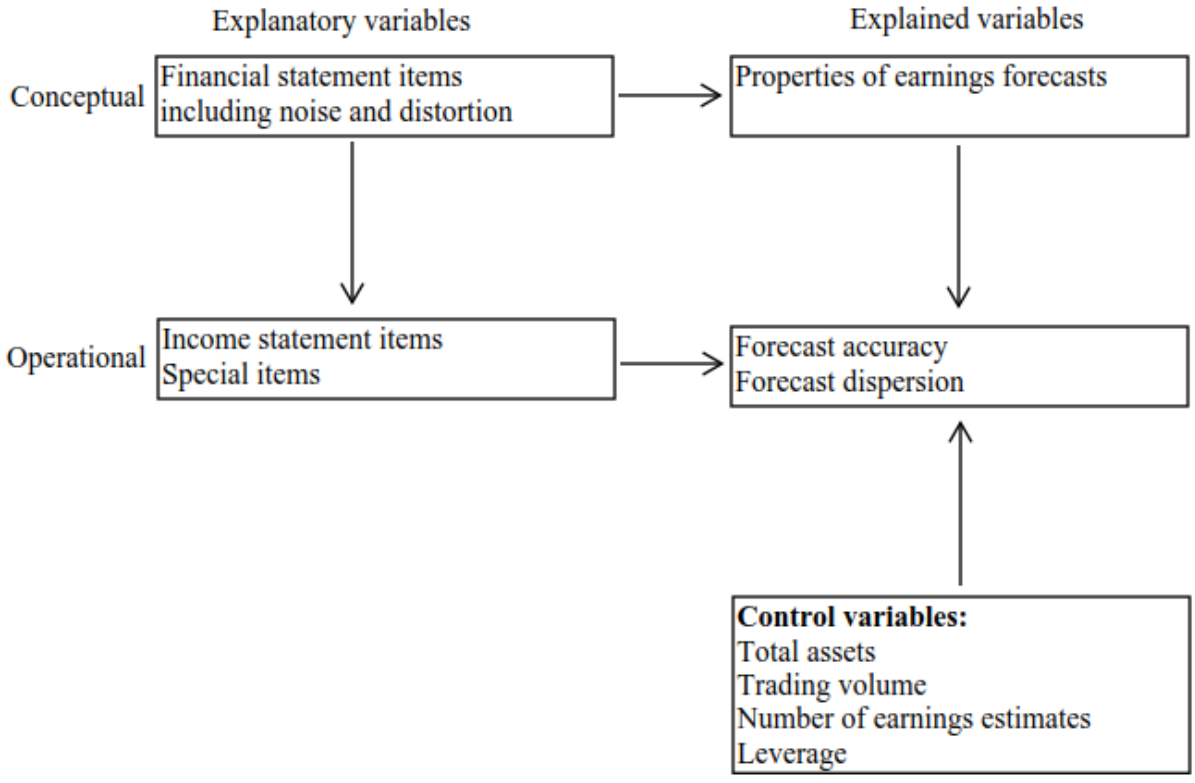
With the results, I will be able to infer whether and which financial statement items affect properties of earnings forecasts.

4 Research design & measurement

This chapter will elaborate on the research method used to test whether the results are in line with my expectations. I will use Libby boxes to give insight into the theoretical constructs, including my control variables and why I use these control variables. I will use a linear regression model to estimate the variables' coefficients. For the dependent variable, I measure both forecast accuracy and forecast dispersion. For the independent variables I use income statement- and special items. Subsequently, I will discuss the data selection process and the adjustments performed.

4.1 Theoretical constructs

Underlying to my hypotheses, the positive accounting theory suggests that managers use discretion in their accounting practice and that this discretion creates a gap between the information analysts have and the information management has (Watts & Zimmerman 1986). Analysts rely heavily on the income statement to forecast future earnings and have to adjust for this discretion (Mikhail et al. 1997). Some items in the income statement occur less frequently than others, so I expect analysts are likely to make more accurate adjustments for items that occur more often. Below, I use Libby boxes in order to translate my theoretical framework to operational variables:



As conceptual framework I use the positive accounting theory which suggest that there is an information gap between corporate management and security analysts. The effect of this is

that accuracy and dispersion of analysts is influenced by the noise and distortion added by corporate management in financial statement items. This concept is translated into operational variables by using income statement and special items as independent variables, which will affect forecast accuracy and dispersion.

4.2 Variables

4.2.1 Dependent variables

The first dependent variable is forecast accuracy (*FACC*). I follow Behn et al. (2008) to measure this variable. They define forecast accuracy as: "*the absolute value of the analyst forecast error, deflated by stock price*". Forecast accuracy is constructed as follows:

$$FACC_t = -(\frac{|EPS_t - AF_t|}{P_t}) \qquad (1)$$

Where *EPS* is the actual earnings per share at time t, *AF* is the analaysts' estimated earnings per share at t, and *P* is share price at t. When the actual earnings per share are equal to the forecasted earnings per share, forecast accuracy will be zero. When actual *EPS* deviates from the forecasted *EPS*, the forecast accuracy value will be lower.

