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Getting past equity - CEO compensation among unlisted SMEs

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Abstract: This thesis analyses how CEO cash compensation in unlisted Small and Medium Enterprises (SMEs) varies with firm performance, and how this compares to large and listed firms, using a series of first difference regression analyses. It uses the results to comment on how constrained access to equity compensation affects CEO pay-for-performance. It finds that unlisted SMEs are no more likely to employ pay-for-performance cash compensation when compared to larger listed firms. A secondary finding is that large and listed firms are more likely to employ previous year's performance to adjust CEO cash compensation. This thesis adds to existing literature by comparing compensation in unlisted SMEs to larger listed firms and drawing links to the access to equity-based executive compensation.

Keywords: Executive compensation, SME, Unlisted, Pay-for-Performance, Variable pay

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1. Introduction

Few topics in corporate governance have received as much attention as executive compensation, yet many fundamental and highly meaningful questions remain unanswered. From a descriptive perspective, we know that executive compensation has undergone a dramatic transition which, while ongoing for almost a hundred years, has showed little sign of slowing its momentum. Executive compensation has increased dramatically, which has attracted the attention of shareholders and outside observers. Murphy (1998) finds that between 1970 and 1996 Chief Executive Officer (CEO) pay for S&P 500 companies developed from around 30 times the average production worker to 90 times the average production worker, or 210 times if accounting for stock options and similar instruments. Another paper by the same author finds that equity derived compensation over the same period moved from being a trivial part of compensation to constituting a clear majority (Murphy, 2012). A key question remains in why executive compensation has undergone these changes. From a normative perspective, competing theories prescribe different mixes of variable and fixed pay, of different determinants, and of the nature of compensation (Edmans and Gabaix, 2016). Empirical research has often showed that executive compensation in practice deviates substantially from any one of these prescriptive theories (Frydman and Jenter, 2010). The agreement is nonetheless that different forms of variable pay are an important source of incentives for executives. Variable pay comes in many forms and a vast literature investigates how CEOs of the most influential, largest listed companies of the world are compensated. Another strand of literature, recent but rich, has investigated executive compensation in a private equity setting. This research is particularly interesting from a practical perspective, as these are companies that hold a high degree of influence. Equity compensation plays a central role in this research.

However, the great majority of CEOs today work in mostly unlisted medium and small enterprises (SMEs) and have relatively little contact with Private Equity firms (Eurostat, 2022). The theoretical research into executive compensation has generally not been limited in a way which precludes its application in an unlisted SME setting, yet few empirical researchers have investigated this bulk of executives. Broadening the scope of research to include executive compensation in unlisted SMEs is valuable. It can contribute to a base of evidence for theories of executive compensation, especially since the context is far different from most research. Apart from providing evidence for the theoretical framework of executive compensation, the empirical results should themselves be interesting to researchers and stakeholders. If executive

compensation differs greatly between unlisted SMEs and larger listed firms, then corporate governance is likely to deviate substantially. When recruiting executives, firms might want to consider how executives from smaller enterprises experience the transition from one compensation system to another. Policymakers might want to consider how to create fair legislation if executives from SMEs are compensated differently to executives from large listed firms (who often receive the most attention in media).

However, one of the most significant contributions of the SME field is the very different access to equity incentives for executives. Previous research has found that equity-compensation among unlisted SMEs is constrained (Chief Executive Group, 2019; Heidrick & Struggles International, 2021; Jensen and Murphy, 1990). Because of the outsize role that equity or equity-based compensation has taken in the executive compensation field, observing pay-for-performance in a setting where equity compensation is constrained can be used to test incentive theories of executive compensation. The Swedish setting aids such comparisons in two ways. Firstly, the access to rich data for unlisted and smaller firms enables extensive quantitative analysis. Secondly, the relative accessibility of equity markets in Sweden can potentially allow us to untangle the access to liquid equity incentives from those of firm size.

This paper aims to contribute to existing research by characterizing executive compensation in unlisted SMEs in Sweden. Specifically, it investigates the elasticity of CEO cash pay to accounting based performance measures. It then goes on to compare the pay-for-performance sensitivity of unlisted SMEs to the classical focus of executive compensation research, large and listed firms. It is motivated by the hypothesis that, given a relative lack of equity-based compensation, firms have to offer more variable cash pay (Jensen and Murphy, 1990).

The main finding of this paper is that despite very different access to equity-based incentives for CEOs, unlisted SMEs and large listed firms use similar cash incentives in their compensation packages. Specifically, both groups focus their pay-for-performance on growth related metrics such as changes in sales, assets and profits. Unlike unlisted SMEs, larger listed firms further reward executives by raising compensation levels also in the year following an increase in firm size. This following-year pay-for-performance link is however relatively minor when compared to same year increases in executive compensation. The results of this paper are largely in line with previous literature investigating differences across firm sizes and geographies, although to the author's knowledge it is unique in commenting on the difference between unlisted SMEs and larger listed firms.

2. Research background

This paper relates to two strands of research in the field of corporate governance. Primarily it investigates unlisted small and medium enterprises, an often ignored but important segment of the economy. Specifically, it investigates the sensitivity of executive compensation to performance in these firms. As such it relates both to broader executive compensation research in unlisted SMEs, and to literature investigating performance linked executive compensation. This section will first present the empirical research related to executive compensation in unlisted SMEs and the contribution of this paper to this strand. It will then present research into performance linked compensation and the contribution of this paper also to this area of research.

2.1 Executive compensation in unlisted SMEs

Existing studies of executive compensation have been highly dependent on data availability. For this reason, research has typically focused on large firms with securities traded in public markets. Such firms are often covered by extensive disclosure requirements and regular reporting figures are relatively widely available. This is especially true for the United States, where such relatively detailed requirements have been in place for almost a century (Murphy, 2012). However, various researchers have utilized more recent similar regulation in Canada and the UK among others (for example Zhou, 2000; Conyon and Murphy, 2000; Murphy, 2012). Some research has also focused on private firms in a private equity-linked context. This focus is a result of the interest from both the academic community and from finance practitioners. Such research has been heavily dependent on the cooperation of private equity firms and linked firms. For example, Burns, Jinda and Minnick (2017) find that private equity-based firms with higher equity incentives are more likely to exit their investments rather than keep the firm private, and that equity incentives are positively correlated with performance as measured by exit valuations. Bengtsson and Hand (2011) find that venture capital backed firms provide CEOs with less cash pay, but also that CEOs are rewarded with higher cash salaries when performing well in fundraising. This previous research illustrates the important heterogeneity that exists also inside the unlisted segment.

Research focused on unlisted firms outside of a private equity context has been relatively sparse. In most countries the disclosure requirement for unlisted firms is limited, and this has naturally also limited the ability of researchers to investigate the field. This limitation is doubly true for

smaller firms like SMEs. In one of few articles directly addressing the issue, Cavalluzzo and Sankaraguruswamy (2000) find that accounting-based performance metrics play a role in regulating CEO salary in unlisted smaller firms, largely concentrated to sales related performance. They also link pay-for-performance with ownership concentration, showing that less concentrated ownership structures motivate a higher degree of pay-for-performance. Ke, Petroni and Safieddine (1999) find no link between performance as measured by Return On Assets (ROA) and executive compensation in private firms, and while Welles (1995) employs interviews and does find a link. However, Welles findings also finds pay-for-performance in private firms to primarily be tied to sales growth. Storey et. al. (1995) find that variable pay among managers at SMEs in the UK was linked to high-growth firms. However, the authors also find that managerial pay was otherwise similarly determined across SMEs and primarily dependent on human resource factors such as age and experience. The overall picture is that sales growth is the most important measure in pay-for-performance in unlisted SME.

Sweden has relatively stringent disclosure requirements for private firms and consequently a higher data availability. Specifically, all private companies, above 50 employees, disclose the total compensation to CEO and board members on an annual basis. This data is available through the public agency Bolagsverket and compiled by various information service providers. This means that the Swedish setting is especially suitable for the study of executive compensation in unlisted SMEs. The analysis of this underrepresented segment constitutes a an important contribution of this paper to existing research.

