



UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Defined Benefit Obligations

A Quantitative Study of the Managerial Opportunism within the
Accounting of Defined Benefit Obligations

Master Thesis

Spring 2019 GM1460

Master's degree Project in Accounting and Financial Management

University of Gothenburg, School of Business, Economics and Law

Graduate School

Authors: Anders Dahnér and Martin Hallgren

Supervisor: Emmeli Runesson

Abstract

In the aftermath of the financial crisis in 2008 the rates on corporate- and government bonds began to diverge (Runesson et al., 2018). The increased differences in bond rates had a large effect on the Swedish firms. As they, due to the lack of a deep market for high-quality corporate bonds, need to apply the rates of government bonds when accounting for their defined benefit obligations (DBOs) (IAS 19). This creates incentives for Swedish firms to deviate from the low government bond rates, in order to mitigate the effect that the low discount rates have on the DBOs. Managers incentives are further enhanced by their substantial discretion over the choice of discount rate, along with the low probability of stakeholders detecting the opportunism due to the complex accounting involved (Comprix & Muller, 2011; Fried et al., 2014; Salewski & Zülch, 2015).

The purpose of the thesis is to investigate whether the discount rates used when accounting for DBOs are more opportunistic among firms in countries that needs to apply the rates of government bonds (Sweden), rather than countries that applies the rates of corporate bonds (UK). Thus, our research question (RQ) is stated as follows: *Is the choice of discount rate when accounting for DBOs more opportunistic in Swedish firms, compared to the UK firms, due to the low rates of Swedish government bonds?* To answer our RQ, we use a quantitative research approach where data was collected from S&P Capital IQ and annual reports between 2008-2017 for 60 Swedish firms, and 260 UK firms. Based on what previous research emphasise as determinants of opportunistic behaviour, three hypotheses were developed. We predict the discount rates to be higher among the Swedish firms, compared to the UK firms in the presence of high chief executive officer (CEO) bonus- and Debt/Equity-ratios (D/E), as well as weaker governance structures. Opportunistic discount rates are identified based on the discount rates deviation from the median within each country, along with the relationship to the predictive variables. A logistic- and a linear regression analysis is used to test our hypotheses.

The findings illustrate that Swedish firms have more opportunistic discount rates when accounting for their DBOs compared to the UK firms, when higher CEO bonus- and D/E-ratios are present. Moreover, we argue that the board of directors are insufficient in preventing the opportunistic behaviour among the CEOs regarding DBO-accounting. Furthermore, we illustrate that the Swedish median discount rate levels are abnormally high considering the median levels in the UK, along with the differences in the government- and corporate bond rates. Henceforth, our findings contribute to the literature of DBO-accounting, opportunistic accounting choices, and discretionary discount rates, and are of interest for investors, creditors, auditors, academics, employees and standard setters as it sheds light on a complex issue, of an unknown extent.

Keywords: *Defined benefit pension plans, Defined benefit obligations, DBO, DBP, Discount rate incentives, Managerial opportunism, Managerial Discretion, IAS 19, Accounting for pension obligations, Opportunistic accounting choices.*

Table of Content

1. Introduction	1
1.1 Background	1
1.2 Motivation for The Study and Research Question	3
1.3 Purpose.....	4
2. Institutional Setting.....	5
3. Literature Review	6
3.1 Earnings Management when Accounting for DBOs	6
3.1.1 <i>Managerial Opportunism</i>	7
3.1.2 <i>Preventing Managerial Opportunism</i>	8
3.2 The Effect of Leverage.....	9
4. Hypothesis Development.....	11
4.1 Hypothesis 1	11
4.2 Hypothesis 2.....	11
4.3 Hypothesis 3.....	12
5. Method.....	13
5.1 Research Design.....	13
5.2.1 <i>Research Question</i>	13
5.2.2 <i>Managerial Opportunism</i>	14
5.2.3 <i>Corporate Governance</i>	15
5.2.4 <i>Internal Factors</i>	15
5.4 Data Gathering	18
5.4.1 <i>Screening Process</i>	18
5.5 Principles of Research Ethics	19
5.6 Limitations	19
6. Results and Discussion	21
6.1 Descriptive Statistics	21
6.2 Bivariate Correlation Analysis	22
6.3 Managerial Opportunism.....	24
6.4 Preventing Managerial Opportunism	26
6.5 The Effect of Leverage.....	27
6.6 Robustness and Model Diagnostics.....	30
7. Conclusion.....	32
8. References	34

Table of Figures

Picture 1: Median Discount Rates for Sweden and the UK	2
Table 1: Definition of Variables	17
Table 2: Descriptive Statistics	22
Table 3: Bivariate Correlation Analysis	23
Table 4: Hypothesis 1	24
Table 5: Hypothesis 2	26
Table 6: Hypothesis 3	28
Table 7: Full Model	31

1. Introduction

1.1 Background

Employers generally offer two kinds of pension plans to their employees, defined contribution plans (DCP) or defined benefit plans (DBP) (Comprix & Muller, 2011). Within a DCP, the employers are required to pay contributions to a pension trust fund, and the investment risk is onwards held by the employees. However, in a DBP the employer owns the investment risk as they promise to pay a predetermined amount to the employee at the time of the retirement (ibid). Thus, when accounting for DBPs firms are required to recognise the difference between the plan assets¹ and the defined benefit obligations (DBO) of the DBP, where the DBOs consists of the present value of future pension-payments to their employees (IAS 19:63). If there is a deficit, a liability has to be recognised on the balance sheet (ibid). This aggregates to the uncertainty within these plans, as they may become too costly, thus incentives arise to reduce the obligations of the plan (Comprix & Muller, 2011; Fried, Davis-Friday & Davis 2014).

Managers use their influence to affect the DBPs, which is done by underfunding or, using discretion over the discount rates to mitigate the DBOs (Asthana, 1999; Cheng & Swenson, 2018; Comprix & Muller, 2011; Fried et al., 2014). Managers who use their discretion over accounting choices in order to increase their own wealth at the cost of others, are referred to as being opportunistic (Watts & Zimmerman, 1990). The incentives to manipulate the DBOs are increased when managers compensation is tied to earnings figures, as the contributions to the DBP then may directly affect their bonus compensation (Cheng & Swenson, 2018).

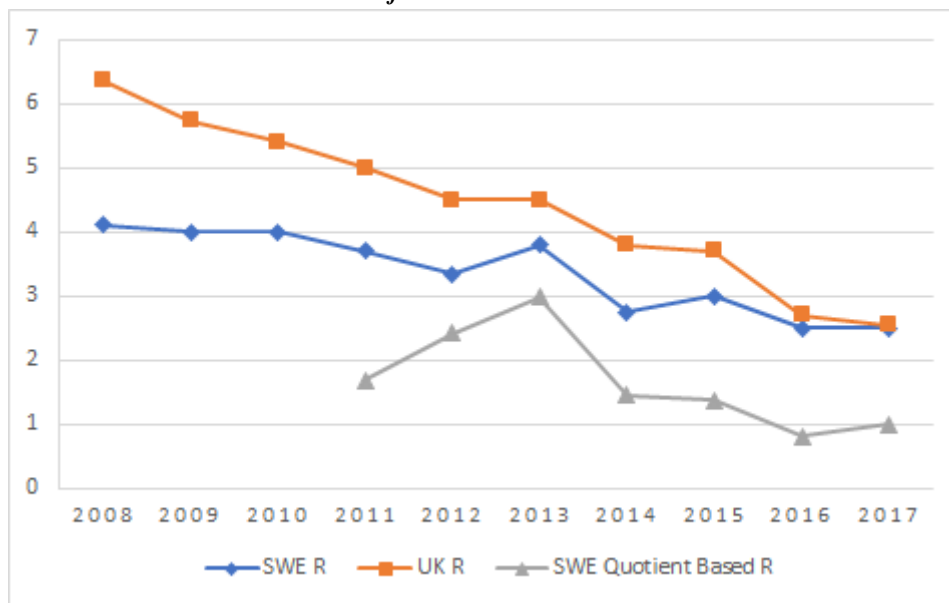
The discount rate used to calculate the present value of the DBOs is required to be based on high-quality corporate bonds, however, if the country lacks a deep market for high-quality corporate bonds, governmental bonds should be used instead (IAS 19:83). Moreover, different future pension obligations have different durations, thus different discount rates have to be applied (IAS 19:85). Although, a single weighted discount rate is accepted (IAS 19:80). Sweden is among those countries that lacks a deep market for high-yield corporate bonds, accordingly Swedish firms have to use the yield on the Swedish government bonds when determining the present value of their DBOs (RFR, 2009). However, in contrast to Sweden, the United Kingdom (UK) has a deep market for corporate bonds, thus their firms should base their discount rates on the UK high-yield corporate bond market.

Runesson, Samani and Marton (2018) highlights that the debate of the discount rates used when accounting for DBOs began after the financial crisis of 2008, due to the declining trend in government bonds, at the same time as the corporate bond rates increased. This increased difference between the government- and corporate bond rates could be viewed as unfair as it

¹ Plan assets are the contributions that has been paid into the DBP by the firm.

led to increased reported liabilities on Swedish balance sheets (ibid). In *Picture 1* the median discount rates for Swedish firms and UK firms are illustrated, along with a Swedish quotient-based proxy rate², which aims to visualise where the Swedish median rates should be, based on the difference in the government- and corporate bond rates. As visualised, the differences in the median between the countries decreases over time and then converge after 2016 (*Picture 1*). This is surprising as the government bond rates are below the UK corporate bond rates, which is illustrated by the proxy rate. Nevertheless, we can see that there is a large difference between the quoted proxy and the actual median rate, indicating that the median levels in Sweden are abnormally high in relation to the UK corporate bonds. This indicates that potential opportunism is involved when Swedish firms determine the discount rate used to account for their DBOs.

Picture 1: Median Discount Rates for Sweden and the UK



Produced by the authors through S&P Capital IQ and Riksbank.se

When accounting for DBOs, the CEOs may face a trade-off as they could be included in the DBP themselves, as well as funding the DBP could affect their bonus compensation (Begley, Chamberlain, Yang & Zhang, 2015). There is further an issue between satisfying debtholders or equity holders, as funding the DBP will increase the tax shield, which is in favour of equity holders but at the expense of debt holders. Because the same assets otherwise would be held as security for borrowed capital. Thus, managers may also have incentives to keep the discount rate low in order to satisfy equity-holders (ibid).