The second dependent variable is forecast dispersion (*DISP*), the standard deviation of earnings forecasts, which shows the uncertainty among analysts regarding securities. When all forecasting parties have the same set of information, they are expected to provide *EPS* forecasts that are equal or nearly equal to each other. In this case the standard error of the forecast will be (near) zero. When analysts differ in opinion about the company, forecasted *EPS* will lie between a certain range. This range is reflecting the uncertainty among analysts, because it tends to reflect disagreement among analysts, where higher dispersion implies more uncertainty among analysts (Behn et al., 2008). Forecast dispersion is constructed as follows:

$$DISP_t = \frac{STD(Forecast_t)}{P_t} \qquad (2)$$

Where *STD(Forecast)* is the standard deviation of earnings forecasts and *P* is share price at time t. When uncertainty is low and analysts agree about the future prospects and performance of a firm, the standard error of forecasted *EPS* will be (near) zero. When uncertainty is high and the standard error of the forecasted *EPS* is high, *DISP* also will be higher.

4.2.2 Independent variables

As independent variables, I include all income statement items, and additonal special items. All these variables are considered to be discretionary which means that an analyst faces some portion of uncertainty in these items. These variables consist of all revenues, gains, expenses and losses stated on the income statement. Among these items are revenue, costs of goods sold, personnell expenses, depreciation and amortization, interest income, interest expenses, pretax income, income taxes and net income. For the definition of these items I refer to appendix I.

Special and extraordinary items are in general non-recurring items which have to be seperately included in the financial statements. For instance, costs incurred with restructuring a reorganization are considered a special item and have to be spearately included or clarified. Special items are defined as follows:

$$Special\ items = Nonrecurring\ items\ included\ in\ the\ financial\ statements \qquad (3)$$

I do not investigate the nature of the special items and the underlying economic activity related to the special items. Compustat Global includes multiple activities when defining special items, such as adjustments applicable to prior years, nonrecurring items, bad debt expenses and nonrecurring profit or loss on the sale of assets, investments and securities. Therefore, defining the underlying economic activity of the special item is left out of the scope of this research and could be followed up in future research.

4.2.3 Control variables

I implement control variables that could be influencing the results. These are size, trading volume, leverage and the number of analyst estimates. Bigger firms supply more information and have a better information environment on which analysts can support (Hutton 2005). Therefore, I expect that analyst forecasts for larger firms are more accurate and less dispersed due to the more complete information environment. As a first proxy for firm size I use the natural logarithm of total assets. This is one of the most popular proxies for firm size used in prior research. Another variable that may indicate a more complete information environment is the trading volume. Barth et al. (2001) find that that trading volume is positively related to the amount of analyst coverage. Analyst coverage is higher when information is more complete, and higher trading volume indicates a larger amount of information available. Third, I include the number of analyst estimates. Firms tend to provide more information in order to provide a

more transparent information environment (Graham et al. 2005). This implies that firms facing a larger information demand(i.e. higher analyst following) will provide more information (Hutton 2005; Chen et al. 2008). Since total assets, trading volume and analyst coverage are positive skewed variables, I opt to use the natural loagrithm of these variables. Taking the logarithm will make the dsitribution more normal, increasing the fit of the regression model (Behn et al. 2008; Bissessur & Veenman 2016). As fourth control variable, the amount of leverage is implemented. Leverage is associated with discretionary accruals. Prior literature finds that highly leveraged firms apply more discretion in order to meet covenant conditions. Therefore, I expect that more leveraged firms will have lower forecast accuracy and higher forecast dispersion. Leverage is computed as shareholders equity divided by the total liabilities (DeFond & Jiambalvo 1994; DeAngelo et al. 1994; Becker et al. 1998).

4.3 Regression model

Libby boxes in section 4.1 summarize how I transform my conceptual variables to operational ones. I use regressions models for accuracy and dispersion. For the definitions of variables used, see appendix 1. The models with forecast accuracy as dependent variable are as follows:

$$FACC_{i,t} = a_0 + \beta_1 lnSIZE_{i,t} + \beta_2 lnVOL_{i,t} + \beta_3 lnNUMEST_{i,t} + \beta_4 LEV_{i,t} + \beta_5 Rev_{i,t} + \beta_6 COGS_{i,t} + \beta_7 Dep_{i,t} + \beta_8 PI_{i,t} + \beta_9 IT_{i,t} + \beta_{10} SE_{i,t} + \beta_{11} IDIT_{i,t} + \beta_{12} XINT_{i,t} + \beta_{13} NCI_{i,t} + \beta_{14} NI_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$FACC_{i,t} = a_0 + \beta_1 lnSIZE_{i,t} + \beta_2 lnVOL_{i,t} + \beta_3 lnNUMEST_{i,t} + \beta_4 LEV_{i,t} + \beta_5 Spi_{i,t} + \varepsilon_{i,t} \quad (5)$$

For the first regression with forecast accuracy as dependent variable(model 4), the maximum value for this dependent variable ranges from [–N, 0]. The predicted sign of all income statement items are negative. This implies that bigger income statement are expected to inclose a proportionally big amount of noise and distortion, which lowers forecast accuracy. The same applies for special items(model 5). The predicted sign is expected to be negative for forecast accuracy.