2.2 Accounting-linked pay for performance

Research into the sensitivity of CEO pay to company performance is plentiful and not feasible to list exhaustively here. An extensive early overview is provided by Murphy (1998) and Murphy also provides yet another highly detailed overview in 2012 (Murphy, 2012). Much research has focused on share price as a measure of company performance. For unlisted firms this metric is not available and such studies are therefore of minor use for research into private firms. Such research is also less applicable as public firms also link a substantial portion of variable executive compensation to the share price, implying that pay-for-performance is structured differently in unlisted firms. Even where equity compensation is employed by unlisted firms, it does not become liquid until and if the firm lists its shares or in certain Mergers and Acquisitions (M&A) transactions. This has been hypothesized to make accounting-based metrics more important in unlisted firms (MacKie-Mason and Gordon, 1997). While a

relatively sparse topic compared to the rest of the field, several previous papers have investigated the link between CEO pay and accounting-based measures. Banker and Datar (1989) recommend accounting based metrics when these are less noisy than share price, as well as when they are closely related to shareholder value (Baker, 1992). Kato and Kudo (2003) find that CEO cash compensation among both public and private firms in Japan is linked to firm performance as measured by ROA. At the same time the authors do not find that CEO cash compensation is significantly linked to sales growth or profitability. They further find that CEOs of private firms faced *lower* sensitivity to firm performance as compared to publicly listed firms¹. Murphy (1998) also finds that cash-based compensation in most surveyed US firms was explicitly linked to some accounting based performance measure through the annual cash bonus. Specifically for a Scandinavian setting, Randøy and Nielsen (2002) find a weak link between performance as measured by ROE and executive compensation. However, Randøy and Nielsen find no relationship when using stock performance and market to book-ratio, or when using multiple measures in their regressions.

One complication in comparing the compensation between public and private firms is still the equity-based or equity derivate based compensation. Such compensation has been shown to be responsible for almost all sensitivity of CEO wealth to shareholder value (Jensen and Murphy, 1990; Hall and Liebman, 1997). Similarly, Murphy (1998) finds that pay for performance sensitivity among S&P 500 companies had increased substantially between 1992 and 1996, but primarily among the very largest firms and primarily through equity and equity linked compensation. Such compensation is widespread in public firms but can also occur in private firms. This is especially true for high-growth private firms with an ambition to list their equity in the near future, or among firms with Private Equity relationships. When it is employed the lesser disclosure requirements for private firms can render this component of the compensation difficult to detect. One way to tackle this issue is to consider only cash compensation when measuring executive compensation. This approach is employed by Kato and Kudo (2003) with the motivation that their results are generalizable as long as variations in equity-based compensation mirror variations in cash compensation. This is a strong assumption, especially for public firms or unlisted high growth firms. It should also be noted that previous research into pay-for-performance, where it has considered a Scandinavian setting, has found equity-based compensation to constitute a relatively minor portion of total compensation compared to

¹ Although sadly no statistical test was performed for this difference.

other countries (Randøy and Nielsen, 2002; Bång and Waldenström, 2009; Fernandes, 2008). Practitioners have also found the occurrence of equity-based compensation in private US firms to vary substantially with firm size, with smaller firms employing almost no equity-based compensation (Chief Executive Group, 2019). This has some implications for the main identification strategy of this paper which will be elaborated on in the methodology section.

That CEO pay is tied to shareholder value almost exclusively through equity and equity derivatives together with the scarcity of this compensation form in unlisted SMEs will form the basis for the main hypothesis of this paper, which is that these firms should exhibit a higher degree of dependence of CEO cash pay to performance. Put into other words, the elasticity of CEO cash pay to performance in unlisted SMEs should be higher when compared to CEO pay in publicly listed firms. This is similar to the argument has been posed in previous literature by MacKie-Mason and Gordon (1997). The hypothesis is however not self-evident. BlackRock CEO Larry Fink has claimed that the transparency of public markets helps push company boards to more tightly regulate CEO performance (Larry Fink, 2021). Other practitioners have also found that the variable portion of cash compensation in private firms increases with firm size (Chief Executive Group, 2019).

Some research into other determinants of CEO pay is useful to mention. There is extensive evidence that CEO pay follows firm size. Furthermore, this elasticity is relatively consistent across countries at around 0.25 (Zhou, 2000). Relative Performance Evaluation (RPE) is another well-researched topic in CEO compensation. Gibbons and Murphy (1990) show that CEO pay is positively and significantly influenced by performance relative to the overall market. However, they find that a link to industry peers is less common. Lastly, there is a wealth of research on the link between poor performance and CEO turnover. Such relationships were first investigated directly by Coughlan and Schmidt (1985) and Warner, Watts and Wruck (1988). Evidence is mixed, with later studies finding no relation for later periods (Mikkelsen and Partch, 1997; Huson, Parrino and Starks, 1998) or a statistically significant but small effect (Jensen and Murphy, 1990). Murphy (1998) argues that the effect of performance on departure rates is stronger for smaller (listed) firms as compared to large (listed) firms. Again this supports the hypothesis that smaller firms face different governance.

3. Theoretical overview

This section will link the contribution of this paper to existing theories in the field of executive compensation. Existing theoretical research generally falls into one of two “views” or is a combination of these. The “Rent Extraction” or “Managerial Power” view states that CEO compensation is the result of the strong bargaining power of CEOs and is thus set to their preferences rather than optimal from a shareholder perspective. The “Optimal Contracting” view claims that executive compensation practices create optimal incentives for CEOs and explains this using various concepts. This section will first provide an overview of the “Rent Extraction” or “Managerial Power” view and then go on to present the “Efficient Contracting” view. It will lastly relate this paper to both views.

3.1 “Managerial power view” and “Optimal contracting view”

What is commonly referred to as the “managerial power” view postulates that executive compensation structures deviate substantially from what is dictated by standard agency theory models. It says that executive compensation is driven by the bargaining power of executives rather than set by boards in a way which maximizes shareholder value. The rent extraction view states that as a result of this, executive compensation is both excessive and misaligned. Specifically, it inadequately disincentivizes managerial slack as well as incentivizing value destroying actions.

There has been extensive research into the degree of influence of CEOs over executive compensation level. O’Reilly, Main and Crystal (1988) show that CEOs who themselves are board members in other firms see their pay influenced by those firms, implying that the CEO themselves have influence over their pay level. Newman and Mozes (1999) find that CEO pay level and structure is significantly impacted by the presence of “insiders” on compensation committees. Fernandes et al. (2012) find that compensation levels increase with board independence. In contrast to this, Bizjak and Anderson (2003) find that CEOs who sit on their own compensation committees in fact earn less than CEOs who are not part of their compensation committees.

In contrast, the “Optimal contracting” view claims that CEO pay packages are the result of optimal contracting. Various authors stand by this viewpoint but employ different explanations for how CEO contracts are efficient. Gabaix and Landier (2008) build a theoretical framework to show that executive compensation levels are not only influenced by individual firm size, but

also by the overall industry size. This explains CEO compensation levels as driven by firm size, although not necessarily that of the CEO's own company. Edmans and Gabaix (2016) show that current equity-based contracts can be deemed optimal if the return of talented managers is higher for larger firms and there are benefits to inducing risk-taking behaviour in CEOs. They go on to argue that seemingly minor details in the model assumptions can lead to greatly different conclusions of optimality. Chaigneau, Edmans and Gottlieb (2023) show that pay-for-performance can be partly motivated by the CEO's notions of fairness, and as such do not need to reflect monetary incentives to the CEO in order to be efficient.

3.2 Contribution and connection to previous research

Drawing conclusions from the optimal contracting debate is difficult due to the many models and topics that have been investigated. The broad overview is nonetheless that substantial evidence exists of CEOs influencing their own compensation practices, but that these compensation practices can still be modeled in a way which suggest that they are optimal.