Prior literature on the topic of DBOs (Begley et al., 2015; Cheng & Swenson, 2018; Comprix & Muller, 2011; Fried et al., 2014; Runesson et al., 2018; Salewski & Zülch, 2015) have not looked at countries that lack a deep market for corporate bonds, as well as comparison between those with- and without such a market. We investigate to what extent opportunistic discretion

² (10 year government bond rates in Sweden/10 year corporate bond rates in the UK) x the UK median rates = the quotient-proxy rate for the Swedish firms. The proxy rates are calculated from 2011 as there was no information to be collected for the UK corporate bond rates before this year in S&P Capital IQ.

is used over the discount rates when accounting for DBOs in Sweden, compared to the UK. This is interesting due to the recent years decreasing Swedish government bond rates, compared to the UK corporate bond rates. Which makes the incentives to overstate discount rates even higher among Swedish firms in order to secure own compensation, or to level the field with foreign competitors. Hence, as the liabilities increases due to lower discount rates, the estimated expense by the firms has to increase, thus affecting both the balance sheet and the income statement (Comprix & Muller III, 2011; Fried et al., 2014). The burden of increasing DBOs can be huge and may ultimately be part of a firm's reason for bankruptcy, as in the case of American Airlines, Northwest and General Motors (Fried et al., 2014).

1.2 Motivation for The Study and Research Question

Investigating whether managers use opportunistic discount rates for their DBOs is interesting as it is highlighted that IAS 19 does not leave room for assumptions or interpretation considering which bond market the discount rates should be based on (Marton, 2012). Rather, it is emphasised that this is one of few specific rules within International Financial Reporting Standards (IFRS) (ibid). Nevertheless, managers may have incentives to opportunistically deviate from the standard by using discount rates based on other markets or manipulate the maturities. Thus, deviating discount rates will create accounting that is non-compliant with IAS 19. Manipulating the balance sheet through the discount rates will not only provide misleading information to investors and other stakeholders about future obligations, it also decreases the accounting quality, as the DBOs are not faithfully represented, as well as the comparability between firms decreases.

Declining discount rates may be problematic for firms because the inflated DBOs will affect the balance sheet, and thus it will be reflected in the financial ratios (Runesson et al., 2018). Accordingly, managers have several incentives to affect the discount rates, in order to satisfy either debt- or equity holders (Begley et al., 2015), if close to violating debt covenants (Asthana, 1999; Watts & Zimmerman, 1990), or seek to meet investors- or analyst expectations (Cheng & Swenson, 2018). Or simply because managers risk missing out on own compensation (Fields, Lys & Vincent, 2001; Healy, 1985; Watts & Zimmerman, 1990). It is further emphasised that larger boards are less efficient in preventing opportunistic behaviour (Core, Holthausen & Larcker, 1999; Jensen, 1993; Yermack, 1997), indicating that the governance structure affects the firm's capability of preventing opportunistic discount rates.

Overstating the discount rates will not only make the accounting figures more appealing, it will also provide firms with better income statements as less contribution is needed to close the funding gap (Asthana, 1999). Therefore, the incentives are substantial in order to satisfy both internal and external stakeholders, as well as increasing CEO compensation. Furthermore, firms freezing their DBPs is an indication that the DBOs is a heavy burden (Begley et al., 2015; Fried et al., 2014). According to Asthana (1999) the underfunding and termination of DBPs could have a negative effect on the firm's employees, even if the pensions are partially insured. The funding policy of the DBP is of further interest to investors and creditors, as it is emphasised to affect firms credit rating and value (ibid).

The strong incentives for Swedish firms are further enhanced by the substantial discretion that managers have over the discount rates, however, the extent of the problem may not be fully acknowledged by the stakeholders due to the complex accounting involved (Comprix & Muller, 2011; Fried et al., 2014; Salewski & Zülch, 2015). Thus, we aim to look for deviating patterns in the Swedish- compared to the UK firms. Thus, our research question pursues:

Is the choice of discount rate when accounting for DBOs more opportunistic in Swedish firms, compared to the UK firms, due to the low rate on Swedish government bonds?

To answer the research question a quantitative study was used, which investigated 60 Swedish, and 260 UK firms between 2008-2017. The results of the study were established based on a logistic- and linear regression analysis. The findings illustrate that Swedish firms are more prone than the UK firms to use opportunistic discount rates in the presence of high CEO bonus- and D/E-ratios. Moreover, the results further indicate that the board of directors are incapable of preventing opportunistic behaviour regarding the DBO-accounting. The findings are interesting for investors, creditors, auditors, academics, employees and standard setters as it sheds light on a complex issue of a previously unknown magnitude. Henceforth, our findings contribute to the literature of DBO-accounting, opportunistic accounting choices, and discretionary discount rates.

However, it should be acknowledged that the benchmark rate used to determine potential opportunism is difficult to determine due to the lack of disclosures regarding the maturities used to determine the discount rates. Thus, there is potential of inaccurately defining opportunistic discount rates. Moreover, the explanatory power of our OLS-regressions indicates that variables predicting the discount rates are excluded in our model.

1.3 Purpose

The purpose of the thesis is to investigate whether the discount rates used when accounting for DBOs are more opportunistic in Sweden compared to the UK, given the low rates on the Swedish government bonds compared to the UK corporate bonds.

2. Institutional Setting

Sweden's financial system shares the characteristics of Continental Europe which is associated with more credit-based funding, weaker equity market and prudent accounting valuation (Hellmann, Perera & Patel, 2013). Whereas the UK belongs to the Anglo-American tradition which relies more on the equity market for funding and has a less prudent accounting (ibid). The differences between these financial systems can further be noticed in that the number of listed firms is higher, stock ownership concentration is lower and that the stocks are predominantly owned through institutional investors in Anglo-American countries compared to Continental countries (Ooghe & De Langhe, 2002). Since Anglo-American countries are more shareholder-oriented the transparency to shareholders are higher, compared to the Continental credit-orientated (ibid). As emphasised by Halaoua, Hamdi and Mejri (2017), Anglo-American countries tend to be prone to manage earnings to meet financial expectations, as they prioritize to gain and obtain external investors. Earnings management is present in Continental countries as well, although they are more focused on satisfying the demands from banks in order to maintain and enable further funding (ibid). Structural differences in governance are also found, which is highlighted to be a result of the different agency problems at place (Ooghe & De Langhe, 2002). It is emphasised that Continental countries relies more on internal governing such as board of directors, whereas Anglo-American relies more on external governing such as high competition, and high liquidity on the equity-market (ibid). Moreover, the UK external governance roots in the specific regulatory settings for DBPs, where the country aims to mitigate the employee risks by requiring firms to disclose substantial changes of risk within the firms (Kiosse & Peasnell, 2009). These regulatory impositions have led to reduced attractiveness for the DBPs among employers, as it has led to increased costs (ibid).

3. Literature Review

3.1 Earnings Management when Accounting for DBOs

The valuation of DBOs are in the hands of managers, thus creating possibilities for manipulation (Bergstresser, Desai & Rauh, 2006; Salewski & Zülch, 2015). There are incentives for earnings management regarding DBO-accounting because of the contributions needed to the plan assets, which ultimately will affect the reported earnings (Bergstresser et al., 2006). Hence, the firms with the most to gain on manipulating their DBOs are the ones with large DBOs relative to net income (ibid). The earnings management perspective is interesting within DBO-accounting as it effects the cash flow of the firms, which is frequently connected to CEO bonus compensation, thus incentivising them to shift income among periods (Cheng & Swenson, 2018). Furthermore, the DBO-accounting is deemed complex and thus opportunistic discretion has a lower probability of being discovered (Salewski & Zülch, 2015). Delaying the funding of the DBPs leads to an increased gap between the plan assets and obligations in the current period, thus the contributions to the DBP will increase in future periods which ultimately affects future compensation (Cheng & Swenson, 2018). However, to mitigating the effect that closing the funding gap would have on the income statement firms tend to increase their discount rates when their DBPs are underfunded, which generates lower obligations and as a result a smaller funding gap (Asthana, 1999). Furthermore, there has emerged a lack of ability to fund the DBPs among firms, providing incentives for managers to engage in opportunistic behaviour to control for the effects of the DBOs (ibid).

Chaudhry, Au Yong and Veld (2017) emphasise that firms still under contribute to their DBPs even though they are financially strong, indicating that there are reasons beyond financial distress to explain the deficits within the DBPs. Henceforth, increasing DBP deficits are shown to be associated with an increase in managers overinvesting in non-value adding investments (ibid). Rauh (2006) also found that contributions to the DBP plan assets had a negative relationship with firm investments, the findings were stronger for firms that were economically constrained and dependent upon external finance. Moreover, Roychowdhury (2006) argued that firms engage in real earnings management activities in order to meet targets or avoid making negative results. Which is further emphasised by Fried et al. (2014), who argues that managers use their discretion over discount rates mainly due to its positive effects on the DBOs, but also because it lowers the service cost and interest cost which ultimately leads to an improved net income. Earnings management activities are done in order to mislead stakeholders that certain goals or targets are met, however, these manipulations do not increase firm value even though enabling managers to meet predetermined goals (Roychowdhury, 2006). Henceforth, since the discount rates affects the reported DBOs on the balance sheet, and possibly the net income if funding is needed, managers have incentives to manipulate the choice of discount rate (Fried et al., 2014).

3.1.1 Managerial Opportunism

Managers with bonus-tied compensation contracts have incentives to make accounting choices to maximise their own compensation at the expense of others (Fields et al., 2001; Healy, 1985; Watts & Zimmerman, 1990). This assumption is based on the diverged interest of managers and shareholders, referred to as the principal-agent conflict where the managers are assumed to act in self-interest (Jensen & Meckling, 1976). Fields et al. (2001) highlights that earnings management is especially present when the contracts are predetermined, then managers do what they can to fulfil the requirements of the contract. Managers that use discretion to influence their own compensation at the expense of others ex post of the contract agreement is acting opportunistically (Watts & Zimmerman, 1990). Managers with no binding upper- or lower limits on their bonus contracts are more likely to use income increasing measures, while those with set limits are more likely to use income-decreasing measures in order to save income to next year (Healy, 1985). Moreover, Cheng and Swenson (2018) finds that firms with higher CEO bonus compensation contribute less to their DBPs, which indicates that managers put their own self-gain before employee pension benefits.

The opportunistic discretion used by managers to inflate their bonuses is likely to impose a cost for the users of the financial statements, as the information may be misleading and not faithfully represented (Fields et al., 2001). Nevertheless, managers are not likely to be completely restricted as they generally are the best ones to determine which accounting choices that best reflects the underlying economics, thus managers may exercise discretion for efficiency reasons that will increase firm value rather than for self-interest reasons (Watts & Zimmerman, 1990). Findings further suggest that decreasing discount rates are used in the periods before freezing or closing DBPs, as firms want to magnify the burden induced by the DBOs, thus firms lower the discount rates to increase the reported obligations in order to justify a freeze of the plan (Comprix & Muller, 2011). Begley et al. (2015) finds that CEOs that have larger interest in the DBPs, are less likely to freeze the plans. Their findings also suggest that managers with larger interest in the DBPs than alternative compensation schemes are also associated with healthier and better funded plans. Opportunistic discretion is further found to be correlated with firms that are financially weak and have underfunded DBPs, indicating that managers may use discretion in these cases to cash out in other ways (ibid).