Second dependent variable is forecast dispersion. The range of forecast dispersion will depend on the information uncertainty of security analysts, ranging from [-N, N]. The predicted sign of income statements items will be positive: bigger income statement items will increase

forecast dispersion due to the increased amount of noise and distortion in these items(model 6). The same applies for special items, on which the predicted sign will be positive(model 7).

$$DISP_{i,t} = a_0 + \beta_1 lnSIZE_{i,t} + \beta_2 lnVOL_{i,t} + \beta_3 lnNUMEST_{i,t} + \beta_4 LEV_{i,t} + \beta_5 Rev_{i,t} + \beta_6 COGS_{i,t} + \beta_7 Dep_{i,t} + \beta_8 PI_{i,t} + \beta_9 IT_{i,t} + \beta_{10} SE_{i,t} + \beta_{11} IDIT_{i,t} + \beta_{12} XINT_{i,t} + \beta_{13} NCI_{i,t} + \beta_{14} NI_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$DISP_{i,t} = a_0 + \beta_1 lnSIZE_{i,t} + \beta_2 lnVOL_{i,t} + \beta_3 lnNUMEST_{i,t} + \beta_4 LEV_{i,t} + \beta_5 Spi_{i,t} + \varepsilon_{i,t} \quad (7)$$

In all models I control for other variables that may affect properties of earnings forecasts. I expect that larger firms are perceived to have a better information environment and generate more trading volume. This implies more information available, raising the expectation that the sign of size(*SIZE*), trading volume(*VOL*) and number of analyst estimates(*NUMEST*) will be positive. Leverage(*LEV*) is expected to have a negative sign due to firms that have a higher amount of leverage apply more discretion in their financial reporting (DeFond & Jiambalvo 1994).

4.4 Sample selection

I want to concentrate on the dutch capital market, therefore I include only Dutch listed companies in my analysis. For the data, I use the IBES and Compustat databases from the Wharton Research Data Services. I start with selecting all Dutch companies that are listed and have data available for the period 2004-2014. I start with the annual fundamental information from Compustat, where I select the option to find all information available from Dutch companies over the given period.

The analyst forecast data is obtained via the I/B/E/S/ database. Because both Compustat and I/B/E/S/ work with unique but different identification codes, the companies obtained in Compustat are manually selected in the I/B/E/S/ database. Hereafter I assigned all identification(ISIN) codes from Compustat to the I/B/E/S/ dataset, so merging could be done on ISIN and fiscal year in Stata. I/B/E/S/ has two dates in their dataset. The forecast period end date is the ending month and year to which the estimate applies. The statistical period is the date on which the estimate was published. In my research, I use the forecast period end date.

For the closing stock price I use the Compustat stock price daily database. I obtained all daily stock prices from 2004-2014 and selected the last observation for each year and company.

I drop observations that have no information regarding net income and the number of outstanding shares, because they are necessary to calculate net income. The stock price dataset is merged with the fundamentals and forecast dataset, resulting in 996 firm year observations covering 145 unique companies. For my sampling procedures, see table 1.

Table 1 – Sample selection

Description	**Observation dropped/added:**	**Total sample size**
Compustat sample		2,053
IBES sample		16,216
Less:		
Keeping only most recent forecasts	-14,885	1331
Total sample size Compustat and IBES		3,384
Merging datasets	-1,058	2,326
Non-matching data	-1,171	1,155
No EPS information	-89	1,066
Adding stock price information	1,325	2,391
Merging stock price and fundamentals dataset	-1,038	1,353
Dropping mismatch observations	-357	996
Total number of observations		**996**
Number of unique companies		145

5 Empirical results and analysis

In this part I will perform the regression analysis in order to retrieve an answer on the research question: Is there a relation between financial statement characteristics and analyst forecast accuracy? First I will discuss the nature of the data sample. Subsequently, I will perform regression analyses to obtain final results.

5.1 Descriptive statistics

I have unbalanced panel data for the years 2004-2014 with a total of 996 firm-year observations. The average firm-year observation per year is 91. The panel data is divided into different industries according to the standard industrial classification code. Table II shows how data is divided among industries. The most prominent industries are manufacturing, service organisations and finance and insurance companies.

Table 2 – Descriptive statistics

Number of observations per year, divided into industry classification

Industry	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	*Total*
Mining	0	1	2	1	2	2	2	2	3	2	2	19
Construction	3	5	5	5	5	5	5	5	5	5	6	54
Manufacturing	30	38	28	36	38	40	40	34	34	33	40	391
Transportation, Communication, Gas and Electricity	7	7	3	5	4	4	3	5	6	6	4	54
Wholesale	4	5	3	5	5	3	3	3	4	3	4	42
Retail	2	3	3	3	5	5	5	5	5	4	5	45
Finance and insurance	13	15	16	18	19	14	15	14	12	11	13	160
Services	15	18	17	16	19	16	19	22	17	17	17	193
Non-classified	1	0	22	12	0	0	0	0	1	1	1	38
Total												**996**

Note:
Number of observations per year, divided into industry classification. The most dominating industries are manufacturing, service organisations and finance and insurance companies.

Since extreme observations can significantly influence descriptive statistics and regression output, I account for outliers by winsorizing my data. I filter my outlying observations by setting the smallest percentile to the second smallest percentile. In table III, descriptive statistics are shown for the variables used in the regression analysis. In this table, winsorization is already applied. The mean of forecast accuracy is -0.30, implying that the average difference between security analysts' forecasts and the actual earnings per share is around three percent of the lagged stock price. The max value for forecast accuracy is 0.00, implying that the estimated earnings per share corresponds to the actual earnings per share. For dispersion, the descriptive statistics show a mean of 0.02. This implies, that on average, forecast

dispersion is around two percent of the lagged security price. The maximum value of dispersion of 2.4 implies that to the utmost, security analysts differ in opinion about the forecasted earnings per share, totalling 2.5 times the lagged stock price of that security. Descriptive statistics for both forecast accuracy and forecast dispersion are about equal to the research from Behn et al. (2008), which method is used for computing both dependent variables.