This paper primarily contributes to a gap in the empirical literature by describing CEO pay-to-performance in unlisted SMEs. However, the hypothesis of this paper also relates to the optimal contracting debate that dominates the theoretical literature. As mentioned in the previous section, it will exploit that equity rewards of the type that has grown highly prevalent among large, listed firms should be much less applicable among firms that face little prospect of selling or listing their equity in the near future. Assuming that the use of equity incentives in large and listed firms reflect optimal contracting, we could expect firms with high constraints to their use of equity compensation to also alter other compensation practices. In other words, if firms are unable to incentivize their managers with these instruments, cash-based performance rewards should be more important. This paper will go on to discuss the implications of a lack of cash-based pay-for-performance as well as other reasons why private firms could maintain effective incentives after presenting its findings.

4. Data and sources

Data is a big limitation in executive compensation research. This is doubly true for the segment that is the focus of this paper. Indeed, the scarce data on unlisted SMEs is probably a key reason that the area has received relatively little treatment until now. This paper is enabled by disclosure requirements imposed on Swedish limited liability firms of most sizes. All firms (and other organisations such as municipalities, non-profits, and other legal firms with economic activity) need to report key accounting measures on at least an annual basis (Justitiedepartementet L1). Furthermore, firms legally defined as “large” are required to disclose the total combined amount paid to the CEO and board of the firm, although not separately. The definition of “large” in this law should not be conflated with how large firms and SMEs are typically defined. According to Årsredovisningslagen any firm that is a) listed, b) possessing more than 50 full time employees, c) possesses a balance sheet of more than 40 million SEK (~4 million Euro) or d) posts annual sales of more than 80 million SEK (8 million Euros) is defined as “large”. While this certainly precludes a large portion of companies that make up the economy, most firms that fall into this category are still considered SMEs by traditional standards such as the European Commission (European Commission).

Despite accounting data being available through Bolagsverket, the collection and compilation of such data is not at all trivial. Various commercial and academic efforts have compiled this data. This paper will exploit the Serrano database provided by the Swedish House of Finance in combination with several supplementary data sources such as commercial databases Valu8 and Capital IQ. These databases are all extensive, in particular the Serrano database covers almost all forms of associations that make up the Swedish business landscape. This paper focuses only on a small subset of these which is still a substantial figure.

The remainder of this section will describe the database, the sample selection process and important considerations that were made in the sample selection process. It goes on to describe the variables of interest in this study. Finally, it presents characteristics of the final sample as well as stylized facts.

4.1 Construction of dataset

The sample used in this paper is constructed from the following sources: The Serrano database Bisnode’s “Financial Statements” database and Valu8.

The Serrano database is a rich source containing over 14 million observations of various Swedish organizations between 1998 and 2021. The database is derived from data collected from the Swedish Companies Registration Office (Bolagsverket), Statistics Sweden (SCB) and Bisnode. Data from these sources is transformed in the Serrano database so that each observation corresponds to a unique combination of organization and year. The base data is analyzed to derive various datapoints, such as conglomerate relationships and corporate events.

Bisnode's "Financial Statements" dataset is one of the sources for the raw data which is used in the Serrano database. It is a compilation of financial data which is registered from all financial statements collected by the Swedish Companies Registration Office. Unlike the Serrano database the data is not curated or annualized and as such the data must generally be processed before it is used.

In addition to these main datasets various other sources are used to bridge gaps in the data. Statistics Sweden's mapping of industry classifications is used to harmonize how firms are classified in the sample. This is necessary as different industry classification systems are used throughout the sample period, and as such a reclassification has been required to perform analysis in this paper. While listed firms are in a clear minority, their figure is still substantial. This paper has utilized data from the business database Valu8 to classify listed firms as such where needed, supplemented by manual controls aided by Standard & Poor's CapitalIQ database. The following three paragraphs summarize the sample creation process.

As an initial step in creating the sample for this paper, the Serrano database was used to provide an exhaustive list of limited liability corporations in Sweden. Serrano's organization-year combination thus forms the basis for observations. Furthermore, the exclusion of non-profit organizations, public organizations and other organizational forms makes the conclusions drawn from this paper comparable to previous research. In addition to the exclusion of other organizational forms, subsidiaries were also excluded from the data. This was served to prevent the inner organizational form of groups from introducing noise into the data, or misrepresenting parts of larger organizations as being SMEs.

After retrieving the complete list of limited liability corporations (hereafter simply referred to as "Firms") complementary data was retrieved from the financial statements database. While the Serrano database is compiled and annualized so that each observation corresponds to one firm and year, the financial statements database contains the accounting figures for each firm as they were filed. As a result, the timeframe covered by observations in this dataset does not

necessarily correspond to the observations in the Serrano database. Group parent companies were represented by their consolidated financial statements rather than their unconsolidated statements for most financial data. However, the unconsolidated financial statements were still used to provide the compensation data for these firms. As such the initial dataset used in this paper is a merged dataset of both consolidated and unconsolidated financial statements. Where the financial year in the financial statements database deviates from the Serrano database, as is the case wherever the financial year did not correspond to the calendar year, observations were annualized in two steps. First the measurements in the observation were scaled to correspond to a full calendar year, where necessary. Secondly the observations were split into months and recompiled per year. This was necessary to enable the matching of observations from Bisnode's financial statements database to the observations from the Swedish House of Finance's Serrano database. It has also been helpful in matching the main dataset to complementary sources.

This sample is further subject to a series of adjustments to aid interpretation. As a first step the sample is limited to three broad industries: "Retail and Wholesale", "Manufacturing" and "Business Services". This narrowing of the sample is prompted by two considerations. Firstly, this limitation is largely imposed by the decision to consider accounting based-performance measures. Relevant accounting measures can deviate considerably between industries, as will likely the connection to executive compensation. Mixing industries which utilize very different metrics to evaluate CEO performance could thus mask a true link between performance and compensation. Selecting a subset of industries with similar and easy to interpret performance metrics enables a thorough and reliable analysis of the firms included. It also avoids some industries where the accounting-based measures utilized would deviate substantially or would be difficult to interpret, such as utilities and financial services firms. As such the segmentation helps provide a more focused discussion. Secondly it focuses the analysis on the most representative industries from previous research. Kato and Kudo (2003) for example find that manufacturing and retail and wholesale corresponds to around 70% of their overall sample and 56% of the overall economy of Japan. A long list of other industries in their sample are represented by only a small number of firms. A more even distribution is present in the data of this paper although the broad picture remains similar. An overview of the industries used in this sample is available in the appendix (Appendix A).

This paper makes considerable further segmentation of the data. One of these is a limitation of the firm sizes considered, both excluding firms too large to be classified as SMEs as well as firms too small for the CEO to have a role comparable to other firms. A lower bound of 50

employees is imposed by the reporting requirements for CEO compensation. Although a large number of firms still report this figure despite not being compelled to, they are not included in this analysis. This is partly to alleviate concerns of self-selection bias, a very real issues when executive compensation is concerned. It also ensures that the CEO fills a somewhat analogous role as in larger companies. This paper uses the European Commission’s size definition to characterize firms employing more than 250 employees as “large”. To provide a clear boundary between the two comparison groups, only the smaller firms in the SME segment are included in the final regression. An upper limit of 100 employees is thus used for the unlisted SME group.

The cleaning and transformation of the data also imposes further limitations on the sample. Despite an overall high quality of the source data, some companies exhibit missing data. Because the dataset is derived directly from firm reports, not all firms are active. Furthermore, lagged effects are important in previous research and such transformation naturally limit the dataset as well by rendering the earliest observations of each firm unavailable for regression. Several other aspects of data handling further limits the final sample. The cleaning and transformation of the data constitutes a substantial portion of the effort that has gone into this paper. More detailed overview of the measures taken is available in the appendix (Appendix B). The final sample of firms used in this paper is outlined below:

Table 1: Process of narrowing sample

Segmentation	Description	Number of firms
<u>Initial sample</u>		46225
Narrowing industry	Only includes Industrial Goods, Consumer Goods and Corporate Services firms	21191
Excluding firms	Include only independent firms and exclude municipal ownership	21158
<u>Final sample after data handling</u>		3242
Listed and Large	Listed firms over 250 employees	118
Unlisted SME	Unlisted firms over between 50 and 100 employees	3124

As the panel data is treated as pooled for the later ordinary least squares (OLS) regressions, all firms are included regardless of whether they are missing observations for some years. As a result the sample is unbalanced across the years 1998-2021.