Funding the DBPs is argued to be a trade-off between current benefit of increasing the plan assets and thus decreasing the deficit reported on the balance sheet, and the cost of reducing the current cash flow which could be used for other purposes (Cheng & Swenson, 2018). Henceforth, managerial compensation based on earning figures are deemed to increase the opportunism used by managers as they generally have the power over accounting choices (Watts and Zimmerman, 1990). Thus, as the funding of the DBPs affects the firm's cash flow there may be incentives to delay the funding of the plan (Cheng & Swenson, 2018), or to use a higher discount rate to close the funding gap (Asthana, 1999) if the CEO is close to missing analyst forecast or managerial compensation (Cheng & Swenson, 2018). Furthermore, there is also argued to be a trade-off in the sense that by contributing to the DBPs managers justify and

secure their own pension plan, at the expense of other compensation schemes (Begley et al., 2015).

3.1.2 Preventing Managerial Opportunism

Jouber and Fakhfakh (2011) argues that the corporate governance structures are neutral to the degree of opportunism used by managers. However, Jensen (1993), Core et al. (1999) and Yermack (1997) all finds evidence for a relationship between the governance structures and opportunistic behaviours among managers. More specifically it is suggested that the governance efficiency tends to fall when the amount of board members exceeds seven to eight, consequently the board is less likely to discover opportunistic activities (Jensen, 1993). Core et al. (1999) further argues that a larger board is easier captured by the CEO, and that individual members of the board are less likely held accountable for certain decisions. Moreover, it is highlighted that the effectiveness of the board tends to increase when the board is smaller in relation to when the board is larger (Yermack, 1997). Findings also concludes that the number of board members is larger in fraud firms than in relation to firms not committing fraud, which further indicates that smaller boards are more efficient (Uzun, Szewczyk & Varma, 2004).

Managerial risk taking associated with compensation schemes has been widely covered, however there has been less focus on the effects that board of directors' compensation has on the firm's risk taking (Deutsch, Keil & Laamanen, 2011). Thus, similar to the principal-agent conflict (Jensen & Meckling, 1976) there has been suggestions that the same conflicts exist among board of directors and debtholders (Ertugrul & Hedge, 2008). As directors are frequently more compensated with stock-options in the firm they are supposed to monitor, it opens for conflicts of interest with debtholders, as their risk-taking increases (ibid). Furthermore, it is emphasised that a relationship exists between the degree of board compensation and monitoring, where the amount of cash compensation to board of directors was found to be correlated with a higher degree of opportunism, indicating that directors with higher compensation are less efficient in their monitoring (Ye, 2014). However, findings from Ertugrul and Hegde (2008) suggests that directors' stock-option compensation increases their monitoring motivation, and thus leads to less managerial opportunism. A conflicting result is found by Deutsch et al. (2011), who illustrates that there is a correlation between granting stock-option to board of directors and the risk taking of firms, their findings even suggests that this relationship is stronger for directors than for CEOs, as the board of directors are better able to diversify their risk and as such are less risk averse (ibid).

There seems to be a consensus in previous literature that the presence of institutional investors has a mitigating effect on opportunistic activities (Cornett, Marcus & Tehranian, 2008; Hartzell & Starks, 2003; Jouber & Fakhfakh, 2011; Klein, 2002; Liu & Lu, 2007; Roychowdhury, 2006). Jouber and Fakhfakh (2011) emphasise that institutional investors are a strong determinant of decreasing opportunistic behaviour. Institutional investors role is an extra layer of monitoring which reduces the agency problems between the firm's shareholders and management (Hartzell & Starks, 2003). It is further highlighted that this is present when institutional investors own a significant part of the firm's stocks as it gives them stronger

incentives for monitoring (Jouber and Fakhfakh, 2011). Klein (2002) found that when a larger block holder of stocks takes on a more active role within the firm it has a mitigating effect on opportunistic activities. Moreover, findings suggest that institutional investors have an overall decreasing effect on all manipulating activities introduced by opportunistic managers (Cornett et al., 2008; Liu & Lu, 2007; Roychowdhury, 2006).

3.2 The Effect of Leverage

Leverage is emphasised to be a useful monitoring tool against the cost of agency problems, as it not only mitigates the opportunistic behaviours of managers in the form of external monitoring by creditors (Fields et al., 2001; Ghazali, Shafie & Sanusi, 2015), but also limits the excessive cash left for managers to spend on wasteful investments (Ghazali et al., 2015). Nevertheless, firms that are managed by an opportunistic self-driven CEO tends to have more debt, the individualism of managers seems also to be associated with their tendency to take higher risk (Fauver & McDonald, 2015). Although, it is highlighted that when examining different capital structures among firms and between countries it is important to consider if the firms possess DBOs or not, as these will affect their capital structure (Bartram, 2016). Firms with large DBOs generally has less regular debt, however these firms tend to have higher overall leverage than those without DBOs (ibid). Firms with more leverage are emphasised to be more likely to opportunistically increase income by using their discretion over accounting choices (Watts & Zimmerman, 1990).

Firm characteristics are also found to determine whether CEOs have incentives to use opportunistic discretion over DBO-accounting (Asthana, 1999). It is shown that firms with overfunded DBPs downward-bias the assumptions in order to decrease the gap between the plan assets and DBOs, however if the DBPs are underfunded the assumptions are upward-biased instead to decrease the DBOs and thus mitigate the funding gap (ibid). It is further emphasised that firms with high profitability and low debt use lower discount rates in order to maximize the tax savings from the contributions, however, high debt and low profitability firms do the opposite, thus they use larger discount rates to minimize the contributions needed (Asthana, 1999). Which is in line with the findings of Watts and Zimmerman (1978), who states that large firms in contrast to small has greater incentives to adopt accounting standards that lowers earnings. This is also in line with the findings of Jouber and Fakhfakh (2011), that opportunistic behaviour is increasing when the equity level of the firm is low, hence large debt seems to be associated with more opportunism. Thus, ultimately there seems to be a trade-off between the benefits of the tax-shield that the contributions to the DBP allows for and the cost of financial distress that increased leverage contributes to (Bartram, 2016).

It is further suggested that biased DBOs can be a problem when valuing firms, nevertheless firms manage their DBOs in order to minimize public scrutiny and penalties (Asthana, 1999). Firms that decides to freeze their DBPs are found to be punished as the freeze will generate a decrease in credit rating due to assumed higher credit risk, affecting the possibility of raising external debt along with increasing the cost of capital (Choy, Lin & Officer, 2014; Kim & Kim, 2018). It is highlighted that firms with high debt prefer to keep contributions to the DBPs low

by inflating the actuarial assumptions, this is done to avoid violating debt covenants alongside keeping the cost for external funding low (Asthana, 1999). This is in line with the findings to Watts and Zimmerman (1990) who argues that the extent of opportunistic activities tends to be higher for firms with high debt as they are closer to breaching the debt covenants. Begley and Feltham (1999) further highlights that CEOs with more wealth in the form of stock ownership raises a warning signal for debtholders and are therefore more prone to restrictions when borrowing. The concern is that CEOs may act opportunistically in order to influence the stock price, and thus act on the behalf of equity-holders at the expense of debtholders (ibid). Findings also suggests that firms with CEOs that has a larger personal interest in the internal debt, hence pension compensations, are associated with less debt covenants, and lower cost of debt as their interests are deemed to be in line with those of debt holders (Anantharaman, Fang & Gong, 2014). Which is in line with the argument that managers holding inside debt reduce the conflict among equity-holders and debtholders (Jensen & Meckling, 1976). On the contrary, the incentives for opportunistic activities are increased when the cost of debt is higher (Jouber & Fakhfakh, 2011).

4. Hypothesis Development

In order to answer our research question *if the choice of discount rate when accounting for DBOs is more opportunistic in Swedish firms, compared to the UK firms, due to the low rates on Swedish government bonds* three hypothesis has been developed based on what previous research, presented in *Section 2*, has emphasised as determinants for potential opportunism.

4.1 Hypothesis 1

As presented in *Section 3.1.1* CEOs with bonus contracts have incentives to opportunistically adjust the discount rates in order to maximise their own bonus compensation (Fields et al., 2001; Healy, 1985; Watts & Zimmerman, 1990). Hence, as contributing to the plan assets can affect CEO bonuses (Asthana, 1999; Cheng & Swenson, 2018), the discount rate could be used to either close the gap, or to mitigate the gap without contributing (Asthana, 1999). Thus, there are incentives for CEOs directly tied to the effect that the discount rate have on the DBOs, moreover, as CEOs generally has the power over accounting choices (Watts & Zimmerman, 1990) it enables them to affect the outcome of the discount rate used for DBO-accounting. Given the differences in the government bond rates that Swedish firms faces and the corporate bond rates which applies to the firms in the UK, we expect the incentives for opportunistic discount rates to be stronger among Swedish firms in the presence of high CEO bonus. Which leads to our first hypothesis:

H1: Higher CEO bonus-ratio is more likely to correspond with a higher choice of discount rate in Swedish firms, compared to the UK firms, given the increased incentives to deviate from the low government bond rates.

4.2 Hypothesis 2

As highlighted in *section 3.1.2* opportunistic managerial discretion is less likely to be captured by larger boards as they are argued to be less efficient compared to smaller boards (Core et al., 1999; Jensen, 1993; Yermack, 1997). Because Swedish firms has larger incentives than the UK firms to manipulate their DBOs due to their prerequisites regarding the discount rate, as well as larger boards inefficiencies in preventing opportunistic behaviour we expect to find a positive relationship between opportunistic discount rates and weaker governance structures. Which concludes our second hypothesis to be:

H2: A weaker governance structure is more likely to correspond with a higher choice of discount rate in Swedish firms, compared to the UK firms, given the increased incentives to deviate from the low government bond rates.

4.3 Hypothesis 3

Section 3.2 emphasise the connection between higher debt ratios and opportunistic managerial discretion (Asthana, 1999; Fauver & McDonald, 2015; Joubert & Fakhfakh, 2011; Watts & Zimmerman, 1990). Debt heavy firms tend to opportunistically manipulate accounting choices (Joubert & Fakhfakh, 2011; Watts & Zimmerman, 1990), especially discount rates not only in order to avoid breaching debt covenants (Asthana, 1999), but also to increase income (Watts & Zimmerman, 1990). Given that Swedish firms need to apply a lower discount rate when accounting for their DBOs than their UK counterparts, along with their higher reliance on bank funding as a Continental country (Ooghe & De Langhe, 2002), their incentives to use an opportunistic discount rate in the presence of high debt should be larger. Therefore, we expect the choice of discount rate to be more opportunistic among Swedish firms, compared to the UK firms in the presence of high debt. Thus, our third hypothesis is stated as follows:

H3: Higher leverage is more likely to correspond with a higher choice of discount rate in Swedish, compared to the UK firms, given the increased incentives to deviate from the low government bond rates.

5. Method

5.1 Research Design

A quantitative research approach was used to fulfil the purpose of the thesis. The data has been gathered from S&P Capital IQ and manually from annual reports when needed. Spot checks has been made against the annual reports in order to ensure the correctness of the variables generated from S&P Capital IQ, thus increasing the accuracy of the variables.

