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# The moderating effect of CEO experience on the SG&A signal in fundamental analysis

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## Abstract

This thesis studies the moderating effect of CEO experience on information usefulness of the change in sales, general and administrative costs to sales ratio (SG&A signal) to investors and analyst. This accounting signal is of importance since it is associated to future firm performance that both parties are interested in. Analysts function as an intermedium to investors through forecast revisions they issue. In this thesis, I test whether the SG&A signal is perceived differently if it is sent by a more experienced CEO. With a mediating test, I also test whether the two parties have a differential interpretation to the same SG&A signal. I find that the perceived credibility is higher for more experienced CEOs to investors, but that this information content is not incorporated into the forecast revision in the same way. I also find by replicating Johnson (2016) that the intermediating relationship is not present as predicted for other accounting signals. This raises the question of what (accounting) information is used by investors to value the firms. The implication of this study is making companies aware that investors link the signaller's characteristics to the signal sent to interpret the information content. This combination of CEO experience and accounting information provides a new angle to the literature on the usefulness of accounting information.

**Keywords:**

CEO experience, SG&A, SG&A ratio, fundamental analysis, signalling

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## 1. Introduction

This thesis studies the usefulness of accounting information. Fundamental analysis is a research stream in the literature that is a concerned with examining accounting information to obtain signals useful for predicting future earnings and firm value. These signals are used by capital market participants (investors) who invest in stocks. Lev & Thiagarajan (1993) identified twelve signals that are associated to future earnings and investor reactions, respectively proxied for by one-year-ahead earnings change and buy-and-hold abnormal returns. However, investors are found to base a large proportion of their investment behaviour on analyst forecasts and not solely on accounting information. These analysts partly use the same accounting signals obtained from the financial statements and impound them into their forecast revisions once the financial statements have been released.

Prior research found signals to be informative about future earnings and firm value that analysts fail to impound in their forecast revision. Even though investors know that analysts use the same accounting signals, investors recognize that they cannot fully rely on the analysts when interpreting the information content of the signals. Given the fact that they function as an intermedium to investors does raise questions why they do not use the information content to the full extent. It is found that one signal in particular causes a major error in their forecast error: the change in sales, general and administrative (SG&A) costs to sales ratio (SG&A signal) (Lev & Thiagarajan, 1993; Abarbanell & Bushee, 1997; Johnson, 2016).

One explanation for analysts not incorporating the full information content of this signal, is that SG&A costs were assumed to move proportional to sales (Noreen, 1991) which is not always the case and therefore wrongfully understood. Anderson et al. (2003) find that SG&A costs increase 0.55% per 1% increase in sales and decrease 0.35% per 1% decrease in sales. In the literature stream of fundamental analysis, only proportional movements are regarded as efficient and future earnings enhancing – henceforth fundamental analysis interpretation – whereas Anderson et al. (2007) find that these inefficiencies could also signal positive future earnings. In order words, non-proportional cost movements to sales do not necessarily mean that a decrease in earnings for the future is expected.

Fundamental analysis interprets inefficiencies in the SG&A ratio as managers not being able to control the costs, whereas efficiencies are interpreted as managers being in control of the

costs. The SG&A costs are thus subject to managerial discretion and are of importance to investors, hence analysts, because of the high amount spent on this: in the sample of this thesis the mean SG&A ratio is 26%. The discretion expresses itself through the call managers can make to adjust the utilized resources. These adjustments come with adjustment costs that managers rather avoid if they expect that sales will rebound and thereby keep resources utilized. Additionally, managers make the SG&A costs increase or decrease less as sales do which causes the asymmetry. The fact that it is such a big amount makes it also a reliable signal about the expectation of the manager about the future expected earnings, and therefore it was identified as a fundamental signal. Managers could hereby either signal private information about future earnings or create principle-agent problems. The information asymmetry due to this discretion has partly been mistaken by analysts for the cost asymmetry: 'sticky costs' (Anderson et al., 2003).

Anderson et al. (2007) and Johnson (2016) incorporated recent literature on the sticky cost theorem and partitioned the SG&A signal into six signals (subsamples). They do so by dividing this on the basis of different movements of the change in SG&A ratio, SG&A costs and sales. Five of these signals represent a combination of both fundamental analysis and cost asymmetry interpretations about the future earnings expectations, and one a fundament analysis interpretation only. They both find that the SG&A signals are associated with the change in one-year-ahead earnings and buy-and-hold abnormal returns.

Even though the signal has been partitioned into six subsamples, analysts still do not impound the full information content. This was tested for using the forecast revision as an intermediating variable to buy-and-hold abnormal returns. The fact that both try to interpret the same signal made me wonder whether there could be something about the signaller that would make analysts and capital market participants recognize the same information content to the same extent on the SG&A signal. Since this signal is subject to managerial discretion it made sense to me to study the credibility of the signaller, and study whether the SG&A signal sent by a more experienced CEO would be interpreted differently than a less experienced CEO. This led me to the following research question:

Is CEO experience a moderating variable in signalling the change in SG&A ratio towards analysts and capital market participants?

Signals sent by experienced CEOs are found to be more informative by analysts and capital market participants (Khurana, 2002; Bragaw, 2013). Companies hire CEOs both because of the experience gained, and to legitimize their strategy and build relations with the press. In either case, I hypothesize that analysts will interpret the information content of the SG&A signal differently due to the differential credibility of the signaller. In other words, I partition the six subsamples further into smaller groups to see whether the same signal sent by more experienced CEOS is perceived differently. I predict this is so, because analysts are risk-averse when it comes to making forecast errors (Weiss, 2010). I also hypothesize that the buy-and-hold abnormal returns to be gained are smaller for investors due to this increase in credibility and less information asymmetry (Banker & Chen, 2006; Weiss, 2010).

In this thesis, I use a sample of 11822 observations for the years 1995 to 2014 of listed companies in the United States only. The usage of cross-sectional data limits me to presenting associations, but this fits an explorative study. To test the hypotheses, I will use a modified model of Johnson (2016) by adding the moderating effect of CEO experience. This is constructed as a latent variable through factor analysis on the measures tenure, age, duality of board president and CEO, and an interaction term of prior CEO job experience with tenure.

This thesis presents four main findings. First, the replication of Johnson (2016) provides complementary results that both predictions about the SG&A signal from a fundamental analysis and cost asymmetry perspective are associated with one-year-ahead earnings change. Still I find that analysts do not recognize the full information content. Second, CEO experience as a moderating effect is not associated with one-year-ahead earnings and analyst one-year-ahead forecast revision. It is however associated with the forecast revision as an independent variable. Third, in contradiction to Johnson's (2016) results I find that only two of the SG&A signals are associated with the buy-and-hold abnormal returns, and that only two other fundamental signals. When adding the CEO experience as a moderating variable, results show associations for the buy-and-hold abnormal with three of six SG&A signals. Together these findings raise the question whether the fundamental signals all together have the most explanatory value for the investment behaviour of investors. Fourth, I do not find analysts to function as an intermedium to investors on the fundamental signals that are associated with the one-year-ahead earnings change. It might be the case

that investors use different information content to base their buying behaviour on than the fundamental signals or that analysts do not recognize the information content to the full extent as investors do. This results could compromise the validity of Johnson's (2016) study.

I expect the results of this study to contribute to the academic literature for two reasons: by enriching the fundamental analysis literature with a study on the signaller and through replication of Johnson's (2016) study. Many researchers have studied the asymmetric cost behaviour in the SG&A signal since Anderson et al. (2003), but to my knowledge only Anderson et al. (2007) and Johnson (2016) have tried to do this in the context of fundamental analysis among the other fundamental signals. Aditionally, even after 20 years it remains unclear why analysts do not recognize the full information content of the SG&A signal and I expect that this exploratory research into the signaller's characteristics will present a valuable new angle to the topic. To do so I replicate the model of Johnson (2016) and then modify it. Even though journals are ought to check the validity and reliability of any paper they publish, replication studies are valuable, especially since I use a different sample. By conducting this research, I do not expect to be able to give any practical hiring implications for companies since I do not study the cause of the change in SG&A ratio but only whether the signal is perceived as more credible. Although, if any associations present themselves this might eventually lead to a new research field that can make recommendations to companies about their hiring policy. Nonetheless, it could make companies aware of the impact that their CEO has on the usage of accounting information by analysts and investors. They could use this at their advantage if they do want to signal private information.

The structure of the thesis is as follows. Chapter 2 provides an overview of the existing literature on fundament analysis and asymmetric costs phenomenon that provide the foundation for the theoretical premises in this thesis. Chapter 3 continues with the theoretical link to CEO experience, that altogether lead to the hypothesis development. Chapter 4 present the methodological framework. Chapter 5 presents the results and chapter 6 elaborates on this with a conclusion, discussion and further research suggestions and presents limitations.

## 2. Theoretical framework

The theoretical framework contains an overview of the relevant theoretical concepts that determine the association between the SG&A signal and CEO experience. Before this conceptual link will be discussed, the theoretical concepts of signalling – in specific the SG&A signal – combined with managerial influence through discretion on this signal will be explained. It is due to this discretion that the research question arises whether this conceptual link to CEO experience exists that analysts and investors might acknowledge.

Section 2.1 discusses the fundamental analysis about the informativeness of accounting information and thereby its signalling effect, where section 2.2 explains the asymmetric cost phenomenon observed around the SG&A signal. In section 2.3 the research done by Johnson (2016) will be discussed. Section 2.4 elaborates on how signals could be perceived when managerial discretion is present and section 2.5 will continue with the drivers behind the asymmetric cost phenomenon that should be considered when interpreting the signal of the SG&A ratio and its components.

### 2.1 Fundamental analysis

In this section, the fundamental analysis of accounting information will be discussed. It is of importance to understand why the asymmetric cost phenomenon observed for SG&A costs is different from other signals provided through financial statements.

Ball & Brown (1968) were the first to shed light on the usefulness of accounting numbers, in a time where accounting numbers were considered to be irrelevant to investors. Since then, the accounting literature has studied many financial statement items in relation to security prices that should capture the value of the current assets and the future firm performance. The first studies of fundamental analysis were concerned with the movement of stock prices in relation to the publication of financial statements, which present the fundamentals for valuing a firm. Stock prices sometimes deviate from the values presented and through fundamental analysis information could be revealed that is not priced into the stock (Ou & Penman, 1989). This line of reasoning follows the efficient market hypothesis where all available information is incorporated into the security prices.

In fundamental analysis, a signal is regarded as useful to predict future earnings or future stock performance if it conveys more information about the current economic situation of the firm than the current earnings number (Lev & Thiagaraian, 1993; Abarbanell & Bushee., 1997; Anderson et al., 2007; Johnson, 2016). The focus of prior research related to SG&A was on the information usefulness of the fundamental signals in relation to issues of earnings persistence, growth and the earnings response coefficient.

Fundamental signals in relation to contemporaneous returns and future earnings were examined by Lev & Thiagaraian (1993), whereas Penman (1992), Abarbanell & Bushee (1997) and Anderson et al. (2007) solely have studied the relation between the fundamental signals to future predicted earnings. They all based their studies on the claim of analysts finding fundamentals presented in the financial statements useful. Lev & Thiagaraian (1993) identified twelve candidate fundamental signals from the Wall Street Journal, Barron's, Value Line publications on "quality of earnings," professional commentaries on corporate financial reporting and analysis, and newsletters of major securities firms commenting on the value-relevance of financial information. This search for fundamental signals would have been superior to the statistical search method of Ou & Penman (1989) who tested financial statement line items against the response coefficient and future earnings. This would be so because Lev & Thiagaraian (1993) based their research on theoretical predictions and using analysts' opinion on what is regarded as useful to them. This theoretical basis would also possibly correct for wrongful interpretations of signals.

The twelve signals studied are: inventory, accounts receivable, capital expenditure, R&D expenses, gross margin, sales and administrative expenses[1], provision for doubtful receivables, effective tax, order backlog, labor force, LIFO earnings, and audit qualification. Their definitions are presented in figure 1 and will be explained hereafter.

[1] Sales and administrative expenses contains the same information as the sales, general and administrative expenses (SG&A); to avoid confusion henceforth SG&A will be used.

*Definition and Measurement of Candidate Fundamental Signals Examined in This Study for Value Relevance (The Signals Were Derived from a Search of Analysts' Pronouncements during 1984–90, Particularly Those Concerning the Quality and Adequacy of Reported Financial Data. The Values of the Variables for Each Signal Are Annual Numbers Derived from Compustat. Compustat Item Numbers Are Given in Parentheses. Δ Refers to Percentage Annual Change in the Variable from the Average of Prior Two Years.)*

| | Signal | Measured as: |
|---|---|---|
| 1 | Inventory[a] | Δ Inventory (78 or 3) − Δ Sales (12) |
| 2 | Accounts Receivable | Δ Accounts Receivable (2) − Δ Sales (12) |
| 3–4 | Capital Expenditure, *R&D* | Δ Industry Capital Expenditures or *R&D* (30(46)) − Δ Firm Capital Expenditures (*R&D*)[b] |
| 5 | Gross Margin | Δ Sales − Δ Gross Margin (12–41) |
| 6 | Sales and Administrative Expenses (*S&A*) | Δ *S&A* (189) − Δ Sales |
| 7 | Provision for Doubtful Receivables | Δ Gross Receivables (2+67) − Δ Doubtful Receivables (67) |
| 8 | Effective Tax | $PTE_t (T_{t-1} - T_t)$<br>$PTE_t$ = pretax earnings (170) at $t$, deflated by beginning price<br>$T$ = effective tax rate[c] |
| 9 | Order Backlog | Δ Sales − Δ Order Backlog (98) |
| 10 | Labor Force | $\dfrac{\left(\dfrac{\text{Sales}_{t-1}}{\text{No. of Employees}_{t-1}} - \dfrac{\text{Sales}_t}{\text{No. of Employees}_t}\right)^{d}}{\dfrac{\text{Sales}_{t-1}}{\text{No. of Employees}_{t-1}}}$ |
| 11 | *LIFO* Earnings | 0 for *LIFO*; 1 for *FIFO* (59) |
| 12 | Audit Qualification | 1 for Qualified; 0 for Unqualified (149) |

[a]The inventory variable we used is "finished goods," when this item is available, and "total inventories" otherwise.
[b]Industry capital expenditure (*R&D*) was measured by aggregating this item for all firms at the two-digit SIC code level.
[c]The effective tax rate is measured as follows, using *Compustat* data items 63/(18+63+49−48−55). See also n. 7 in the text.
[d]*Compustat* data item for number of employees is 29.

*Figure 1: The twelve fundamental signals; Lev & Thiagarajan (1993)*

Disproportionate inventory increases to sales are a negative signal that suggests difficulties in generating sales, obsolete items that will be written off in the future, or increase current earnings by absorbing overhead costs at the expense of future earnings. An inventory decrease could be a positive signal that signals higher than expected sales, a decrease in overhead cost absorption, and prevent possible stock-outs or hedge against future price changes. Accounts receivables increases disproportionate to sales convey a negative signal of difficulties in generating sales, earnings management at the expense of future earnings or recording earnings with a low persistence. Capital expenditure and R&D increases can signal higher future costs due to depreciation and amortisation costs and are subject to managerial discretion which could signal lower earnings persistence. Gross margin disproportional decreases to sales are a negative signal about the future performance due to increased competition or higher costs in relation to sales. Provisions for doubtful accounts is highly discretionary and can be a negative signal when unusual changes occur. The same holds for the effective tax rate that unusual changes signal low earnings persistence. The order backlog to sales can signal high future earnings when the ratio increases and is a positive signal. Labor force restructuring benefits are not conveyed in the current earnings but are a positive signal about future earnings. LIFO earnings are regarded as a more sustainable inventory method than FIFO earnings, and thus a positive signal, due

to the closer relation of the replacement cost of the inventory to the actual prices. Audit qualification is a reassurance to financial statement users and is a negative signal if not provided or if a negative audit opinion is provided.

In particular, an increase in the SG&A costs in relation to sales between the previous and the current period was interpreted as a negative signal about future performance from a theoretical point of view. This interpretation (henceforth fundamental analysis interpretation) is formulated in this way because the SG&A ratio is a measure of operational efficiency, which could signal inefficiencies when it increases – the inability of managers to control costs – and signal efficiencies when the ratio decreases. Decreases in the SG&A ratio are perceived as tight managerial control and should lead to higher future firm performance. These costs are sunk in the next period but the managers will still be there with their abilities, and would thereby thus have predictive power over future performance (Anderson et al., 2007).

These twelve signals were tested by Lev & Thiagaraian (1993) for value relevance against abnormal earnings – beyond market expectations – and subsequent changes in earnings over the years to identify if they signal earnings persistence; which they did. Abarbanell & Bushee (1997) noticed that only nine[2] of the twelve signals were repeatedly reported in analysts' reports and financial statement analysis texts and decided to test whether the theoretical predictions of the signals observed were incorporated into the forecast revision by analysts. Results show that seven out of nine signals that were tested against one-year-ahead earnings were statistically significant; SG&A cost ratio was insignificant. Even though this measure was derived from what analysts themselves considered to be informative – also by investors (Healy & Palepu, 2001) – the information content was not fully exploited.

Forecast revisions were not adapted to the theoretical predictions of the SG&A signal, whereas the investors priced it in correctly and recognized the information content. By studying the analysts' forecast error Abarbanell & Bushee (1997) concluded a general underreaction to detailed accounting information which could be eliminated by leaving out the detailed earnings information. Two possible explanations arise: the SG&A signal

[2] The nine signals of Abarbanell & Bushee (1997): inventory, accounts receivable, capital expenditure, gross margin, sales and administrative expenses[1], effective tax, earnings quality, labor force, and audit qualification.

contains value relevant information that is not earnings-related or investors do not believe analysts' forecast revisions incorporate the earnings-related information from the signal. Since analysts function as an intermedium to capital market participants through their fundamental analysis of signals (Lehavy et al., 2011), one needs to establish the interpretation of those signals to be able to study its association to future firm performance. Until then there had not been a consensus on how to interpret the SG&A signal in relation to future firm performance: earnings persistence.

Anderson et al. (2007) offer an explanation that has a different interpretation of the SG&A ratio signal, where managers recognize that decreasing sales do not necessarily lead to permanent decreases in demand. Managers maintain the utilization level of resources (SG&A costs) in the hope the sales rebound. This explanation contradicts the fundamental analysis interpretation of inefficiency. This observed behaviour was labelled by Anderson et al. (2003) as 'cost stickiness'. The underlying assumption to the fundamental interpretation is that the relation between costs and volume is symmetric for volume increases and decreases, which lacks an empirical foundation (Anderson et al., 2003).

Concluding, the fundamental analysis interpretation of (in)efficiency of the SG&A ratio is called into question. It could thus be that analysts still impound the information into their forecast revisions due to this different interpretation offered by Anderson et al. (2007). To get an understanding of this differential interpretation the concept of asymmetric costs underlying the interpretation will be discussed.

### 2.2 Asymmetric cost phenomenon

This section discusses the explanation of the SG&A signal introduced by Anderson et al. (2003). It forms the basis of the theoretical interpretation of the SG&A signal together with the fundamental analysis. It also forms the basis of the stream of literature that eventually leads to the conceptual link that will be introduced between the asymmetric cost phenomenon and CEO experience due to its discretionary character.

Asymmetric cost is a relatively new research topic where traditional activity-based costing does not apply (Anderson et al., 2003; Anderson et al., 2007; Balakrishnan et al.,2004; Banker et al., 2014; Weiss, 2010; Dierynck et al.,2012; Johnson, 2016). Traditional activity-based costing systems divide the link between business activities and costs up into variable

and fixed costs. Fixed and variable costs are allocated to activities based on different cost drivers (Noreen, 1991). Fixed costs are predetermined and economies of scale can be reached when the activity volume increases, whereas variable costs are the utilization of more (fewer) resources when the activity volume increases (decreases). In short, the change in resource utilization is proportional in relation to changes in business activity volume and changes automatically.

However, researchers present results that this symmetric association does not hold (Noreen & Soderstrom, 1997; Cooper and Kaplan, 1998): costs rise more when activity volume increases than costs fall with decreases. Anderson et al. (2003) provide results on this topic for SG&A costs rising more when sales increases than costs falling when sales decreases. As can be seen in figure 2, this behaviour is labelled by Anderson et al. (2003) as 'cost stickiness': "Specifically, costs are sticky if the magnitude of the increase in costs associated with an increase in volume is greater than the magnitude of the decrease in costs associated with an equivalent decrease in volume." Cost stickiness was also found for other operating costs that face adjustment costs (Calleja et al., 2006).

Figure 1: Overview of different cost curves in relation to changes in activity

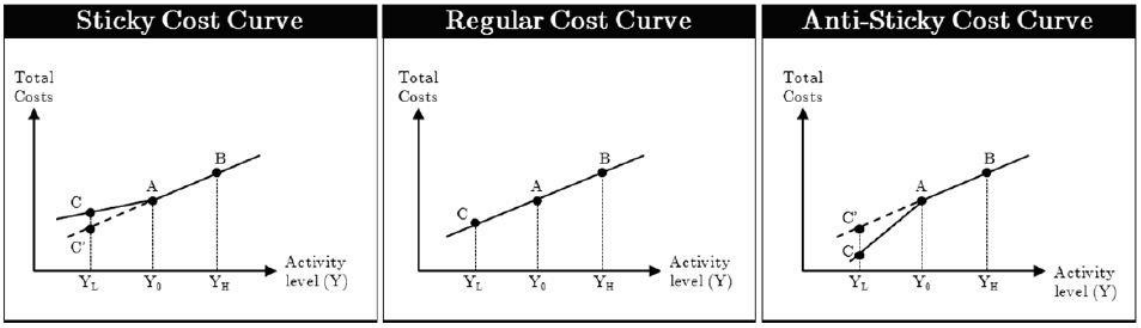


Figure 1 depicts three different cost functions which illustrate asymmetric cost behavior with sticky costs (left graph) and anti-sticky costs (right graph) as well as symmetrical cost behavior (middle graph). The dashed cost function illustrates the regular cost curve without conditioning on the direction of activity changes. Y refers to the activity level of the company in a range from low ($Y_L$) to high ($Y_H$).
Costs are sticky if they decrease less for decreases in activity than they increase for increases in activity. Thus, the cost function is flatter between $Y_0$ and $Y_L$ than between $Y_0$ and $Y_H$. Costs are anti-sticky if they decease more for decreases in activity than they increase for increases in activity. Thus the cost function is flatter between $Y_0$ and $Y_H$ than between $Y_0$ and $Y_L$.