On average, firms in the sample have total revenue of 5 billion dollar and a cost of goods average of 3 billion dollar. Indicating an average gross profit margin of 40%. On average, firms in the sample cope with more inetrest expenses than interest income. Staff expenses amount to 940 million dolla ron average. The mean of special items is -26 million dollar, implying that on average, the companies in the sample cope with a loss of 26 million when reporting special items in the financial statements.

Table 3 – Descriptive statistics

Variable	N	Mean	S.D.	Min	Q25	Median	Q75	Max
		Panel A						
FACC	996	-0.30	4.04	-120	-0.04	-0.01	-0.00	0.00
DISP	821	0.02	0.14	0.00	0.00	0.00	0.01	2.40
		Panel B						
Revenue	996	5.015	10.825	0	175	844	3.253	51.324
Cost of goods sold	812	3.000	6.044	0	90	559	2.328	30.381
Depreciation	980	185	403	0	6	28	103	2.261
Special items	898	(26)	118	(627)	(14)	0	0	456
Pretax income	996	421	1.234	(728)	4	37	209	7.114
Income taxes	994	94	290	(89)	0	8	39	1.844
Staff expenses	796	940	2.060	0	30	200	647	12.840
Interest and related income	934	67	301	0	0	2	10	2.477
Interest and related expenses	978	127	335	0	3	15	67	2.375
Noncontrolling interest	956	25	109	(261)	0	0	2	1.632
Net income	993	316	929	(780)	2	27	150	5.027
		Panel C						
Total assets	996	13.517	48.273	19	296	1.089	4.350	345.577
Trading volume	948	252.877	597.502	1	5.099	34.050	597.502	3.634.993
Number of estimates	996	8.67	8.31	1	2	6	11	42
Leverage	443	1.18	4.93	-0.31	0.41	0.76	1.15	101.778

Note:
The descriptive statistics are generated after adjusting for outliers by winsorizing the first top and bottom percentile. Panel A shows the descriptive statistics for the dependent variables *FACC* and *DISP*. *FACC* is the accuracy in analysts'earnings forecast. This is defined as the negative absolute difference of actual EPS minus analysts' estimated EPS, divided by share price. *DISP* is the dispersion in analysts forecast estimates, This is defined as thestandard deviation of forecast estimates, divided by share price. Panel B shows descriptive statistics for independent variables, stated in thousands of dollars. Noncontrolling interest is the investment in a subsidiairy where the company holds a minority interest. Panel C shows the descriptive statistics for the control variables. The mean for total assets is 13.517, which is equal to 13,5 million dollar. Number of estimates are the total number of analyst forecasts. *Leverage* is defined as total shareholders equity divided by total liabilities.

5.2 Empirical results – Discretionary income items

To test whether discretionary income statement items affect security analysts performance measured by forecast accuracy and dispersion, the following hypotheses will be tested:

$$H1_a = Greater\ discretionairy\ items\ in\ net\ income\ will\ decrease\ forecast\ accuracy$$
$$H2_a = Greater\ discretionairy\ items\ in\ net\ income\ will\ increase\ forecast\ dispersion$$

As for the control variables, I add *SIZE*, *VOL* and *NUMEST*. I expect that larger firms measured by firm size will have a larger and more complete set of information available. For *VOL*, I expect that companies who generate more trading volume have more information available on which analysts and other market participants can base their trading decision on. *NUMEST* is perceived the degree of information demand. I expect that firms facing a larger information demand will provide more volunatry disclosure. The sign of *NUMEST* is expected to be positive. A positive sign is also expected for *SIZE* and *VOL*. This implies that larger firms will positively affect analysts' performance measured in terms of forecast accuracy. Final control variable is *Leverage* of which is expected that a higher degree of leverage will imply more noise and distortion in the income statement items. The sign of *Leverage* is expected to be negative.

5.2.1 Greater discretionary items in net income will decrease forecast accuracy

I expect that when discretionary income statements are larger, it becomes harder for security analysts to identify the underlying economic substance of the company. As a result, analyst performance measured by forecast accuracy and dispersion will be lower. I therefore expect that all income statement items will have a negative sign, implying that when these values are increasing, forecast accuracy will be lower. When income statement items are regressed on forecast accuracy, the following output is obtained:

Table 4 – Regression results model H1

Variables	Coefficient	Prediction	T-value	P-value [a]	
Intercept	-0.2217		-3.02	0.003	***
Size	0.0083	(+)	0.66	0.512	
VOL	0.0090	(+)	1.48	0.140	
NUMEST	0.0188	(+)	1.09	0.276	
Leverage	-0.0193	(–)	-1.85	0.065	*
Revenue	0.0000	(–)	0.17	0.863	
COGS	-0.0000	(–)	-0.09	0.925	
Depreciation	0.0000	(–)	0.18	0.856	
Pretax income	0.0007	(–)	7.56	0.000	***
Income taxes	-0.0008	(–)	-4.55	0.000	***
Staff expenses	-0.0000	(–)	-0.43	0.664	
Interest income	0.0001	(–)	0.16	0.872	
Interest expenses	-0.0001	(–)	-0.73	0.466	
Non-controlling income	-0.0006	(–)	-4.44	0.000	***
Net income	-0.0007	(–)	-7.43	0.000	***

F (probability)	5.62	(0.000)
Adjusted R^2	0.174	
Number of observations	307	

Note:
Variable definitions: *Size* is a proxy for firm size and is defined as the natural log of total assets. *VOL* is natural log of trading volume and is a proxy for the quality of a firm's information environment. *NUMEST* is the natural log of number of analyst providing a forecast and is perceived as information demand. *Leverage* is the degree to which a firm uses liabilities to finance operations and is measured by total shareholder's equity divided by total liabilities. *Special items* are non-recurring items in the financial statements and are defined as the absolute value of special items. *Forecast accuracy* is defined as the difference between actual and estimated EPS, divided by share price. It has a maximum value of zero, which reflects that estimated earnings per share are equal to actual earnings per share.