4.2 Variable definition

The variables employed in the identification strategy are all based on reported data from the databases reported in the data section of this paper. They broadly fall into two categories: Continuous accounting-based variables and categorial variables. Several key variables, including the year-on-year change in executive compensation, are not directly obtainable from the Serrano database. Furthermore, consolidated accounts are not directly obtainable from the Serrano database. Categorial variables are generally available for each combination of calendar year and organizational ID. Continuous variables are available on the basis of each reporting year and organizational ID. To match categorial variables to accounting data, accounting variables have been annualized. Where categorial variables need to be annualized, categories have been assigned to the year in which the financial reporting associated with a given variable concludes.

The key relation of interest in this paper is the sensitivity of CEO cash compensation to firm performance. For this reason, a definition of sensitivity is necessary. Up until this point this paper has used the term sensitivity to refer to two different measures that have both been utilized by previous research. The most straight forward of these is the unit change in CEO compensation for each unit change in appropriate independent variable. The outcome variable in this case is the unit amount of CEO compensation. This specification is often used when the independent variable is the equity value or firm value, in which case the interpretation is straight forward. The Beta of such a variable has the useful property of being interpreted as the share of value created which goes to the CEO. Similarly, when the independent variable is a profit measure the figure comes to reference the share of profits created which goes to the CEO. The main drawback of this measure is that previous research has found CEO compensation to scale only at a fraction of firm value (Murphy, 2012). This means that as firm size increases the share of profits or firm value which is allocated to the CEO each year through direct compensation decreases and this renders the measure difficult to compare across firm sizes.

The other measure commonly employed is the elasticity of CEO compensation. This measures the percentage change in CEO compensation for a given change in the independent variables. This measure has the benefit of being more consistent across firm size. Furthermore, previous research has proved it to be remarkably consistent across firms and geographies (Zhou, 2000; Murphy, 2012; Yang, Singh and Wang 2020). While relatively straightforward to employ for direct CEO compensation, the measure becomes difficult to employ when adding indirect CEO

compensation in the form of existing equity holdings in the firm. This would require data or assumptions regarding the CEOs existing wealth and the lack of such data has created a preference for the sensitivity measure of the previous paragraph.

Since this paper concerns primarily direct cash compensation both pay-for-performance when measured as sensitivity and elasticity can be employed. However, since this paper will compare firm sizes elasticity measures are generally preferable. Furthermore, when independent variables are given as ratios the interpretation of sensitivity becomes difficult. This is the case for this paper when change in ROA is employed as an independent variable, as is the case further down in this section. For this reason, this paper will employ elasticity as the only outcome measure. The main outcome variable of this paper is thus:

$$\Delta Compensation = \frac{Compensation_t}{Compensation_{t-1}} - 1$$

Where compensation is an accounting figure describing the total compensation to CEO and the board which is reported by the firm on an annual basis. The suitability of this accounting figure to describe CEO compensation is discussed extensively under the limitations subheading of this section as well as the discussion section of this paper.

This paper will employ four independent variables to measure firm performance. The first of these is the percentage point change in ROA. This is a rough measure of the efficiency in which a firm uses its assets. To make Return on Assets more comparable across years, assets is defined as the total assets of a firm minus goodwill. This makes the measure less sensitive to merger activities. A control for growth in assets is included to make the variable less sensitive to large fluctuations in assets, primarily stemming from M&A activity and large investments. The second variable of interest is the firm growth as measured by annual sales. These variables are suitable to combine with the elasticity of CEO cash compensation and this combination has been employed in previous research, specifically by Kato and Kudo (2003). The third independent variable used in this paper will be the growth in firm operating profits. This measure is useful as a proxy for firm value. Private firms are commonly valued at a multiple of profit. Assuming that the multiple of the firm remains constant, a percentage change in firm profit should result in an equivalent percentage change in firm value, *ceteris paribus*. Growth in operating profit can thus enable a comparison with share price in listed firms. Lastly, a dummy variable denoting whether the firm achieved profitability each year is used to make results comparable to Kato and Kudo (2003).

The independent variables are thus:

$$\Delta ROA = \frac{Operating Profit_t}{Total Assets_t} - \frac{Operating Profit_{t-1}}{Total Assets_{t-1}}$$

$$\Delta Sales = \frac{Sales_t}{Sales_{t-1}} - 1$$

$$\Delta Operating Profit = \frac{Operating Profit_t}{Operating Profit_{t-1}} - 1$$

$$Profitable = \begin{cases} 1 & \text{if } Operating Profit > 1 \\ 0 & \text{if } Operating Profit \leq 1 \end{cases}$$

As noted by Murphy (1998), CEO cash compensation is often explicitly tied to firm performance. To account for the possibility that compensation is adjusted based on previous years' performance lagged variations of each variable are also introduced. This will capture any cases where CEO base pay is adjusted based on previous performance.

4.3 Data limitations

Despite a major contribution of this paper being its examination of an otherwise under-researched topic, it faces many of the same limitations as previous papers. The lack of previous research has largely resulted from the relative scarcity of data from this segment. While using a rich dataset and exploiting far-reaching disclosure requirements in Sweden, this reliance on still highly imperfect data limits this paper. Specifically, this paper faces two major limitations in its identification strategy.

The first major limitation is that reported data for CEO compensation is bundled together with compensation to board members. This firstly introduces noise as variations in board members' compensation are captured by the primary outcome measure. Secondly, assuming board members' compensation is not sensitive to firm performance or at least less sensitive to firm performance as compared to CEO compensation, this will bias outcome measures downwards. The issue is alleviated by two stylized facts: board compensation tends to constitute a minority of this bundled sum and tends to not be as variable as CEO compensation (PricewaterhouseCoopers, 2017; Deloitte Touche Tohmatsu Limited, 2022; Ernst & Young Global Limited, 2022). This limitation and its implication for interpreting the results of this paper will be further elaborated in the discussion section of this paper.

The second major limitation is the correlation between firm size and firms' involvement in public markets as well as interest from investment firms. A major assumption of this paper is that large & listed firms are more prone to employ equity compensation as compared to unlisted SMEs. This has support among industry researchers as well as academic researchers (Chief Executive Group, 2019; Heidrick & Struggles International, 2021; Jensen and Murphy, 1990). While this enables an interpretation where unlisted SMEs are compared to larger listed firms to provide an approximation of how access to equity incentives affect cash incentives, it also prevents the unbundling of these otherwise relevant but different effects. This paper will not attempt to unbundle these effects. However, Sweden provides a relevant context for such research due to the relatively high participation of SMEs in public markets and this is an interesting avenue for future research. Nonetheless, the fact that SMEs are more involved poses its own issues for the main hypothesis of this paper. While CEOs of private firms can be assumed to receive less equity-based compensation it is still conceivable that some firms might employ this reward. Such equity-based compensation is naturally less liquid than equity compensation of a firm traded on public markets. However, it can still be considered valuable by the CEO and remuneration committee if the firm anticipates to list in the future. The fact that private SMEs are not excluded from stock exchanges, and face various opportunities to take part in a growing number of growth-oriented marketplaces in Sweden, mean that equity-based compensation still likely occurs to some degree in the SME segment. Elaboration of this issue will be found in the discussion section of this paper, under headline 7. *Discussion*.