*Figure 2: Cost curve presenting sticky, regular and ant-sticky costs; Hoffman (2016)*

Another component of asymmetric cost behaviour is cost anti-stickiness, as can be seen in the picture on the right in figure 2. Costs and sales move in the same direction but the adjustment in costs is proportionally larger to sales (Anderson et al., 2003). The differential degree of stickiness would be attributable to the opportunistic or pessimistic mindset of the managers about respectively better or worse future firm performance (Banker et al., 2012).

Next to that, Anderson et al. (2003) provide results that there is a larger lagged response to adjusting the SG&A costs downwards when sales decrease in comparison to SG&A costs adjusted upwards when sales increase. These adjustments are made by managers who face adjustment costs for adjusting the resource utilization. For example, one would have to fire and rehire personnel with every movement in sales for a short period, which comes with adjustment costs from human resources (Anderson et al., 2003). When managers have to decrease the SG&A costs they might retain some utilized resources to avoid the adjustment costs, and in case of increasing SG&A costs they might have to attract more resources than yet available within the company and might avoid doing so because of uncertainty about future adjustment costs (Banker et al., 2012). To this extent, managers are aware of the underlying fundamental signal they send to financial statement users about the earnings persistence (Mintz, 1999), but choose to go for the asymmetrical cost utilization anyways (Banker et al., 2012).

Anderson et al. (2007) recognize that this asymmetric cost phenomenon might explain the insignificant result of Abarbanell & Bushee (1997) for the SG&A signal. Anderson et al. (2007) hypothesize and find increase in the SG&A ratio when sales decrease signal better future performance – formally regarded as an inefficiency. Baumgarten et al. (2010) confirm this result and stipulate that it is important to distinguish intentional increases from inefficiencies in the SG&A ratio by management since the first enhances future earnings. More recently, Johnson (2016) recognized that a combination of the fundamental analysis view and the asymmetric costs theory could form a bundle of interpretations of the signal for different circumstances. This study is unique in incorporating recent theory on SG&A cost behaviour and managerial discretion into the research framework used by Abarbanell & Bushee (1997) and Anderson et al. (2007). To understand the interpretations of the SG&A signal the next sections will discuss the drivers behind the topic of cost asymmetry in SG&A.

Concluding, asymmetric cost phenomenon provides an explanation to the actual cost behaviour observed that is not in line with the traditional activity-based costing view. The managerial discretion is acknowledged and leads to cost asymmetry. In both papers tests are performed on the signal of SG&A ratio in association to one-year-ahead earnings changes and observe analysts' forecast revisions. However, no researcher studies the management itself, even though they state that it is important to distinguish between intentional behaviour and inefficiencies. The next sections will explain more on the drivers of cost stickiness and give an insight into managerial decision making regarding signalling to get an understanding of the different interpretations of the SG&A signal offered by Johnson (2016).

### 2.3 Partitioning of the change in SG&A ratio by Johnson (2016)

Based on the recent stream of literature on cost asymmetry and the fundamental analysis, Johnson (2016) recognized that changes in the SG&A ratio and its components could provide different information in different circumstances. He recognized that there was still a gap in the literature on why analysts do not impound the SG&A signal completely into their forecast revision. This section will give an overview of the research method and results of Johnson (2016).

Abarbanell & Bushee (1997) were the first to show that that the SG&A costs in relation to one-year-ahead earnings changes was not fully impounded in the analysts' forecast revisions even though it was the main cause of noise in the forecast error. Anderson et al. (2003) examined the lack of insignificance in the results of Abarbanell & Bushee (1997) and find the cause: cost stickiness. Anderson et al. (2007) elaborate on that and show results in accordance with the cost stickiness theorem which not necessarily lead to a negative signal about future earnings as the fundamental analysis predicts. An increase in the SG&A ratio when sales decline does convey a positive signal about future performance: the manager is not adjusting the costs downwards in expectation of future earnings increases. Based on their predicted earnings model, Anderson et al. (2007) find that positive abnormal returns are to be earned through portfolio investments by going long on firms with high increases in the SG&A ratio and short on firms with low increases in the SG&A ratio in revenue-declining periods. This result contrasts the fundamental analysis' interpretation of the signal where the SG&A ratio is a measure of operation efficiency, which would signal inefficiencies when

it increases – the inability of managers to control costs – and signal efficiencies when the ratio decreases – tight managerial control.

Johnson (2016) acknowledges this gap in the literature that a consensus has not yet been reached on the interpretation of the SG&A ratio signal. The main question in the research of Johnson (2016) is whether the responses of analysts and capital market participants are in the same direction as the theoretically predicted signal provided in each 'subsample, capturing the reaction of analysts through earnings forecast revision and the capital market participants through the buy-and-hold abnormal returns.

This research is relevant since investors use analyst forecast consensus for their firm valuation and prefer accurate and least volatile earnings forecasts as possible; analysts function as an intermedium to capital market participants through their fundamental analysis of signals (Lehavy et al., 2011). Even though the theory of cost asymmetry has been constructed and publicly available, results show that analysts' earnings forecasts are less accurate when the degree of cost stickiness is higher (Weiss, 2010). It is argued that stickier costs indicate more volatile future earnings due to firm-specific cost structures (Diether et al., 2002; Banker & Chen, 2006).

However, it not only affects the earnings forecast accuracy but also the analyst coverage per firm and the market response to an earnings announcement. Analysts counterintuitively decrease the amount of coverage per firm due to risk aversion regarding their credibility knowing the likelihood of (larger) forecast errors occurring, where one would expect more coverage to assure the forecast accuracy (Weiss, 2010). Market response is found to be weaker for earnings surprises when the degree of stickiness is higher (Banker & Chen, 2006; Weiss, 2010). However, it is critical to distinguish whether an increase in the SG&A ratio is intended by management (Baumgarten et al., 2010): intentional increases enhance future earnings whereas unintentional increases signal inefficiencies.

Johnson (2016) combines the latest findings on the SG&A cost asymmetry topic that will be presented in section 2.5 and fundamental analysis as presented from section 2.2 to formulate theoretical interpretations of the signal under different circumstances and uses the research design of Abarbanell & Bushee (1997) to study the association between the signal and one-year-ahead earnings, one-year-ahead analyst forecast revisions and investor

reactions through buy-and-hold abnormal returns. All six possible combinations are presented in figure 3.

| | Subsample 1 | Subsample 2 | Subsample 3 | Subsample 4 | Subsample 5 | Subsample 6 |
|---|---|---|---|---|---|---|
| SG&A Ratio | - | - | - | + | + | + |
| Sales | + | + | - | + | - | - |
| SG&A Costs | + | - | - | + | + | - |

*Figure 3: Partitioned SG&A signal into six subsamples; Johnson (2016)*

Reasoning from a fundamental analysis perspective a decrease in the SG&A ratio – subsample 1 to 3 – signals efficiency and an increase in the SG&A ratio – subsample 4 to 6 – signals inefficiency. Subsample 1 to 3 would therefore be expected to have a positive future earnings signal and subsample 4 to 6 a negative signal. Conform to the stickiness theory of Anderson et al. (2003), subsample 1 and 6 are examples of cost stickiness where costs respectively increase and decrease less proportional to sales. Subsample 3 and 4 signal anti-stickiness where costs respectively increase and decrease more proportional to sales. Subsamples 5 and 6 are found by Anderson et al. (2007) to signal positive future earnings based, contradicting the expectations of the fundamental analysis.

The modified model of Johnson (2016) only uses nine[2] out of twelve signals from Abarbanell & Bushee (1997) and partitions its sample into the six subsamples presented in figure 3. Johnson (2016) hypothesizes that analysts and investors will incorporate the SG&A ratio signal (β) as they are related to future earnings for each subsample to test whether they can see past the fundamental analysis prediction. This means that the theoretically predicted interpretation of the earnings persistence signal for better or worse future performance is incorporated in the same direction (sign: + or -) in the analyst forecast revision that proxies for analyst reactions and in the buy-and-hold abnormal returns that proxies for investor reactions. See equation 1 for the test to establish the association of the nine accounting signals with the one-year-ahead earnings change proxying for future firm performance.

*Equation 1: One-year-ahead earnings change; Johnson (2016)*

$$CEPS1_{i,t} = \alpha + \beta_1 SS\_1_{i,t} + \beta_2 SS\_2_{i,t} + \beta_3 SS\_3_{i,t} + \beta_4 SS\_4_{i,t} + \beta_5 SS\_5_{i,t} + \beta_6 SS\_6_{i,t} + \delta CEPS_{i,t} + \Sigma\gamma_{ij} Other\ Signals_{ij} + \varepsilon_{i,t}$$

Johnson (2016) reports results that subsamples 1 and 4 are negatively related to the one-year-ahead earnings change, subsamples 2, 3, 5 and 6 are positively associated of which

subsamples 3 and 5 were insignificant and thereby unrelated. This result confirms that cost stickiness signals worse future performance in subsample 1, and positive future performance due to cost stickiness in subsample 6; subsample 2 and 4 confirm the fundamental analysis predictions of respectively efficiency and inefficiency. It can also be concluded that analysts only capture the signal correctly in two out of six subsamples (2 and 6), whereas the capital market participants react correctly to the theoretical predictions in all subsamples. Also, investors recognize that analysts do not provide any value relevance on the SG&A signal, since the SG&A ratio remains significantly associated with the buy-and-hold abnormal returns after controlling for the information contained in the forecast revisions as a mediating variable.

The question arises whether analysts and investors interpret the information content of the SG&A signal the same and whether the analysts thereby function as an intermedium. It could either be that the information content is incorporated differently from what the association to the future earnings suggests but that the direction of the association to the forecast revision is the same or that they do not exploit the full information content of the signal and therefore not (fully) incorporate it into their forecast revision (Conelly et al., 2011; Johnson, 2016). This research will therefore focus on the observation of a possible differential interpretation of the same signal sent by different signallers and receivers. See figure 4 for a the signalling timeline to get an overview of what above is explained.

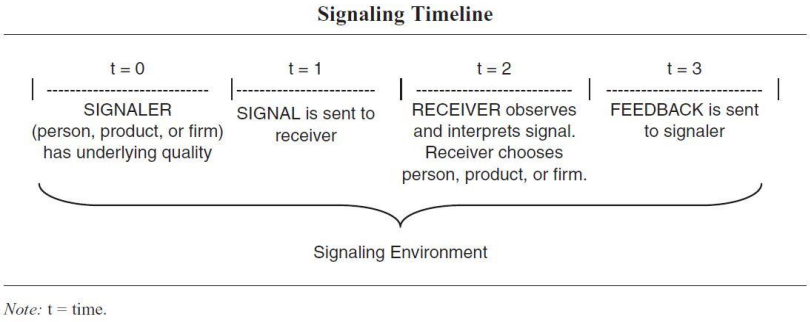


*Figure 4: Signalling timeline; Conelly et al. (2011)*

As stated in the literature review, managerial discretion is an important factor regarding cost asymmetry. The CEO will be the manager in this study and thus the signaller, because the CEO is considered to carry the end responsibility for the firm. Regarding the agency theory, it is important to have a CEO who acts in line with the interests of the stakeholders (Jensen & Meckling, 1976; Chen et al., 2012; Wang et al., 2016). Khurana (2002) and Bragaw

(2013) provide evidence on analysts and capital market participants finding signals more informative and credible if a CEO is more experienced. Combined with the notion of Johnson (2016) that CEOs might want to signal private information when using their discretion, analysts might convey the signal differently depending on the experience of the CEO and/or the costs of acquiring the information could be lower (Connelly et al., 2010). CEO experience might be a moderating factor in explaining why analysts do not take the information into account in all six situations. The matter will be addressed in this thesis by trying to answer the research question:

Is CEO experience a moderating variable in signalling the change in SG&A ratio towards analysts and capital market participants?

## 2.4 Agency theory

To better understand how managerial discretion can be applied and its influence on the SG&A signal this section will introduce the agency theory. This theoretical concept is underlying to some of the drivers behind the asymmetric cost phenomenon and contributes to the interpretation of the signal observed.

Managerial discretion is the main driver that distinguishes between the traditional and cost asymmetric view, and Anderson et al. (2003) conclude that managers may deliberately influence the resource adjustment in a (non-)optimal way for the company. In this section, the principle-agent theory will be discussed to better understand the association between the manager, the company and its stakeholders.

The principle-agent theory states an association between both an agent and a principle, where the agent is authorized to act on behalf of the principle (Ross, 1973). Both are motivated by self-interest, minimize their effort and maximize their utility. The uncertainty – that is always present to some extent – in the relationship is formed by the unpredictability of future actions of agents: the agency problem. The perfect information assumption does not hold in the real world and is therefore considered to be too expensive if the principle incurs costs that do exceed the benefits by gathering information about their agents' motives. Due to that cause, principals have less information than their agents about their motives, which is called information asymmetry and this has two consequences: adverse selection and moral hazard (Eisenhardt, 1989). Adverse selection arises if the principle is not

able to fully identify the abilities and intentions of the agent before agreeing to a contract. Moral hazard refers to the lack of effort on the agent's part in contrast to the contracted effort due to information asymmetry.

Jensen & Meckling (1976) formulate the principle- agent theory as where conflicts of interest between managers (agent) and shareholders (principle) can potentially reduce the value of the company. Anderson et al. (2003) conclude that managers have incentives to keep resources committed at the expense of company profits to retain personal benefits; a principle-agent conflict of interest. Chen et al. (2012) examine this association and confirm that managers in some cases do deliberately act on self-interested motives. Both Baumgarten et al. (2010) and Banker & Chen (2006) argue that it is crucial to distinguish whether an increase in the SG&A ratio is intended by management – an increase is regarded as intended if a company's past SG&A ratio was below its industry average, representing efficiency in SG&A cost management - or caused by economic factors (unintended) because this enhances future earnings. An occasion where SG&A cost asymmetry is observed might thus be either optimal or non-optimal. Concludingly, it is thus of importance to know the drivers behind the SG&A cost asymmetry. The next section will discuss these drivers.

## 2.5 Drivers of cost stickiness

Literature focusses on two streams of drivers of cost stickiness: managerial discretion with possible principle-agent conflicts and economic factors. In this section, the focus will be both on drivers and moderating factors of cost stickiness in SG&A.

### 2.5.1 Adjustment costs

Movement in costs when sales rise or decline are there to maximize the value for a company. However, if there is uncertainty about the future demand and firms must incur adjustment costs when adjusting resource utilization, managers may deliberately delay resource adjustment decision (Anderson et al., 2003). The underlying assumption here is that frequently changing resource commitments would outweigh the costs of keeping resources committed. For example; Anderson et al. (2003) argue that the costs of dismissal of employees and recruitment and training costs of new hires in the short-run are neither fixed nor variable, and keeping these resources committed could outweigh the benefits if sales would rise again. This long-term view justifies the stickiness of the resource utilization (Hoffman, 2016).

### 2.5.2 Capacity utilization

Balakrishnan et al. (2004) studied the capacity utilization within a hospital and found that the total available capacity influences the differential response by managers. They confirmed the stickiness found by Anderson et al. (2003) was incurred by the adjustment costs when resource utilization was considered to be at a normal level, but when the utilization of capacity was high (strained capacity) the degree of stickiness would be more severe and when capacity utilization was low (excess capacity) the results show anti-stickiness. Managers may use a decrease in demand to relieve pressure on available resources when they experience pressure (high utilization) on resources and keep slack resources available up to a certain threshold when capacity utilization is low.

Not only do managers adjust the capacity, but they are willing to adjust selling prices as well. Managers adjust prices downward to utilize existing capacity instead and add capacity when demand rises, rather than adjusting prices (Cannon, 2014). The counterintuitive result in this study is that firms incur fewer costs when they build up resources as demand falls than they incur costs to build up resources as demand rises.

### 2.5.3 Managerial expectations

Managers' expectations about the future demand are key in the decision-making process of resources adjustments. Expectations about the future are influenced by managerial optimism or pessimism in its outlook on the future demand. When managers are optimistic about future firm performance based on market conditions, they are more likely to keep resources committed. Banker et al. (2013) show that managers also consider the long-term trends in sales and extend their results from slack resources to expenditure cases, although access to capital is a constraining factor when resource adjustments need to be made (Cheng et al., 2016). This suggests once more that managers do take into account the future adjustment costs by adjusting the committed resources now and thereby signal information about expectations of future firm performance.

The strategic importance of costs moderates the effects observed where managers are reluctant to cut costs related to core operating activities (Balakrishnan & Gruca, 2008). This study was done on a firm level basis, whereas most studies are done inter-company. Banker et al. (2014) confirm this results on an intercompany level and find that optimism and pessimism act as a moderating effect on the positive association between a differentiation

strategy and cost stickiness. However, where overconfidence follows optimism, managers are more likely to drive costs away from the optimal level (Chen et al., 2012). Overconfident managers are found to have a higher expectation of sales increases and/or lower expectation on future sales decreases. The deliberate decision to keep resources committed and incur more costs is known as the empire building phenomenon (Chen et al., 2012).

### 2.5.4 Earnings management

Anderson et al. (2003) hold the view that managerial decisions to retain unutilized capacity may also be motivated by the personal considerations. In this context, earnings management is adjusting the committed resources to maximize profit to the desired level. Earnings management might not solely be motivated by what is best for the company and its stakeholders when managers are able to put their own interest first; a principle-agent problem arises (Hart, 1983). Managers might perform empire building (Chen et al., 2012) or show signs of CEO hubris in mergers and acquisitions (Yang, 2015). Though, a strong corporate governance can be a mitigating variable of agency problems (Chen et al., 2012).

Earnings management could also be used to meet or beat earnings forecasts or achieve earnings targets. Kama and Weiss (2013) find that when managers face incentives to avoid losses or earnings decreases, they expedite the downward adjustment of slack resources for sales decreases. This contrasts with the finding of Anderson et al. (2003) where managers prefer to wait longer before making the resource adjustment decision and is the result of incentives received by the firm to meet the earnings target. Dierynck et al. (2012) show similar results when managers are motivated to meet or beat analysts' forecasts resulting in a lower level of cost stickiness. This is an important contribution to the finding of Weiss (2010) that the higher the degree of stickiness the less accurate analysts' earnings forecast become.

### 2.5.5 Other findings

Critics of the explanation given by Anderson et al. (2003) have researched possible different explanations for the asymmetric cost phenomenon. This led to new insights into moderating (economic) factors, where all reported some degree of cost stickiness (Hoffmann, 2016). Holzhacker et al. (2015) show that ownership and regulation from outside of the hospital setting have an impact on the cost stickiness within the setting. The introduction of fixed-price reimbursement for diagnosis services lowers the cost stickiness by decreasing the

amount of discretion managers have on the revenue generation process, where the effect was stronger for for-profit hospitals than non-for-profits. Regulation in the form of employee protection laws differ in strictness across countries and result in different degrees of cost stickiness (Banker et al., 2013). Calleja et al. (2006) specifically find that operating costs are more sticky in the UK and the US who put more emphasis in corporate governance on shareholder value maximization, whereas the corporate governance systems in Germany and France weigh the importance of internal and external stakeholders' interest more balanced. Cultural differences across countries are found to have an effect, where the degree of stickiness is higher in countries with low uncertainty avoidance, femininity and myopia (Kitching et al., 2016).

On a country-level, Subramaniam & Watson (2016) conclude that the cost stickiness differs among industries due to the differences in operational, production and economic environments that each have different levels of asset- and inventory intensity. The highest level op cost stickiness was documented for the manufacturing industry and the least for the merchandising industry. The higher the level of competition within the industry and the bigger the market share, the higher the degree of SG&A cost stickiness is pronounced (Cheung et al., 2016). On a firm-level Balakrishnan et al. (2014) argue that the cost structure is the determining factor that is unique per company and regards this as something that cannot easily be altered. Banker et al. (2014) find that the adjustment decision is affected by prior changes in sales, showing managers are not purely myopic oriented.

Concluding, all these different drivers and moderating factors, whether they are caused by managerial discretion or economic factors, are contributing to how the SG&A ratio signal should be interpreted. Even though this information is publicly available, Johnson (2016) finds that analysts still do not fully exploit the information provided by the SG&A ratio signal by not revision their forecast revision whereas investors do. The next section will hypothesizes about a possible association of CEO characteristics and the SG&A signal. It could well be that more CEO experienced CEOs are perceived differently for sending the same signal.

## 3. Hypothesis development

As stated before, managers might use the discretion they enjoy at their own interest and agency problems arise due to information asymmetry. On the other hand, managers might be willing to signal this private information to the outside world if they are incentivized to do so, or are willing to falsely provide signals without having the underlying quality: a different expectation on the future performance of the firm than the signal provides (Conelly et al., 2011). It is thus crucial to be able to interpret these two signals correctly. In the signalling literature, the interpretation dependents on the signaller, the signal provided, the receiver and the feedback, and the signal environment as can be seen in figure 4. Since Johnson (2016) found a differential response of investors and analysts to the same signal - both receivers - this study will focus on the signaller. The forecast revision and buy-and-hold abnormal returns are proxies for the receiver's feedback as can be seen in figure 4. By expanding the study of Johnson (2016) through partitioning on the CEOs providing the signal, I might be able to provide an answer to the research question.

The focus among management scholars is on the signaller's credibility; defined as the extent to which the signaller actually has the underlying quality associated with the signal (Conelly et al., 2011). The credibility of a signal provided by a signaller is interchangeably used by many researchers for 'reliability', and are both confused with 'signal fit' and 'honesty' (Connely et al., 2011). Credibility and reliability are characteristics of the signaller, whereas the latter are characteristics of the signal.

There are two streams of research suggesting that CEOs with prior experience are valuable to a firm (Bragaw, 2013). The human capital theory states that CEOs accumulate value through former learning on-the-job experiences that reflect the CEO's knowledge, skills, and abilities (Becker, 1964). This experience is accumulated into the paradigm that is unique to the CEO. In addition, the upper echelon perspective of Hambrick and Mason (1984) support this view that past experiences help shape the perceptions, interpretations, and prioritizations that lead to specific strategic outcomes. The second view on CEO experience is rather a source of legitimacy and a symbol of credibility for the hiring board of directors (Khurana, 2002; Cohen and Dean, 2005). It establishes credibility with business press and legitimacy with shareholders. When hiring a CEO it is hard to predict its performance due to the information asymmetry and job specific requirements, therefore a company uses the

former experiences gained as a measure for performance prediction (Zhang & Rajagopalan, 2010; Bragaw, 2013). It is very important to have a fit with the strategy of the company and the CEOs experience, and therefore companies pay much attention to the selection process (Guthrie & Datta, 1997; Schimdt & Hunter 1998; Schneider et al., 1995). Schmidt & Hunter (1998) do a meta-analysis where they proxy for performance by ability and find that skills and abilities are correlated to job performance at 0.63. However, not all studies conclude that CEOs with prior experience outperform counterparts lacking experience and find that it is mostly perceived as more legitimate (Graffin et al., 2013; Graffin et al., 2011; Bragaw, 2013; Hamori & Koyuncu, 2014).