[a] Significance at <0.01 (***), <0.05 (**), and <0.10 (*).

The regression results of equation 4 are reported in table 4. Results show that independent variables *Income taxes, Non-controlling income* and *Net income* are negative and significant, implying that when these variables are larger, forecast accuracy gets lower. Holding all other variables constant, when income taxes go up by one dollar, forecast accuracy goes down by 0.0008. However, a change in income tax will also imply a change in other variables such as pretax income and net income. *Pretax income* is positive and significant. Implying that when pretax income is higher, forecast accuracy will be higher. Control variables' coefficients for

SIZE, *Vol* and *NUMEST* are positive but not significant. Implying that there might exist a relation between the quality and quantity of the information environment, but not a significant one. *Leverage* is negative and significant, implying that it is harder for firms with a higher degree of leverage to accurately estimate future earnings. Variables *COGS*, *Staff expenses* and *Interest expenses* have a negative coefficient as expected but are not significant. Adjusted R^2 shows a value of 0.174, implying some degree of explanatory value of the model. Overall, these results show that there are items directly related to income such as *Income taxes*, N*on-controlling interests* and N*et income* that significantly decrease forecast accuracy. This implies that when analysts make use of these variables in their estimations, on average forecast accuracy goes down. This information implies that successful analysts might not make use of the items in estimating future earnings, but might have other sources in order to successfully estimate future earnings. These can relate to having a more complete set of information or have better firm or industry knowledge than competing analysts.

5.2.2 Greater discretionary items in net income will increase forecast dispersion

When we perform the regression for the second hypothesis, which states that larger discretionary items in net income will increase forecast dispersion. An elevation of forecast dispersion implies that consensus among analysts differs and their estimates will differ more widely than when consensus about future firm performance is more concentrated. I expect that larger discretionary items in net income will make it harder for analysts to reach a mode of consensus. When discretionary income items on forecast dispersion is regressed, the following output is obtained:

Table 5 – Regression results model H2

Variables	Coefficient	Prediction	T-value	P-value [a]	
Intercept	-0.0039		-0.12	0.905	
lnSize	-0.0006	(–)	-0.16	0.877	
lnVOL	0.0043	(–)	1.64	0.103	
lnNUMEST	-0.0123	(–)	-1.59	0.114	
Leverage	-0.0003	(+)	-0.10	0.922	
Revenue	-0.0000	(+)	-0.42	0.676	
COGS	0.0000	(+)	0.46	0.643	
Depreciation	-0.0001	(+)	-2.49	0.013	**
Pretax income	-0.0001	(+)	-2.77	0.006	***
Income taxes	0.0001	(+)	2.54	0.012	**
Staff expenses	0.0000	(+)	0.59	0.555	
Interest income	-0.0002	(+)	-2.46	0.014	**
Interest expenses	0.0002	(+)	2.85	0.005	***
Non-controlling income	0.0000	(+)	0.64	0.526	
Net income	0.0001	(+)	2.08	0.039	**

F (probability)	1.90	(0.027)
Adjusted R^2	0.048	
Number of observations	247	

Note:
Variable definitions: *Size* is a proxy for firm size and is defined as the natural log of total assets. *VOL* is natural log of trading volume and is a proxy for the quality of a firm's information environment. *NUMEST* is the natural log of number of analyst providing a forecast and is perceived as information demand. *Leverage* is the degree to which a firm uses liabilities to finance operations and is measured by total shareholder's equity divided by total liabilities. *Forecast dispersion* is defined as the range of analysts' forecast, measured by the standard deviation of analyst estimates divided by share price.

[a] Significance at <0.01 (***), <0.05 (**), and <0.10 (*).

The regression results of equation 5 are reported in table 5. Results show that independent variables *Income taxes*, *Interest expenses* and *Net income* are positive and significant, implying that when these variables are larger forecast dispersion increases. *Depreciation*, *Pretax income* and *Interest income* are negative and significant. This implies that when these items increase, forecast dispersion gets lower, indicating a higher mode of consensus among analysts. Control variables'coefficients for *SIZE*, *Vol* and *NUMEST* are negative but not significant. Implying that there might exist a relation between the quality and quantity of the information environment, but not a significant one. *Leverage* is positive but not significant, implying that

there is no or little relation between the amount of leverage and the overall consensus of analyst forecasts' estimates. Variables *COGS, Staff expenses* and *Non-controlling income* have a positive coefficient as expected but are not significant. Adjusted R^2 shows a value of 0.048, implying little degree of explanatory value of the model. Overall, these results show that there are items directly related to income such as *Income taxes, Interest expenses* and N*et income* that significantly increase forecast dispersion. This implies that when analysts make use of these variables in their estimations, on average forecast dispersion increases. Implying that on average, when I assume that analysts include these items in their forecasting analysis, analysts will allocate different weight to these variables. The effect of this is that inaccurate analysts will over- or undervalue these income statement items, which results into inaccurate estimates. Inaccurate estimates among analysts will automatically increase forecast dispersion.