5. Method

The aim of this paper is to identify if CEO cash compensation in unlisted SMEs is sensitive to accounting based metrics of company performance, and if yes, this sensitivity is higher when compared to firms with better access to equity incentives. The identification strategy of this paper is divided into two parts. The first part attempts to identify a connection between CEO cash compensation and company performance inside the unlisted SME segment. The second part compares the performance sensitivity of unlisted SME firms to the performance sensitivity of larger listed firms. This section begins by outlining the variables employed in the econometric specifications of this paper. After this the econometric specifications used in the two parts of the identification strategy are outlined.

This paper utilizes a first difference model with pooled OLS regressions in an initial step to obtain estimates of how CEO compensation varies with different accounting-based performance metrics. It uses t-tests to test whether CEO compensation differs between unlisted SMEs and larger, listed companies. It will then attempt to draw inference from this to argue any potential differences to CEO compensation that might be derived from access to equity incentives.

5.1 Measuring pay-for-performance

In an initial step, a first difference pooled OLS regression is used to estimate whether there is a correlation between CEO cash compensation and firm performance in large, listed firms and unlisted SMEs, separately. Additionally, separate regressions are presented for the effect of listing and the effect of being a SME firm. These models analyze how the annual change in CEO cash compensation depends on the performance of the firm in that year as well as the preceding year. The measure of performance used is each of the variables outlined in section 4.2: Increase in Return on Assets, Increase in Sales, Increase in Operating Profit and a dummy variable for profitability. The annual change in compensation is initially regressed over each independent variable separately, and subsequently regressed on the full model. The full model specification for this regression looks as follows:

$$\begin{aligned}\Delta Comp_{it} = & \beta_0 + \beta_1 * \Delta ROA_{it} + \beta_2 * \Delta ROA_{it-1} + \beta_3 * \Delta Sales_{it} + \beta_4 * \Delta Sales_{it-1} + \beta_5 \\ & * \Delta Operating Profit_{it} + \beta_6 * \Delta Operating Profit_{it-1} + \beta_7 * Profitable_{it} \\ & + \beta_8 * Profitable_{it-1} + \gamma_{it}\end{aligned}$$

In extension to these variables, this paper also introduces year fixed effects. This could alleviate some other firm-invariant drivers of CEO compensation, such as labour market effects, and hopefully provide more precise estimates for the sensitivity of CEO compensation to firm performance by removing noise. The inclusion of year fixed effects is not entirely obvious. These fixed effects will absorb any compensation-performance relations that are common across firms for any given year. The absence of compensation-performance effects when controlled for year fixed effects should thus not be taken as indications that executives are not compensated for performance. Rather it can mean that labour market effects even out compensation across firms. Because of this both regressions employing fixed effects and without fixed effects are presented in the results section and appendix. The implication of any differences will be elaborated under the discussion headline.

As a last step the regression results for unlisted SMEs and large, listed firms are compared using t-tests to reveal any differences in the degree to which executive compensation depends on the access to equity incentives for firms. The differences are presented in the same format as the regression model above. Additionally, similar differences are illustrated for the constituent differences between SMEs and larger firms, as well as the differences between listed firms and unlisted firms.

To interpret the coefficients in the above regression it is necessary to assume that the underlying data is normally distributed. This is not a trivial assumption and to support it tests of the skewness and kurtosis of the data are performed. The results are presented below:

Table 2: Skewness and kurtosis of underlying data

Metric	Compensation	ROA	Sales	Op. Profit
Skewness	317	-28	29	99
Kurtosis	107,174	39,545	1,176	21,974

Note: The figures for skewness and kurtosis refers to the output of skewness and kurtosis tests according to the methodology in Joanes and Gill (1998).

This indicates a high degree of deviation from what can be considered normal. Inspection of the data reveals several occurrences of extreme outliers. These are present throughout the data but especially severe in the compensation. Closer inspection of a random sample of occurrences

reveal these to mostly be related to M&A activities that dramatically alter the financials of a firm between any two years. Compensation in particular is subject to large spikes when a company undergoes merger activity.

This paper compensates for this in three ways. Firstly, observations are excluded from the sample where the company has changed its status from independent or parent company to subsidiary in any of the years used to calculate the primary outcome and performance metrics. Secondly the data is logged and winsorized at the 5% and 95% level, which should further reduce the occurrence of outliers. These measures are implemented at various stages of the data transformation process, as appropriate. With these measures as well as the transformation of the data, the skewness and kurtosis of the final variables is reduced to the level below:

Table 3: Skewness and kurtosis of used variables

Metric	Skewness	Kurtosis
<i>Ln ($\Delta Compensation$)</i>	0,19	3,45
<i>Ln (ΔROA)</i>	-0,16	3,12
<i>Ln ($\Delta Assets$)</i>	0,41	2,88
<i>Ln ($\Delta Sales$)</i>	0,23	3,01
<i>Ln ($\Delta Operating profit$)</i>	-0,08	3,08

Note: The figures for skewness and kurtosis refers to the output of skewness and kurtosis tests according to the methodology in Joanes and Gill (1998).

There still remains some deviation from optimal distribution of the data at these levels, but the data is nonetheless much closer to a normal distribution after this cleaning process. No further steps are taken in regards to the normality of the data.

5.2 Measuring the difference in pay-for-performance

In a second step the strength of the correlation between the change in compensation and each variable is compared between the two main groups, unlisted SMEs and large listed firms. The original model specification is amended with an interaction term for each variable.

$$\begin{aligned}
\Delta Comp_t = & \beta_0 + \beta_1 * \Delta ROA_{it} + \beta_2 * \Delta ROA_{it-1} + \beta_3 * \Delta Sales_{it} + \beta_4 * \Delta Sales_{it-1} + \beta_5 \\
& * \Delta Operating Profit_{it} + \beta_6 * \Delta Operating Profit_{it-1} + \beta_7 \\
& * \Delta Profitable_{it} + \beta_8 * \Delta Profitable_{it-1} + \beta_9 * LargeListed + \delta_1 \\
& * \Delta ROA_{it} + \delta_2 * \Delta ROA_{it-1} + \delta_3 * \Delta Sales_{it} + \delta_4 * \Delta Sales_{it-1} + \delta_5 \\
& * \Delta Operating Profit_{it} + \delta_6 * \Delta Operating Profit_{it-1} + \delta_7 * Profitable_{it} \\
& + \delta_8 * Profitable_{it-1} + \gamma_{it}
\end{aligned}$$

Where δ represents the additional effect size of large and listed firms. The main hypothesis of this paper can be expressed as: $\delta_{1:8} < 0$

6. Results

This section presents the result from the regressions specified in the previous section. The results are laid out as follows. In the initial section this paper estimates the sensitivity of CEO compensation to accounting performance in two steps. Secondly the sensitivity of each metric is estimated independently, and then in combination. These are measured separately for unlisted SMEs and for large, listed firms. The last section presents the results of a regression with interaction term where each estimated coefficient is compared between the two groups.

6.1 Measuring pay-for-performance

The sensitivity of CEO compensation to performance through is estimated through an OLS regression with one observation for each firm and year. The standard errors are clustered at a firm level. Initially, whether there is any sensitivity for unlisted SMEs is tested, since this is the focus of this paper. The results are presented below.