Bragaw (2013) researched what the impact of a CEO's second term was on firm performance and found that CEOs have similar SG&A ratio numbers in both terms and conclude that this is positively associated with prior performance. However, when the firm tenure increases due to a second term, the divesting behaviour becomes negatively associated with firm performance. This would suggest that managers might use their discretion negatively and let the SG&A costs become more sticky; an agency problem.

As CEO experience is associated with firm performance, positively associated with the credibility of signalling firm performance and the signal containing more private information, it could be the case that it is in a moderating variable in the asymmetric cost phenomenon. Johnson (2016) found that investors do take the SG&A cost ratio into account but analysts only incorporate the signal into their forecast revision in two out of six situations. Since prior literature is inconclusive about whether CEO experience enhances future performance or not, where it is the job of financial analysts and capital market participants to value a company (Lehavy et al., 2011), I hypothesize that financial analysts and capital market participants will react differently to SG&A signals the more experienced a CEO is. The following hypothesis that can be derived:

Hypothesis 1: the SG&A signal about the expected future firm performance will be valued as more informative by analysts when the CEO is more experienced.

If the signal would be valued as more informative due to a more experienced CEO as signaller – more credible signaller - the theoretically predicted signal of SG&A ratio about

the future firm performance per subsample will be incorporated into the forecast revision in the same direction.

Not only do I hypothesize that analysts consider the SG&A signal to be more informative when the CEO is more experienced, I also hypothesize that investors will value the signaller as more credible and thus the signal as more informative. Since investors already incorporated the signal in the same direction as theoretically predicted (Johnson, 2016), I hypothesize that the association will be stronger when the CEO is more experienced. The following hypothesis that can be derived:

Hypothesis 2: the buy-and-hold abnormal returns to be gained are smaller if the CEO is more experienced.

Hereby I predict that the buy-and-hold abnormal returns that can be gained are smaller if the CEO is more experienced. The signaller should be perceived as more credible and the signal as more informative, whereby the efficient market hypothesis predicts that fewer abnormal returns can be earned (Barber & Lyon, 1997; Conelly et al., 2011). The buy-and-hold returns should equal zero on average if all information would we incorporated into the price. With a more predictable CEO sending more credible signals, I expect that the abnormal returns will be smaller than if the CEO is less credible. Earnings surprises could present themselves more easily when there is more information asymmetry.

## 4. Methodology

This chapter describes the sample selection process, the variables that will be used and their definitions, and how the analyses will be conducted.

### 4.1 Sample

For this research, I gather data for the United States for a sample period of 1995 to 2014 to have 20 years to study of cross-sectional data, which is almost as long of a sample period as Johnson (2016) and Abarbanell & Bushee (1997) use. I obtain annual data from the fiscal year-end from of the financial statements of companies in North America from Compustat monthly updates, North America, fundamentals annual. Stock price data is obtained from the CRSP database, annual update, stock / security files, monthly stock. Analyst forecast data is obtained from the I/B/E/S database from Thomson Reuters, IBES Academic, Summary History, Summary Statistics. The Capital IQ database for People Intelligence is used to obtain data about the CEOs. See table 1 for the sample selection process.

From the Compustat database I obtain 394.864 observations for the period between January 1984 to May 2017. I eliminate 128,271 observations of firms in the financial services industry (SIC codes 6000 to 6999) because of differences in interpreting the financial statements compared to other industries (Subramanyan, 1996). Non-for-profits and other governmental organisations will be deleted later since they are not listed on a stock exchange. After calculating the variables, I drop observations with missing data in any of the variables, and observations without a timestamp; 77,427 observations remained; henceforth dataset 1.

Next, I obtain 2,813,028 observations from the CRSP database for the period between December 1985 and December 2016. First, I dropped all duplicates and observations containing non-common stock items. Second, I created a link table containing the fiscal year-end date, cusip and ticker of all original observations of the Compustat database, to be able to identify the month of the fiscal year-end – since the CRSP is monthly data and the Compustat yearly – and drop all non-merged observations. Third, I calculated the twelve-month cumulative buy-and-hold abnormal returns and dropped all observations where the month date of CRSP was not equal to the fiscal year-end month and 68,344 remained. Merging this dataset on ticker and fiscal year with dataset 1 resulted in 28,914 matching observations; henceforth dataset 2.

For the period between December 1984 and September 2016 I obtain 9,255,021 observations from the I/B/E/S database that contain all consensus earnings per share forecasts issued per fiscal year-end. First, after having dropped all duplicates, I kept only the observations that were issued within the eleventh or twelfth month before the actual earnings announcement date for the forecasts within the same fiscal year – respectively 366 days and 304 days before – to overcome possible leap years. If there were multiple forecasts issued within this timeframe, I kept the one closest to the 304 days before the announcement date. Secondly, I kept only the observations that were issued within the twenty-third and twenty-fourth month before the actual earnings announcement date for the forecasts issued as one-year-ahead forecasts – respectively 732 days and 670 days before. Third, I calculated the one-year-ahead forecast revision and eliminated the observations not containing a value, and 191,491 observations remained. Merging this dataset on cusip (8 digits) and fiscal year with dataset 2 resulted in 16,781 matching observations; henceforth dataset 3.

From the Capital IQ professional database 12,855,434 observations are obtained of which 487,770 are CEOs. This database is defined as the person who is the CEO per company for the duration of the job position; no period needed for downloading. To be able to merge this with dataset 3, I had to reshape the data to have it defined as the year of job position per company after which I eliminated all observations without a start year. Next, I added the gvkey identifier via a joinby function on the companyid and eliminated all years that did not fit the period of the gvkey. After calculating the variables needed and deleting the observations with missing values 628,004 observations were left. Merging this dataset on gvkey and year with dataset 3 resulted in 16,056 observations; henceforth final dataset. Other adjustments were made regarding missing data, duplicates and cleaning up the database in terms of doubtful CEO positions where the ending year of the position was missing, resulting in 11,822 observations over the period of 1995 to 2014.

**Table 1 - Sample selection process**

| Database | Number of observations |
|---|---|
| **Compustat - North America Fundamentals Annual** | 394,864 |
| Less: industry sic code 6000-6999 | 128,271 |
| Less: missing data in terms of fiscal year-end and duplicates | 981 |
| Less: missing data in terms of calculated variables (see table 2) | 188,185 |
| **Compustat - North America Fundamentals Annual** | 77,427 |
| | |
| **Capital IQ - People Intelligence** | 12,855,434 |
| Less: non-CEO jobs | 12,367,664 |
| Less: missing data in terms of startyear | 339,621 |
| Plus: reshaped to long on years | - 1,125,374 |
| Less: duplicates in terms of CEOs | 504 |
| Less: missing data in terms of yearfounded | 187,591 |
| Less: joinby with Capital IQ gvkey indentifier file | 437,545 |
| Less: position held not within the fiscal year | 19,879 |
| **Capital IQ - People Intelligence** | 628,004 |
| | |
| **CRSP - Monthly Stock Files** | 2,813,028 |
| Less: keep only the common stocks (shrcd 10 & 11) on NYSE/NASDAQ/AMEX | 782,296 |
| Less: missing data in terms of marketcap (prc * shrout) | 18,324 |
| Less: duplicates in terms of datayear ticker | 18,067 |
| Less: merge with Compustat to add fiscal years and months | 886,391 |
| Less: keep only if month is equal to fiscal year-end month | 1,024,021 |
| Less: missing data in terms of value-weighted returns for non 12 month long periods | 15,585 |
| **CRSP - Monthly Stock Files** | 68,344 |
| | |
| **I/B/E/S - Summary History** | 9,255,021 |
| Less: duplicates in terms of all variables | 8,675 |
| Less: missing data in terms of actual earnings announcement date | 888,438 |
| Less: observations from months unequal to the eleventh or twenty-third month for respectively one-year and two-year forecast | 7,734,109 |
| Less: missing data in terms of analysts' consensus forecast mean | 432,292 |
| **I/B/E/S - Summary History** | 191,491 |
| | |
| **Compustat - North America Fundamentals Annual** | 77,427 |
| Less: merge with CRSP | 48,513 |
| Less: merge with I/B/E/S | 12,133 |
| Less: merge with Capital IQ | 725 |
| Less: if startdate of CEO after fiscal year-end | 1 |
| Less: observations outside sample period of 1995 to 2014 | 407 |
| Less: if endyear of CEO position is unknown | 2,963 |
| Less: if currency is not USD | 6 |
| Less: missing data in terms of age | 18 |
| Less: duplicates | 839 |
| **Final sample** | 11,822 |

*Table 1: Sample selection process*

### 4.2 Variable selection

This section describes the variables to be used and how to calculate them. See table 15 in the appendix for the variable description and the exact calculation.

#### 4.2.1 Dependent variables

As used by Johnson (2016) this thesis will use the same dependent variables: one-year-ahead earnings change, one-year-ahead analyst forecast revision, and buy-and-hold abnormal returns.

To study the association between the SG&A ratio and the one-year-ahead earnings change *(CEPS1)*, the measure of one-year-ahead earnings change will be calculated as the change in the adjusted earnings per share (divided by the accumulated price factor) between the next year and the current year.

To calculate the one-year-ahead earnings per share analyst forecast revision of fiscal year (t) *(FR)*, the difference between the one-year analyst consensus forecast issued in t+1 minus the adjusted earnings per share (divided by the accumulated price factor), and the two-year analyst consensus forecast issued in t minus the one-year-ahead analyst consensus forecast issued in t, both divided by the adjusted ending share price of t-1. For the one-year forecast is taken the forecast from eleven months before the earnings announcement and for the two-year forecast twenty-three months before the earnings announcement, because by then the analysts cannot know the earnings number yet from private information and have to rely on the earnings number issued. (Abarbanell & Bushee, 1997). The reason to use the forecast revision with one- and two-year-ahead forecasts it controls for the mean-reverting walk down effect (De Bondt & Thaler, 1989).

Buy-and-hold abnormal returns (*BHAR*) are calculated as size-adjusted equally-weighted buy-and-hold abnormal returns (dividends excluded) accumulated from the fourth month after the fiscal year-end of the current year through twelve subsequent months so that all data from the financial statements will be incorporated. The size-adjusted equally-weighted returns are based on market portfolios of firms having similar market values of equity at the beginning of the calendar year in which the return cumulation period begins (Sloan, 1996; Abarbanell & Bushee, 1998). The reason to use the equally-weighted buy-and-hold abnormal returns instead of the cumulative abnormal returns is due to that the cumulative

abnormal returns are too optimistic compared to buy-and-hold abnormal returns, whereby the magnitude of the effect is overstated if one would have invested in a comparable market-size portfolio, whereby not only common stocks are considered as investable products, so this makes the comparison among stocks biased (Barber & Lyon, 1997; Carina et al., 1998; Crawford et al., 2011).

The methodology of Barber & Lyon (1997) is followed to calculate the buy-and-hold returns[3]. The holding period returns are provided by CRSP. To calculate the expected size-adjusted equally-weighted returns, I created ten size deciles based on market value of equity (price multiplied by the number of outstanding shares) in June per year for common stocks only: stock exchange codes *(exchcd)* 10 and 11. The portfolios are rebalanced annually in June, since most fiscal year-ends are in December in my sample (untabulated results), and these five months will guarantee that all information from the financial statements will be incorporated into the price in case the market is inefficient (Barber & Lyon, 1997). Stocks listed on the NYSE are larger in their market value of equity and will be put into the size deciles before adding stocks from AMEX and NASDAQ to the deciles to overcome any biases (Sloan, 1996). Hereby the number of firms for the smaller deciles is indeed larger but not problematic. The calculation of the size decile portfolio would be an equivalent of a portfolio investment strategy with monthly rebalancing (Barber & Lyon, 1997).

### 4.2.2 CEO experience

**Independent variables**

In this thesis, measures from both the human capital theory (Becker, 1964; Hambrick & Mason, 1984) and the legitimacy theory (Khurana, 2002; Cohen & Dean, 2005) will be used to measure CEO experience, because not only are actual gained experiences and demographics related to the paradigm of the CEO, also its perceived credibility matters. The following independent variables will be used: tenure, prior CEO job experience, age and formal education.

[3] $BHAR_{it} = \prod_{t=1}^{\tau}[1 + R_{it}] - \prod_{t=1}^{\tau}[1 + \mathrm{E}(R_{it})]$ where $R_{it}$ is the holding period return per month and $E(R_{it})$ the monthly average holding period return for a equally-weighted portfolio (Barber & Lyon, 1997).

Tenure *(TNR)* can be used to measure the experience gained through learning on the job (Katz, 1974). The CEO life cycle starts with an experimental phase and results in the refinement and commitment to a set of specific actions, a repertoire, that tends to persist over time (Hambrick & Fukutomi, 1991; Miller, 1991). The consensus about the CEO life cycle from its appointment on as CEO is that the experimental phase takes about two to three years and within this phase the first half year is characterized by the decisions made by the predecessor (Gabarro, 1987; Hambrick & Fukutomi, 1991; Bragaw, 2013). This repertoire tends to persist even in the face of changing environments (f.e. different industries), but the commitment to the repertoire can change (Castanias & Helfat, 2001; Bragaw, 2013). The results of Castanias & Helfat (2001) also show that not all (gained) knowledge is applicable in different environments, but it is argued that it does add value to the paradigm when CEOs have worked in different environments (Bailey & Helfat, 2003). Results also show that the longer the tenure the less adaptive the CEO becomes to adding new knowledge to its repertoire and results show that the longer the tenure the more conservative and predictable the CEO becomes (Weisbach, 1998; Dikolli et al., 2014). This phenomenon is combined with less supervision due to lower information asymmetry and leads to more discretion on behalf of the CEO when the tenure increases (Graffin et al., 2013), which might be also be a survivorship bias due to the dismissal of CEOs early in their appointments when they do not comply with the expectations (Miller, 1991; Dikolli et al., 2014). Longer tenure increases the credibility of the CEO and thereby the way shareholders perceive the CEO also changes over time due to lower information asymmetry when tenure increases (Miller, 1991; Conelly et al., 2011), but this could possibly lead to overconfidence which invokes the credibility.

Concludingly, tenure is a relevant proxy for measuring experience since it contributes to the paradigm of the CEO and how the signaller is perceived. To measure tenure this thesis will use the date of appointment of the current CEO at the fiscal year-end; this to overcome the effect of having multiple CEOs per year. The value is calculated as the difference between the fiscal year and the appointment year.

Prior CEO job experience *(CEOXPs)* is not like tenure an important factor for the paradigm of the CEO since no results are found that hiring a CEO with prior appointments increases firm performance (Khurana, 2002). This result runs counter to the human capital theory that

states that job experience increases the paradigm of the CEO where the CEO has had the opportunity to develop skills that are valuable (Carpenter et al., 2001; Combs & Skills, 2003) that would form a source of competitive advantage to the firm (Catanias & Helfat, 1991). The main argument for board of directors to hire a CEO with prior CEO job experience is that it establishes credibility with the business press and legitimacy with shareholders; anchoring behavior (Khurana, 2002; Bragaw, 2013). Prestigious directors can signal legitimacy to investors, but this legitimacy is negatively related to appointments of former prestigious CEOs (Certo et al., 2001; Certo, 2003). Bragaw (2013) finds that firms are willing to pay more in total and in the form of contingent payments to CEOs with prior job experience, but a survivorship bias might impact this results due to the fact that badly performing CEOs are probably dismissed early in their appointments (Miller, 1991; Dikolli et al., 2014). To conclude, CEOs appointed with prior CEO job experience might not cause better firm performance but are perceived as more legitimate in their position. Therefore, CEO job experience will contribute positively to the perceived experience. Prior CEO job experience will be measured as a dummy variable with the value of 1 if the CEO has had at least one prior CEO appointment and 0 if not and form an interaction variable to tenure. This measure is constructed as the first year present in the database in the role of CEO and is 1 if the same person has held another CEO position at a different firm with a later start year. One problem with this measure is that due to data availability, some persons might have held (multiple) CEO jobs before that are not recorded by the Capital IQ database. Following Hoffman (2016) I also add an interaction term of tenure and prior CEO experience (*TNRXP*) to the repertoire of CEO experience variables, reasoning that the CEO is able to impact the organisation earlier in the CEO life cycle.

Age *(AGE)* is a variable used to measure experience, since it captures the years a CEO has had to develop its paradigm (Becker, 1964), and as a signal of a person's propensity for risk-taking and change (Child, 1974, Guthrie & Datta, 1997). Prior literature states that the older the CEO is the more committed one is to its paradigm (Hambrick et al., 1993), reduced ability to learn new behaviours (Chown, 1960; Rodenback & Brettel, 2012), and more conservative and less risk-taking (Hambrick & Mason, 1984; Guthrie & Datta, 1997; Bertrand & Schoar, 2003). Younger CEOs tend to take on more risky strategies and initiate change (Hambrick & Mason, 1984). On the other hand, Bertrand & Schoar (2003) found no

differences in SG&A spending in association with age. However, this study did not study the SG&A signal in association with analysts and investors. Therefore, I regard age as a valid proxy for experience and of interest to study the perceived difference in the SG&A signal. Age will be measured as the difference between the fiscal year and the birthyear of the CEO (Rodenback & Brettel, 2012).

Education is used as a measure for formal training that one has had and is found to be impacting future organizational actions and outcomes and is related to financial policies (Malmendier & Tate, 2005; Bragaw, 2013). Prior research states that MBA graduates are by nature probably more risk-averse than entrepreneurial self-made executives (Collins & More, 1970), whereby there might be a self-selection bias that MBA programmes attract more conservative and risk-averse students together with the fact that MBA programmes are perceived as doing little toward developing innovative or risk-taking skills in students but teach analytical skills oriented toward avoiding immense mistakes or losses (Hambrick & Mason, 1984; Finkelstein & Hambrick, 1996; Gottschalk, 2006). However, Betrand & Schoar (2003) find that managers holding an MBA degree to follow more aggressive strategies, but this could be due to the fact that a larger proportion of the MBA degree holders were also younger in terms of age in their sample. The conservatism constitutes predictability and therefore can also be perceived differently by the capital market (Conelly et al., 2011). Education thus contributes to the paradigm of the CEO (Bragaw, 2013). Due to data availability, the status of undergraduate *(UGRAD)* and graduate *(GRAD)* will be used from the Capital IQ database, whereby they both are dummy variables with the value of 1 if the CEO holds that status. Holding a graduate degree will be considered as more experienced than an undergraduate status.

**Latent variable construct as interaction term**

CEO experience will be treated as a latent moderating variable constructed out of the variables *AGE, TNR, DUAL, CEOXP, GRAD, UGRAD, and TNRXP*. The theoretical predictions are that CEO experience can alter how the signal of the change in the SG&A cost ratio is perceived, which makes it a perfect moderating variable (Baron & Kenny, 1986). Since the SG&A cost ratio is a highly discretionary variable the interaction effects will be implemented on the change in SG&A cost ratio *(SS_1-6)*. However, one should be aware of a possible simultaneous bias here, where the latent variable (moderator) might cause the independent

variable or the other way around: the firm might appoint a CEO to legitimize its SG&A costs or the CEO appointed causes the firm to spend the amount spent on SG&A. In this thesis, I am concerned whether the signal is perceived differently and therefore it is not of interest to research the cause but only recognize whether it does have an explanatory power. For this reason, I am able to use both variables from the human capital theory and legitimacy theory (Becker, 1964; Khurana, 2002). The latent variable 'CEO experience' will be constructed in section 5.1.

**Control variables**

CEO characteristic variables are known for lacking endogeneity problems – especially the easily observable ones used in this paper – where the CEOs can be appointed because of their personal characteristics (Malmendier & Tate, 2005). However, this will probably not impact the results, since the main contribution of this paper is about whether the signal is perceived in the same direction as theoretically predicted. In order to address other endogeneity concern, I will control for managerial discretion, firm-specific and industry effects. See table 15 in the appendix for the variable description and the exact calculation.

Managerial discretion is one of the underlying concepts of the cost asymmetry theory. Finkelstein & Hambrick (1990) use two measures that are related to the upper echelon theory to proxy for resource slack: board tenure and board size. Dikolli et al. (2014) confirm the results on the board size measure, where larger boards have fewer incentives to monitor the CEO, and find results on CEO duality – CEO also serving as chairman of the board of directors – where the separation of the function would increase the incentive to monitor the CEO. Bragaw (2013) also used CEO duality to control for managerial discretion. In this thesis, CEO duality is used as a proxy for corporate governance. CEO duality *(DUAL)* will be a dummy variable with the value of 1 if the CEO is also the chairman of the board of directors and 0 if not.

Firm age *(FA)* is a proxy for information asymmetry. It is argued by scholars that uncertainty about the firm's performance is reduced within the years between the founding and its initial public offering (IPO) or over its total lifespan (Miller, 1991; Guthrie & Datta, 1997; Cohen & Dean, 2005; Rodenback & Brettel, 2012). The accumulated amount of information available about the firm is larger when a firm does an IPO and when it is older. Next to that,

the firm could attract different types of CEOs at different stages over its lifespan (Guthrie & Datta, 1997). Firm size also controls for a selection bias for the CEO. The age of the firm will be measured as the function of the years since it has been founded (Guthrie & Datta, 1997).

Firm size, measured as the number of employees, is found to be positively associated with organizational tenure of the CEO and is argued to be a proxy for firm complexity or an indication of a larger pool of managerial talent (Guthrie & Datta, 1997). It influences the hiring policy of the CEO in both settings, where complexity causes the board to look for a more all-round skilled CEO (Dalton & Kesner, 1983), and the organizational talent argument states that the probability is higher for attracting a more appropriate candidate with significant firm tenure and the right fit with the firm's strategy (Tushman & Romanelli, 1985). Firm size will thus be a control variable for a CEO selection bias. Firm size is taken as the number of employees by Guthrie & Datta (1997) and Bragaw (2013). However, one of the fundamental signals 'labor force' will be incorporated and altogether function as a fundamental signal and control variable. This variable will be discussed in section 4.2.3.

Growth in the national product of a country is found to be related to the stickiness of the SG&A cost ratio. Managers would be less willing to decrease the committed resources in periods of higher economic growth (Anderson et al., 2003). Anderson et al. (2007) specified this to sales growth per industry to control for industry effects in growth. In this thesis, the growth in sales *(Growth)* will be calculated according to Anderson et al. (2007) as the percentage growth in sales of current year over the year before. This is the same as the fundamental signal from Abarbanell & Bushee (1997).