Furthermore, the data has been cleaned by winsorizing the outliers outside the 99% confidence interval, these outliers was then changed to the highest and lowest values within the interval (Erceg-Hurn & Mirosevich, 2008). This was done to increase the effectiveness of the statistical models, as we wanted to avoid potential disturbance created by the outliers (Huebner, Vach & Le Cessie, 2016). Furthermore, as the study covered a large time period it ensured stability in the data, and reduced fluctuations in order to ultimately provide a cleaner empirical result (Bryman & Bell, 2013).

5.2.1 Research Question

To answer our research question *if the choice of discount rate when accounting for DBOs is more opportunistic in Swedish firms, compared to the UK firms, due to the low rates on Swedish government bonds* three hypothesis were established as presented in *Section 4*. All three hypotheses are connected to what previous research has emphasised to affect opportunistic behaviour, more specifically opportunistic discount rates. Moreover, the deviation from the median³ was used as a proxy for potential opportunistic discount rates.

$$DUMMY1 = Discount\ rate - Median$$

Dummy1 takes on the value 1 if the discount rate is above the median and 0 otherwise. The dependent variable highlights firms with large discount rates not knowing their maturities⁴. Whether the discount rates are claimed to be opportunistic or not, was further determined based on the relationship to the independent variables which represents the determinants presented in *Section 4*. Control variables was included in each hypothesis test to provide further understanding about the firm's opportunistic behaviours, these are presented below.

A continuous proxy for the potential opportunistic discount rates was also used based on the following equation:

$$DISCMED = Discount\ rate - Median$$

The continuous proxy allowed us to capture the continuous scale of the dependent variable, and not only if the rates was above or below the median. Thus, enabling insights if opportunistic

³ For each country, each year.

⁴ As the maturities that the discount rates were based on are not required to be disclosed in the annual reports.

tendencies were underlying increasing discount rates. We emphasised that having the deviation as a continuous variable was an important complementing aspect as the median levels seems to be overstated in Sweden as presented by *Picture 1*.

Other forms of benchmarks for the discount rates were discussed, such as the average government-, and corporate bond rates for different maturities, as well as the quoted discount rates presented in *Picture 1*. However, the average government-, and corporate bond rates was deemed insufficient because it might had overstated the maturities, and thus not lead to a sufficient comparison within, or between the countries. Nevertheless, if the maturities were disclosed by the firms this would have been the best suited benchmark. Moreover, the quoted discount rates presented in *Picture 1* yields a good proxy for the Swedish firms, as their maturities then get based on the rates of the UK firms. However, the proxy would overstate the benchmark rates in the UK, considering the high Swedish median levels, and thus the comparison between the countries would be insufficient, and perhaps even misleading.

5.2.2 Managerial Opportunism

Hypothesis 1 tested whether a discount rate above the median was more affected by high CEO bonus compensation among the Swedish firms, compared to the firms in the UK. By including an interaction term for the UK sample according to the following logistic regression:

$$\begin{aligned}
 Pr(DUMMY1_{it+t} = 1) &= \Lambda \left[\beta_0 + \beta_1 BONUSR_{it} + \beta_2 BONUSR_{it} \times COUNTRY_{it} + \beta_3 EARNM_{it} + \beta_4 EARNM_{it} \times COUNTRY_{it} \right. \\
 &\quad \left. + \sum_{j=1}^n \beta_5 Controls_{jt+\tau} + \varepsilon_{it} \right]
 \end{aligned}$$

Furthermore, an independent variable was included in the regression for *Hypothesis 1* to control for the increased CEO incentives for earnings management related to DBO-accounting (Bergstresser et al., 2006), hence opportunistic discount rates, with a corresponding interaction term for the UK sample.

The preceding control variables were included for all the hypothesis as they are relevant for each test. These did not include any interaction terms. The funding ratio, along with the size of the DBOs compared to total liabilities was controlled for as this has been emphasised to potentially affect the discount rate used (Asthana, 1999; Cheng & Swenson, 2018; Fried et al., 2014). Contribution to the DBPs was further controlled for as contribution is argued to potentially affect CEO compensation, thus there might be incentives to keep the contribution low (Begley et al., 2015; Cheng & Swenson, 2018). Profitability was also controlled for, by dividing the operating income by the total assets, as it has been emphasised to affect the choice of discount rate (Asthana, 1999). Lastly the logarithm of the total assets was used as a size dummy, because size has been argued to increase firm's compliance with accounting standards (Watts & Zimmerman, 1978). For each of the control variables interaction terms for the UK

firms has been calculated in order to enable comparison between the countries. The variables definitions will be further presented in *Table 1* below.

Moreover, the same variables except for the dependent variable, which was changed to the continuous scale (DISCMED), was further used within an OLS-regression according to the following equation:

$$DISCMED_{it} = \left[\beta_0 + \beta_1 BONUSR_{it} + \beta_2 BONUSR_{it} \times COUNTRY_{it} + \beta_3 EARNM_{it} + \beta_4 EARNM_{it} \times COUNTRY_{it} + \sum_{j=1}^n \beta_5 Controls_{jt+\tau} + \varepsilon_{it} \right]$$

5.2.3 Corporate Governance

Hypothesis 2 investigated whether a discount rate above the median was more affected by weak governance structures among the Swedish firms, compared to the firms in the UK. By including an interaction term for the UK firms according to the following logistic regression:

$$Pr(DUMMY1_{it+t} = 1) = \Lambda \left[\beta_0 + \beta_1 BOARDM_{it} + \beta_2 BOARDM_{it} \times COUNTRY_{it} + \beta_3 BOARDC_{it} + \beta_4 BOARDC_{it} \times COUNTRY_{it} + \sum_{j=1}^n \beta_5 Controls_{jt+\tau} + \varepsilon_{it} \right]$$

Weak governance structure was measured by the number of board members in each firm, each year, as the boards efficiency has been argued to decrease when the number of board members increase (Core et al., 1999; Jensen 1993; Yermack 1997). An independent variable for the average compensation of the board was also included with a corresponding interaction term for the UK, as higher compensated boards has been highlighted to decrease the boards monitoring efficiency (Ye, 2014).

The corresponding OLS-regression, with the continuous dependent variable (DISCMED) was conducted based on the following equation:

$$DISCMED_{it} = \left[\beta_0 + \beta_1 BOARDM_{it} + \beta_2 BOARDM_{it} \times COUNTRY_{it} + \beta_3 BOARDC_{it} + \beta_4 BOARDC_{it} \times COUNTRY_{it} + \sum_{j=1}^n \beta_5 Controls_{jt+\tau} + \varepsilon_{it} \right]$$

5.2.4 Internal Factors

Hypothesis 3 examined whether a discount rate above the median was more affected by higher D/E-ratios among the Swedish firms, compared to the firms in the UK. By including an interaction term for the UK firms according to the following logistic regression:

$$\begin{aligned}
Pr(DUMMY1_{it+t} = 1) &= \Lambda \left[\beta_0 + \beta_1 D/E_{it} + \beta_2 D/E_{it} \times COUNTRY_{it} + \beta_3 DEBTC_{it} + \beta_4 DEBTC_{it} \times COUNTRY_{it} \right. \\
&\quad \left. + \sum_{j=1}^n \beta_5 Controls_{jt+\tau} + \varepsilon_{it} \right]
\end{aligned}$$

Henceforth, the debt cost was also controlled for within the Swedish firms, with an UK interaction term, because it has been highlighted to affect the choice of discount rate (Jouber & Fakhfakh, 2011), even more so when firms are financially weak (Asthana, 1999; Begley et al., 2015). The control variable was calculated by dividing debt cost with operating income.

Moreover, the corresponding OLS-regression including the continuous dependent variable (DISCMED) was conducted based on the following equation:

$$\begin{aligned}
DISCMED_{it} = & \left[\beta_0 + \beta_1 D/E_{it} + \beta_2 D/E_{it} \times COUNTRY_{it} + \beta_3 DEBTC_{it} + \beta_4 DEBTC_{it} \times COUNTRY_{it} \right. \\
& \left. + \sum_{j=1}^n \beta_5 Controls_{jt+\tau} + \varepsilon_{it} \right]
\end{aligned}$$

The analysis and conclusion were based on the results of the logistic- and OLS-regressions presented above. Hence, the significance levels used to reject the null-hypothesis in favour of the alternative hypothesis has been established at p-value ≤ 0.05 .

Table 1: Definition of Variables

Variables	Definition of Variables
Dependent Variables	
DUMMY1	Potential opportunism, binomial variable that takes the value of 1 if the discount rate is above the median and 0 otherwise.
DISCMED	Potential opportunism, continuous variable that shows the discount rates deviation from the country median.
Independent Variables	
BONUSR	CEO bonus ratio, calculated as CEO bonus ratio divided by CEO total compensation.
EARNM	Proxy for opportunistic incentives regarding DBO-accounting. Calculated as defined benefit obligations divided by net income.
D/E	Debt/Equity-ratio. Calculated as debt divided by total equity.
DEBTC	Cost of debt. Calculated as debt cost divided operating income.
BOARDM	Number of board members, shows the number of board members for each firm in absolute numbers.
BOARDC	Board compensation, calculated as board compensation divided by the number of board members.
Control Variables	
PLAN/OBL	Funding gap of the defined benefit pension plan. The amount of defined benefit plan assets divided by the defined benefit obligations.
OBL/LIAB	The amount of defined benefit obligations divided by the total liabilities of the firm.
CONTR.PL	Contribution to plan, shows the total amount paid into the defined benefit plan assets during the year.
SIZE	Firm size, calculated as the logarithm of firm total assets.
PROFIT	Firm profit, calculated as operating income divided by the firm's total assets.
COUNTRY	Takes on the value 1 for Swedish firms, and 2 for UK firms. Used within the interaction terms in the regressions.

5.3 Robustness and Model Diagnostics

To determine whether a random- or fixed effects model would be more efficient a Hausman-test was conducted (Brooks, 2014). Based on the results of the Hausman-test, fixed effects models were used for all the logistic-, and OLS-regressions. Nevertheless, random effect models were used to control for the effect of the industry dummies. Where *Food Products*, *Machinery* and *Metals and Mining* were chosen, as these industries were common in our data sample.

Furthermore, control tests were carried out on the data to make sure that the data fulfilled the requirements of the regression models (Brooks, 2014). In order to test for normal distribution⁵ the skewness and kurtosis were investigated. Moreover, robust standard errors have been used to control for heteroscedasticity⁶ in the data (ibid). The multicollinearity problem⁷ has also been controlled for by analysing the correlations within the countries by using a pairwise

⁵ If the distribution was not normal the regressions may have provided misleading results (Brooks, 2014).

⁶ If heteroscedasticity was present the standard errors could have been misleading, and led to incorrect results (Brook, 2014).