Table 4: Compensation sensitivity for unlisted SMEs

	<i>Dependent variable: $\Delta \ln$ (Compensation)</i>				
	(1)	(2)	(3)	(4)	(5)
ΔROA (scaled to %)	-0.001 (0.0004)				-0.002*** (0.001)
ΔROA lagged (scaled to %)	0.00002 (0.0004)				-0.001 (0.001)
$\Delta \ln$ (Assets)	0.215*** (0.020)				0.079*** (0.025)
$\Delta \ln$ (Assets) lagged	0.088*** (0.018)				-0.015 (0.025)
$\Delta \ln$ (Sales)		0.331*** (0.020)			0.319*** (0.028)
$\Delta \ln$ (Sales) lagged		0.013 (0.018)			0.007 (0.026)
$\Delta \ln$ (Op. Profit)			0.014*** (0.005)		0.0002 (0.007)
$\Delta \ln$ (Op. Profit) lagged			0.016*** (0.005)		0.008 (0.007)
Profitable				0.019** (0.008)	-0.010 (0.013)
Profitable lagged				0.005 (0.009)	
Constant	0.021*** (0.003)	0.021*** (0.002)	0.045*** (0.003)	0.026*** (0.007)	0.027** (0.013)
<i>n</i>	9254	9337	6960	10730	6890

*Note: The table shows the output of (1)-(4) OLS regressions of a single explanatory variable and its lagged equivalent as well as (5) the full regression of all explanatory variables. Coefficients are presented as the main figures, with standard errors in brackets below. Standard errors are heteroskedasticity robust and clustered at a firm level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$*

The regression reveals a connection between firm performance and CEO compensation. Interestingly and in a break with some previous research, an increase in ROA is negatively correlated with executive compensation, even when controlling for an increase in assets. However, the effect size is very small with a 1 percentage point increase in ROA only corresponding to a 0.001% decrease in compensation. In fact, when all performance measures are included an increase in ROA is even more negatively correlated with a growth in CEO compensation and the effect becomes statistically significant, with a 1 percentage point

increase in ROA corresponding to a 0.002% decrease in compensation. Some caution is advised in interpreting this result, and possible explanations are offered in the discussion section.

Unsurprisingly an increase in assets is positively correlated with executive compensation and the coefficient is both statistically and economically significant. It indicates that a 1% increase in assets leads to a 0.22% increase in executive compensation. Similarly, a 1% increase in assets is also rewarded with a 0.09% increase in executive compensation in the following year, although again some caution is advised in interpreting this result. It could both indicate that some firms reward their CEO in the same year while some reward the CEO in the following year, that an increase in assets is rewarded with both a bonus (same year) and a permanent increase in base salary (the following year). Lastly, it could indicate a cumulative effect where a CEO who consistently grows assets is rewarded more than one who leads a one-year growth spurt. In the full model specification the same-year effect of a 1% increase in assets drops down to a 0.08% increase in compensation and the next-year effect becomes insignificant.

In line with previous research a growth in sales is positively related to an increase in CEO compensation with the same year effect being 0.33% and 0.32% for same year effects in the univariate and multivariate specification respectively. Interestingly the size of the coefficient is also broadly in line with previous research which places the number between 0.2 and 0.4 (Zhou 2000; Yang, Singh and Wang 2020). The coefficient for the lagged variable is close to zero and not statistically significant.

The effect of a growth in operating profit is statistically significant but small compared to the effect for sales growth. A 1% increase in operating profit only corresponds to a 0.015% increase in compensation for both the same and the following year. The effect size is further diminished in the multivariate analysis where the effect size also becomes statistically insignificant. However, the effect of a firm being profitable for a given year is statistically significant at a 5% level. Furthermore, the effect size is roughly 2%. This indicates that a CEO whose company is profitable will see their salary increase by 2% more than one whose firm is not. Compared to the average CEO compensation growth of around 4.3% this is a meaningful effect.

Table 5: Compensation sensitivity for listed large firms

	<i>Dependent variable: $\Delta \ln$ (Compensation)</i>				
	(1)	(2)	(3)	(4)	(5)
ΔROA (scaled to %)	-0.002* (0.001)				-0.003* (0.002)
ΔROA lagged (scaled to %)	0.0004 (0.001)				0.0001 (0.002)
$\Delta \ln$ (Assets)	0.207*** (0.043)				0.089 (0.057)
$\Delta \ln$ (Assets) lagged	0.178*** (0.047)				0.066 (0.062)
$\Delta \ln$ (Sales)		0.394*** (0.058)			0.363*** (0.083)
$\Delta \ln$ (Sales) lagged		0.099** (0.048)			0.033 (0.075)
$\Delta \ln$ (Op. Profit)			0.034* (0.018)		0.004 (0.023)
$\Delta \ln$ (Op. Profit) lagged			0.062*** (0.017)		0.016 (0.024)
Profitable				-0.009 (0.026)	-0.015 (0.043)
Profitable lagged				0.023 (0.033)	
Constant	0.033*** (0.005)	0.026*** (0.006)	0.061*** (0.006)	0.058* (0.030)	0.034 (0.043)
<i>n</i>	1176	1177	977	1246	972

Note: The table shows the output of (1)-(4) OLS regressions of a single explanatory variable and its lagged equivalent as well as (5) the full regression of all explanatory variables. Coefficients are presented as the main figures, with standard errors in brackets below. Standard errors are heteroskedasticity robust and clustered at a firm level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

For large firms the effects are similar to unlisted SMEs. These results unsurprisingly indicate that CEO cash compensation is indeed sensitive to firm performance for large and listed firms. Surprisingly the results again indicate that a 1 percentage point increase in return on assets is associated with a 0.002% decrease in CEO compensations but the effect is weakly statistically significant. The equivalent lagged coefficient is positive but statistically (and economically) insignificant. The control variable, asset growth, is however positive and both statistically and economically significant. This variable indicates that each percent increase in assets is rewarded with a 0.21% increase in compensation assuming no increase in return of these assets.

The equivalent lagged variable is also significant with an effect size of 0.18%, indicating that the salary increase is not contained in the year of the asset increase. It is important to note the lagged coefficient should be interpreted as the effect of a growth in assets with no further change in the following year. Executives who see an increase in firm size are in other words rewarded both in the same year and then further rewarded in the following year.

Growth in sales is also both statistically and economically significant at a 1% level. This is an intuitive and unsurprising result. A 1% increase in sales corresponds to a 0.39% increase in compensation. What is interesting is that the lagged sales variable is smaller in size while still statistically significant. This indicates that executives see their compensation accelerate also in the following year even given no further increase in sales, although again this effect is small with a 1% increase in sales accelerating compensation growth by 0.10% in the coming year. The results are overall comparable to the results for unlisted SMEs.

The coefficients for same-year and lagged EBIT growth are statistically significant. The results are small: a 1% increase in EBIT in the same year yields around a 0.034% increase in CEO compensation in that year. The following-year effect is even stronger at 0.062% increase in compensation for each 1% increase in operating profit. The dummy effect of achieving profitability is not statistically significant.

When the regressing the full model some care should be taken to remember the strong mechanical correlation between several of the independent variables. A company with constant margins should, for example, see a 1% increase in sales perfectly mirror a 1% increase in EBIT. Accordingly, the statistical significance of many of the measures are dramatically reduced. The most noticeable effect of the multivariate regression is that the effect size of revenue growth is largely constant even when adding the other variables. Asset growth effect is reduced, by almost 50%, but is still there although not statistically significant. Interestingly the negative ROA effect is larger although still very small.

6.2 Measuring the difference in pay-for-performance

Table 6: Sensitivity difference between large and listed firms and unlisted SMEs

	<i>Dependent variable: $\Delta \ln$ (Compensation)</i>				
	(1)	(2)	(3)	(4)	(5)
$\delta * \Delta ROA$ (scaled to %)	-0.002 (0.001)				-0.001 (0.002)
$\delta * \Delta ROA$ lagged (scaled to %)	0.0004 (0.001)				0.001 (0.002)
$\delta * \Delta \ln$ (Assets)	-0.008 (0.047)				0.010 (0.062)
$\delta * \Delta \ln$ (Assets) lagged	0.090* (0.050)				0.080 (0.067)
$\delta * \Delta \ln$ (Sales)		0.063 (0.061)			0.044 (0.087)
$\delta * \Delta \ln$ (Sales) lagged		0.086* (0.052)			0.025 (0.079)
$\delta * \Delta \ln$ (Op. Profit)			0.020 (0.019)		0.004 (0.024)
$\delta * \Delta \ln$ (Op. Profit) lagged			0.046*** (0.018)		0.007 (0.025)
$\delta * Profitable$				-0.028 (0.027)	-0.005 (0.045)
$\delta * Profitable$ lagged				0.017 (0.034)	
<i>LargeListed</i>	0.012** (0.006)	0.006 (0.007)	0.016** (0.007)	0.032 (0.031)	0.007 (0.045)
<i>n</i>	10430	10514	7937	11976	7862

*Note: The table shows only the interaction term between a dummy set to 1 for large and listed firms and variables of (1)-(4) OLS regressions of a single explanatory variable and its lagged equivalent as well as (5) the full regression of all explanatory variables. Coefficients are presented as the main figures, with standard errors in brackets below. A positive coefficient indicates that large and listed firms are more prone to varying cash compensation as compared to unlisted SMEs. Standard errors are heteroskedasticity robust and clustered at a firm level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$*

The main results of this paper is that unlisted SMEs, while lacking as effective equity compensation of listed large firms, do not employ more variable cash compensation. In fact, there appears to be very little difference between the two groups in terms of performance sensitivity.