Leverage *(LEV)* is found by Anderson et al. (2007) to influence the SG&A signal. When firms have higher fixed to variable SG&A costs – a greater operational leverage – they will experience relatively bigger increases in the SG&A signal in periods of revenue declines. If the revenue demand is restored they will also experience greater increases in future earnings. Leverage thus increases the magnitude of the signal. Leverage is also a fundamental signal from Abarbanell & Bushee (1997).

Industry will be controlled for due to the characteristics that shape the firm and lead to different levels of cost stickiness in SG&A, and possible endogeneity concerns related to the CEO's paradigm. Industries can differ in the complexity of the business, the technological

status, the cost of capital and competition that eventually contribute to firm-specific elements (Abarbanell & Bushee, 1997; Cheung et al., 2016). Banker & Chen (2006) and Baumgarten et al. (2010) find different levels of cost stickiness for different industries. Since the business and signals obtained per industry differ, it will be controlled for. On the CEO's part, the human capital theory states that CEOs might get equipped with different abilities from different industries (Castanias & Helfat, 2001; Bragaw, 2013). The applicability of those abilities can differ among industries, but this might be a selection criterion for CEOs to be appointed. The level of discretion that CEOs enjoy also differs among firms (Finkelstein & Hambrick, 1990). Industry will thus both for firm-specific reasons and endogeneity concerns controlled for. Industry fixed effects will be controlled for using the Fama & French (1997) 12 industry classifications as Anderson et al. (2007) uses as well.

### 4.2.3 Fundamental signals

**Independent variables**

As used by Abarbanell & Bushee (1997) and described by Lev & Thiagarajan (1993) the following nine variables will be used: change in inventory *(ΔINV)*; change in accounts receivable *(ΔAR)*; change in capital expenditures *(ΔCAPX)*; change in gross margin *(ΔGM)*; subsample sales, general and administrative expenses *(SS_x),* with x as the number of the subsample; effective tax rate *(ETR)*; labor force *(LF)*; change in leverage *(ΔLEV)*; sales growth *(Growth)*; auditor opinion *(AO)*; and earnings quality *(EQ)*. These variables will be calculated as absolute measures and as a ratio to sales.

Change in the adjusted earnings per share for the current year compared to the last year *(CEPS)* is used as the operationalization of the fundament signal for earnings change for the current year. This has next to the change in future earnings a signalling effect about the earnings persistence (Anderson et al., 2003; Johnson, 2016).

## 4.3 Research Design

The research design to be used is a modified model of Johnson (2016), which is adjusted to include the CEO experience. The descriptive statistics will describe the sample and function also as a validity test of the theoretical framework since the sample differs from Johnson (2016). Next, the hypotheses will be tested for by adding the CEO experience measure.

In this thesis, I will use Ordinary Least Squares (OLS) regressions on the cross-sectional data from the sample. Specifically, a model with year and industry fixed effects is going to be used, as it eliminates all constant factors over time which can be confounding (Wooldridge, 2014). Due to missing observations across years per company resulting in a different number of observations per year, the sample is defined as cross-sectional data. Even though time series data is preferred for its reliability and efficiency, cross-sectional data suits the purpose of answering the research question. This study is focused on the usefulness of accounting information and not on studying the firms over time. Conclusions can be drawn between firms with different changes in the SG&A ratio and its components.

I will test the model of Johnson (2016) and one with the CEO experience incorporated for their explanatory power by regressing the one-year-ahead earnings change *(CEPS)* on the fundamental signals and the change in SG&A ratio: equation 2 is a replication of Johnson (2016) without the CEO experience variables to show how each coefficient is influenced when adding the interaction effect, equation 3 includes the CEO experience variables as an independent variable, and equation 4 includes the CEO experience variable as an interaction effect. The one-year-ahead earnings change proxies for the future earnings. The test in equation 2 is conducted to check whether the CEO experience has a significant effect on other fundamental signals.

*Equation 2: Unmodified model of Johnson (2016)*

$$DV_{i,t} = \beta_0 + \beta_1 * SS_{1i,t} + \beta_2 * SS_{2i,t} + \beta_3 * SS_{3i,t} + \beta_4 * SS_{4i,t} + \beta_5 * SS_{5i,t} + \beta_6 * SS_{6i,t} + \sum \gamma_{ij} OtherSignals_{ij}$$

*Equation 3: Modified model including ExperienceVar as an independent variable*

$$DV_{i,t} = \beta_0 + \beta_1 * SS_{1i,t} + \beta_2 * SS_{2i,t} + \beta_3 * SS_{3i,t} + \beta_4 * SS_{4i,t} + \beta_5 * SS_{5i,t} + \beta_6 * SS_{6i,t} + \beta_7 * ExperienceVar_{i,t} + \beta_8 * FA_{i,t} + \sum \gamma_{ij} OtherSignals_{ij}$$

*Equation 4: Modified model including ExperienceVar as a moderating variable*

$$DV_{i,t} = \beta_0 + \beta_1 * SS_{1i,t} + \beta_2 * SS_{2i,t} + \beta_3 * SS_{3i,t} + \beta_4 * SS_{4i,t} + \beta_5 * SS_{5i,t} + \beta_6 * SS_{6i,t} + \beta_{7-12} * SS_{1-6i,t} * ExperienceVar_{i,t} + \beta_{13} * ExperienceVar_{i,t} + \beta_{14} * FA_{i,t} + \sum \gamma_{ij} OtherSignals_{ij} + \varepsilon$$

DV stands for the independent variable. ExperienceVar stands for the latent variable CEO experience. OtherSignals stands for the variables: *CEPS; ΔINV; ΔAR; ΔCAPX; ΔGM; ETR; LF;*

*ΔLEV; Growth; AO; and EQ*. The *CEPS* is included as a one-year lagged independent variable of the dependent variable to control for reversed causality.

I predict the following for *SS_1-6* for equation 2 as presented in table 2 panel A: Reasoning from a fundamental analysis perspective a decrease in the SG&A ratio – subsample 1 to 3 – signals efficiency and an increase in the SG&A ratio – subsample 4 to 6 –signals inefficiency. Subsample 1 to 3 would therefore be expected to have a positive future earnings signal and subsample 4 to 6 a negative signal. Conform to the stickiness theory of Anderson et al. (2003), subsample 1 and 6 are examples of cost stickiness where costs respectively increase and decrease slower than sales do. Subsample 3 and 4 signal anti-stickiness where costs respectively increase and decrease quicker than sales do. Subsamples 5 and 6 are found by Anderson et al. (2007) to signal positive future earnings based, contradicting the expectations of the fundamental analysis.

Even though Johnson (2016) found no association between *SS_3* and *SS_5* and the one-year-ahead earnings change, I do predict that this association will be found; there is enough theory suggesting these associations should be found. Thereby this test also functions as a validity check of Johnson (2016). I do not predict any changes in other variables will occur when the moderating effect of CEO experience is added in their association to one-year-ahead earnings, since I only predict that it will influence the interpretation of the signal and do not make any predictions about changes in the ratio itself. If I would do this I would need to test for the simultaneous bias, but that is out of the scope of this thesis. I also do not expect the explanatory power of the test in equation 3 to increase in comparison to equation 1 and 2. I will compare this on goodness-of-fit measures based on the parsimony principle (Busemeyer et al., 2015).

**Table 2 - Panel A - Theoretical predictions of the change in SG&A ratio in relation to CEPS1**

| Variable of interest | Equation 1 | Equation 3 |
|---|---|---|
| SS_1 | negatively associated with DV* | negatively associated with DV |
| SS_2 | positively associated with DV | positively associated with DV |
| SS_3 | positively associated with DV | positively associated with DV |
| SS_4 | negatively associated with DV | negatively associated with DV |
| SS_5 | positively associated with DV | positively associated with DV |
| SS_6 | positively associated with DV | positively associated with DV |
| SS_1*ExperienceVar | | - |
| SS_2*ExperienceVar | | - |
| SS_3*ExperienceVar | | - |
| SS_4*ExperienceVar | | - |
| SS_5*ExperienceVar | | - |
| SS_6*ExperienceVar | | - |

**Table 2- Panel B - Theoretical predictions of the change in SG&A ratio in relation to FR and BHAR**

| Variable of interest | Equation 5 and 8 | Equation 6 and 9 |
|---|---|---|
| SS_1 | negatively associated with DV | negatively associated with DV |
| SS_2 | positively associated with DV | positively associated with DV |
| SS_3 | positively associated with DV | positively associated with DV |
| SS_4 | negatively associated with DV | negatively associated with DV |
| SS_5 | positively associated with DV | positively associated with DV |
| SS_6 | positively associated with DV | positively associated with DV |
| SS_1*ExperienceVar | | negatively associated with DV |
| SS_2*ExperienceVar | | positively associated with DV |
| SS_3*ExperienceVar | | positively associated with DV |
| SS_4*ExperienceVar | | negatively associated with DV |
| SS_5*ExperienceVar | | positively associated with DV |
| SS_6*ExperienceVar | | positively associated with DV |

*DV = dependent variable

*Table 2: Theoretical predictions*

To test the first hypothesis, I will test whether the change in SG&A ratio is perceived differently by analysts and impounded correctly into their forecast revision if the CEO is more experienced. If analysts incorporate the information correctly the association of variables *(SS_1-6)* to one-year-ahead analysts forecast revision in equation 2 should equal the association to the one-year-ahead earnings. However, this was not the case for *SS_1* and *SS_4* in the study of Johnson (2016), and therefore I predict that if any asymmetries occur between these two tests, that these will be dissolved by incorporating the CEO experience as a moderating effect presented in table 2 panel B. I also predict that the explanatory power of the model increases.

The mediation test will provide a definitive test to hypothesis 1 to see whether analysts also incorporated the signals correctly according to the investors, and function as an intermedium.

I will regress analyst forecast revision (*FR)* as the dependent variable on the fundamental signals and the change in SG&A ratio *(SS_1-6)* in equation 2, include the CEO experience in equation 3, and include the CEO experience interaction term in equation 4.

The signs of the change in SG&A ratio *(SS_1-6)* should equal the theoretical predictions presented in table 2 panel B. If the coefficients are significant and signs in the opposite direction, it means that the analysts do impound the information but in the opposite direction of what the new information suggests. If the coefficients are insignificant, it should be interpreted as the analysts not using the information, only if the information is not anticipated on more than one year ahead (Johnson, 2016).

To test the second hypothesis, I will test whether the change in SG&A ratio is perceived correctly by investors. I regress the buy-and-hold abnormal returns as the dependent variable on the fundamental signals and the change in SG&A ratio *(SS_1-6)* in equation 2, include the CEO experience variable in equation 3, and include the CEO experience interaction term equation 4.

Again, the signs of the change in SG&A ratio *(SS_1-6)* should equal the theoretical predictions presented in table 2 panel B if the information is priced into the stocks. I also predict that the explanatory power of the test in equation 4 is larger than equation 2. In contrast to the analysts, investors already incorporated the information correctly according to their association to one-year-ahead earnings in the study of Johnson (2016). Therefore, I predict investors to find the information more credible if the CEO is more experienced and that fewer returns are to be earned: that the total change in *BHAR* will be smaller for the combined effect of *(SS_1-6)* and its interaction term in equation 4 compared to equation 2. In other words, the change in SG&A ratio should be regarded as more credible and informative when CEO experience is incorporated and fewer buy-and-hold abnormal returns are to be gained.

Since analysts function as an intermedium to investors to base their investment behaviour on, I am going to test to what extent the information provided by analysts (*FR)* is used for pricing the securities equation 5. The test in equation 6 includes the CEO experience variable as an independent variable and equation 7 includes the CEO experience variable as an interaction term.

*Equation 5: Buy-and-hold abnormal returns including the forecast revision; Johnson (2016)*

$$BHAR_{i,t} = \alpha + \beta_1 SS\_1_{i,t} + \beta_2 SS\_2_{i,t} + \beta_3 SS\_3_{i,t} + \beta_4 SS\_4_{i,t} + \beta_5 SS\_5_{i,t} + \beta_6 SS\_6_{i,t} + \delta CEPS_{i,t} + \Sigma \gamma_{ij} Other\ Signals_{ij} + \beta_7 FR_{i,t} + \varepsilon_{i,t}$$

*Equation 6: Buy-and-hold abnormal returns including the forecast revision including CEO experience*

$$BHAR_{i,t} = \beta_0 + \beta_1 * SS_{1i,t} + \beta_2 * SS_{2i,t} + \beta_3 * SS_{3i,t} + \beta_4 * SS_{4i,t} + \beta_5 * SS_{5i,t} + \beta_6 * SS_{6i,t} + \beta_7 * ExperienceVar_{i,t} + \beta_8 * FA_{i,t} + \sum \gamma_{ij} OtherSignals_{ij} + \beta_9 * FR_{i,t} + \varepsilon$$

*Equation 7: Buy-and-hold abnormal returns including the forecast revision including CEO experience interaction effect*

$$BHAR_{i,t} = \beta_0 + \beta_1 * SS_{1i,t} + \beta_2 * SS_{2i,t} + \beta_3 * SS_{3i,t} + \beta_4 * SS_{4i,t} + \beta_5 * SS_{5i,t} + \beta_6 * SS_{6i,t} + \beta_{7-12} * SS_{1-6i,t} * ExperienceVar_{i,t} + \beta_{13} * ExperienceVar_{i,t} + \beta_{14} * FA_{i,t} + \sum \gamma_{ij} OtherSignals_{ij} + \beta_{15} * FR_{i,t} + \varepsilon$$

This test provides results to what extent the analysts function as an intermedium. If the coefficients remain significant in the presence of *(FR)*, it should be interpreted as investors recognizing the fact that analysts do not fully or wrongfully impound the information contained in the signals. This final test provides results for hypothesis 1 to show whether analysts do incorporate the signal correctly. I predict that the signals will become statistically insignificant in the presence of *(FR)* in equation 7; any possible occurring asymmetry should be dissolved.

## 5. Results

This chapter contains the descriptive statistics and the regression analysis.

### 5.1 Descriptive Statistics

The sample contains 11,822 firm-year observations for the years 1995 to 2014 with 1731 unique firms. To remove outliers all variables are winsorized at the top and bottom 1% of the distribution – more winsorizing did not improve the normality. The variables *GRAD* and *UGRAD* are deleted since all observations contain a value of zero and *AO* is deleted because only one observation holds a value of one.

Table 3 reports the historical SG&A ratio per year to present that on average the SG&A ratio is 25.79% with standard deviation of 18.65% and a median of 21.38%, which is fairly the same as the research of Anderson et al. (2003) reports with a mean of 26.41%, a standard deviation of 17.79% and median of 22.62%, but about 10 percent point lower (35.65%) then Johnson (2016) reports on average, 12 percent point lower (33.84%) in standard deviation, and 4 percent point lower (25.21%) in the median. The differences in statistics could be due to different sample periods and the use of different databases and/or countries; Anderson et al. (2003) uses 1979 to 1998 and Johnson (2016) uses 1990 to 2009, and both use databases for the continent of North America where I use the United States only.

**Table 3 - Descriptive statistics on historical SG&A ratio**

| | Firm-year observations | Mean SG&A ratio (%) | Median SG&A ratio (%) | Lower quartile (%) | Upper quartile (%) | Standard deviation (%) |
|---|---|---|---|---|---|---|
| 1995 | 91 | 25.15 | 22.99 | 10.82 | 35.55 | 17.48 |
| 1996 | 107 | 24.73 | 21.23 | 11.40 | 33.48 | 17.69 |
| 1997 | 151 | 24.03 | 20.48 | 11.33 | 33.37 | 16.51 |
| 1998 | 209 | 24.82 | 20.78 | 11.14 | 34.65 | 16.32 |
| 1999 | 258 | 24.30 | 21.49 | 11.78 | 33.52 | 15.43 |
| 2000 | 306 | 23.94 | 20.60 | 11.61 | 32.02 | 16.79 |
| 2001 | 346 | 25.45 | 21.19 | 12.13 | 34.73 | 17.87 |
| 2002 | 430 | 27.24 | 22.62 | 11.93 | 36.93 | 19.80 |
| 2003 | 541 | 25.60 | 21.03 | 11.30 | 35.80 | 18.13 |
| 2004 | 603 | 25.27 | 21.55 | 11.41 | 35.17 | 17.23 |
| 2005 | 663 | 26.25 | 22.37 | 12.18 | 36.67 | 18.13 |
| 2006 | 717 | 25.62 | 21.16 | 11.17 | 36.26 | 18.59 |
| 2007 | 808 | 25.38 | 20.43 | 10.81 | 36.06 | 18.63 |
| 2008 | 826 | 26.24 | 21.66 | 10.73 | 36.52 | 19.55 |
| 2009 | 849 | 26.61 | 22.81 | 11.98 | 37.36 | 18.49 |
| 2010 | 922 | 25.46 | 22.05 | 11.47 | 35.28 | 17.72 |
| 2011 | 956 | 25.45 | 21.23 | 10.91 | 35.63 | 18.76 |
| 2012 | 995 | 25.82 | 21.21 | 11.17 | 35.60 | 18.96 |
| 2013 | 1,023 | 26.18 | 20.80 | 10.79 | 35.91 | 20.05 |
| 2014 | 1,021 | 26.58 | 21.25 | 10.73 | 36.64 | 20.41 |
| Total | 11,822 | 25.79 | 21.38 | 11.32 | 35.78 | 18.65 |

*Table 3: Descriptive statistics on Historical SG&A ratio*

Over the years, the median SG&A ratio is quite stable, but the standard deviation increases as can be seen in table 3. Both the sales and SG&A costs increase after 2001 in the upper quartile, where the SG&A costs increase more rapidly than the sales resulting in a higher SG&A ratio. This increasing trend is also observed by Johnson (2016). The average amount spent on SG&A increases across all industries with a higher growth pattern for the Telecom industry is presented in table 5 panel B, which is more represented in the upper quartile in table 3. This could either or both be a survivorship bias after the crisis in 2001 for companies in the telecom industry or be a change in the way these companies and markets function. No break in the increasing pattern is found around the years of the crisis in 2008 (table 5 – panel B). The telecom sector is more present in subsample 1 and 4 which might influence the predictions formulated in table 5 panel A. To control for any exogenous changes attributable to certain years and industries I include the year and industry fixed effects, but I will also run the model without industry fixed effects due to the limited number of observations per industry per year.

**Table 4 - Descriptive statistics of variables**

| | Full sample | | Subsample 1 | | Subsample 2 | | Subsample 3 | | Subsample 4 | | Subsample 5 | | Subsample 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| CEPS1 | 0.006 | 0.004 | -0.002 | 0.004 | 0.002 | 0.004 | 0.028 | 0.008 | -0.008 | 0.002 | 0.010 | 0.003 | 0.065 | 0.016 |
| FR | 0.015 | 0.002 | 0.006 | 0.001 | 0.013 | 0.001 | 0.028 | 0.004 | 0.009 | 0.001 | 0.018 | 0.001 | 0.054 | 0.011 |
| BHAR | -0.002 | -0.049 | -0.018 | -0.055 | -0.021 | -0.059 | 0.049 | -0.038 | -0.006 | -0.038 | 0.008 | -0.075 | 0.046 | -0.046 |
| TNR | 7.586 | 6.000 | 7.900 | 6.000 | 7.344 | 5.000 | 6.231 | 4.000 | 7.703 | 6.000 | 7.710 | 6.000 | 6.981 | 5.000 |
| CEOXP | 0.095 | 0.000 | 0.088 | 0.000 | 0.125 | 0.000 | 0.119 | 0.000 | 0.095 | 0.000 | 0.068 | 0.000 | 0.102 | 0.000 |
| AGE | 55.124 | 55.000 | 54.997 | 55.000 | 55.635 | 55.000 | 55.394 | 55.000 | 54.899 | 55.000 | 55.160 | 55.000 | 55.620 | 55.000 |
| DUAL | 0.321 | 0.000 | 0.334 | 0.000 | 0.302 | 0.000 | 0.309 | 0.000 | 0.335 | 0.000 | 0.306 | 0.000 | 0.267 | 0.000 |
| FA | 50.012 | 35.000 | 48.075 | 33.000 | 51.381 | 37.000 | 60.331 | 45.000 | 48.923 | 32.000 | 48.987 | 35.000 | 53.928 | 42.000 |
| Sales | 4612.149 | 928.353 | 4585.028 | 961.749 | 5427.130 | 931.122 | 5399.016 | 1045.475 | 4442.448 | 993.649 | 4517.647 | 666.759 | 4096.648 | 799.572 |
| ΔSales | 264.183 | 49.696 | 547.845 | 135.683 | 337.752 | 47.387 | -262.293 | -47.038 | 383.204 | 81.400 | -218.921 | -36.669 | -464.519 | -144.178 |
| SG&A | 780.027 | 177.083 | 764.466 | 182.186 | 690.480 | 133.895 | 977.359 | 184.062 | 836.166 | 195.885 | 673.125 | 133.690 | 729.390 | 173.007 |
| ΔSG&A | 43.066 | 9.281 | 62.919 | 16.104 | -28.804 | -5.785 | -66.837 | -22.294 | 95.309 | 26.000 | 35.078 | 6.793 | -46.635 | -11.679 |
| SG&A ratio | 0.258 | 0.214 | 0.251 | 0.211 | 0.223 | 0.163 | 0.245 | 0.202 | 0.270 | 0.230 | 0.266 | 0.209 | 0.279 | 0.233 |
| ΔSG&A ratio | -0.001 | -0.001 | -0.019 | -0.008 | -0.037 | -0.016 | -0.018 | -0.008 | 0.015 | 0.008 | 0.040 | 0.020 | 0.029 | 0.015 |
| CEPS | 0.011 | 0.005 | 0.022 | 0.011 | 0.051 | 0.014 | 0.040 | 0.003 | 0.000 | 0.002 | -0.031 | -0.018 | -0.011 | -0.024 |
| INV | 423.179 | 70.723 | 419.362 | 73.792 | 452.766 | 60.134 | 533.024 | 76.516 | 397.470 | 69.813 | 433.094 | 58.889 | 409.489 | 80.049 |
| ΔINV | 0.000 | 0.000 | -0.004 | 0.000 | -0.004 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 | 0.010 | 0.002 | 0.010 | 0.002 |
| AR | 614.363 | 124.243 | 607.756 | 134.928 | 715.693 | 114.986 | 762.276 | 138.275 | 580.873 | 131.900 | 585.739 | 83.659 | 582.957 | 106.586 |
| ΔAR | -0.001 | 0.000 | -0.005 | -0.002 | -0.005 | -0.001 | 0.002 | 0.001 | -0.001 | -0.001 | 0.004 | 0.002 | 0.013 | 0.007 |
| CAPX | 246.903 | 34.591 | 239.020 | 35.140 | 298.435 | 39.110 | 270.947 | 38.191 | 241.762 | 38.486 | 259.712 | 30.076 | 220.516 | 22.072 |
| ΔCAPX | 0.000038 | 0.000005 | 0.000124 | 0.000018 | -0.000065 | -0.000001 | -0.000160 | -0.000023 | 0.000113 | 0.000015 | -0.000063 | -0.000007 | -0.000202 | -0.000027 |
| GM | 1581.681 | 325.344 | 1561.762 | 349.530 | 1597.208 | 302.912 | 2013.567 | 337.647 | 1641.106 | 360.360 | 1404.058 | 226.988 | 1365.454 | 264.631 |
| ΔGM | -0.000152 | 0.000288 | 0.001448 | -0.000621 | -0.002117 | -0.003630 | -0.008457 | -0.005184 | 0.004092 | 0.004483 | -0.006758 | -0.002866 | -0.005720 | -0.002135 |
| ETR | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| LF | -0.047 | -0.037 | -0.111 | -0.080 | -0.096 | -0.063 | -0.015 | 0.005 | -0.038 | -0.031 | 0.068 | 0.053 | 0.089 | 0.082 |
| ΔLEV | 0.014 | 0.000 | -0.005 | 0.000 | 0.004 | 0.000 | -0.003 | 0.000 | 0.045 | 0.000 | 0.111 | 0.000 | -0.078 | 0.000 |
| Growth | -0.019 | -0.011 | 0.083 | 0.040 | 0.043 | 0.016 | -0.092 | -0.075 | -0.018 | -0.005 | -0.221 | -0.147 | -0.233 | -0.181 |
| EQ | 0.181 | 0.000 | 0.177 | 0.000 | 0.200 | 0.000 | 0.218 | 0.000 | 0.175 | 0.000 | 0.159 | 0.000 | 0.196 | 0.000 |
| TNRXP | 0.375 | 0.000 | 0.381 | 0.000 | 0.439 | 0.000 | 0.347 | 0.000 | 0.379 | 0.000 | 0.274 | 0.000 | 0.398 | 0.000 |
| Number of observations | | 11,822 | | 4,464 | | 1,016 | | 724 | | 3,389 | | 1,063 | | 1,166 |

*Table 4: Descriptive statistics of variables*

Table 4 presents the descriptive statistics for all variables for the full sample and the subsamples. The change in SG&A ratio is normally distributed for the full sample, nonetheless, the partitioning does convey large differences: subsample 2 versus 5. All but *FA*

is normally distributed because they are almost all ratios or differences in ratios between two years. The predictive power of the variable *FA* is improved by taking the natural logarithmic function: *ln_FA*. The binary variables *(CEOXP DUAL EQ)* do not represent a fair view in table 4, but they do give an insight into the distribution per subsample. Even though Johnson (2016) deleted EQ, I will keep it because on average eight-teen percent of the observations across all years uses an inventory method that is not LIFO, but the number is falling from twenty-eight percent to fourteen during the sample period; this could be due to the usage of I.F.R.S. as an accounting method that does not allow for FIFO inventory methods that U.S. GAAP does.