5.3 Empirical results – Special items

In this section I will analyze the effect special items have on the forecast accuracy and dispersion of security analysts. I expect that it will be harder for analysts to perform accurate estimates when special items are present in the financial statements. Since the nature of special items is hard to determine, I use the big bath theory to set my expectations. This theory implies that companies will undertake a large amount of costs(i.e. reorganization costs, disposal of a division) in order to become more profitable in the near future. These costs are processed via special items in the financial statements. Since the nature of special items is hard to determine, my overall expectation is that forecast accuracy will decrease when special items are larger. The following hypotheses will be tested:

$$H3_a = Greater\ infrequent\ items\ in\ net\ income\ will\ decrease\ forecast\ accuracy$$
$$H4_a = Greater\ infrequent\ items\ in\ net\ income\ will\ increase\ forecast\ dispersion$$

5.3.1 Greater infrequent items in net income will decrease forecast accuracy

The first hypothesis is that greater infrequent items in net income will decrease forecast accuracy. Since special items can be negative and positive, I use the absolute value of special items to measure the size of the special item. I expect that special items have a negative sign, implying that forecast accuracy decreases when the absolute value of special items is larger. The following results are obtained:

Table 6 – Regression results model H3

Variables	Coefficient	Prediction	T-value	P-value [a]
Intercept	-0.2981		-1.43	0.155
lnSize	0.0067	(+)	0.26	0.794
lnVOL	0.0121	(+)	0.58	0.562
lnNUMEST	0.0072	(+)	0.15	0.882
Leverage	0.0124	(–)	0.35	0.725
Special items	-0.0004	(–)	-1.27	0.204
F (probability)	0.41	(0.842)		
Adjusted R^2	-0.008			
Number of observations	345			

Note:
Variable definitions: *Size* is a proxy for firm size and is defined as the natural log of total assets. *VOL* is natural log of trading volume and is a proxy for the quality of a firm's information environment. *NUMEST* is the natural log of number of analyst providing a forecast and is perceived as information demand. *Leverage* is the degree to which a firm uses liabilities to finance operations and is measured by total shareholder's equity divided by total liabilities. *Special items* are non-recurring items in the financial statements and are defined as the absolute value of special items. *Forecast accuracy* is defined as the difference between actual and estimated EPS, divided by share price. It has a maximum value of zero, which reflects that estimated earnings per share are equal to actual earnings per share.

[a] Significance at <0.01 (***), <0.05 (**), and <0.10 (*).

The regression results of equation 6 are reported in table 6. Results show that the independent variable *Special items* is negative but not significant, implying that when this variables is larger forecast accuracy decreases. Control variables'coefficients for *SIZE*, *Vol* and *NUMEST* are positive but not significant. Implying that there might exist a relation between the quality and quantity of the information environment, but not a significant one. *Leverage* is negative but not significant, implying that there is no or little relation between the amount of leverage and the accuracy of analyst forecasts' estimates. Adjusted R^2 shows a value of -0.008, implying the model has no explanatory value for the relation between the amount of special items in net income and forecast accuracy. Overall, results can be interpreted as that analysts do not include special items in their forecast analysis. This can be explained by the fact the underlying economic substance is very hard to determine and to foresee whether special items in the financial statements will generate future earnings or not. Another explanation might be that the nature and economic effects of special items move into other financial statement items.

An example might be a reorganisation. Such events in general will include expenses. In the subsequent year, due to the lower amount of personnel, staff expenses will be lower. An explanation can be that analysts will investigate the nature of the special, but will focus on the income statement items to which this special item is related in the subsequent period, and not on the special item itself.

5.3.2 Greater infrequent items in net income will increase forecast dispersion

For forecast dispersion I have the same expectations as for forecast accuracy. I predict that the sign of special items will be negative. The base for this prediction is that the nature of special items is hard to determine, implying that larger special items will generate higher uncertainty for future earnings. Analysts will face more difficulty to filter noise and distortion, which results in larger forecast dispersion among analysts. When the regression is performed, the following output is obtained:

Table 7 – Regression results model H4

Variables	Coefficient	Prediction	T-value	P-value [a]
Intercept	0.0088		0.14	0.889
lnSize	-0.0028	(–)	-0.45	0.651
lnVOL	0.0054	(–)	0.90	0.370
lnNUMEST	-0.0073	(–)	-0.50	0.620
Leverage	-0.0078	(+)	-1.00	0.318
Special items	-0.0000	(+)	-0.05	0.957
F (probability)	0.41	(0.841)		
Adjusted R^2	-0.01			
Number of observations	294			

Note:
Variable definitions: *Size* is a proxy for firm size and is defined as the natural log of total assets. *VOL* is natural log of trading volume and is a proxy for the quality of a firm's information environment. *NUMEST* is the natural log of number of analyst providing a forecast and is perceived as information demand. *Leverage* is the degree to which a firm uses liabilities to finance operations and is measured by total shareholder's equity divided by total liabilities. *Special items* are non-recurring items in the financial statements and are defined as the absolute value of special items. *Forecast dispersion* is defined as the range of analysts' forecast, measured by the standard deviation of analyst estimates divided by share price.

[a] Significance at <0.01 (***), <0.05 (**), and <0.10 (*).