There is a somewhat sizeable negative effect of a firm's profitability in terms of same year effect which disappears in the multivariate model. However, both this effect and positive lagged effect are far from statistically significant. The same-year effect of an increase in assets is close to zero and statistically insignificant, although the lagged effect of an increase in assets is positive and significant at a 10% level. The effect is almost the same size as that of unlisted SMEs indicating that an increase in assets is twice as beneficial in the following year to CEOs of large listed firms. The effect size is also roughly the same when included in the full regression although much less statistically significant. The insignificance in the full regression is unsurprising, an increase in assets can be assumed to be highly correlated with other growth measures such as sales and profit growth.

Similar results are obtained for sales growth and profit growth. Here the size of the coefficients for same year-effects are somewhat sizeable when compared to the size of effects obtained in tables 4 and 5. Despite this the effect is not statistically significant even at a 10% level. However, the lagged effects for both sales growth and profit growth are statistically significant and sizeable, indicating that a CEO whose firm's sales grow by 1% in the previous year see a 0.09% higher increase in salary when working for a large and listed company compared to when working for an unlisted SME. Similarly, a CEO who sees their firm's profit grow by 1% in the previous year can expect a 0.05% higher increase in salary if they work for a large and listed firm.

When the full regression is utilized the sales growth and profit growth effects become drastically smaller and statistically insignificant.

Lastly, the effects are robust to the inclusion of time fixed effects. The sensitivity difference with the inclusion of yearly fixed effects is presented in Appendix C.

7. Discussion

This paper hypothesized that unlisted SMEs would have stronger cash compensation incentives when compared to large and listed firms. This hypothesis was based on the stylized fact that unlisted SMEs have worse access to equity-based incentives for their executives, stemming from two sources. Firstly, the CEO of an unlisted firm could not liquidate their holdings in the firm freely either while working there or when leaving the firm. Secondly, the CEO of an unlisted SME would face lower prospects of listing their firm due to the relatively higher occurrence of listed firms in the larger segment. The combined effect of these two limitations on equity-based compensation is somewhat supported by previous research as well as reports by current practitioners. The hypothesis of this paper was that these limitations on equity-based compensation could (and should) be compensated by a higher variability of cash compensation. Such a variability could help align the incentives of the CEO to the owners, even when missing the natural incentives that equity compensation implies.

The main results of this paper indicate that unlisted SMEs do not adjust for the lack of equity-based compensation with more variable cash compensation. In fact, the only difference that could be identified was a slightly higher sensitivity to previous year performance in large and listed firms. That equity-constrained firms did not offer more variable pay as compared to the listed firms, but offered almost exactly the same level of pay-for-performance in their cash compensation is worth commenting on. Previous research implies that the executive compensation for an unlisted SME as being as being dramatically different both in magnitude and structure as compared to a large, listed firm, as almost all of a CEO's sensitivity to firm value is created by the revaluation of their own equity (Murphy, 2012). That the cash portion of the compensation should be structured almost exactly the same is thus a surprising result.

7.1 Interpreting the results

The performance measures presented in this thesis can be broadly split into two categories. Asset growth, Sales Growth and Profit Growth are all a possible reflection of firm size. An increase in ROA and the Profitability dummy are on the other hand size independent measures of performance.

According to the findings in this paper, the connection between firm performance and CEO compensation is largest for firm size metrics such as sales growth, asset growth and profit growth. It is difficult to disentangle these metrics from one another as they are highly correlated.

The consistency of a positive and statistically significant effect across all of these metrics is in line with previous research and confirms that CEOs are rewarded for growing their firm. Furthermore, the absence of differences between large and listed firms and unlisted SMEs indicates that the elastic effect is largely consistent across firm sizes, which is also broadly in line with what previous research has found. Lastly, the magnitude of the measured results in this paper is slightly larger than what has previously been recorded in the UK, US, Canada and Japan. However, the broad picture is still that growth related compensation is present both in the larger and smaller firms in the Swedish sample, that the compensation is consistent across sizes, and that the compensation is invariant with access to equity-based compensation.

The careful reader will have noted that the size of the effect for sales growth is much larger when compared to profit growth. Some care should be taken when interpreting these results. Profits tend to be more volatile compared to sales and a such a 1% increase in sales should not be compared to a 1% increase in profits. In this sample the standard deviation of profit growth is roughly 70% compared to a standard deviation of 15% for sales. Even though the coefficient is smaller, the effect of increased profits could thus dominate the effect of sales growth for firms. It should also be noted that for firms with a slim profit margin the percentage change in profits be very volatile, especially in SMEs that might lack multiple revenue streams.

Unlike unlisted SMEs, larger listed firms display a following-year effect of growth metrics in addition to the same-year effects. While these are small in magnitude, they are still statistically significant and consistently present in different metrics. These effects are puzzling and do not directly relate to the main focus of this paper, access to equity compensation. However, as these effects are neither present in unlisted SMEs nor a replacement for same-year effects, they mean that the total pay-for-performance link in large, listed firms is higher than for unlisted SMEs. The existence of a following-year effect in the main analysis of this paper highlights the importance of considering lagged effects in executive compensation research and is an unintended contribution of this paper to the existing literature. Some caution is advised: the results could be contaminated by the annualization procedure which splits the financial year into months and then compiles the results on an annual basis. It is also conceivable that some firms reward the CEO in the same year and some in the following.

Measures of non-growth performance present a puzzling picture. In line with the main hypothesis of this paper there is a statistically same-year significant effect of achieving profitability in unlisted SMEs which is not present in large and listed firms. Interpretation of

this result is however complicated by two facts. Firstly, the coefficient is close to zero when the full regression model is run. This indicates that the profitability dummy reflects one of the other metrics in the model. Secondly, when testing the difference between constrained and unconstrained firms this paper fails to identify a statistically significant difference in sensitivity. However, the difference in sensitivity between constrained and unconstrained firms is roughly of equal magnitude as the coefficient of the sensitivity of constrained firms. In other words, a CEO of an unlisted SME sees their cash salary increase by roughly 2 percentage points more if they achieve profitability in a given year, while the CEO of a large and listed firm sees no difference in their compensation from achieving profitability. While this fact is stylistically convenient and in line with the main hypothesis of this paper, it is still far from statistically significant.

The other main non-growth performance metric tested in this paper is the change in return on assets of a firm. There is a puzzling negative correlation between ROA and CEO compensation for both the constrained and unconstrained group. It is unlikely that this reflects a reduction in CEO compensation for firms that efficiently use their assets. More likely it is one more reflection of the growth performance metric. A firm which increases its asset base should see ROA decrease, yet the coefficient for asset growth in the regression is positive and economically meaningful. Meanwhile the negative coefficient for an increase in ROA is relatively small, a mere 0.002 percentage point decrease in CEO compensation for a 1 percentage point increase in ROA. This should also be compared to the mean ROA in this sample of around 8 percentage points. Taken together, this seems to indicate a very minor although still somewhat puzzling effect. It does not change the main results of this paper, that access to public equity markets appears to have little effect on cash-based pay-for-performance in Swedish firms.

7.2 Possible explanations for the missing pay-for-performance gap

One obvious difference between listed and unlisted firms is the extra transparency that is provided by public markets. This has been flagged as an important motivation for listing firms. If listed firms face greater governance pressure, that could be a driver of better executive compensation practices. This effect could counteract the lesser need of variable cash compensation. Greater transparency of public markets is a key motivation for the listing of firms and is intimately linked to governance just as executive compensation is. It is thus difficult to control for the added governance benefits of a public listing of a given firm.