**Table 5 - Panel A - Descriptive statistics of industries**

| Industry classification | Number of observations | Percentage (%) | Subsample 1 | Subsample 2 | Subsample 3 | Subsample 4 | Subsample 5 | Subsample 6 |
|---|---|---|---|---|---|---|---|---|
| Business Equipment | 2,908 | 24.60 | 1,095 | 220 | 164 | 842 | 275 | 312 |
| Chemicals | 596 | 5.04 | 231 | 58 | 37 | 160 | 57 | 53 |
| Consumer Durable | 515 | 4.36 | 177 | 49 | 31 | 136 | 59 | 63 |
| Energy | 618 | 5.23 | 247 | 71 | 33 | 139 | 74 | 54 |
| Health | 1,148 | 9.71 | 488 | 78 | 45 | 397 | 84 | 56 |
| Manufacturing | 2,064 | 17.46 | 770 | 192 | 140 | 491 | 196 | 275 |
| Consumer Nondurable | 724 | 6.12 | 257 | 57 | 71 | 220 | 61 | 58 |
| Other | 1,756 | 14.85 | 587 | 192 | 138 | 525 | 140 | 174 |
| Telecom | 252 | 2.13 | 85 | 27 | 20 | 77 | 28 | 15 |
| Shops | 1,210 | 10.24 | 519 | 65 | 45 | 392 | 84 | 105 |
| Utilities | 31 | 0.26 | 8 | 7 | - | 10 | 5 | 1 |
| Total | 11,822 | 100.00 | 4,464 | 1,016 | 724 | 3,389 | 1,063 | 1,166 |

**Table 5 - Panel B - Descriptive statistics on average SG&A ratio per year per industry**

| Industry / Years | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Average per industry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Business Equipment | 35.23 | 34.43 | 34.86 | 34.97 | 31.91 | 31.82 | 37.42 | 39.51 | 37.38 | 33.88 | 36.45 | 36.70 | 37.56 | 39.20 | 38.47 | 35.40 | 36.55 | 38.22 | 39.53 | 40.69 | 37.33 |
| Chemicals | 26.81 | 26.46 | 27.28 | 25.11 | 28.24 | 28.89 | 24.32 | 21.58 | 22.08 | 21.32 | 21.01 | 19.95 | 19.37 | 18.15 | 21.91 | 21.27 | 22.91 | 22.53 | 21.53 | 21.85 | 21.91 |
| Consumer Durable | 18.73 | 15.46 | 15.31 | 14.43 | 18.81 | 14.82 | 16.18 | 17.17 | 19.25 | 20.74 | 18.84 | 20.17 | 19.52 | 18.62 | 19.31 | 19.42 | 19.66 | 20.23 | 17.66 | 19.73 | 18.84 |
| Consumer Nondurable | 28.68 | 32.80 | 31.57 | 29.05 | 30.21 | 30.33 | 29.75 | 29.48 | 29.97 | 29.48 | 29.31 | 28.51 | 27.26 | 27.10 | 27.31 | 26.63 | 26.55 | 26.11 | 25.83 | 25.95 | 27.72 |
| Health | 36.93 | 43.13 | 45.65 | 42.93 | 38.85 | 40.22 | 42.31 | 43.51 | 39.51 | 41.72 | 42.77 | 45.42 | 44.23 | 46.49 | 43.33 | 43.39 | 42.38 | 42.27 | 44.25 | 43.88 | 43.15 |
| Manufacturing | 21.17 | 20.30 | 19.22 | 20.45 | 20.19 | 16.71 | 18.34 | 21.02 | 19.02 | 18.18 | 18.98 | 17.79 | 17.89 | 17.70 | 20.75 | 17.98 | 17.23 | 16.93 | 17.37 | 18.05 | 18.35 |
| Energy | 16.38 | 10.59 | 8.25 | 9.81 | 10.27 | 7.06 | 9.14 | 8.30 | 9.17 | 8.39 | 10.22 | 9.69 | 11.34 | 9.32 | 12.44 | 9.67 | 10.89 | 8.67 | 8.66 | 8.69 | 9.67 |
| Other | 14.73 | 12.32 | 13.03 | 15.28 | 17.51 | 16.21 | 17.58 | 17.95 | 16.83 | 17.48 | 18.25 | 17.89 | 18.34 | 18.43 | 18.53 | 18.31 | 18.59 | 19.32 | 18.62 | 17.97 | 18.06 |
| Telecom | - | - | 20.54 | 16.42 | 15.65 | 19.10 | 38.58 | 35.27 | 27.56 | 29.00 | 30.45 | 27.32 | 29.02 | 27.84 | 30.19 | 27.11 | 26.93 | 27.48 | 26.71 | 28.14 | 28.05 |
| Utilities | - | - | - | 13.09 | 13.56 | 14.21 | 17.77 | 14.34 | - | 18.34 | - | 17.54 | 19.08 | 15.06 | 14.81 | 19.54 | 15.26 | 12.70 | 12.80 | 14.74 | 15.09 |
| Shops | 16.86 | 14.07 | 14.80 | 17.51 | 15.55 | 17.01 | 15.40 | 16.38 | 15.73 | 17.20 | 18.74 | 17.95 | 16.46 | 17.62 | 17.93 | 17.71 | 17.05 | 17.66 | 17.94 | 17.29 | 17.28 |
| Average per year | 25.15 | 24.73 | 24.03 | 24.82 | 24.30 | 23.94 | 25.45 | 27.24 | 25.60 | 25.27 | 26.25 | 25.62 | 25.38 | 26.24 | 26.61 | 25.46 | 25.45 | 25.82 | 26.18 | 26.58 | 25.79 |

The industry classifications are based on Fama & French (1997) 12 industry definition after deleting financial service industry (SIC code 6000-6999).

1. Business Equipment -- Computers, Software, and Electronic Equipment (SIC code 3570-3579,3660-3692,3694-3699,3810-3829,7370-7379)
2. Chemicals -- Chemicals and Allied Products (SIC code 2800-2829,2840-2899)
3. Consumer Durable -- Cars, TV's, Furniture, Household Appliances (SIC code 2500-2519,2590-2599,3630-3659,3710-3711,3714-3714,3716-3716,3750-3751,3792-3792,3900-3939,3990-3999)
4. Energy -- Oil, Gas, and Coal Extraction and Products (SIC code 1200-1399,2900-2999)
5. Health -- Healthcare, Medical Equipment, and Drugs (SIC code 2830-2839,3693-3693,3840-3859,8000-8099)
6. Manufacturing -- Machinery, Trucks, Planes, Off Furn, Paper, Com Printing (SIC code 2520-2589,2600-2699,2750-2769,3000-3099,3200-3569,3580-3629,3700-3709,3712-3713,3715-3715,3717-3749,3752-3791, 3793-3799,3830-3839,3860-3899)
7. Consumer Nondurable -- Food, Tobacco, Textiles, Apparel, Leather, Toys (SIC code 0100-0999,2000-2399,2700-2749,2770-2799,3100-3199,3940-3989)
8. Other -- Everything Else -- Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment
9. Telecom -- Telephone and Television Transmission (SIC code 4800-4899)
10. Shops -- Wholesale, Retail, and Some Services (Laundries, Repair Shops) (SIC code 5000-5999,7200-7299,7600-7699)
11. Utilities -- Utilities (SIC code 4900-4949)

*Table 5: Descriptive statistics on industries*

Table 16 in the appendix presents a polychoric correlation matrix. A polychoric correlation test creates the following correlations: a polyserial correlation if both variables are binary, a polychoric correlation if (one of) both variables have less than ten different values but more than two, and a Pearson correlation if both variables have more than ten different values. No abnormal correlations are present and therefore I assume that there is no perfect collinearity among the variables. The positive correlation of 51.4% between *FA* and *QE* can be explained due to the accounting method of I.F.R.S that has published its first standards in 2003. The correlation between TNR, AGE, CEOXP and *DUAL* can be explained by the human capital theory as the chances of becoming a CEO and president of the board increasing when being older and the same counts for tenure; both through having gained more experience.

### 5.2 Latent variable construct

To create the construct of the latent variable 'CEO experience', I will use factor analysis. Factor analysis has the preference over principle component analysis, since the first is an exploratory method about a reflective construct that does not require theoretical predictions about the direction of the construct (Kolenikov & Angeles, 2004). Factor analysis uses a correlation matrix to determine the covariance in the latent variable that is simultaneously explained by the input variables and places weights on the input variables to construct the variable. This is a more advanced method than simply aggregating the input variables to create a construct.

One of the assumptions of factor analysis is that all input variables should be normally distributed to create the correlation matrix, but *DUAL* and *CEOXP* are binary variables with the value of 0 and 1. Therefore, I have to use the polychoric method which accepts both ordinal values and continues, as long as the latent construct is continuous and normally distributed, which CEO experience is as one can gain more experience within the constraint of a lifetime. The correlation matrix is presented in table 6 panel A. Even though *DUAL* was supposed to be included as a control variable, I do include it in the construct due to its high correlation to *TNR.*

The correlations are the largest with *TNR* – which will the variable getting the biggest weight in providing the variance in the construct. The communality of these four factors is 96.1% and stands for the variance in the construct variable *ExperienceVar2* explained for by these

four variables. The communality is presented in table 6 panel B and calculated as the sum of the squared factor loadings (Yong & Pearce, 2013). The score value is the actual weight that the variable has in the latent variables variance.

Based on the human capital theory it does not make sense that the overall experience decreases when one has had a prior CEO experience. This can be explained by the chances of having had a prior CEO experience decreasing when tenure increases – one chooses to stay at one company versus multiple CEO positions. This should not be a discount on the experience one has gained. Therefore, I create a second variable *ExperienceVar* with *TNRXP* instead of *CEOXP,* which has a communality of 69.9%; see table 6 panel D. This is much lower than the 96.1% but it is economically more significant. As can be seen in table 6 panel D, the weight in the construct is now positive with 0.006. As a robustness test, I will regress models with either variable, since the construct CEO Experience will probably better fit the sample.

**Table 6 - Panel A - Polychoric correlation matrix - ExperienceVar2**

| | TNR | AGE | DUAL | CEOXP |
|---|---|---|---|---|
| TNR | 1 | | | |
| AGE | 0.372 | 1 | | |
| DUAL | 0.318 | 0.053 | 1 | |
| CEOXP | -0.399 | 0.085 | -0.179 | 1 |

**Table 6 - Panel B - Factor loadings - *ExperienceVar2***

| | Factor 1 | | Factor loadings | Uniqueness | Score |
|---|---|---|---|---|---|
| Eigenvalues | 0.961 | TNR | 0.716 | 0.487 | 0.523 |
| Difference | 0.649 | AGE | 0.330 | 0.891 | 0.145 |
| Proportion | 1.053 | DUAL | 0.380 | 0.856 | 0.167 |
| | | CEOXP | -0.441 | 0.805 | -0.215 |

**Table 6 - Panel C - Polychoric correlation matrix - ExperienceVar**

| | TNR | AGE | DUAL | TNRXP |
|---|---|---|---|---|
| TNR | 1 | | | |
| AGE | 0.372 | 1 | | |
| DUAL | 0.318 | 0.053 | 1 | |
| TNRXP | -0.033 | 0.091 | -0.046 | 1 |

**Table 6 - Panel D - Factor loadings - EperienceVar**

| | Factor 1 | | Factor loadings | Uniqueness | Score |
|---|---|---|---|---|---|
| Eigenvalues | 0.699 | TNR | 0.604 | 0.635 | 0.434 |
| Difference | 0.555 | AGE | 0.449 | 0.799 | 0.276 |
| Proportion | 1.383 | DUAL | 0.364 | 0.868 | 0.212 |
| | | TNRXP | 0.008 | 0.999 | 0.006 |

*Table 6: Factor analysis*

## 5.3 Regression results

This section will present the regression results of the tests described in the research design.

### 5.3.1 The association of CEO experience with future earnings

Table 7 presents results from the regression relating changes in the SG&A ratio to one-year-ahead earnings. Model 1 presents the regression results where *SS_1-6* all have the predicted sign and are all significant but SS_1. As *SS_1* is insignificant this means that a decrease in SG&A ratio, increase in sales and increase in SG&A costs is not associated with future earnings, the sign is in the predicted direction. That *SS_3* and *SS_5* are also both significant and in the predicted direction, is complementary to Johnson (2016) who found that both variables are not associated with one-year-ahead earnings. Both sticky costs, anti-sticky costs and fundamental analysis predictions are associated with one-year-ahead earnings. When adding the *ExperienceVar* as an independent variable in model 2 the signs remain the same for all variables in the regression, but *SS_2* and *SS_5* do change in significance. The *ExperienceVar* itself has a negative sign and is both economically and statistically insignificant. By adding this to the regression it does not seem to impact any other fundamental signal, which makes sense since the change in SG&A ratio is the most discretionary signal.

Model 3 presents results on the interaction effect and shows that the signs of *SS_1* and *SS_5* change in direction and all but *SS_3* and *SS_6* become insignificant. None of the interaction variables are statistically significant, and *SS_2*ExperienceVar* and *SS_3*ExperienceVar* both have a negative sign which is not in line with the predictions. The robustness test of model 4 also shows that the sign of *SS_1* changes to positive and *SS_2, SS_4 and SS_5* lose their significance. None of the interaction effects are statistically significant and *SS_2*ExperienceVar, SS_3*ExperienceVar and SS_4*ExperienceVar* have signs that are not in accordance with the predictions. In contrast to model 3, the *ExperienceVar2* has a positive sign, but this could be due to a better fit with the sample but lacking the correct theoretical prediction.

That coefficient *SS_3* is much larger than the other coefficients in changes in SG&A ratio coefficients might be attributable to the industry utility. Table 5 panel B shows that subsample 3 does not contain any firms in the utility industry. Subsample 6 also has a lower

amount of companies in the utility sector compared to the overall sample. Untabulated results show that running the same regressions without industry fixed effects does not significantly change the results.

Based on these results I conclude that there is no association between the moderator CEO experience and one-year-ahead earnings. Model 2 has the most explanatory value based on the BCI (smallest value is best fit), and has an almost equally high adjusted $R^2$ (highest value is best fit) and almost equal RSS (smallest value is best fit) to the other models. The somewhat lower RSS for model 2 might be due to the inclusion of *ln_FA* which was correlated to EQ. However, I do not find any multicollinearity between the two in a post-estimation test.

**Table 7 - One-year-ahead earnings change**

| | Model 1 (EQ. 2) | | Model 2 (EQ. 3) | | Model 3 (EQ. 4) | | Model 4 (EQ. 4) | |
|---|---|---|---|---|---|---|---|---|
| DV = CEPS1 | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| CEPS | -0.274*** | (0.023) | -0.275*** | (0.023) | -0.276*** | (0.024) | -0.275*** | (0.024) |
| INV | -0.175*** | (0.054) | -0.175*** | (0.054) | -0.179*** | (0.054) | -0.178*** | (0.054) |
| AR | 0.085** | (0.039) | 0.085** | (0.039) | 0.085** | (0.039) | 0.085** | (0.039) |
| CAPX | -3.658*** | (1.025) | -3.676*** | (1.026) | -3.674*** | (1.023) | -3.672*** | (1.022) |
| GM | -0.016 | (0.048) | -0.015 | (0.048) | -0.014 | (0.048) | -0.015 | (0.048) |
| ETR | 2.299* | (1.256) | 2.326* | (1.254) | 2.331* | (1.258) | 2.329* | (1.257) |
| LF | -0.020** | (0.01) | -0.020** | (0.01) | -0.020** | (0.01) | -0.020** | (0.01) |
| LEV | 0.002 | (0.001) | 0.002 | (0.001) | 0.002 | (0.001) | 0.002 | (0.001) |
| EQ | -0.003 | (0.003) | -0.000 | (0.003) | -0.000 | (0.003) | -0.000 | (0.003) |
| Growth | 0.024*** | (0.006) | 0.025*** | (0.006) | 0.025*** | (0.006) | 0.025*** | (0.006) |
| SS_1 | -0.080 | (0.074) | -0.112 | (0.074) | 0.288 | (0.291) | 0.151 | (0.213) |
| SS_2 | 0.026*** | (0.1) | 0.242** | (0.1) | 0.454 | (0.417) | 0.337 | (0.288) |
| SS_3 | 2.857*** | (0.477) | 2.845*** | (0.476) | 3.787* | (2.156) | 3.075** | (1.511) |
| SS_4 | -0.281** | (0.133) | -0.322** | (0.134) | -0.220 | (0.648) | -0.404 | (0.416) |
| SS_5 | 0.228** | (0.111) | 0.215* | (0.111) | -0.031 | (0.461) | 0.073 | (0.327) |
| SS_6 | 1.448*** | (0.186) | 1.437*** | (0.186) | 1.280* | (0.75) | 1.327** | (0.513) |
| ln_FA | | | -0.004*** | (0.002) | -0.004** | (0.001) | -0.004*** | (0.001) |
| ExperienceVar | | | -0.000 | (0) | -0.000 | (0) | | |
| SS_1*ExperienceVar | | | | | -0.022 | (0.015) | | |
| SS_2*ExperienceVar | | | | | -0.012 | (0.021) | | |
| SS_3*ExperienceVar | | | | | -0.054 | (0.123) | | |
| SS_4*ExperienceVar | | | | | -0.006 | (0.033) | | |
| SS_5*ExperienceVar | | | | | 0.013 | (0.024) | | |
| SS_6*ExperienceVar | | | | | 0.009 | (0.039) | | |
| ExperienceVar2 | | | | | | | 0.000 | (0) |
| SS_1*ExperienceVar2 | | | | | | | -0.022 | (0.016) |
| SS_2*ExperienceVar2 | | | | | | | -0.008 | (0.021) |
| SS_3*ExperienceVar2 | | | | | | | -0.021 | (0.136) |
| SS_4*ExperienceVar2 | | | | | | | 0.007 | (0.031) |
| SS_5*ExperienceVar2 | | | | | | | 0.012 | (0.025) |
| SS_6*ExperienceVar2 | | | | | | | 0.010 | (0.039) |
| Constant | -0.016* | (0.009) | 0.002 | (0.012) | -0.001 | (0.012) | 0.000 | (0.011) |
| No. observatons | 11822 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 11.9% | | 12.0% | | 11.9% | | 11.9% | |
| ACI | -1.439 | | -1.439 | | -1.439 | | -1.439 | |
| BCI | -127522.737 | | -127511.910 | | -127459.124 | | -127458.899 | |
| RSS | 162.810 | | 162.701 | | 162.653 | | 162.656 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 7: One-year-ahead earnings change*

Table 8 presents robustness tests to check for validity of the *ExperienceVar* constructs, where model 17 includes all CEO experiences variables as independent variables and model 18 to 22 includes each CEO experience variable separately as moderating variables. Model 17 is almost equal to model 3 in explanatory value and no influence of the CEO experience variables is present on all signals. However, in model 18 almost subsamples become insignificant, and *SS_1* and *SS_5* also changes in direction. Because *AGE* enjoys more weight in *ExperienceVar* than in *ExperienceVar2*, this finding might explain the change in direction for *SS_1* and *SS_5* in model 3. Additionally, the less weight the CEO experience variable has in the latent construct, the less changes occur in the SG&A signal except for *AGE* that enjoys less weight compared to *TNR.* This finding confirms that if analysts and investors do

interpret the signals differently it is mostly perceived differently. The fact that *DUAL* for subsample 2 is both significant in the interaction term and independent variable means that there is a negative association between *DUAL* and one-year-ahead earnings. I expect to find this association as well for analysts and investors since this is not perceived only.