⁷ If multicollinearity was present it could have been difficult to determine the effect of the independent variables (Collis & Hussey, 2014), as they may have looked significant when not (Brooks, 2014).

bivariate correlation (Collis & Hussey, 2014). All correlations above 0.50 were further analysed. Levin-Lin-Chu unit root test has been conducted to control if the assumptions of stationarity⁸ held (Brooks, 2014). Residual diagnostics was also performed on the OLS-regressions to make sure that the model sufficiently captures the data and did not overbiased the coefficients or standard errors (Brooks, 2014). Henceforth, the results robustness has been controlled for by altering the regression models (White & Lu, 2014). This was done by adding control variables that should not have any effect on the dependent variables, as well as dropping control variables to see how it affected the independent variables (ibid). The variables that were added to test the robustness was: *Shares outstanding*, *Cost of goods sold*, *Inventory*, and *Selling, General & administrative costs*. Tests were further made when all the control variables were dropped, and when solely the insignificant control variables were dropped.

5.4 Data Gathering

Data has been gathered from one country that have and one that lacks a deep market for high-quality corporate bonds. Sweden was chosen as it is an IFRS-country that lacks a deep market for corporate bonds, but is a developed country with large public firms, as well as actively traded government bonds (BIS, 2019). Moreover, the UK was chosen as a comparable country because they have the deepest market for high-quality corporate bonds among the IFRS-countries (BIS, 2019).

The determinants for opportunistic discount rates which were presented in *Section 3* has been gathered directly from S&P Capital IQ for each of the firms within the chosen countries.

5.4.1 Screening Process

In order to be included in the data sample the following requirements was needed to be fulfilled for the entire measurement period.

- Selection requirements:*
1. Listed at London Stock Exchange (LSE) or OMX Nordic Exchange Stockholm (OM).
 2. Had DBOs.

The exclusion of firms that did not fulfil the requirements were relevant as we first of all did not want to include firms outside Sweden or the UK, further we did not want our sample to be influenced by firms that did not have DBOs. Moreover, as our research question was based on the accounting rules of IFRS, it was essential that the entire sample used IFRS when accounting for their DBOs. Because listed firms are required to apply IFRS, the exclusion of non-listed firms was made to exclude firms not using IFRS. Ultimately, our sample consisted of 60 Swedish firms and 260 UK firms, that was investigated over a 10-year period.

If a firm changed accounting period from calendar year towards broken fiscal year, the year of the change will not be included in the sample as there is no annual report for that year.

⁸It would not have been possible to validly conduct a hypothesis test if the data was non-stationary (Brooks, 2014).

Furthermore, a few Swedish firms were removed completely from the sample as these argued that the insurance company used to secure their DBOs was incapable of providing the information needed to account for their DBOs according to IAS 19. Furthermore, firms that did not have DBOs for their employees in Sweden or the UK was removed⁹.

The selection criteria ought to make sure that the study in fact measured what it was supposed to, and to mitigate any bias. The selection requirements were further important to make sure that if similar research were to be conducted on an identical sample, the result would be the same.

5.5 Principles of Research Ethics

The only ethical aspect being emphasised as important when conducting the quantitative research was the aspect of confidentiality (Bryman & Bell, 2013). Thus, the names or other knowledge which revealed the identity of the firms was not disclosed in order to fulfil the requirement of confidentiality. Hence, this made the selection of firms easier as the risk of the firms refusing participation was removed, as if kept anonymous they did not have to be informed (ibid). Furthermore, the identity of the firms was not important to answer the purpose of the thesis, and as such the aspect of confidentiality may as well be intact, if not to guard the firms in the sample to be associated with disingenuous conduct. Henceforth, as the gathered data is public information there was no need for further actions except anonymity when handling the data (ibid). However, the original data with the names will be stored by ourselves for safekeeping if the thesis examiners would like to access it.

5.6 Limitations

The benchmark for the discount rates was difficult to determine, as firms are not required to disclose neither the duration nor how the rates has been weighted for the different durations. Even though, the lack of disclosures is the base for the incentives of opportunistic discretion, it also decreases the accuracy of determining if the rates are upward-biased or not. Although, the benchmark we used solves the maturity problem, the correctness of the benchmark could still be questionable.

Henceforth, it could be claimed that our data sample suffers from survival bias, due to firms that are unlisted, or subject of bankruptcy being left out of the sample. However, as mentioned before, we deemed it important for comparability reasons that all firms accounted for their DBOs according to IFRS throughout the measurement period, which listed firms are required to.

It should be considered that cleaning the variables by winsorizing could result in incorrect conclusions or inappropriate statistical modelling (Huebner et. al, 2016). However, this is mitigated by prudently winsorizing the outliers. There is further a possibility of errors made

⁹ As these firms then according to IAS 19 could use the discount rate for the actual country in which these employees work.

during the data gathering¹⁰. Nevertheless, this has been reduced by collecting substantial parts of the data together.

Moreover, our regressions did have a rather low explanatory power with respect to the variance in the dependent variable. This was a limitation as there obviously were other variables not included in the models that further explains the movements in the discount rate. However, the independent- and control variables has been included based on what has been highlighted by previous research. Therefore, we still deemed that important conclusions could be made based on the significant results of the regressions, even though a large part of the variance was not captured.

¹⁰ Although, these errors should be symmetric and insignificant in a large sample.

6. Results and Discussion

6.1 Descriptive Statistics

Table 2 illustrates the descriptive statistics for both the Swedish firms and the UK firms. As visualised, the DISCMED is higher in the UK compared to Sweden, which could be explained by the fact that the Swedish median levels are overrepresented in the first place (*Picture 1*), leading to less deviations. Moreover, the UK firms has higher BONUSR, providing more incentives for managerial opportunism. On the contrary, the Swedish firms have higher D/E which provides them with opportunistic incentives as well. Furthermore, the UK firms have on average more BOARDM, as well as higher BOARDC, which could be explained by that firms on average are larger in the UK, as illustrated by the Size variable. We can further see that DEBTC is larger in Sweden than in the UK. Which could indicate that debt funding less expensive in the UK, or a result of less debt finance. Moreover, the EARNM variable is higher in Sweden than in the UK, which further enhance our beliefs that the Swedish firms have more incentives than the UK firms to use opportunistic discount rates. Further, the Swedish firms have on average less funded DBPs than the UK firms. The UK firms CONT.PL are also higher than in Sweden, which provides the Swedish firms with even more incentives to use higher discount rates in order to mitigate an increase in the funding gap.

Henceforth, the bivariate correlation analysis will be presented in *Section 6.2*. The remaining part of the chapter will be structured in a similar way as the literature review. The findings will be summarised at the end of the chapter before presenting the conclusion.

Table 2: Descriptive Statistics

Variables	Country	Obs	Median	Mean	Std Dev.	Min	Max
DISCMED	Sweden	600	0	-0.0003	0.007	-0.02	0.019
	UK	2600	0	0.002	0.008	-0.02	0.050
BONUSR	Sweden	600	0.226	0.264	0.217	0	0.574
	UK	2600	0.296	0.322	0.232	0	0.785
D/E	Sweden	600	0.536	1.365	3.598	0	19.921
	UK	2600	0.536	1.308	2.441	0	11.401
BOARDM	Sweden	600	8	7.822	2.584	1	13
	UK	2600	8	8.443	2.751	3	15
EARNM	Sweden	600	0.997	8.521	16.392	0.002	49.471
	UK	2600	0.316	5.961	11.598	0	32.970
DEBTC	Sweden	600	0.085	1.287	3.169	0	12.782
	UK	2600	0.122	0.257	0.410	0	1.861
BOARDC	Sweden	600	55.31	137.014	230.823	7.945	834.264
	UK	2600	265.58	417.527	432.391	31.297	1893.65
PLAN/OBL	Sweden	600	0.610	0.549	0.347	0	1.258
	UK	2600	0.888	0.861	0.208	0	1.256
OBL/LIAB	Sweden	600	0.103	0.167	0.208	0.005	1.227
	UK	2600	0.361	0.620	0.743	0.002	3.855
CONTR.PL	Sweden	600	0	0.361	1.040	0	5.454
	UK	2600	0.04	2.111	6.071	0	40.198
SIZE	Sweden	600	7.376	7.605	1.855	4.561	12.534
	UK	2599	7.490	7.648	2.023	3.529	13.998
PROFIT	Sweden	600	0.079	0.085	0.060	-0.047	0.336
	UK	2600	0.074	0.086	0.065	-0.069	0.318

6.2 Bivariate Correlation Analysis

The bivariate correlation presented in *Table 3* should be analysed by looking at the variable names for the correlations within Sweden, the correlations for the UK is presented below the variable names. Thus, the correlations are sorted by country to visualise the within country relationships, and the differences between the countries. Henceforth, the bivariate correlation analysis illustrates how the variables relates to each other and provides an indication if the variables are suitable predictors for the discount rates. As illustrated the variable DISCMED is significantly correlated with several of the variables in both countries, thus the independent variables seem to be able to predict the discount rates in both the Swedish- and UK firms.

Analysing the correlations between the independent variables is also valuable to ensure that there is no potential risk for (Collis & Hussey, 2014). As illustrated in *Table 3*, the only correlation of a magnitude which might indicate multicollinearity is between BOARDM and BOARDC. However, this outcome was anticipated as they are connected to each other, nevertheless, they are providing different aspects of analysis. Thus, we deem it important to keep the variables in order to be able to include both the aspect that BOARDM and BOARDC might have on the choice of discount rate. These two variables were further tested separately in the regressions to see if the results were affected, which they were not.