The regression results of equation 7 are reported in table 7. Results show that the independent variable *Special items* is negative but not significant, implying that when this variables is larger forecast dispersion decreases. Control variables'coefficients for *SIZE*, *NUMEST* and *Leverage* are negative but not significant. Implying that there might exist a relation between the quality and quantity of the information environment, but not a significant one. *Vol* is positive but not significant, implying that there is no or little relation between the amount of trading volume and dispersion of analyst forecasts' estimates. Adjusted R^2 shows a value of -0.01, implying the model has no explanatory value for the relation between the amount of special items in net income and forecast accuracy. Overall, these results imply that overall consensus among analysts regarding special items is equal, and that special items are, on average, processed in a similar way. If analyst process items in a similar way, this will also not influence forecast dispersion.

6 Conclusion

This thesis investigates whether there is a relation between noise and distortion and properties of earnings forecast. These properties are measured by forecast accuracy and dispersion, where the base of the measure for these properties are the estimated earnings per share. The motivation for this expectation is the assumption that items in net income contain noise and distortion, affecting these properties of earnings forecasts. Before drawing a conclusion to the research question: "Is there a relation between financial statement characteristics and analyst forecast accuracy?", I divide the answer to this question into two parts.

The first part is the effect of discretionary items in net income on forecast accuracy and forecast dispersion. Based on the literature, I expect that items in net income include a component of noise and distortion which makes it harder for analysts to identify the true economic underlying substance. The effect of noise and distortion is that analysts' future earnings estimates and their accuracy will be negatively affected. The first hypothesis states that greater items in net income will decrease forecast accuracy. Results show that a significant relation exists between income taxes, net income and non-controlling income and a decreasing forecast accuracy. The other items in net income show a positive relation or a negative non-significant relation, indicating that for these items, there is no significant relation between these items and forecast accuracy. Second hypothesis states that greater items in net income will increase forecast dispersion. Results show that there is a significant relation between net income, income taxes and interest expenses and forecast dispersion. Other items show a relation that is not in line with expectation or is in line with my expectation but not significantly. The control variables are in general in line with my expectations and appear to be the right proxies to measure the quality of the information environment.

The second part is the effect of special items in net income on forecast accuracy and forecast dispersion. Special items are non-recurring items in the financial statements, which are related to expenses or income that is only incurred one time and are not persistent. The nature and future implications of current special items are hard to determine. I raised the expectation that larger special items in net income affect properties of earnings forecasts. The third hypothesis states that greater special items in net income will decrease forecast accuracy. Results show that the sign of special items is negative as expected. However, the test statistic and explanatory value of the model indicate that special items do not affect forecast accuracy. The last hypothesis states that greater special items in net income will increase forecast dispersion. The results show special do not affect forecast dispersion. This is a logical

conclusion since the results on hypothesis three shows that larger special items do not affect forecast accuracy, and that forecast accuracy is highly correlated with forecast dispersion.

To answer the research question: "Is there a relation between financial statement characteristics and analyst forecast accuracy" results show that discretionary income statement items do affect properties of earnings forecasts and special items do not affect properties of earnings forecasts. Since not all items in this analysis move in the direction of my expectation in combination with the low explanatory value of the models, I conclude that there is no relation between financial statement characteristics and analyst forecast accuracy. However, this research does reveal which part of the items in net income are likely (not) to be incorporated in the analysis of security analysts, which is referred to as a "black box" by Bradshaw (2009). The outcome shows that when the method used by analysts to forecast future earnings is transparent(i.e. the analyst shows which factors he includes in his analysis), stakeholders are able to base their decision on this transparent analysis. When analysts put more weight to net income and income taxes, based on the results of this research, it is more likely that the specific estimate of that analyst will be more inaccurate than analysts who do not support on net income and income taxes in their analysis. The results for special items and the effect on properties of earnings forecasts imply that analysts do not include special items in their analysis. Special items also do not affect forecast dispersion, which indicates that overall consensus regarding special items is equal among analysts, which might indicate that analysts have a common method for processing certain financial statement info, such as special items.

7 Implications

This research is based on the assumption that security analysts use financial statements in the process of determining a future earnings forecast. Literature shows that analysts not only use financial statements but also make use of (among other things) conference calls, voluntary disclosure and information in the notes in the financial statements. I did not include these factors in the scope of this research. Furthermore, analysts face a learning curve over time and specialize in certain industries (Bradshaw 2011). In this research, it is not taken into account how much experience the analysts have and in which industry they are specialized. As last, I did not correct for the number of analyst estimates. Certainly the combination of experience and number of estimates might affect results. I.e. two experienced analysts will likely have higher forecast accuracy and therefore lower forecast dispersion than two inexperienced analysts. A suggestion for future research might be to include the level of experience of analysts and the number of estimates.

8 Bibliography

Abarbanell, J., & Bushee, B. (1997). Fundamental analysis, future earnings and stock prices. *Journal of Accounting Research*, 1-24.

Akerlof, G. A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, 488-500.

Athanasakou, V., Strong, N., & Walker, M. (2007). Classificatory income smoothing: The impact of a change in regime of reporting financial performance. *Journal of Accounting and Public Policy*, 387-435.

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 159-178.

Barker, R., & Imam, S. (2008). Analysts' perceptions of earnings quality. *Accounting and Business Research*, 313-329.

Barnes, P. (1987). The analysis and use of financial ratios: A review article. *Journal of Business Finance & Accounting*, 449-457.

Becker, C., DeFond, M., Jiambalvo, J., & Subramanyam, K. (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research*, 1-24.

Behn, B. K., Cho, J.-H., & Kang., T. (2008). Audit quality and properties of analysts earnings forecasts. *The Accounting Review*, 327-349.

Beyer, A., A.Cohen, D., Z.Lys, T., & R.Walther, B. (2010). The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics*, 296-343.