**Table 8 - One-year ahead earnings change**

| | Model 17 (EQ. 3) | | Model 18 (EQ. 4) | | Model 19 (EQ. 4) | | Model 20 (EQ. 4) | | Model 21 (EQ. 4) | | Model 22 (EQ. 4) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *ExperienceVar =* | | | *AGE* | | *TNR* | | *CEOXP* | | *DUAL* | | *TNRXP* | |
| DV = CEPS1 | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| CEPS | -0.275*** | (0.023) | -0.276*** | (0.023) | -0.275*** | (0.024) | -0.276*** | (0.023) | -0.275*** | (0.023) | -0.276*** | (0.023) |
| INV | -0.174*** | (0.054) | -0.178*** | (0.054) | -0.176*** | (0.054) | -0.174*** | (0.054) | -0.178*** | (0.054) | -0.174*** | (0.054) |
| AR | 0.084** | (0.039) | 0.085** | (0.039) | 0.084** | (0.039) | 0.082** | (0.039) | 0.083** | (0.039) | 0.085** | (0.039) |
| CAPX | -3.622*** | (1.026) | -3.694*** | (1.025) | -3.673*** | (1.022) | -3.705*** | (1.026) | -3.678*** | (1.025) | -3.669*** | (1.026) |
| GM | -0.016 | (0.047) | -0.014 | (0.048) | -0.015 | (0.048) | -0.015 | (0.047) | -0.016 | (0.047) | -0.016 | (0.047) |
| ETR | 2.336* | (1.254) | 2.314* | (1.258) | 2.317* | (1.257) | 2.322* | (1.254) | 2.269* | (1.258) | 2.366* | (1.258) |
| LF | -0.020** | (0.01) | -0.020** | (0.01) | -0.020** | (0.01) | -0.019** | (0.01) | -0.020** | (0.01) | -0.020** | (0.01) |
| LEV | 0.002 | (0.001) | 0.002 | (0.001) | 0.002 | (0.001) | 0.002 | (0.001) | 0.002 | (0.001) | 0.002 | (0.001) |
| EQ | -0.000 | (0.003) | -0.000 | (0.003) | -0.000 | (0.003) | -0.000 | (0.003) | 0.000 | (0.003) | -0.000 | (0.003) |
| Growth | 0.025*** | (0.006) | 0.026*** | (0.006) | 0.025*** | (0.006) | 0.025*** | (0.006) | 0.025*** | (0.006) | 0.025*** | (0.006) |
| SS_1 | -0.107 | (0.075) | 0.324 | (0.42) | -0.011 | (0.119) | -0.083 | (0.077) | -0.113 | (0.087) | -0.128* | (0.078) |
| SS_2 | 0.240** | (0.1) | 0.863 | (0.695) | 0.248 | (0.152) | 0.156 | (0.101) | 0.378*** | (0.114) | 0.248** | (0.102) |
| SS_3 | 2.809*** | (0.475) | 6.181* | (3.477) | 2.752*** | (0.667) | 2.706*** | (0.496) | 2.911*** | (0.57) | 2.857*** | (0.481) |
| SS_4 | -0.319** | (0.134) | 0.680 | (1.092) | -0.406** | (0.202) | -0.255* | (0.142) | -0.389** | (0.172) | -0.297** | (0.14) |
| SS_5 | 0.214* | (0.111) | -0.256 | (0.687) | 0.168 | (0.171) | 0.194* | (0.117) | 0.235* | (0.137) | 0.185 | (0.113) |
| SS_6 | 1.434*** | (0.186) | 1.318 | (1.265) | 1.397*** | (0.266) | 1.455*** | (0.201) | 1.358*** | (0.211) | 1.451*** | (0.193) |
| ln_FA | -0.004*** | (0.002) | -0.004*** | (0.002) | -0.004*** | (0.002) | -0.004*** | (0.002) | -0.004*** | (0.002) | -0.004*** | (0.002) |
| AGE | 0.000 | (0) | 0.000 | (0) | | | | | | | | |
| TNR | -0.000 | (0) | | | 0.000 | (0) | | | | | | |
| CEOXP | 0.009 | (0.007) | | | | | 0.001 | (0.006) | | | | |
| DUAL | 0.002 | (0.002) | | | | | | | 0.001 | (0.003) | | |
| TNRXP | -0.002 | (0.001) | | | | | | | | | -0.001 | (0.001) |
| SS_1*ExperienceVar | | | -0.008 | (0.008) | -0.012 | (0.01) | -0.16 | (0.215) | 0.008 | (0.131) | 0.036 | (0.035) |
| SS_2*ExperienceVar | | | -0.011 | (0.013) | -0.001 | (0.013) | 0.789** | (0.333) | -0.542** | (0.217) | -0.017 | (0.11) |
| SS_3*ExperienceVar | | | -0.061 | (0.064) | 0.016 | (0.09) | 1.049 | (1.61) | -0.187 | (1.067) | -0.013 | (0.394) |
| SS_4*ExperienceVar | | | -0.019 | (0.02) | 0.011 | (0.016) | -0.38 | (0.386) | 0.213 | (0.238) | -0.033 | (0.064) |
| SS_5*ExperienceVar | | | 0.009 | (0.012) | 0.006 | (0.015) | 0.235 | (0.324) | -0.079 | (0.182) | 0.122 | (0.123) |
| SS_6*ExperienceVar | | | 0.002 | (0.023) | 0.006 | (0.024) | -0.162 | (0.465) | 0.364 | (0.389) | -0.031 | (0.092) |
| Constant | -0.007 | (0.013) | -0.013 | (0.015) | 0.001 | (0.011) | -0.001 | (0.011) | -0.002 | (0.011) | -0.000 | (0.011) |
| No. observatons | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 12.0% | | 12.0% | | 11.9% | | 12.0% | | 12.0% | | 12.0% | |
| ACI | -1.439 | | -1.439 | | -1.439 | | -1.440 | | -1.439 | | -1.439 | |
| BCI | -127479.788 | | -127461.848 | | -127459.324 | | -127469.920 | | -127466.793 | | -127460.696 | |
| RSS | 162.626 | | 162.615 | | 162.650 | | 162.504 | | 162.547 | | 162.631 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 8: One-year-ahead earnings change robustness test*

### 5.3.2 The association of CEO experience with analyst forecast revision

Table 9 presents results from the regression of the one-year-ahead analyst forecast revision. I find for model 5 that *SS_1* is correctly interpreted as predicted and significant, even though model 1 in table 7 presents no association of *SS_1* and one-year-ahead earnings change. Next to that, the sign of *SS_4* is not as predicted and insignificant. For *SS_1, SS_5 and SS_6* I can conclude that the that the analyst incorporates the information available from the cost (anti-)stickiness theorem, where *SS_2* is a fundamental analysis prediction of efficiency. The results from model 5 are in accordance with the findings of Johnson (2016) except for *SS_1*.

Model 6 presents an improvement on model 5 when incorporating *ExperienceVar* as an independent variable, by having the predicted sign for *SS_4*. *ExperienceVar* itself is positively associated with the one-year-ahead analyst forecast revision, although one cannot speak of economic significance with such a small coefficient.

Many variables become insignificant and change signs when the interaction effect is incorporated in model 7: *SS_4* changes back to positive compared to model 6; *SS_5* becomes negative; and *SS_1, SS_2, SS_3* and *SS_5* turn insignificant. Only *SS_6* is thus correctly interpreted by analysts taking into account the findings of model 3. Model 8 presents the same signs for all interaction effects and *SS_1-6, ExperienceVar2* and *SS_3* remain significant: an improvement over model 7. The latter is interesting though, that the second construct is thus also positively associated with one-year-ahead analyst forecast revision where it lacks the theoretical basis.

**Table 9 - One-year ahead analyst forecast revision**

| | Model 5 (EQ. 2) | | Model 6 (EQ. 3) | | Model 7 (EQ. 4) | | Model 8 (EQ. 4) | |
|---|---|---|---|---|---|---|---|---|
| DV = FR | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| CEPS | -0.184*** | (0.017) | -0.185*** | (0.017) | -0.185*** | (0.017) | -0.185*** | (0.017) |
| INV | -0.09*** | (0.031) | -0.089*** | (0.031) | -0.091*** | (0.031) | -0.090*** | (0.031) |
| AR | 0.061*** | (0.022) | 0.060*** | (0.022) | 0.061*** | (0.022) | 0.061*** | (0.022) |
| CAPX | -1.98*** | (0.571) | -1.986*** | (0.572) | -1.989*** | (0.573) | -1.988*** | (0.573) |
| GM | -0.083*** | (0.028) | -0.081*** | (0.028) | -0.08*** | (0.028) | -0.080*** | (0.028) |
| ETR | 1.703** | (0.827) | 1.737** | (0.825) | 1.744** | (0.827) | 1.754** | (0.826) |
| LF | -0.013** | (0.005) | -0.013** | (0.005) | -0.013** | (0.005) | -0.013** | (0.005) |
| LEV | 0.002** | (0.001) | 0.002** | (0.001) | 0.002** | (0.001) | 0.002** | (0.001) |
| EQ | -0.004** | (0.002) | -0.002 | (0.002) | -0.002 | (0.002) | -0.002 | (0.002) |
| Growth | 0.018*** | (0.003) | 0.019*** | (0.003) | 0.019*** | (0.003) | 0.019*** | (0.003) |
| SS_1 | -0.087** | (0.039) | -0.125*** | (0.039) | -0.049 | (0.157) | -0.066 | (0.11) |
| SS_2 | 0.200*** | (0.063) | 0.178*** | (0.063) | 0.356 | (0.278) | 0.259 | (0.191) |
| SS_3 | 1.611*** | (0.274) | 1.585*** | (0.273) | 2.078 | (1.282) | 1.802** | (0.909) |
| SS_4 | 0.003 | (0.064) | -0.049 | (0.064) | 0.138 | (0.318) | 0.046 | (0.211) |
| SS_5 | 0.106* | (0.055) | 0.091* | (0.055) | -0.195 | (0.188) | -0.117 | (0.125) |
| SS_6 | 0.982*** | (0.123) | 0.968*** | (0.122) | 1.057** | (0.458) | 1.118*** | (0.31) |
| ln_FA | | | -0.005*** | (0.001) | -0.005*** | (0.001) | -0.005*** | (0.001) |
| ExperienceVar | | | 0.000*** | (0) | 0.000* | (0) | | |
| SS_1*ExperienceVar | | | | | -0.004 | (0.008) | | |
| SS_2*ExperienceVar | | | | | -0.010 | (0.014) | | |
| SS_3*ExperienceVar | | | | | -0.028 | (0.071) | | |
| SS_4*ExperienceVar | | | | | -0.010 | (0.016) | | |
| SS_5*ExperienceVar | | | | | 0.015 | (0.011) | | |
| SS_6*ExperienceVar | | | | | -0.005 | (0.024) | | |
| ExperienceVar2 | | | | | | | 0.000*** | (0) |
| SS_1*ExperienceVar2 | | | | | | | -0.005 | (0.009) |
| SS_2*ExperienceVar2 | | | | | | | -0.007 | (0.014) |
| SS_3*ExperienceVar2 | | | | | | | -0.021 | (0.08) |
| SS_4*ExperienceVar2 | | | | | | | -0.008 | (0.015) |
| SS_5*ExperienceVar2 | | | | | | | 0.017 | (0.011) |
| SS_6*ExperienceVar2 | | | | | | | -0.013 | (0.024) |
| Constant | 0.005 | (0.005) | 0.029*** | (0.006) | 0.028*** | (0.006) | 0.028*** | (0.006) |
| No. observatons | 11822 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 11.9% | | 12.0% | | 11.9% | | 11.9% | |
| ACI | -1.439 | | -1.439 | | -1.439 | | -1.439 | |
| BCI | -127522.737 | | -127511.910 | | -127459.124 | | -127458.899 | |
| RSS | 162.810 | | 162.701 | | 162.653 | | 162.656 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 9: One-year-ahead analysts forecast revision*

Table 10 presents robustness tests to check for validity of the *ExperienceVar* constructs, where model 17 includes all CEO experiences variables as independent variables and model 18 to 22 includes each CEO experience variable separately as moderating variables. Model 6 and model 23 present fairly equal results that some of the variance in the forecast revision is explained by the CEO experience variables, but have a very small impact on the signals. Here too an association with *DUAL* is found and not only for *SS_2* as predicted. Other associations are also present for TNR and TNRXP, but in different subsamples. The changes in direction for the subsamples in model 7 and 8 are not exactly the same to respectively models 3 and 4, but seem are similar to the directions in model 24 including *AGE*. This

presents to me that analysts closely observe the one-year-ahead earnings change, but also take notion of the CEO's characteristics.

**Table 10 - One-year ahead analyst forecast revision**

| | Model 23 (EQ. 3) | | Model 24 (EQ. 4) | | Model 25 (EQ. 4) | | Model 26 (EQ. 4) | | Model 27 (EQ. 4) | | Model 28 (EQ. 4) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *ExperienceVar =* | | | *AGE* | | *TNR* | | *CEOXP* | | *DUAL* | | *TNRXP* | |
| DV = FR | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| CEPS | -0.185*** | (0.016) | -0.185*** | (0.017) | -0.185*** | (0.017) | -0.185*** | (0.016) | -0.185*** | (0.016) | -0.186*** | (0.016) |
| INV | -0.088*** | (0.031) | -0.092*** | (0.031) | -0.089*** | (0.031) | -0.088*** | (0.031) | -0.093*** | (0.031) | -0.088*** | (0.031) |
| AR | 0.058*** | (0.022) | 0.060*** | (0.022) | 0.061*** | (0.022) | 0.060*** | (0.022) | 0.056** | (0.022) | 0.060*** | (0.022) |
| CAPX | -2.001*** | (0.573) | -2.017*** | (0.571) | -1.994*** | (0.573) | -2.049*** | (0.571) | -2.045*** | (0.57) | -2.048*** | (0.574) |
| GM | -0.081*** | (0.028) | -0.081*** | (0.028) | -0.080*** | (0.028) | -0.081*** | (0.028) | -0.081*** | (0.028) | -0.081*** | (0.028) |
| ETR | 1.743** | (0.824) | 1.723** | (0.826) | 1.762** | (0.826) | 1.727** | (0.826) | 1.675** | (0.824) | 1.741** | (0.826) |
| LF | -0.013** | (0.005) | -0.013** | (0.005) | -0.013** | (0.005) | -0.013** | (0.005) | -0.013** | (0.005) | -0.013** | (0.005) |
| LEV | 0.002** | (0.001) | 0.002** | (0.001) | 0.002** | (0.001) | 0.002** | (0.001) | 0.002** | (0.001) | 0.002** | (0.001) |
| EQ | -0.002 | (0.002) | -0.001 | (0.002) | -0.002 | (0.002) | -0.001 | (0.002) | -0.001 | (0.002) | -0.001 | (0.002) |
| Growth | 0.019*** | (0.003) | 0.020*** | (0.003) | 0.019*** | (0.003) | 0.020*** | (0.003) | 0.020*** | (0.003) | 0.020*** | (0.003) |
| SS_1 | -0.121*** | (0.039) | -0.087 | (0.227) | -0.095* | (0.057) | -0.110*** | (0.042) | -0.131*** | (0.046) | -0.126*** | (0.041) |
| SS_2 | 0.173*** | (0.063) | 0.635 | (0.45) | 0.192** | (0.096) | 0.170*** | (0.065) | 0.254*** | (0.076) | 0.190*** | (0.065) |
| SS_3 | 1.543*** | (0.274) | 2.673 | (1.957) | 1.601*** | (0.397) | 1.675*** | (0.299) | 1.702*** | (0.336) | 1.718*** | (0.285) |
| SS_4 | -0.048 | (0.064) | 0.306 | (0.495) | -0.025 | (0.104) | -0.024 | (0.067) | -0.034 | (0.077) | -0.031 | (0.066) |
| SS_5 | 0.089 | (0.055) | -0.148 | (0.319) | 0.002 | (0.065) | 0.091* | (0.054) | 0.132** | (0.067) | 0.073 | (0.054) |
| SS_6 | 0.953*** | (0.123) | 0.384 | (0.814) | 1.056*** | (0.165) | 0.947*** | (0.133) | 0.831*** | (0.127) | 0.960*** | (0.127) |
| ln_FA | -0.005*** | (0.001) | -0.005*** | (0.001) | -0.005*** | (0.001) | -0.004*** | (0.001) | -0.005*** | (0.001) | -0.005*** | (0.001) |
| AGE | 0.000** | (0) | 0.000 | (0) | | | | | | | | |
| TNR | -0.000*** | (0) | | | -0.000*** | (0) | | | | | | |
| CEOXP | 0.009** | (0.004) | | | | | 0.011*** | (0.003) | | | | |
| DUAL | -0.002* | (0.001) | | | | | | | -0.004** | (0.001) | | |
| TNRXP | -0.000 | (0.001) | | | | | | | | | 0.001** | (0.001) |
| SS_1*ExperienceVar | | | -0.001 | (0.004) | -0.003 | (0.005) | -0.136 | (0.095) | 0.012 | (0.072) | -0.001 | (0.02) |
| SS_2*ExperienceVar | | | -0.008 | (0.008) | -0.002 | (0.009) | 0.056 | (0.208) | -0.325*** | (0.114) | -0.03 | (0.034) |
| SS_3*ExperienceVar | | | -0.02 | (0.035) | -0.006 | (0.054) | -0.65 | (0.705) | -0.35 | (0.582) | -0.318** | (0.148) |
| SS_4*ExperienceVar | | | -0.007 | (0.009) | -0.003 | (0.008) | -0.20 | (0.185) | -0.043 | (0.123) | -0.030 | (0.033) |
| SS_5*ExperienceVar | | | 0.004 | (0.006) | 0.011* | (0.006) | 0.011 | (0.269) | -0.182** | (0.09) | 0.09 | (0.123) |
| SS_6*ExperienceVar | | | 0.011 | (0.015) | -0.013 | (0.014) | 0.128 | (0.34) | 0.581* | (0.325) | 0.028 | (0.081) |
| Constant | 0.015** | (0.007) | 0.017** | (0.008) | 0.025*** | (0.006) | 0.021*** | (0.006) | 0.024*** | (0.006) | 0.022*** | (0.006) |
| No. observatons | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 16.0% | | 15.7% | | 15.8% | | 15.8% | | 16.0% | | 16.2% | |
| ACI | -2.652 | | -2.649 | | -2.651 | | -2.650 | | -2.652 | | -2.650 | |
| BCI | -141821.140 | | -141764.845 | | -141785.296 | | -141782.752 | | -141800.725 | | -141778.507 | |
| RSS | 48.344 | | 48.498 | | 48.414 | | 48.425 | | 48.351 | | 48.442 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 10: One-year-ahead analyst forecast revision robustness test*

Reviewing these results, I cannot conclude that there is no association moderator CEO experience and one-year-ahead analysts forecast revision since no asymmetries are dissolved in model 7 and none of the interaction terms are significant. This does not mean that analysts do not take notion of any CEO experience characteristic. That there are asymmetries confirms the notion of Aberbanell & Bushee (1997) and Johnson (2016) that analysts do not correctly or fully incorporate all available information. There is however an increase in the explanatory value when CEO experience is included as an independent variable by having the predicted sign for *SS_4* and *ExperienceVar* being positive and significant. Even though the BCI is lower for model 5, the adjusted $R^2$ and RSS are almost equal to in model 6, wherefore I conclude that model 6 has more explanatory value than model 5.

### 5.3.3 The association of CEO experience with buy-and-hold abnormal returns

Table 11 presents findings on the relation between CEO experience and the buy-and-hold abnormal returns on common stocks. In model 9 *SS_3* and *SS_6* have the predicted signs in accordance with model 1. One improvement is found in model 10 where the sign of *SS_1* is now in the predicted direction.

Model 11 provides some interesting results on the interaction terms *SS_3*ExperienceVar, SS_5*ExperienceVar and SS_6*ExperienceVar* that are statistically significant and their counterparts *SS_3, SS_5* and *SS_6* as well where *SS_3* and *SS_5* also have the predicted sign. It is interesting hereby to observe that the coefficients increased in size compared to models 9 and 10 and that the sign of the interaction term is in the opposite direction of the change in SG&A ratio variable. I interpret this as investors taking the experience into account and giving a discount to the signal if the CEO is more experienced. This confirms the predictions that fewer buy-and-hold abnormal returns can be gained if the signal is regarded as more credible. Observing the characteristics of subsamples 3, 5 and 6 I find that these are the subsamples that have a positive *BHAR* on average and a negative median, which makes it an interesting finding that *SS_6's* direction changes to negative. This would suggest a negative association for CEO experience for *SS_3* and *SS_5,* and a positive association for *SS_6.*

Model 12 does show a better fit of the CEO experience construct, which causes the same subsamples to be significant, but probably since it is not in accordance with the theoretical predictions the interaction term *SS_6*ExperienceVar2* is significant. I regard model 11 as the best model, having the best goodness-of-fit measures (ACI, BCI, adjusted $R^2$ and RSS).

The models in table 12 show that this mean-reverting association is not attributable to one variable for *SS_3.* It thereby explains the larger coefficient for *SS_3* since more variance in *SS_3* is explained by all measures of the constructs *ExperienceVar* and *ExperienceVar2*. Model 30 presents that *AGE* is the CEO characteristic of most interest to the investors, because the only association found next to that is with *TNR* for *SS_5.*

Additionaly, I found heterogeneity problems and controlled for this with robust standard errors. This also explains the larger BCI, lower adjusted $R^2$, and relatively high RSS. This should however not impact the sign and size of the coefficients, but only the significance which makes the model unreliable. The same holds for models 10 to 16.

It can thereby be interpreted for subsample 3 that there is a positive association between the buy-and-hold abnormal returns when the SG&A ratio decreases, sales decrease and costs decrease more than sales, whereby fewer abnormal buy-and-hold abnormal returns are gained when the CEO is more experienced. This finding signals efficiency in the form of anti-stickiness. For subsample 5 it can be interpreted that there is a positive association between the buy-and-hold abnormal returns when the SG&A ratio increases, the sales decrease and SG&A costs increasing, whereby fewer buy-and-hold abnormal returns are gained if the CEO is more experienced. For subsample 6 it can be interpreted that there is a negative association between the buy-and-hold abnormal returns and an increase in the SG&A ratio, decrease in SG&A costs and a larger decrease in sales proportional to SG&A costs, whereby there is a positive discount if the CEO is more experienced. Based on these findings I partially reject hypothesis 2 because I did not find an association for all subsamples whilst this was predicted. For three out of six subsamples a mean-reverting

effect is found with increased coefficients and mean-reverting interaction terms, which is in line with the findings of Khurana (2002) and Bragaw (2013).