Table 3: Bivariate Correlation Analysis

	DISCMED	BONUSR	D/E	BOARDM	EARNM	DEBTC	BOARDC	PLAN/OBL	OBL/LIAB	CONT.PL	SIZE	PROFIT
DISCMED	1.000											
UK	1.000											
BONUSR	0.0649	1.000										
UK	0.2438*	1.000										
D/E	0.1468*	0.0352	1.000									
UK	0.0577*	0.0089	1.000									
BOARDM	0.0723	0.1359*	-0.0571	1.000								
UK	0.1619*	0.1690*	0.0487*	1.000								
EARNM	-0.0743	-0.0837*	0.1634*	0.1350*	1.000							
UK	0.1792*	-0.0218	0.0974*	0.0916*	1.000							
DEBTC	0.0073	0.0254	0.0864*	0.1331*	0.0679	1.000						
UK	0.0978*	0.0062	0.1760	0.0401*	0.4787*	1.000						
BOARDC	0.0914*	0.2128*	0.1302*	0.4720*	0.0538	0.1140*	1.000					
UK	0.2070*	0.2794*	0.0133	0.5079*	0.0588*	-0.0019	1.000					
PLAN/OBL	0.0594	-0.1697*	0.0612	0.0452	0.0064	0.0383	0.0944*	1.000				
UK	-0.3728*	-0.0988*	0.0031	-0.0688*	-0.1297*	-0.0486*	-0.1617*	1.000				
OBL/LIAB	0.1947*	-0.0638	-0.0693	0.0017	-0.0181	0.0130	-0.1061*	0.1558*	1.000			
UK	-0.0808*	-0.0553*	0.0553*	-0.2579*	-0.1032*	-0.0170	-0.1915*	0.1485*	1.000			
CONT.PL	0.1688*	0.1298*	-0.0636	0.1939*	-0.1439*	0.0746	0.0830*	0.1700*	0.2388*	1.000		
UK	-0.0259	-0.0145	0.0904*	0.1170*	-0.0287	-0.0146	0.0893*	0.0737*	0.0136	1.000		
SIZE	-0.0445	-0.1195*	-0.1008*	0.3807*	-0.0467	0.1209*	0.3182*	0.4714*	-0.0470	0.2233*	1.000	
UK	-0.0600*	0.0552*	-0.0007	0.3804*	0.0012	-0.0550*	0.3592*	0.1378*	-0.3857*	0.3877*	1.000	
PROFIT	0.1913*	0.0253	-0.0192	-0.0361	-0.0878*	-0.3699*	-0.0299	0.0818*	-0.0706	0.0248	-0.0181	1.000
UK	0.0293	0.0350	0.0783*	-0.0297	-0.2800*	-0.4561*	0.0267	-0.0659*	0.1747*	-0.0277	-0.2142*	1.000

6.3 Managerial Opportunism

As illustrated by the logistic regression in *Table 4*, Swedish CEOs with higher BONUSR are more prone to use greater discount rates than those with lower bonus-linked compensation. The findings are in line with previous research which has emphasised that there are increasing incentives among managers with bonus-linked contracts to opportunistically affect accounting choices in order to maximize own gain (Fields et al., 2001; Healy, 1985; Watts & Zimmerman, 1990). The interaction term for the UK is negatively significant, indicating that when looking at firms with a discount rate above the median, we can conclude that the bonus ratio generates higher incentives among the Swedish firms, compared to the UK firms. Thus, we reject the null hypothesis of *Hypothesis 1*, in favour of our alternative hypothesis.

Table 4: Hypothesis 1, Logistic- and OLS-Regression

Variables	Logistic Regression	OLS-Regression
BONUSR	0.079** (2.65)	0.004 (1.91)
<i>UK Interaction</i>	-1.782* (-2.41)	-0.004* (-2.00)
EARNM	-0.001 (-0.65)	-0.001 (-0.13)
<i>UK Interaction</i>	0.011 (1.16)	0.001 (0.68)
PLAN/OBL	0.475** (4.63)	0.003 (1.64)
OBL/LIAB	-0.096* (-2.40)	-0.001** (-3.82)
CONT.PL	0.011* (2.29)	0.001** (3.26)
SIZE	-0.054 (-1.57)	-0.001 (-1.27)
PROFIT	0.265 (1.08)	0.002 (0.68)
INTERCEPT		0.006 (1.18)
LR Chi2	43.30	
R-sq		0.019
Adj. R-sq		0.016
Obs	2890	3200

**, * indicates significances at 0.01, 0.05 respectively. The parentheses display the z-values for the logistic regression, and t-values for the OLS-regression.

If looking at the OLS-regression in *Table 4* the UK interaction term for BONUSR is still negatively significant, however, the coefficient for the Swedish firms is not. Nevertheless, still demonstrating that the BONUSR affects the choice of discount rate more among the Swedish firms compared to the UK firms. These results were anticipated due to the low government bond rates the Swedish firms has to adapt to, compared to the corporate bond rates that the UK firms uses. Hence, the incentives for increasing the rates are lower in the UK than they are in Sweden. Which is further illustrated by the results for the interaction terms from *Table 4* for the UK firms, indicating that they do not use opportunistic discount rates to meet the expectations of investors and analysts, which is contradicting to the findings of Begley et al. (2015) and Halaoua et al. (2017). These findings may have severe implications for Swedish

investors and creditors as their decisions might be based on biased and even misleading information from the financial reports (Fields et al., 2001). Hence, the findings imply that there is a higher cost for stakeholders basing their decisions on Swedish financial reports compared to the financial reports from the UK firms when the CEO has a larger bonus-linked contract. Because they then tend to use opportunistic discount rates which are in non-compliance with IAS 19, leading to the DBOs not being faithfully represented.

Moreover, *Table 4* visualise that there are insignificant results from both the logistic- and the OLS-regression regarding EARNM. Indicating that EARNM has no predictive power over the discount rates. Which is inconclusive with previous research, as it has been emphasised that high levels of DBOs in contrast to low net income provides CEOs with more incentives to manipulate their discount rates (Bergstresser et al., 2006). *Table 4-6* further illustrates that the coefficient for SIZE is insignificant, thus firm characteristics does not seem to have an impact on the choice of discount rate. Although, larger firms are more exposed to the public, as well as governmental scrutiny, they should be less likely to choose opportunistically high discount rates for their DBOs. However, the incentives for larger firms to use higher discount rates could also be higher considering that their DBOs are larger, leading to more alterations when manipulating the discount rate compared to smaller firms, with smaller DBOs. Nevertheless, the results do not apply that there are any differences between small and large firms, which is inconsistent with the findings of Watts and Zimmerman (1978).

The results further enlighten a broader aspect of what kind of compensation contract that is best suited for CEOs. As argued by (Fields et al., 2001; Healy, 1985; Watts & Zimmerman, 1990) bonus linked contracts increases the incentives to act opportunistically. Provided that bonus-linked compensation relate to higher discount rates, it also indicates that less bonus is equal to less opportunism within DBO-accounting. Nevertheless, managers discretion could be beneficiary as they normally have the best information at hand to make accounting decisions that is most representative, thus discretion may be exercised for efficiency reasons rather than for self-interest reasons (Watts & Zimmerman, 1990). This could explain the high discount rates, however it is more likely to be the case in the UK than in Sweden. As the Swedish median levels are abnormally high compared to the median rates in the UK (*Picture 1*). Thus, the Swedish discount rates that are above the median strongly indicates potential opportunism given the differences in the rates of Swedish government bonds and the UK corporate bonds. Moreover, because the findings clearly illustrate the positive relationship with bonus contracts, it can be concluded that the choice of discount rate among Swedish firms are opportunistic, and thus rather driven by self-interest than providing the most representative information. Moreover, both the logistic- and OLS regressions in *Table 4* implies that the BONUSR has more implications on the discount rates in Swedish firms, compared to the UK firms. Thus, it can be concluded that Swedish firms are more prone to use higher, hence more opportunistic discount rates when accounting for their DBOs than the UK firms are in the presence of high CEO bonus.

6.4 Preventing Managerial Opportunism

As presented in *Table 5* the null hypothesis for *Hypothesis 2* could not be rejected. Thus, we can conclude that a weak governance structure does not imply that firms manipulate their discount rates. Rather the results indicate that the chosen discount rate has no relationship to BOARDM. Nevertheless, the OLS-regression in *Table 5* illustrates that the DEBTC is less associated with high discount rates in the UK firms, compared to the Swedish firms due to the negatively significant interaction term.

Table 5: Hypothesis 2, Logistic- and OLS-Regression

Variables	Logistic Regression	OLS-Regression
BOARDM	0.006 (-0.61)	-0.001 (-1.01)
<i>UK Interaction</i>	0.072 (1.12)	0.001 (1.01)
BOARDC	-0.001 (1.26)	0.001 (1.63)
<i>UK Interaction</i>	-0.001 (-1.70)	-0.001* (-2.16)
PLAN/OBL	0.456** (4.63)	0.003 (1.65)
OBL/LIAB	-0.088* (-2.32)	-0.001** (-3.66)
CONT.PL	0.009* (2.19)	0.001** (3.01)
SIZE	-0.043 (-1.31)	-0.001 (-1.12)
PROFIT	0.240 (1.06)	0.002 (1.13)
Intercept		0.008 (1.13)
LR chi2	39.56	
R-sq		0.02
Adj. R-sq		0.018
Obs	2890	3200

**,* indicates significances at 0.01, 0.05 respectively. The parentheses display the z-values for the logistic regression, and t-values for the OLS-regression.

This is inconsistent with previous research that has emphasised BOARDM to affect the accounting quality, and hence opportunistic decisions (Jensen, 1993; Core et al., 1999; Yermack 1997; Uzun et al., 2004). The results from the OLS-regression are further in line with those of Ye (2014), that higher BOARDC tends to fuel the opportunistic behaviours of managers more in Sweden, than in the UK. However, the accounting for DBOs has been highlighted as complex, and difficult to comprehend (Salewski & Zülch, 2015). Thus, there may be a lack of expertise within the boards for these specific accounting rules which might explain the inconclusive results. As such, neither the BOARDM, nor the BOARDC matters if there is a lack of knowledge needed to understand the underlying accounting problems, the assumptions that are made, as well as the consequences of these assumptions. Even though, Swedish firms has smaller boards than the UK firms, which indicates higher governance efficiency (Jensen 1993; Core et al., 1999; Yermack 1997), they are unable to prevent the use

of opportunistic discount rates. Hence, nor does higher compensated boards seem to be able to prevent opportunistic discount rates among the Swedish firms.

The logistic regressions in *Table 4-6* illustrates that PLAN/OBL is positively significant. Implying that a decrease in the funding gap correspond to an increase in the discount rate, which may be explained by firms manipulating the discount rates to close the funding gap (Asthana, 1999). This may be of interest as it affects the reported liabilities, and hence their ability to secure funding from both investors and creditors. As visualised by *Table 2*, the Swedish firms have on average less funded DBPs compared to the UK firms. Given that, the Swedish firms has potentially even more incentives, than the UK firms to maintain their discount rates at high levels, because of the low government bond rates, as well as the increasing difficulties for firms to fund their DBPs (Asthana, 1999).

Our results indicate that there is no connection between the governance structures and the discount rates. Thereby, we can conclude that weak governance structures do not affect the decisions of the discount rates more among the Swedish firms than the UK firms, as the results are inconclusive for them both. However, as it was concluded from *Hypothesis 1* that there exists opportunism in the discount rates, we can further state that the governance of the firms is ill-equipped at preventing opportunistic behaviour within the Swedish firms. Thus, either the CEOs are superior in capturing the board, or the board lacks sufficient knowledge over the complex accounting at place to be able to intervene. Nevertheless, they are not able to prevent the opportunistic behaviours of managers considering the discount rates used for DBO-accounting.