Bissessur, S., & Veenman, D. (2016). Analyst information precision and smal earnings surprises. *Review of Accounting Studies*, 1327-1360.

Bradshaw, M. T. (2009). Analyst information processing, financial regulation, and academic research. *The Accounting Review*, 1073-1083.

Bradshaw, M. T. (2011, 6). Analysts' Forecasts: What Do We Know After Decades of Work?

Burgstahler, D., Jiambalvo, J., & Shevlin, T. (2002). Do stock prices fully reflect the implications of special items for future earnings? *Journal of Accounting Research*, 585-612.

Byard, D., & Cebenoyan, F. (2007). Alternatiev evidence on financial analysts' use of financial statement information. *Review of Accounting and Finance*, 442-459.

Chen, S., Chen, X., & Cheng, Q. (2008). Do family firms provide more or less voluntary disclosure? *journal of Accounting research*, 499-536.

Curtis, A., McVay, S., & Wolfe, M. (2014). An analysis of the implications of discontinued operations for continuing income. *Journal of Accounting and Public Policy*, 190-201.

DeAngelo, H., DeAngelo, L., & Skinner, D. (1994). Accounting choice in troubled companies. *Journal of Accounting and Economics*, 113-143.

Dechow, P. (1994). Accounting earnings and cash flows as measures of firm performance: the role of accounting accruals. *Journal of Accounting and Economics*, 3-42.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 35-59.

Dechow, P., & Ge, W. (2006). The persistence of earnings and cash flows and the role of special items: Implications for the accrual anomaly. *Review of Accounting Studies*, 253-296.

DeFond, M., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics*, 145-176.

Fairfield, P. K. (2009). Are special items informative about future profit margins? *Review of Accounting Studies*, 204-236.

Fama, E. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, 283-206.

Givoly, D., & Lakonishok, J. (1979). The information content of financial analysts' forecasts of earnings: some evidence on semi-strong inefficiency. *Journal of Accounting and Economics*, 165-185.

Graham, J., Harvey, C., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 3-73.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, 405-440.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, 405-440.

Hutton, A. (2005). Determinants of managerial earnings guidance prior to regulation fair disclosure and bias in analysts' earnings forecasts. *Contemporary Accounting Research*, 867-914.

Hutton, A. (2005). Determinants of managerial earnings guidance prior to regulation fair disclosure and bias in analysts' earnings forecats. *Contemporary Accounting Research*, 867-914.

Jones, J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, 193-228.

Kimmel, P. D., Weygandt, J. J., & Kieso, D. E. (2009). *Accounting: Tools for Business Decisions Making*. Aptara Inc.

Kirk, M. (2011). Research for sale: determinants and consequences of paid-for analyst research. *Journal of Financial Economics*, 182-200.

Kothari, S., Leone, A., & Wasley, C. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics* , 163-197.

Kothari, S., Leone, A., & Wasley, C. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, 163-197.

Levitt, A. (1998, 9 28). The "Numbers Game". New York.

Lin, H., & McNichols, M. (1998). Underwriting relationships, analysts' earnings forecasts and investment recommendations. *Journal of Accounting and Economics*, 101-127.

Mary E. Barth, R. K. (2001). Analyst Coverage and Intangible Assets. *Journal of Accounting Research*, 1-34.

Mikhail, M., Walther, B., & Willis, R. (1997). Do Security Analysts Improve Their Performance with Experience? *Expertise in Accounting, Auditing, and Tax*, 131-157.

Palepu, K. G., Healy, P. M., & Peek, E. (2013). *Business analysis and valuation*. Cengage Learning.

Ramnath, S., Rock, S., & Shane, P. (2008). The financial analyst forecasting literature: A taxonomy with suggestions for further research. *International Journal of Forecasting*, 34-75.

Revsine, L. C. (2005). *Financial reporting and analysis*. New Jersey: Prentice Hall.

Schipper, K. (1991). Commentary on Analysts' Forecasts. *Accounting Horizons*, 105-122.

Watts, R., & Zimmerman, J. (1986). *Positive Accounting Theory*. London: Prentice-Hall.

9 Appendix

Appendix 1. Variable Definition

Variable	Variable	Definition
Forecast accuracy	*FACC*	The absolute value of the analyst forecast error, deflated by stock price, where a lower value indicates higher accuracy, with a maximum of 0.
Forecast dispersion	*DISP*	Range of forecast estimates by analysts.
Revenue	*Rev*	Amount of goods sold
Cost of goods sold	*COGS*	Cost associated with the amount of goods sold
Staff expense	*SE*	Total staff expenses
Amortisation, depreciation and impairments	*Dep*	Non-cash expenses reflecting the decrease of the useful life of assets
Interest income	*IDIT*	Income from interest bearing loans and facilities
Interest expenses	*XINT*	Expenses from interest bearing loans and facilities
Pretax income	*PI*	Income before taxes
Income taxes	*IT*	Taxes relating to income earned
Net income	*NI*	Income after taxes paid
Noncontrolling interest	*NCI*	Income from subsidiary for the part not owned by the parent
Absolute value of special items	*Spi*	Absolute value of non-recurring items
Total assets	*lnSIZE*	Total assets
Trading volume	*lnVOL*	Trading volume of shares per day
Number of analyst estimates	*lnNUMEST*	Number of analyst estimates for the estimated earnings per share at year-end
Leverage	*LEV*	Degree of leverage. Computed as total equity divided by total liabilities
Earnings per share	*EPS*	Earnings per share. Computed as net income divided by total shares outstanding.