**Table 11 - Buy-and-hold abnormal returns**

| | Model 9 (EQ. 2) | | Model 10 (EQ. 3) | | Model 11 (EQ. 4) | | Model 12 (EQ. 4) | |
|---|---|---|---|---|---|---|---|---|
| DV = BHAR | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| CEPS | -0.142*** | (0.053) | -0.147*** | (0.053) | -0.147*** | (0.053) | -0.147*** | (0.053) |
| INV | -0.043 | (0.192) | -0.042 | (0.191) | -0.056 | (0.191) | -0.052 | (0.191) |
| AR | 0.041 | (0.138) | 0.039 | (0.138) | 0.022 | (0.137) | 0.023 | (0.137) |
| CAPX | -7.529** | (3.27) | -7.68** | (3.259) | -7.542** | (3.256) | -7.493** | (3.262) |
| GM | -0.040 | (0.145) | -0.034 | (0.144) | -0.038 | (0.144) | -0.038 | (0.144) |
| ETR | -0.309 | (3.214) | -0.180 | (3.204) | -0.028 | (3.193) | -0.059 | (3.191) |
| LF | -0.008 | (0.032) | -0.008 | (0.032) | -0.010 | (0.031) | -0.008 | (0.032) |
| LEV | -0.002 | (0.004) | -0.002 | (0.004) | -0.002 | (0.004) | -0.002 | (0.004) |
| EQ | -0.003 | (0.011) | 0.009 | (0.011) | 0.008 | (0.011) | 0.009 | (0.011) |
| Growth | -0.026 | (0.021) | -0.021 | (0.021) | -0.020 | (0.021) | -0.020 | (0.021) |
| SS_1 | 0.058 | (0.351) | -0.098 | (0.353) | 1.942 | (1.418) | 1.196 | (0.993) |
| SS_2 | -0.155 | (0.373) | -0.241 | (0.374) | 0.115 | (1.651) | 0.264 | (1.122) |
| SS_3 | 5.219*** | (1.551) | 5.204*** | (1.543) | 17.874** | (6.992) | 10.958** | (4.639) |
| SS_4 | 0.214 | (0.433) | 0.017 | (0.435) | -2.65 | (1.885) | -1.190 | (1.261) |
| SS_5 | 0.450 | (0.448) | 0.389 | (0.448) | 4.809** | (1.873) | 3.121** | (1.312) |
| SS_6 | 0.916* | (0.513) | 0.870* | (0.513) | -4.114** | (1.799) | -1.770 | (1.255) |
| ln_FA | | | -0.020*** | (0.005) | -0.019*** | (0.005) | -0.019*** | (0.005) |
| ExperienceVar | | | 0.000 | (0.001) | 0.001 | (0.001) | | |
| SS_1*ExperienceVar | | | | | -0.112 | (0.071) | | |
| SS_2*ExperienceVar | | | | | -0.020 | (0.09) | | |
| SS_3*ExperienceVar | | | | | -0.726* | (0.385) | | |
| SS_4*ExperienceVar | | | | | 0.150 | (0.104) | | |
| SS_5*ExperienceVar | | | | | -0.237** | (0.092) | | |
| SS_6*ExperienceVar | | | | | 0.274*** | (0.095) | | |
| ExperienceVar2 | | | | | | | 0.001 | (0.001) |
| SS_1*ExperienceVar2 | | | | | | | -0.109 | (0.071) |
| SS_2*ExperienceVar2 | | | | | | | -0.043 | (0.092) |
| SS_3*ExperienceVar2 | | | | | | | -0.532 | (0.408) |
| SS_4*ExperienceVar2 | | | | | | | 0.105 | (0.103) |
| SS_5*ExperienceVar2 | | | | | | | -0.224** | (0.092) |
| SS_6*ExperienceVar2 | | | | | | | 0.226** | (0.097) |
| Constant | -0.011 | (0.043) | 0.061 | (0.05) | 0.044 | (0.053) | 0.048 | (0.051) |
| No. observatons | 11822.0000 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 1.10% | | 1.20% | | 1.50% | | 1.40% | |
| ACI | 1.151 | | 1.150 | | 1.147 | | 1.148 | |
| BCI | -96907.552 | | -96902.742 | | -96885.682 | | -96874.300 | |
| RSS | 2169.519 | | 2166.961 | | 2159.787 | | 2161.867 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 11: Buy-and-hold abnormal returns*

**Table 12 - Buy-and-hold abnormal returns**

| | Model 29 (EQ. 3) | | Model 30 (EQ. 4) | | Model 31 (EQ. 4) | | Model 32 (EQ. 4) | | Model 33 (EQ. 4) | | Model 34 (EQ. 4) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *ExperienceVar =* | | | *AGE* | | *TNR* | | *CEOXP* | | *DUAL* | | *TNRXP* | |
| DV = BHAR | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| CEPS | -0.149*** | (0.053) | -0.147*** | (0.053) | -0.146*** | (0.053) | -0.148*** | (0.053) | -0.148*** | (0.053) | -0.147*** | (0.053) |
| INV | -0.041 | (0.191) | -0.049 | (0.191) | -0.046 | (0.191) | -0.041 | (0.192) | -0.051 | (0.191) | -0.043 | (0.192) |
| AR | 0.041 | (0.138) | 0.025 | (0.137) | 0.026 | (0.138) | 0.033 | (0.137) | 0.037 | (0.138) | 0.036 | (0.138) |
| CAPX | -7.487** | (3.26) | -7.825** | (3.242) | -7.495** | (3.265) | -7.701** | (3.259) | -7.696** | (3.26) | -7.581** | (3.264) |
| GM | -0.039 | (0.144) | -0.039 | (0.144) | -0.038 | (0.144) | -0.030 | (0.144) | -0.038 | (0.144) | -0.028 | (0.145) |
| ETR | -0.090 | (3.204) | -0.010 | (3.205) | -0.127 | (3.191) | -0.185 | (3.205) | -0.238 | (3.207) | -0.163 | (3.211) |
| LF | -0.009 | (0.032) | -0.014 | (0.032) | -0.007 | (0.032) | -0.005 | (0.031) | -0.008 | (0.032) | -0.008 | (0.032) |
| LEV | -0.002 | (0.004) | -0.002 | (0.004) | -0.002 | (0.004) | -0.002 | (0.004) | -0.002 | (0.004) | -0.002 | (0.004) |
| EQ | 0.010 | (0.011) | 0.008 | (0.011) | 0.009 | (0.011) | 0.009 | (0.011) | 0.010 | (0.011) | 0.009 | (0.011) |
| Growth | -0.021 | (0.021) | -0.021 | (0.021) | -0.020 | (0.021) | -0.022 | (0.021) | -0.020 | (0.021) | -0.022 | (0.021) |
| SS_1 | -0.089 | (0.354) | 2.362 | (2.277) | 0.363 | (0.542) | -0.004 | (0.381) | -0.171 | (0.401) | -0.057 | (0.37) |
| SS_2 | -0.228 | (0.374) | -2.03 | (2.673) | 0.031 | (0.538) | -0.423 | (0.378) | 0.119 | (0.433) | -0.333 | (0.379) |
| SS_3 | 5.123*** | (1.541) | 32.939*** | (11.183) | 5.949*** | (1.978) | 4.493*** | (1.653) | 4.245** | (1.806) | 5.193*** | (1.593) |
| SS_4 | 0.007 | (0.438) | -5.867** | (2.932) | -0.178 | (0.627) | 0.043 | (0.472) | -0.426 | (0.546) | -0.065 | (0.455) |
| SS_5 | 0.406 | (0.448) | 7.520** | (3.05) | 1.327* | (0.706) | 0.270 | (0.466) | 0.448 | (0.53) | 0.389 | (0.459) |
| SS_6 | 0.905* | (0.513) | -9.454*** | (3.307) | 0.192 | (0.689) | 0.982* | (0.545) | 0.638 | (0.598) | 0.899* | (0.528) |
| ln_FA | -0.020*** | (0.005) | -0.019*** | (0.005) | -0.019*** | (0.005) | -0.020*** | (0.005) | -0.020*** | (0.005) | -0.020*** | (0.005) |
| AGE | 0.000 | (0.001) | 0.000 | (0.001) | | | | | | | | |
| TNR | 0.000 | (0.001) | | | 0.001 | (0.001) | | | | | | |
| CEOXP | 0.035 | (0.025) | | | | | -0.001 | (0.018) | | | | |
| DUAL | 0.027*** | (0.009) | | | | | | | 0.017* | (0.01) | | |
| TNRXP | -0.007 | (0.005) | | | | | | | | | -0.002 | (0.003) |
| SS_1*ExperienceVar | | | -0.046 | (0.041) | -0.059 | (0.043) | -0.574 | (0.769) | 0.293 | (0.669) | -0.072 | (0.126) |
| SS_2*ExperienceVar | | | 0.033 | (0.049) | -0.035 | (0.056) | 1.675 | (1.39) | -1.368* | (0.793) | 0.298 | (0.243) |
| SS_3*ExperienceVar | | | -0.510*** | (0.197) | -0.127 | (0.255) | 4.933 | (4.518) | 3.352 | (3.424) | 0.011 | (1.187) |
| SS_4*ExperienceVar | | | 0.112** | (0.056) | 0.026 | (0.06) | -0.111 | (1.158) | 1.407* | (0.829) | 0.143 | (0.232) |
| SS_5*ExperienceVar | | | -0.131** | (0.053) | -0.116** | (0.055) | 1.321 | (1.595) | -0.157 | (0.937) | -0.025 | (0.301) |
| SS_6*ExperienceVar | | | 0.189*** | (0.06) | 0.094 | (0.06) | -0.997 | (1.367) | 1.209 | (0.957) | -0.072 | (0.32) |
| Constant | 0.052 | (0.056) | 0.056 | (0.061) | 0.056 | (0.048) | 0.063 | (0.048) | 0.055 | (0.047) | 0.064 | (0.048) |
| No. observatons | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 1.30% | | 1.60% | | 1.80% | | 1.70% | | 1.40% | | 1.20% | |
| ACI | 1.149 | | 1.146 | | 1.149 | | 1.150 | | 1.149 | | 1.150 | |
| BCI | -96877.213 | | -96899.846 | | -96862.417 | | -96855.490 | | -96866.123 | | -96849.165 | |
| RSS | 2164.766 | | 2157.201 | | 2164.041 | | 2165.310 | | 2163.363 | | 2166.468 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 12: Buy-and-hold abnormal returns robustness test*

### 5.3.4 The mediating effect of forecast revision on buy-and-hold abnormal returns

Table 13 presents findings on when the one-year-ahead analyst forecast revision is included as an independent variable to test for its mediating effect on buy-and-hold abnormal returns. In model 13 the signs of *SS_1-6* remain the same as in model 9, but where *SS_6* is significant in model 9 it turns insignificant in model 13; *SS_3* remains significant. This means that analysts do incorporate the change in SG&A ratio correctly for subsample 6 and do consider the cost stickiness theorem. This finding is in accordance with the results of Anderson et al. (2007) and complements Johnson (2016). It confirms that analysts recognize the increase in the change in SG&A ratio signal better future performance, even though resources are kept utilized causing the stickiness. Since there are no changes in table 14 compared to table 13, I cannot provide results on which specific variable contributed to this. In other words, analysts and investors might even regard the usefulness CEO experience variables differently. The same findings hold for model 14 and just like in model 10 the sign of *SS_1* becomes as predicted. However, the other signals *CAPX* and *Growth* are significant as well. This means that *FR* does not function as an intermedium for all variables.

Model 15 and 16 present significant results for the same variables as model 11 and 12, but the goodness-of-fit measures improve now that the one-year-ahead analyst forecast

revision is included. This means that some of the variation in *BHAR* is explained by *FR.* Even though the variable *SS_6* is significant in model 7 and its interaction term not, investors do interpret this signal and its interaction term differently than analysts do when the CEO's experience is known.

Based on these results I reject hypothesis 1, since no interaction effect was statistically significantly incorporated correctly interpreted by analysts when the CEO's experience was included as a moderating effect (model 15). The CEO experience thus not functions as a moderating variable to analysts to interpret the signal change in SG&A ratio correctly.

**Table 13 - Buy-and-hold abnormal returns including one-year ahead analyst forecast revision**

| | Model 13 (EQ. 2) | | Model 14 (EQ. 3) | | Model 15 (EQ. 4) | | Model 16 (EQ. 4) | |
|---|---|---|---|---|---|---|---|---|
| DV = BHAR | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| FR | 0.636*** | (0.093) | 0.626*** | (0.093) | 0.630*** | (0.093) | 0.631*** | (0.093) |
| CEPS | -0.025 | (0.053) | -0.031 | (0.052) | -0.030 | (0.052) | -0.029 | (0.052) |
| INV | 0.014 | (0.191) | 0.013 | (0.191) | 0.002 | (0.191) | 0.004 | (0.191) |
| AR | 0.002 | (0.137) | 0.001 | (0.137) | -0.016 | (0.137) | -0.015 | (0.137) |
| CAPX | -6.270* | (3.247) | -6.437** | (3.238) | -6.289* | (3.237) | -6.238* | (3.242) |
| GM | 0.013 | (0.144) | 0.017 | (0.144) | 0.012 | (0.143) | 0.012 | (0.143) |
| ETR | -1.392 | (3.14) | -1.267 | (3.133) | -1.127 | (3.119) | -1.167 | (3.117) |
| LF | 0.000 | (0.032) | -0.000 | (0.032) | -0.001 | (0.031) | 0.000 | (0.032) |
| LEV | -0.003 | (0.003) | -0.003 | (0.003) | -0.003 | (0.003) | -0.003 | (0.003) |
| EQ | -0.001 | (0.011) | 0.010 | (0.011) | 0.009 | (0.011) | 0.010 | (0.011) |
| Growth | -0.038* | (0.021) | -0.033 | (0.021) | -0.032 | (0.021) | -0.032 | (0.021) |
| SS_1 | 0.113 | (0.352) | -0.020 | (0.353) | 1.973 | (1.42) | 1.237 | (0.995) |
| SS_2 | -0.282 | (0.375) | -0.352 | (0.376) | -0.110 | (1.639) | 0.100 | (1.115) |
| SS_3 | 4.195*** | (1.514) | 4.212*** | (1.509) | 16.565** | (6.858) | 9.820** | (4.578) |
| SS_4 | 0.212 | (0.434) | 0.048 | (0.437) | -2.737 | (1.904) | -1.219 | (1.274) |
| SS_5 | 0.383 | (0.451) | 0.332 | (0.451) | 4.932*** | (1.885) | 3.195** | (1.319) |
| SS_6 | 0.291 | (0.51) | 0.264 | (0.51) | -4.780*** | (1.76) | -2.476** | (1.235) |
| ln_FA | | | -0.017*** | (0.005) | -0.017*** | (0.005) | -0.017*** | (0.005) |
| ExperienceVar | | | 0.000 | (0.001) | 0.001 | (0.001) | | |
| SS_1*ExperienceVar | | | | | -0.110 | (0.071) | | |
| SS_2*ExperienceVar | | | | | -0.013 | (0.089) | | |
| SS_3*ExperienceVar | | | | | -0.708* | (0.378) | | |
| SS_4*ExperienceVar | | | | | 0.157 | (0.105) | | |
| SS_5*ExperienceVar | | | | | -0.247*** | (0.092) | | |
| SS_6*ExperienceVar | | | | | 0.277*** | (0.092) | | |
| ExperienceVar2 | | | | | | | 0.001 | (0.001) |
| SS_1*ExperienceVar2 | | | | | | | -0.106 | (0.072) |
| SS_2*ExperienceVar2 | | | | | | | -0.038 | (0.091) |
| SS_3*ExperienceVar2 | | | | | | | -0.519 | (0.404) |
| SS_4*ExperienceVar2 | | | | | | | 0.110 | (0.103) |
| SS_5*ExperienceVar2 | | | | | | | -0.235** | (0.093) |
| SS_6*ExperienceVar2 | | | | | | | 0.234** | (0.095) |
| Constant | -0.014 | (0.043) | 0.043 | (0.05) | 0.026 | (0.053) | 0.031 | (0.05) |
| No. observatons | 11822 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 2.00% | | 2.10% | | 2.40% | | 2.30% | |
| ACI | 1.142 | | 1.141 | | 1.139 | | 1.140 | |
| BCI | -97005.938 | | -96997.524 | | -96982.091 | | -96971.018 | |
| RSS | 2149.833 | | 2147.953 | | 2140.547 | | 2142.552 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 13: Buy-and-hold abnormal returns including one-year-ahead analyst forecast revision*

**Table 14 - Buy-and-hold abnormal returns including one-year ahead analyst forecast revision**

| | Model 35 (EQ. 6) | | Model 36 (EQ. 7) | | Model 37 (EQ. 7) | | Model 38 (EQ. 7) | | Model 39 (EQ. 7) | | Model 40 (EQ. 7) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *ExperienceVar =* | | | *AGE* | | *TNR* | | *CEOXP* | | *DUAL* | | *TNRXP* | |
| DV = BHAR | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE | Coefficient | Robust SE |
| FR | 0.630*** | (0.094) | 0.624*** | (0.093) | 0.632*** | (0.093) | 0.626*** | (0.093) | 0.627*** | (0.094) | 0.629*** | (0.093) |
| CEPS | -0.032 | (0.052) | -0.032 | (0.052) | -0.028 | (0.052) | -0.032 | (0.053) | -0.032 | (0.053) | -0.03 | (0.053) |
| INV | 0.015 | (0.191) | 0.008 | (0.191) | 0.010 | (0.191) | 0.014 | (0.192) | 0.008 | (0.191) | 0.013 | (0.192) |
| AR | 0.005 | (0.137) | -0.012 | (0.136) | -0.012 | (0.137) | -0.005 | (0.137) | 0.002 | (0.137) | -0.002 | (0.137) |
| CAPX | -6.226* | (3.241) | -6.567** | (3.223) | -6.235* | (3.245) | -6.418** | (3.238) | -6.414** | (3.239) | -6.293* | (3.243) |
| GM | 0.013 | (0.144) | 0.011 | (0.143) | 0.012 | (0.144) | 0.021 | (0.143) | 0.012 | (0.143) | 0.023 | (0.144) |
| ETR | -1.188 | (3.133) | -1.085 | (3.131) | -1.24 | (3.118) | -1.266 | (3.135) | -1.288 | (3.136) | -1.258 | (3.14) |
| LF | -0.001 | (0.032) | -0.006 | (0.032) | 0.001 | (0.032) | 0.003 | (0.031) | 0.0000 | (0.032) | 0.000 | (0.032) |
| LEV | -0.003 | (0.003) | -0.003 | (0.003) | -0.003 | (0.003) | -0.003 | (0.003) | -0.003 | (0.003) | -0.003 | (0.003) |
| EQ | 0.012 | (0.011) | 0.009 | (0.011) | 0.010 | (0.011) | 0.010 | (0.011) | 0.011 | (0.011) | 0.009 | (0.011) |
| Growth | -0.033 | (0.021) | -0.033 | (0.021) | -0.032 | (0.021) | -0.034 | (0.021) | -0.032 | (0.021) | -0.035 | (0.021) |
| SS_1 | -0.013 | (0.354) | 2.416 | (2.28) | 0.423 | (0.543) | 0.065 | (0.381) | -0.089 | (0.4) | 0.022 | (0.371) |
| SS_2 | -0.337 | (0.376) | -2.427 | (2.687) | -0.091 | (0.541) | -0.53 | (0.381) | -0.041 | (0.435) | -0.452 | (0.382) |
| SS_3 | 4.151*** | (1.507) | 31.271*** | (10.913) | 4.938** | (1.944) | 3.445** | (1.628) | 3.177* | (1.763) | 4.113*** | (1.565) |
| SS_4 | 0.038 | (0.439) | -6.057** | (2.964) | -0.162 | (0.634) | 0.058 | (0.472) | -0.405 | (0.547) | -0.045 | (0.456) |
| SS_5 | 0.35 | (0.451) | 7.612** | (3.06) | 1.326* | (0.708) | 0.212 | (0.468) | 0.365 | (0.533) | 0.344 | (0.462) |
| SS_6 | 0.304 | (0.51) | -9.694*** | (3.278) | -0.475 | (0.686) | 0.389 | (0.539) | 0.117 | (0.589) | 0.295 | (0.524) |
| ln_FA | -0.017*** | (0.005) | -0.016*** | (0.005) | -0.016*** | (0.005) | -0.017*** | (0.005) | -0.017*** | (0.005) | -0.017*** | (0.005) |
| AGE | -0.000 | (0.001) | 0.000 | (0.001) | | | | | | | | |
| TNR | 0.0000 | (0.001) | | | 0.001 | (0.001) | | | | | | |
| CEOXP | 0.029 | (0.025) | | | | | -0.008 | (0.018) | | | | |
| DUAL | 0.029*** | (0.009) | | | | | | | 0.020* | (0.01) | | |
| TNRXP | -0.007 | (0.005) | | | | | | | | | -0.003 | (0.003) |
| SS_1*ExperienceVar | | | -0.046 | (0.041) | -0.057 | (0.043) | -0.489 | (0.761) | 0.286 | (0.671) | -0.071 | (0.126) |
| SS_2*ExperienceVar | | | 0.038 | (0.049) | -0.034 | (0.055) | 1.641 | (1.403) | -1.164 | (0.808) | 0.317 | (0.242) |
| SS_3*ExperienceVar | | | -0.498*** | (0.192) | -0.123 | (0.256) | 5.34 | (4.335) | 3.571 | (3.365) | 0.210 | (1.138) |
| SS_4*ExperienceVar | | | 0.116** | (0.056) | 0.027 | (0.06) | 0.014 | (1.172) | 1.434* | (0.833) | 0.162 | (0.233) |
| SS_5*ExperienceVar | | | -0.133** | (0.054) | -0.123** | (0.055) | 1.314 | (1.626) | -0.044 | (0.945) | -0.081 | (0.317) |
| SS_6*ExperienceVar | | | 0.183*** | (0.06) | 0.102* | (0.059) | -1.077 | (1.374) | 0.845 | (0.96) | -0.089 | (0.311) |
| Constant | 0.043 | (0.056) | 0.045 | (0.06) | 0.04 | (0.048) | 0.049 | (0.048) | 0.04 | (0.047) | 0.05 | (0.048) |
| No. observatons | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | | 11822 | |
| Fixed effects Year | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Fixed effects Industry | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | | Controlled | |
| Adj. $R^2$ | 2.20% | | 2.50% | | 2.20% | | 2.10% | | 2.20% | | 2.50% | |
| ACI | 1.141 | | 1.138 | | 1.141 | | 1.141 | | 1.140 | | 1.142 | |
| BCI | -96973.181 | | -96994.393 | | -96959.097 | | -96950.244 | | -96961.144 | | -96944.739 | |
| RSS | 2145.562 | | 2138.320 | | 2144.714 | | 2146.321 | | 2144.343 | | 2147.321 | |

***coefficient is significant at p<=0.001 ** coefficient is significant at p<=0.05 *coefficient is significant at p<=0.10.