6.5 The Effect of Leverage

As illustrated by the logistic regression in *Table 6* the D/E for the Swedish firms are insignificant, however the interaction term for the UK firms is negatively significant, indicating that UK firms with a discount rate above the median has lower D/E compared to Swedish firms. Moreover, when looking at the OLS-regression in *Table 6* we can establish that the D/E affects the level of discount rates among the Swedish firms, however, the interaction term for the UK firms is insignificant. Nevertheless, considering the combined results in *Table 6* we can establish that a higher level of debt is making firms more likely to use a higher discount rate in Sweden, compared to the UK given the negative interaction term from the logistic regression along with the positive relation between D/E and higher discount rates in Sweden provided by the OLS-regression. This is in line with previous research that has emphasised Continental countries to be more reliant on bank funding, compared to Anglo-American countries (Hellman et al., 2013; Ooghe & De Langhe, 2002), thus incentivising them to keep their DBOs low, to report lower liabilities on the balance sheet. Furthermore, high debt levels have been highlighted to lead to overstated discount rates (Asthana, 1999), as well as higher levels of managerial discretion (Watts & Zimmerman, 1990). Moreover, *Table 6* further illustrates that the DEBTC interaction term for the UK is significant, indicating that DEBTC affects the choice of discount rate more in the UK firms than the Swedish firms. Which is surprising given that the Swedish firms are more dependent upon the banks for funding (Hellman et al., 2013; Ooghe

& De Langhe, 2002). Nevertheless, UK firms may have incentives to decrease their DBOs when the DEBTC is higher as they want to affect their credit rating by displaying lower liabilities and thus, potentially be able to lower the DEBTC as well as increase their attractiveness against investors (Asthana, 1999). Henceforth, Asthana (1999) and Joubert & Fakhfakh (2011) both argue that high DEBTC is increasing the incentives of manipulating the discount rates, thus conclusive with the results in the UK.

Table 6: Hypothesis 3, Logistic- and OLS-Regression

Variables	Logistic Regression	OLS-Regression
DE	-0.007 (1.59)	0.001* (2.34)
<i>UK Interaction</i>	-0.143* (-2.11)	-0.001 (-0.69)
DEBTC	-0.059 (-1.92)	-0.001 (-1.87)
<i>UK Interaction</i>	0.388* (2.31)	0.018* (2.12)
PLAN/OBL	0.439** (4.28)	0.002 (1.54)
OBL/LIAB	-0.101* (-2.54)	-0.001** (-3.95)
CONT.PL	0.011* (2.41)	0.001** (3.42)
SIZE	-0.044 (-1.29)	-0.001 (-1.00)
PROFIT	0.272 (1.00)	0.003 (0.88)
Intercept		0.004 (0.83)
LR Chi2	46.54	
R-sq		0.025
Adj. R-sq		0.022
Obs	2890	3200

*** indicates significances at 0.01, 0.05 respectively. The parentheses display the z-values for the logistic regression, and t-values for the OLS-regression.

The significant positive relationship between CONT.PL and increasing discount rates presented by the logistic-, and OLS-regression in *Table 4-6* illustrates that contributions increases as the discount rates increases. The incentives to contribute to the plan may be in order for the CEOs to secure and justify their own pension plans (Begley et al., 2015). Thus, the results may indicate that the CEOs own pension schemes are included in the DBPs, and thus they prioritise the funding and well-being of the DBPs (Begley et al., 2015) at the potential cost of higher bonus, and other investments (Cheng & Swenson, 2018). The contributions to the DBP may also be due to legitimacy reasons, as firms feel the urge to reimburse for their lack of adjusting the discount rates accordingly towards the rates of the corporate- and government bonds. Hence, as illustrated by Picture 1 the UK firms do not need to legitimise their discount rates to the same extent as the Swedish firms, given the high median rates among the Swedish firms. Moreover, the differences in the rates among the UK firms are perhaps more related to maturity differences than they are in Sweden. These differences among the countries are not that unexpected considering that Continental countries has more incentives than Anglo-American to keep the DBOs low. Thus, the contributions will not only look pleasant, it will

also mitigate the DBOs displayed on the balance sheet which banks should be more fond of than the capital market. Therefore, should the incentives to close the gap be higher in Sweden than in the UK. Moreover, when the discount rate is increased the contributions needed to close the funding gap decreases (Asthana, 1999). Hence, firms with incentives to provide better financial reports towards the bank may increase their discount rates in order to decrease the amount needed to close the funding gap and are thereby able to present satisfying accounting figures to the banks at a lower cost.

Even though, the OLS-regression provided significant results the logistic regression was not able to conclude that a higher debt level was contributing to firms in Sweden to have discount rates above the median (*Table 6*). These results could be explained by the fact that leverage has been emphasised to be a useful monitoring tool against opportunistic managers (Fields et al., 2001; Ghazali et al., 2015). Thus, the inconclusive results from the logistic regression might indicate that higher leverage, instead of fuelling the opportunistic actions among managers in Swedish firms, is working as a control mechanism, and mitigates the opportunistic behaviour instead. However, as illustrated by *Picture 1* the median levels for the Swedish firms are suspiciously high compared to the UK. Given that the median rates in the UK are based on higher rates (corporate bonds) than the Swedish median rates this does not add up. Moreover, as the interaction term for the UK is negatively significant in the logistic regression (*Table 6*), we can state that debt heavy Swedish firms have more incentives than debt heavy UK firms to use opportunistic discount rates when accounting for their DBOs. Combined with the results from the OLS-regression in *Table 6* which concludes that higher debt is associated with higher discount rates in Sweden, we emphasise that the debt level does in fact affect the level of opportunistic discount rates in Sweden more than in the UK. Although, not as strongly as the bonus-ratio.

Is the choice of discount rate when accounting for DBOs more opportunistic in Swedish firms, compared to the UK firms, due to the low rate on Swedish government bonds?

Based on our results, two main factors that explains opportunistic tendencies, debt (Asthana, 1999; Fauver & McDonald, 2015; Joubert & Fakhfakh, 2011; Watts & Zimmerman, 1990) and bonus-ratios (Asthana, 1999; Cheng & Swenson, 2018; Fields et al., 2001; Healy, 1985; Watts & Zimmerman, 1990) are shown to predict the discount rate levels more among Swedish firms than the UK firms. Thus, we can confirm that the choice of discount rate used for DBO-accounting is more opportunistic in Sweden than in the UK. Furthermore, we can see that the governance structures are unable to prevent the opportunistic tendencies among Swedish firms, which raises concerns whether the lack of knowledge considering the implications are shared among investors and creditors. Hence, the findings clearly indicate that the lack of disclosure requirements for the discount rate maturities within IAS 19 is creating an incentive for managerial opportunism.

6.6 Robustness and Model Diagnostics

In order to test the robustness of the results, the models were altered, both by dropping control variables and by adding more variables (White & Lu, 2014). The main independent variables: BONUSR, EARNM, BOARDM, BOARDC, DE and DEBTC were left the same in all cases as these were the ones we would like to test the robustness of. In all the logistic regressions there were minimal movements in these variables, except for the BOARDM that did move more than the others, when all the control variables were dropped. This indicated that the results from the logistic regression were robust. Considering the OLS-regressions there were more movements than for the logistic regression, however, the significant variables still stayed significant. As the results were not influenced it suggested that the significant results for which the analysis was based on are robust. However, there were more movements considering the BOARDM variable indicating less robustness in the governance model which was not surprising given that the model did not have any explanatory power over the discount rate. Moreover, using a random effects model we controlled for the potential industry effects of *Food Products*, *Machinery* and *Metals and Mining*. The results were inconclusive indicating that there were no association towards any of the industries controlled for, as well as there were no significant changes on the results by including them. Furthermore, as our fixed effects models omitted the institutional investors variable due to it being time-invariant, we tested the variable within a random effects model as well. However, the variable did not provide any significant results for neither Sweden, nor the UK interaction term. Implying that institutional investors do not provide a mitigating effect on opportunistic behaviour, which is inconclusive to previous research (Cornett et al., 2008; Hartzell & Starks, 2003; Joubert & Fakhfakh, 2011; Klein, 2002; Liu & Lu, 2007; Roychowdhury, 2006). The results of the model were not altered by the variable.

Henceforth, when the insignificant variables were removed from the model there were no significant changes in the variables. Moreover, when variables were included in the model which should not have any direct effects on the dependent variable, our results did not change, which further indicated robustness of the results.

Nevertheless, when looking at the full model in *Table 7*, we can see that the results for BONUSR for the logistic regression holds, however the UK interaction term becomes insignificant for the OLS-regression, indicating less robustness within the OLS-results. Moreover, the D/E results for Sweden in the OLS-regression are unchanged, thus still indicating that there is a positive relation between higher leverage and increasing discount rates, however, the interaction term for the UK becomes insignificant indicating that the difference between the countries are exposed to less robust results. Interestingly, the DEBTC variable becomes significant for the Swedish firms, indicating that Swedish firms with a discount rate above the median has higher DEBTC which is line with previous research (Asthana, 1999; Joubert & Fakhfakh, 2011). Moreover, the interaction term for UK is still significant indicating a higher effect of DEBTC among the UK firms. Conclusively we can see from the full model in *Table 7* that there are some changes in the results, where some variables that were significant below a p-value of 0.05, became insignificant slightly over 0.05, nevertheless, altering the

significance of the results. However, strong robustness is indicated for the BONUSR results, as well as the D/E result for Sweden.

Residual diagnostics was also performed on the OLS-regressions, these indicated that there was no linear dependence among the variables and the residuals. Thus, implying that the model sufficiently captures the data and did not overbiased the coefficients or standard errors (Brooks, 2014). Moreover, the data could be determined to be of normal distribution, as well as stationary. Which further justifies that our analysis and conclusion is based upon valid results (ibid).

Table 7: Full Model, Logistic- and OLS-Regression

Variables	Logistic Regression	OLS-Regression
BONUSR	0.079* (0.018)	0.003 (1.58)
<i>UK Interaction</i>	-1.672* (-2.13)	-0.004 (-1.60)
BOARDM	0.004 (-0.76)	-0.001 (-1.05)
<i>UK Interaction</i>	0.079 (1.19)	0.001 (0.99)
DE	-0.076 (1.15)	0.001* (2.29)
<i>UK Interaction</i>	-0.122 (-1.76)	-0.001 (-0.45)
EARNM	0.001 (-0.93)	-0.001 (-0.55)
<i>UK Interaction</i>	0.010 (1.03)	0.001 (0.41)
BOARDC	-0.001 (0.67)	0.001 (1.25)
<i>UK Interaction</i>	-0.001 (-1.10)	-0.001 (-1.85)
DEBTC	0.048* (-2.02)	-0.001* (-1.99)
<i>UK Interaction</i>	0.357* (1.96)	0.001 (1.91)
PLAN/OBL	0.441** (4.52)	0.003 (1.81)
OBL/LIAB	-0.091* (-2.38)	-0.001** (-3.67)
CONT.PL	0.009* (2.25)	0.001** (3.07)
SIZE	-0.039 (-1.18)	-0.001 (-0.93)
PROFIT	0.296 (1.14)	0.004 (1.00)
Intercept		0.004 (0.76)
LR chi2	58.35	
R-sq		0.033
Adj. R-sq		0.028
Obs	2890	3200

*** indicates significances at 0.01, 0.05 respectively. The parentheses display the z-values for the logistic regression, and t-values for the OLS-regression.

7. Conclusion

Our findings establish that the firms in Sweden use more opportunistic discount rates when accounting for their DBOs compared to the firms in the UK. *Hypothesis 1 and 3* both concludes that bonus ratios and leverage are affecting the discount rates more in Sweden than in the UK. Thus, we can conclude that opportunistic behaviour is involved when deciding the discount rates within Swedish firms. Moreover, we can establish that the governance structures are inefficient in mitigating the opportunistic behaviour regarding DBO-accounting. This is of concern, mainly due to the cost it imposes on investors and creditors, but also as there seems to be a lack of expertise needed to understand and mitigate the implications of the opportunistic discount rates. Moreover, *Picture 1* illustrates that the discount rates used by Swedish firms are abnormally high, thus the extent of opportunism goes beyond the level of being above the median level for Swedish firms, considering the differences in the government- and corporate bond rates in Sweden and the UK. The presence of opportunism in Sweden was not a surprise, however, the degree of opportunism that *Picture 1* visualise is at astonishing levels considering the government bond rates.

Our findings contribute to the literature of DBO-accounting, opportunistic accounting choices, and discretionary discount rates as it further provides evidence that bonus-tied compensation provides CEOs with more incentives to act opportunistic. The thesis further emphasises the effect that leverage has on firms' decisions, where we can see that higher leverage provides firms with more incentives to use opportunistic discount rates. We also show that the board of directors are incapable of mitigating the opportunism involved in the DBO-accounting, which raises further concerns if stakeholders also are unable to see through the opportunism at place. Contributions are also made to the discussion of IAS 19, where we have provided evidence which indicates that countries that has to adjust to government bond rates are more prone to opportunistically increase their discount rates, than countries using corporate bond rates are. Moreover, we wish to emphasise the importance of IAS 19 to require the disclosing of the pension maturities that the discount rates are based on, as this would mitigate the possibility of opportunistic behaviour among managers.

One limitation to our thesis is that we have not included variables that captures the incentives of stock-option compensation for managers and board of directors. This has however, been highlighted by previous research (Begley & Feltham, 1999; Deutsch et al., 2011; Ertugrul & Hedge, 2008), and might have resulted in interesting insights. Another limitation is that we have not been able to obtain information regarding the maturities that the firms use to decide their discount rates. Although, this is a major drawback, it is difficult to obtain as firms are not required to disclose them. Moreover, as highlighted in the method the variance of the dependent variable is not well captured by our regression models, which indicates that variables explaining the variance is missing in the model. However, this provides useful insights to future researchers when deciding upon which independent variables to use.

Our suggestion for future research is to study the firms that accounts for their DBPs as DCPs, claimed that they lack the information needed to fulfil the requirements of IAS 19. This was something we encountered in our own data collection, where several firms within Sweden argued that because they used an external insurance company that was unable to provide them with sufficient information related to their DBOs they accounted them as DCPs instead. Resulting in these liabilities to be left outside their financial reports. Further research could also investigate the problem from a qualitative point of view. By conducting questionnaires and interviews be able to obtain information on the actuarial assumptions used when accounting for DBOs. Moreover, another dimension could be added to the study by introducing the framework of DiMaggio and Powell (1983) to further examine the effects that isomorphism has on the choice of discount rate.

8. References

- Anantharaman, D., Fang, V., & Gong, G. (2014). Inside Debt and the Design of Corporate Debt Contracts. *Management Science*, 60(5), 1260-1280.
- Asthana, S. (1999). Determinants of Funding Strategies and Actuarial Choices for Defined-Benefit Pension Plans*. *Contemporary Accounting Research*, 16(1), 39–74.
- Bartram, S.M. (2016). Corporate Post-Retirement Benefit Plans and Leverage *. *Review of Finance*, 20(2), 575–629.
- Begley, J., Chamberlain, S., Yang, S., & Zhang, J. (2015). CEO incentives and the health of defined benefit pension plans. *Review of Accounting Studies*, 20(3), 1013-1058.
- Begley, J., & Feltham, G.A. (1999). An empirical examination of the relation between debt contracts and management incentives. *Journal of Accounting and Economics*, 27(2), 229-259.
- Bergstresser, D., Desai, M. & Rauh, J. (2006). Earnings Manipulation, Pension Assumptions, and Managerial Investment Decisions. *The Quarterly Journal of Economics*, 121(1), 157–195.
- BIS. (2019). Summaries of Debt Securities Outstanding. Collected 2019-01-08, from: <https://www.bis.org/statistics/secstats.htm?m=6%7C33%7C615>.
- Brooks, C. (2014). *Introductory Econometrics for Finance*. Cambridge: Cambridge University Press.
- Bryman, A., & Bell, E. (2013). *Företagsekonomiska forskningsmetoder* (2., [rev.] uppl. ed.). Stockholm: Liber.
- Chaudhry, N., Au Yong, H.H. & Veld, C. (2017). How does the Funding Status of Defined Benefit Pension Plans Affect Investment Decisions of Firms in the United States? *Journal of Business Finance & Accounting*, 44(1-2), 196–235.
- Cheng, Q. & Swenson, L. (2018). Executive compensation and cash contributions to defined benefit pension plans. *Journal of Business Finance & Accounting*, 45(9-10), 1224–1259.
- Choy, H.S., Lin, J. & Officer, M.S. (2014). Does freezing a defined benefit pension plan affect firm risk? *Journal of Accounting and Economics*, 57(1), 1–21.
- Collis, J. & Hussey, R. (2014). *Business research a practical guide for undergraduate & postgraduate students*, Fourth Edition. London: Red Globe Press.
- Comprix, J., & Muller, K. (2011). Pension plan accounting estimates and the freezing of defined benefit pension plans. *Journal of Accounting and Economics*, 51(1-2), 115-133.

- Core J.E., Holthausen R.W., & Larcker D.F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics*, 51(3), 371-406.
- Cornett, M.M., Marcus, A.J., & Tehranian, H. (2008). Corporate governance and pay-for-performance: The impact of earnings management. *Journal of Financial Economics*, 87(2), 357-373.
- Deutsch, Y., Keil, T., & Laamanen, T. (2011). A dual agency view of board compensation the joint effects of outside director and CEO stock options on firm risk. *Strategic management journal*, 32(2), 212–227.
- DiMaggio, P., & Powell, W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Erceg-Hurn, D., & Miroseovich, V. (2008). Modern Robust Statistical Methods: An Easy Way to Maximize the Accuracy and Power of Your Research. *American Psychologist*, 63(7), 591-601.
- Ertugrul, M., & Hegde, S. (2008). Board compensation practices and agency costs of debt. *Journal of Corporate Finance*, 14(5), 512–531.
- Fauver, L.B. & McDonald, M.B. (2015). Culture, agency costs, and governance: International evidence on capital structure. *Pacific Basin Finance Journal*, 34, 1–23.
- Fields, T., Lys, T., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting and Economics*, 31(1), 255–307.
- Fried, A.Z., Davis-Friday, P. & Davis, H.Z. (2014). The impact of duration on management's discount rate choice. *Research in Accounting Regulation*, 26(2), 217–221.
- Ghazali, A.W., Shafie, N.A. & Sanusi, Z.M. (2015). Earnings Management: An Analysis of Opportunistic Behaviour, Monitoring Mechanism and Financial Distress. *Procedia Economics and Finance*, 28, 190–201.
- Halaoua, S., Hamdi, B., & Mejri, T. (2017). Earnings management to exceed thresholds in continental and Anglo-Saxon accounting models: The British and French cases. *Research in International Business and Finance*, 39(A), 513-529.
- Hartzell, J., & Starks, L. (2003). Institutional Investors and Executive Compensation. *Journal of Finance*, 58(6), 2351-2374.
- Healy, P.M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics*, 7(1), 85–107.

- Hellmann, A., Perera, H., & Patel, C. (2013). Continental European accounting model and accounting modernization in Germany. *Advances in Accounting: A Research Annual*, 29(1), 124-133.
- Huebner, M., Vach, W. & Le Cessie, S. (2016). A systematic approach to initial data analysis is good research practice. *Journal of Thoracic and Cardiovascular Surgery*, 151(1), 25–27.
- IAS 19. (2001). IAS 19 – Employee Benefits. Retrieved 2018-12-20 from URL: <http://eifrs.ifrs.org/eifrs/bnstandards/en/IAS19.pdf>
- Jensen, M.C. (1993). The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems. *Journal of Finance*, 48(3), 831–880.
- Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- Jouber, H., & Fakhfakh, H. (2011). Earnings management and board oversight: An international comparison. *Managerial Auditing Journal*, 27(1), 66-86.
- Kim, T.N., & Kim, K. (2018). External cost of leverage adjustment: Evidence from defined benefit pension plans. *Journal of Economics and Business*, 96, 1–14.
- Kiosse, P., & Peasnell, K. (2009). Have changes in pension accounting changed pension provision? A review of the evidence. *Accounting and Business Research*, 39(3), 255-267.
- Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33(3), 375-400.
- Liu, Q., & Lu, Z. (2007). Corporate governance and earnings management in the Chinese listed companies: A tunneling perspective. *Journal of Corporate Finance*, 13(5), 881–906.
- Marton, J. (2012). Strider svensk användning av diskonteringsräntan mot IAS 19? *Balans*, 2012, Iss. 5, (5), pp.Balans, 2012, Iss. 5.
- Ooghe, H., & De Langhe, T. (2002). The Anglo-American versus the Continental European corporate governance model: Empirical evidence of board composition in Belgium. *European Business Review*, 14(6), 437-449.
- Rauh, J.D. (2006). Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans. *Journal of Finance*, 61(1), 33–71.
- RFR. (2009). *Comment Letter: Discussion Paper – Preliminary Views on Amendments to IAS 19 Employee Benefits*. The Swedish Financial Reporting Board.

- Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, 42(3), 335–370.
- Runesson, R., Samani, R., & Marton, J. (2018). *Financial Accounting Theory - An Accounting Quality Approach*. Lund: Studentlitteratur.
- Salewski, M. & Zülch, H. (2015). Discretion in the accounting for defined benefit obligations – an empirical analysis of German IFRS statements. *Journal of Pension Economics and Finance*, 14(3), 266–292.
- Uzun, H., Szewczyk, S., & Varma, R. (2004). Board Composition and Corporate Fraud. *Financial Analysts Journal*, 60(3), 33-43.
- Watts, R. & Zimmerman, J. (1978). Towards a Positive Theory of the Determination of Accounting Standards. *The Accounting Review*, 53(1), 112.
- Watts, R. & Zimmerman, J. (1990). POSITIVE ACCOUNTING THEORY - A 10 YEAR PERSPECTIVE. *Accounting Review*, 65(1), 131–156.
- White, H., & Lu, X. (2014). Robustness checks and robustness tests in applied economics. *Journal of Econometrics*, 178(1), 194-206.
- Ye, K. (2014). Independent director cash compensation and earnings management. *Journal of Accounting and Public Policy*, 33(4), 391–400.
- Yermack, D. (1997). Good timing: CEO stock option awards and company news announcements. *Journal Of Finance*, 52(2), 449-476.