*Table 14: Buy-and-hold abnormal returns including one-year-ahead analyst forecast revision robustness test*

Concluding, hypothesis 1 is rejected and hypothesis 2 partially. Analysts do not seem to find CEO experience as a moderating variable having any explanatory value in interpreting the SG&A signal for all subsamples. However, when CEO experience is included as an independent variable the sign of *SS_4* is interpreted as predicted by the cost stickiness theory. For investors, the CEO experience does add significant explanatory value as a moderating effect. In the next section I will discuss these findings in relation to their theoretical predictions.

## 6. Conclusion and discussion

This study has the objective to examine the effect of CEO experience on the SG&A signal as a moderating variable. This chapter will answer the research question in section 6.1 and discusses the results and further research suggestions in section 6.2. Furthermore, it discusses the limitations in section 6.3.

### 6.1 Conclusion

This thesis examines the research question *is CEO experience a moderating variable in signalling the change in SG&A ratio towards analysts and capital market participants?*

Through the development of an extensive theoretical model, which led to two hypotheses, and the statistical analysis using cross-sectional data, I am able to answer this question. First, I find that five out of six subsamples are associated with the one-year-ahead earnings change; all but *SS_1*. This confirms that the theoretical predictions of the (anti-)cost stickiness theory are correct about future earnings. I do not find any significant changes in this association when the moderating effect is included, but to draw any further conclusions on this association one would need to test for the simultaneous bias that could be present. Only for *SS_2* I find a moderating effect with *DUAL.* Second, I predicted that analysts will incorporate the change in SG&A signal correctly if CEO experience is included as a moderating variable, regarding correctly as the usefulness to investors. I reject this hypothesis on the basis of not finding any significant improvements by analysts impounding the SG&A signal into their forecast revision. Five *(SS_2, SS_3, SS_4, SS_5 and SS_6)* out of the six signals of the SG&A signal that are associated with the one-year-ahead earnings change are impounded correctly into the forecast revision in the predicted direction. However, investors regard the information content differently than analysts and recognize that only signal *SS_6* is correctly impounded and *SS_3* incorrectly. I fail to provide answers on signals *SS_2, SS_4* and *SS_5,* because no association is found between them and the buy-and-hold abnormal returns. In addition, I find that analysts do take CEO experience variables into account, but that on these signals the analysts also not functions as an intermedium to investors. The fact that both SG&A signals and other fundamental signals *Growth* and *Capex* remain significant in the present of analyst forecast revision raises the question whether the mediation test should be interpreted as that there is no mediation effect at all. This finding serverely damages the reliability of Johnson's (2016) model if not caused by the

heteroskedasticity. Third, I predicted that the buy-and-hold abnormal returns to be gained are smaller if the CEO is more experienced due to a more credible signal. I partially reject this hypothesis on the basis of finding only significant results for three of six subsamples. The coefficients for *SS_3, SS_5 and SS_6* become larger in size with a mean-reverting discount in the opposite direction of the coefficient for every unit increase of *ExperienceVar*. *AGE* is mainly attributable for these findings. Even though Bertrand & Schoar (2003) found no association between *AGE* and SG&A costs, in this study investors react to this differently.

Concluding, I found a moderating effect of CEO experience recognized by that capital market participants through measuring the buy-and-hold abnormal returns which was not recognized by analysts or interpreted differently. This effect is in a mean-reverting direction of what was theoretically predicted and therefore I have to conclude that capital market participants do interpret a discretionary signal differently when the CEO is more experienced, and CEO experience thus functions as a moderating variable in three out of six subsamples.

### 6.2 Discussion and further research suggestions

In this thesis, I have used a modified model of Johnson (2016) and conducted a validity test by replicating his research where my results corroborate Johnson (2016). I found that subsample 3 and 5 are associated with one-year-ahead earnings change in the direction based on the cost stickiness theorem. Even though Johnson (2016) found that subsample 1 is associated with one-year-ahead earnings change, I only found that the coefficients are associated in the same direction. Therefore, I regard the partitioning of the change SG&A ratio signal into six subsamples as a valid method of capturing the SG&A signal in association with future earnings and analyst forecast revision, that I would recommend to be used in further research.

Although I have not been able to find an answer to why analysts do not impound the SG&A signal the same way capital market participants do, I do find that analysts correctly interpret the association of the SG&A signal with one-year-ahead earnings when CEO experience is included as an independent variable. The latter causes a change in the direction of subsample 1's sign in the predicted direction. However, when adding the moderating effect of CEO experience to the model, four of the SG&A signals become insignificant and two change in sign. Testing whether one-year-ahead analyst forecast revision functions as a

moderating variable fails to present that analysts impound the SG&A signal the same way investors do, but also for other fundamental signals as *Growth* and *CAPX.* I interpret this as analyst forecast revision correctly interpreting the fundamental signals in association with one-year-ahead earnings change, but not functioning as an intermedium to investors on these eleven signals. However, forecast revision is statistically significant when included in the regression and thus explains some of the variance in the buy-and-hold abnormal returns. It might be that capital market participants base their investment behaviour on other signals that are either included in the forecast revision and/or on other information content. The eleven fundamental signals only explain the variance in the forecast revision for 12% and the variance in buy-and-hold abnormal returns around the 1.5%. I would suggest for further research to identify what signals are nowadays used by both capital market participants and analysts; more information could be available from other resources than financial statements. It has been more than twenty years since Lev & Thiagaraian (1993) identified these signals and it might be that investors place more weight on other information than accounting information about the change in one-year-ahead earnings.

From that point of view, I think this thesis contributes to the literature by doing exploratory research in the direction of combining accounting information with characteristics of the signaller: CEO experience. The mean-reverting result found for the buy-and-hold abnormal returns confirms that signals sent by more credible senders are regarded as more informative. However, overall the CEO experience is not associated with the one-year-ahead earnings change. It is thus that capital market participants respond differently to the same signal sent by a different signaller. This could mean that there is less information asymmetry if the signal is more predictable and credible, that fewer earnings surprises will be present or that they cause less volatility in the stock prices (Ball & Brown, 1986). I would therefore suggest that further research studies CEO experience as a mediating effect to know whether it is only differently perceived or that more experienced CEOs are the cause of the change in SG&A ratio. This would also corroborate Banker & Chen (2006) and Weiss (2010) who found that weaker earnings surprises are present if the costs are stickier and Baumgarten et al. (2010) who mention that it is important to distinguish between intentional sticky costs and not. Next to that, I recommend that researchers not only do this for CEO experience but for more CEO characteristics. *AGE* contributed the most to the associations found, but this is

not solely a measure used for CEO experience. *AGE* is in general found to found to be negatively associated with risk-taking and positively associated with signaller's credibility (Hambrick & Mason, 1984; Guthrie & Datta, 1997; Bertrand & Schoar, 2003), and there might be more CEO characteristics that are associated with credibility.

Although I find that cost stickiness, cost anti-stickiness and fundamental analysis predictions are combined and recognized through the subsampling by investors, I cannot state whether the manager is intentionally signalling private information at the best interest of the company or that it is caused by economic factors. This limits me in making recommendations for hiring policies of companies. I can conclude though that I find results that corroborate Banker & Chen (2006) and Weiss (2010), that the SG&A signal is considered to be more credible if the CEO is more experienced which investors regard as more informative. I also conclude that analysts and investors regard the SG&A signal as a discretionary variable, as no other fundamental signals are influenced by including the CEO experience as an independent variable. Companies should take notice of investors linking the signal to the signaller when the signal is subject to managerial discretion.

### 6.3 Limitations

The data and research design that I use in this thesis contain several limitations. First, the data is cross-sectional which limits my findings to associations between listed firms in the United States only. Even though this suits an explorative research design, it does not aim for causality. Second, the databases used do not provide random sampling as required by the Gauss-Markov assumptions of OLS regressions. Especially the Captial IQ database plays its parts here, because it has a lot of missing data on crucial items such as: start date, end date, education and years that had not been observed per CEO. This also limited me in the use of education. Third, regarding the OLS I used, I have found heteroskedasticity problems for the model 9 to 16 which I was not able to resolve completely by winsorizing, excluding variables and fixed effects, and robust standard errors; the models presented have the best goodness-of-fit. However, heteroskedasticity does not prevent me from drawing conclusions upon the sign and size of a coefficient.

Fourth, the use of factor analysis has its limitations. I have used it in a proper way without having to make predictions up front (Kolenikov & Angeles, 2004), but prefer construct *ExperienceVar* over *ExperienceVar2.* The first better fits the theory and the latter has a

significantly better fit with the sample with a communality of 96.1%. The communality of 69.9% suggests that I miss variables in explaining the variable of the latent construct or that the reliability of the construct is not so high and potentially makes this an ambiguous measure (Yong & Pearce, 2013). Yong & Pearce (2013) suggest not using a construct with a communality of 80.0%, because this increases the endogeneity concern. Nonetheless, the robustness test also suffers from the same heteroskedasticity problems. It is a shame that I was not able to include a variable for education, which would have contributed a lot to the construct according to the literature on CEO experience. Next to that, I find that *AGE* is mainly attributable for the moderating effect found, which is not only a measure for CEO experience. The latent construct could thus suffer from validity problems.

Fifth, in this thesis I make the assumption that analysts are intrinsically motivated to serve as an intermedium to investors. Even though this is relationship is well founded (Lehavy et al., 2011) it could well be that there are unobserved relations between the CEO, investor and analyst that influence these results or that this relationship changes during the sample.

The generalizability of this study is also limited. Results from this thesis can only be generalized for listed firms in an Anglo-Saxon country with common stocks. Anglo-Saxon one-tier board structures are common in the United States and a control variable *DUAL* would be less relevant outside of that. Corporate governance structures might also influence other CEO experience characteristics and generalizing these results might lead to ambiguous interpretations. Additionally, I cannot provide practical recommendations for companies about a hiring policy, but only make them aware that investors link the signaller to the signal.

Lastly, for this thesis, I have chosen to research the signaller that sends the signal. This choice was based on the differential response of analysts and investors to the same signal and I still regard this as a valid choice. However, it has become quite a complex model with the subsampling, construction of a latent variable and the interaction effect of CEO experience. The CEO experience construct could be ambiguous and contain a risk of endogeneity, even though control variables are in place extracted from the extensive literature review that has been done. Omitted variables or measurement error may also cause a bias in the estimated results because it is not possible to measure CEO experience directly.

## 7. Appendix

| **Table 15 - variable description** | | | |
|---|---|---|---|
| Variable name | Database (measure) | Measure | Calculation |
| One-year-ahead earnings change | Compustat: diluted earnings per share excluding dividends (epsfx), accumulated adjustment factor price (adjex_f), closing stock price (prcc_f) | CEPS1i,t | [Adjusted earnings per sharei,t + 1 − adjusted earnings per sharei,t]/adjusted ending stock price t − 1] |
| One-year-ahead analyst forecast revision | Compustat: diluted earnings per share excluding dividends (epsfx), accumulated adjustment factor price (adjex_f), closing stock price (prcc_f). I/B/E/S: mean analyst consensus forecast (meanest), median analysts consensus forecast (medest). | FRi,t | [(Consensus analyst forecast for t + 1 issued in t + 1 (eleven months before earnings announcement date) − adjusted earnings per sharei,t) − (consensus analyst forecast for t + 1 issued in t (twenty-three months before earnings announcement date) − consensus analyst forecast for t issued in t (eleven months before earnings announcement date)]/adjusted ending stock price t − 1] |
| Buy-and-hold abnormal returns | CRSP: holding period returns excluding dividends (retx), closing price (prc), number of outstanding shares (shrout) | BHARi,t | Annual size-adjusted equally-weighted, buy-and-hold abnormal return of firm i cumulated from fourth month after the fiscal year-end of year t through twelve subsequent months |
| | | | |
| Tenure | Capital IQ: startyear of service (startyear), startmonth of service (startmonth). Compustat: fiscal year-end (fyear), actual fiscal month of year-end (fyrc) | TNRi,t | Fiscal year - year service began |
| Prior CEO experience | Capital IQ: startyear of service (startyear) | CEOXPi,t | First position of count of CEO positions at different companies |
| Age | Capital IQ: birthyear (yearborn). Compustat: fiscal year-end (fyear) | AGEi,t | Fiscal year - year born |
| Education | Capital IQ: graduateflag (graduateflag) | GRADi,t | Dummy variable is 1 if graduated, 0 otherwise |
| Education | Capital IQ: undergraduateflag (undergraduateflag) | UGRADi,t | Dummy variable is 1 if holds a position at an educational institution, 0 otherwise |
| CEO duality | Capital IQ: boardrank (boardrank) | DUALi,t | Dummy variable is 1 if CEO and chairman of board at the same time, 0 otherwise |
| Firm age | Capital IQ: year of founding (yearfounded). Compustat: fiscal year-end (fyear) | FAi,t | Fiscal year - year founded |
| Industry | Compustat: standard industry classification (sic) | INDi,t | SIC code, Fama & French (1997) 12 industry codes |
| | | | |
| Current year earnings change | Compustat: diluted earnings per share excluding dividends | CEPSi,t | [Adjusted earnings per sharei,t − adjusted earnings |

| | | | |
|---|---|---|---|
| | (epsfx), accumulated adjustment factor price (adjex_f), closing stock price (prcc_f) | | per sharei,t − 1]/adjusted ending stock pricet − 1] |
| Chang in inventory | Compustat: total inventory (invt), sales (sale) | ΔINVi,t | (Inventoryi,t/salesi,t) − (inventoryi,t − 1/salesi,t − 1) |
| Change in accounts receivable | Compustat: total accounts receivables (rect), sales (sale) | ΔARi,t | (Accounts receivablei,t/salesi,t) − (accounts receivablei,t − 1/salesi,t − 1) |
| Change in capital expenditures | Compustat: capital expenditures (capx) | ΔCAPXi,t | (Firm capital expendituresi,t/industry capital expendituresi,t) − (firm capital expendituresi,t − 1/industry capital expendituresi,t − 1) |
| Change in gross margin | Compustat: gross profit (gp), sales (sale) | ΔGMi,t | (Gross margini,t/salesi,t) − (gross margini,t − 1/salesi,t − 1) |
| Effective tax rate | Compustat: taxes paid (txpd), sales (sale) | ETRi,t | [(Average tax rate from t − 3 to t − 1 − tax rate in t) * CEPSi,t] |
| Labor force | Compustat: number of employees (emp), sales (sale) | LFi,t | [(Salesi,t − 1/# of employeesi,t − 1) − (salesi,t/# of employeesi,t)]/(salesi,t − 1/# of employeesi,t − 1) |
| Change in leverage | Compustat: total level of debt (dltt), common equity (ceq) | ΔLEVi,t | (Long-term debti,t/equityi,t) − (long-term debti,t − 1/equityi,t − 1) |
| Sales growth | Compustat: sales (sale) | Growthi,t | (Salesi,t/salesi,t − 1) − (salesi,t − 1/salesi,t − 2) |
| Auditor opinion | Compustat: auditor opinion (auop) | AOi,t | Dummy variable is 1 if the auditor's opinion was qualified or adverse, 0 for an unqualified opinion |
| Earnings quality | Compustat: lifo (lifr) | EQi,t | Dummy variable is 1 if FIFO, average cost, or other inventory method, 0 for LIFO |
| Subsample 1 | Compustat: sales, general and administrative expenses (xsga), sales (sale) | SS_1i,t | Change in SG&A ratio, multiplied by −1, when SG&A ratio decreases, sales increase, and SG&A costs increase, and 0 otherwise |
| Subsample 2 | Compustat: sales, general and administrative expenses (xsga), sales (sale) | SS_2i,t | Change in SG&A ratio, multiplied by −1, when SG&A ratio decreases, sales increase, and SG&A costs decrease, and 0 otherwise |
| Subsample 3 | Compustat: sales, general and administrative expenses (xsga), sales (sale) | SS_3i,t | Change in SG&A ratio, multiplied by −1, when SG&A ratio decreases, sales decrease, and SG&A costs decrease, and 0 otherwise |
| Subsample 4 | Compustat: sales, general and administrative expenses (xsga), sales (sale) | SS_4i,t | Change in SG&A ratio when SG&A ratio increases, sales increase, and SG&A costs increase, and 0 otherwise |

| | | | |
|---|---|---|---|
| Subsample 5 | Compustat: sales, general and administrative expenses (xsga), sales (sale) | SS_5i,t | Change in SG&A ratio when SG&A ratio increases, sales decrease, and SG&A costs increase, and 0 otherwise |
| Subsample 6 | Compustat: sales, general and administrative expenses (xsga), sales (sale) | SS_6i,t | Change in SG&A ratio when SG&A ratio increases, sales decrease, and SG&A costs decrease, and 0 otherwise |
| | | | |

*Table 15: Variable description*

**Table 16 - Correlation matrix**

| | CEPS1 | FR | BHAR | CEPS | ETR | GM | CAPX | AR | INV | EQ | LF | Growth | FA | SS_1 | SS_2 | SS_3 | SS_4 | SS_5 | SS_6 | CEOXP | DUAL | AGE | TNR | TNRXP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CEPS1 | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| FR | 0.625 | 1 | | | | | | | | | | | | | | | | | | | | | | |
| BHAR | 0.259 | 0.108 | 1 | | | | | | | | | | | | | | | | | | | | | |
| CEPS | -0.243 | -0.304 | -0.040 | 1 | | | | | | | | | | | | | | | | | | | | |
| ETR | -0.035 | -0.045 | -0.011 | 0.267 | 1 | | | | | | | | | | | | | | | | | | | |
| GM | -0.081 | -0.134 | -0.019 | 0.305 | 0.090 | 1 | | | | | | | | | | | | | | | | | | |
| CAPX | -0.042 | -0.041 | -0.022 | -0.004 | -0.011 | 0.006 | 1 | | | | | | | | | | | | | | | | | |
| AR | 0.030 | 0.043 | 0.014 | 0.004 | 0.001 | -0.032 | -0.044 | 1 | | | | | | | | | | | | | | | | |
| INV | -0.010 | 0.003 | 0.009 | -0.071 | -0.005 | -0.081 | -0.005 | 0.214 | 1 | | | | | | | | | | | | | | | |
| EQ | -0.020 | -0.058 | -0.001 | -0.023 | -0.031 | 0.018 | -0.008 | 0.000 | -0.011 | 1 | | | | | | | | | | | | | | |
| LF | 0.038 | 0.057 | 0.018 | -0.139 | 0.018 | -0.173 | -0.040 | 0.330 | 0.372 | -0.012 | 1 | | | | | | | | | | | | | |
| Growth | -0.031 | -0.043 | -0.033 | 0.183 | 0.036 | 0.181 | 0.047 | -0.077 | -0.168 | 0.032 | -0.367 | 1 | | | | | | | | | | | | |
| FA | -0.018 | -0.043 | -0.034 | -0.021 | 0.003 | 0.013 | -0.017 | 0.006 | 0.000 | 0.514 | 0.013 | 0.037 | 1 | | | | | | | | | | | |
| SS_1 | -0.031 | -0.051 | -0.006 | 0.098 | -0.010 | 0.068 | 0.031 | -0.115 | -0.147 | -0.242 | -0.350 | 0.312 | -0.149 | 1 | | | | | | | | | | |
| SS_2 | -0.002 | -0.002 | -0.015 | 0.138 | 0.026 | 0.031 | -0.016 | -0.042 | -0.065 | -0.114 | -0.137 | 0.102 | -0.056 | -0.082 | 1 | | | | | | | | | |
| SS_3 | 0.060 | 0.054 | 0.039 | 0.097 | 0.056 | -0.062 | -0.048 | 0.009 | -0.015 | -0.029 | 0.017 | -0.051 | 0.015 | -0.074 | -0.039 | 1 | | | | | | | | |
| SS_4 | -0.037 | -0.013 | 0.005 | -0.066 | -0.011 | 0.038 | 0.038 | 0.003 | 0.035 | -0.200 | 0.052 | -0.037 | -0.120 | -0.144 | -0.077 | -0.069 | 1 | | | | | | | |
| SS_5 | 0.026 | 0.022 | 0.019 | -0.100 | -0.015 | -0.091 | -0.015 | 0.051 | 0.135 | -0.145 | 0.216 | -0.248 | -0.074 | -0.086 | -0.046 | -0.041 | -0.080 | 1 | | | | | | |
| SS_6 | 0.141 | 0.172 | 0.029 | -0.080 | -0.059 | -0.052 | -0.046 | 0.147 | 0.162 | -0.064 | 0.253 | -0.249 | -0.036 | -0.089 | -0.047 | -0.042 | -0.083 | -0.049 | 1 | | | | | |
| CEOXP | 0.004 | 0.064 | 0.007 | 0.034 | -0.001 | 0.024 | 0.020 | 0.007 | -0.018 | -0.181 | -0.025 | -0.010 | -0.092 | 0.035 | 0.026 | 0.038 | 0.065 | -0.028 | 0.027 | 1 | | | | |
| DUAL | -0.006 | -0.044 | 0.031 | 0.017 | -0.007 | 0.016 | 0.001 | -0.008 | 0.001 | -0.124 | 0.018 | 0.005 | -0.030 | -0.013 | -0.032 | -0.006 | 0.012 | -0.034 | -0.052 | -0.179 | 1 | | | |
| AGE | -0.001 | 0.005 | -0.009 | -0.011 | -0.008 | 0.005 | 0.010 | 0.005 | 0.005 | 0.103 | 0.000 | 0.012 | 0.144 | -0.063 | -0.010 | -0.012 | -0.075 | -0.018 | -0.005 | 0.085 | 0.053 | 1 | | |
| TNR | -0.012 | -0.036 | -0.002 | -0.011 | 0.004 | 0.005 | 0.021 | -0.016 | 0.008 | -0.242 | 0.001 | -0.004 | -0.108 | 0.027 | -0.001 | -0.053 | 0.009 | 0.014 | -0.015 | -0.399 | 0.318 | 0.372 | 1 | |
| TNRXP | -0.011 | 0.028 | -0.006 | 0.007 | -0.007 | 0.004 | 0.027 | 0.003 | -0.004 | -0.101 | -0.008 | -0.008 | -0.047 | 0.019 | -0.003 | -0.007 | 0.034 | -0.021 | 0.005 | 0.765 | -0.043 | 0.091 | -0.033 | 1 |

*Table 166: Correlation matrix*

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