Nonetheless the effect should not be ignored and is a prime candidate for explaining the lack of the anticipated high pay-for-performance in unlisted SME. If incentives are lacking because of worse governance in unlisted SMEs, that is a prime argument for better governance of unlisted firms. The implication that the majority of CEOs in Sweden face sub-standard compensation practices is startling.

Another reason that firms' access to equity-based executive compensation does not affect the likelihood of also employing variable cash-based compensation could be the relatively minor role which cash-based compensation plays in aligning the incentives of a CEO. Previous studies have found that the vast majority of a CEO's sensitivity to their firm's performance is derived from the equity holdings of the CEO (Murphy, 2012). Although this stylized fact explain why listed firms would not be too concerned by the variable cash portion of their CEO compensation, it would imply that variable cash pay is one of the few means by which private firms might provide incentives to their executives. This would imply that unlisted SMEs are not making up for a lack of equity incentives because cash-based variable pay is simply an ineffectual tool for doing so. This also has major implications for compensation systems in unlisted SMEs, that are almost entirely reliant on this type of variable pay to provide CEO incentives.

Finally, previous studies have found pay-for-performance to be negatively linked to CEO ownership (Cavalluzzo and Sankaraguruswamy, 2000; Allen, 1981; Lambert, Larcker and Weigelt, 1993). It could be that the more concentrated ownership structure in private firms offset the lack of equity incentives in smaller firms. This could for example be because smaller firms award their CEO with greater ownership. The CEO would thus be incentivized as a shareholder rather than as an employee. This certainly offers the most benign explanation for the missing pay-for-performance in unlisted SMEs.

Ultimately, this paper will not explore which of these effects might be responsible for the missing pay-for-performance in unlisted SMEs, and instead suggest that measuring their relative importance is an interesting topic for future research.

7.3 Limitations

While building on data from several generous sources, this paper still faces stiff limitations imposed by data availability. The most important of these limitations are presented below.

Firstly, and as has been touched upon several times in this paper, two different characteristics are used as proxies for a firm's access to effective equity incentives. On one hand the participation in public equity markets makes equity compensation more liquid and therefore more effective. This comes with the important caveat that CEOs of listed firms are often restricted in their ability to sell their shares in the firm they work for. They can also face explicit or implicit penalties for doing so. Additionally private firms sometimes also employ similar equity incentives that become liquid when the firm's equity becomes listed or when the firm participates in some M&A activities. The other effect that this paper utilizes is the much lower participation in public equity markets of smaller firms. This is a fact partly supported by the much lower proportion of listed firms in the SME sample of this paper as well as some previous research and practitioner's comments which has confirmed that equity incentives are much less common among smaller firms.

Nonetheless the mixing of these two measures of a company's access to effective equity incentives mean that the regressions in this paper really pick up two different effects. One unfortunate side effect of this is the real risk that both the status of the firm as listed or its size brings with it effects that counterweight the real effect of a lower access to effective equity incentives. Either effect is on its own a prominent problem, but the combination introduces issues of its own, especially if the directional effect of being listed is different to the directional effect of a larger size.

Secondly, this thesis uses an outcome measure which captures both the compensation received by the CEO and the board of the given firm. This complicates comparisons to extant literature which focuses on the compensation received by the CEO of a given firm. Assuming that board compensation is more or less variable than the CEO compensation, this would bias the results of this paper. I argue that such bias should be relatively minor and, if present, should bias the result of this thesis downwards in absolute terms. CEO compensation tends to be larger in size when compared to the compensation received by board members. Various surveys among listed firms in Sweden have placed the total compensation received by board member's at roughly half of the fixed portion of the CEO's compensation (PricewaterhouseCoopers, 2017; Deloitte Touche Tohmatsu Limited, 2022; Ernst & Young Global Limited, 2022). Board members also generally do not take part in a bonus system at the firm. Based on these two facts it could be assumed that the variability of cash compensation might be downwards biased in absolute terms by at most one third. While this would imply that the sensitivity measures presented by this paper are biased, the same survey's find that the ratio between fixed CEO salary and board

compensation is relatively stable across firm sizes (PricewaterhouseCoopers, 2017; Ernst & Young Global Limited, 2022). This means the main results of this paper, that there is little difference in the variability of cash compensation between unlisted SMEs and larger listed firms, should not be invalidated by this bias.

7.4 Suggestions for future research

Like the previous literature in the field of executive research, this paper possibly raises more questions than it answers. One important question which it raises is why firms with lower equity incentives for executives do not impose stricter cash-based incentives for their leadership. Especially for the SME segment, previous research has largely been descriptive. Yet as the great majority of CEOs in Sweden and elsewhere work in unlisted SMEs, it should be of great interest to determine whether the lack of pay-for-performance is due to a lack of effective governance or whether unlisted SMEs display characteristics which makes this kind of variable pay less effective. Further research could confirm the results of this paper in a broader context, in terms of firm size, industry and geography. It should also aim to evaluate the extent to which current compensation practices in unlisted SMEs are effective and why these firms do not see a need to compensate for their lack of equity incentives.

This paper also finds that the elasticity of executive compensation to firm size is in line with previous research. It is a well-documented yet enigmatic fact that the elasticity of executive compensation is so consistent across geographies and industries despite the great heterogeneity of the firms that are investigated. This paper compounds this puzzling result by illustrating that firms of a much lower size than previously tested also exhibit a similar elasticity. This paper finds that the growth elasticity of all tested firms fall within the recorded elasticity span of 0.2-0.4. Providing an explanation for this phenomenon is remaining subject of further research. It should however be mentioned that the elasticities recorded in this paper are all on the upper end of previously recorded effects.

Lastly, this paper contributes to the existing research by measuring both same-year and lagged effects. In doing so this paper uncovers an interesting fact. Large and listed firms display a lagged elasticity effect which is not present in the smaller test group of this paper. One of the many results of this paper which runs contrary to its main hypothesis, this fact illustrates the importance of considering multiple-year effects in executive compensation research. The robustness of previous research, such as the constant growth elasticity of compensation, in the presence of lagged effects is an interesting topic for further research.

8. Conclusion

This paper aims to answer whether firms which have limited access to the equity incentives which have come to dominate executive compensation in public companies instead employ more cash-based pay-for-performance. The way in which this is tested is in a series of regressions which compare the cash-based pay-for-performance elasticities of two sets of firms in Sweden. One group is constituted of firms which have a documented and intuitively limited access to equity incentives, namely unlisted small and medium sized firms. The other is a traditional target of research into executive compensation, large and listed firms. Contrary to my hypothesis, this paper found that unlisted SMEs did not have a lower degree of cash-based pay-for-performance when compared to larger listed firms. In fact, the few differences between firms that appear in my tests point to the opposite effect. The firms most likely to employ equity-based incentives for their executives are also slightly more prone to rewarding their executives with cash. The form of this additional reward for performance takes the shape of a next year increase in compensation for CEO's who grow their firm's size when measured in sales, profits and assets.

The results of this paper are largely in line with the previous research into executive compensation, which has found pay-for-performance to be limited to growth metrics across firm sizes with some indication for small negative effects on pay for performance among smaller firms. Other results of this paper are like what has been found in previous research, most prominently the regressions reveal a growth elasticity of executive compensation of around 0.35. This is slightly higher than previous papers, but still confirms the remarkable consistency of CEO compensation elasticity to firm size. Apart from confirming these previous results, this paper contributes to existing research by investigating pay-for performance in a previously neglected yet very important part of the economy, unlisted small and medium enterprises. My results also illustrate the importance of considering lagged effects in the field of executive compensation. Lastly, my results raise an important question for future research: if firms with worse access to equity-based CEO incentives do not employ variable cash pay instead, is this due to worse governance or due to the different nature of executive compensation in these firms?

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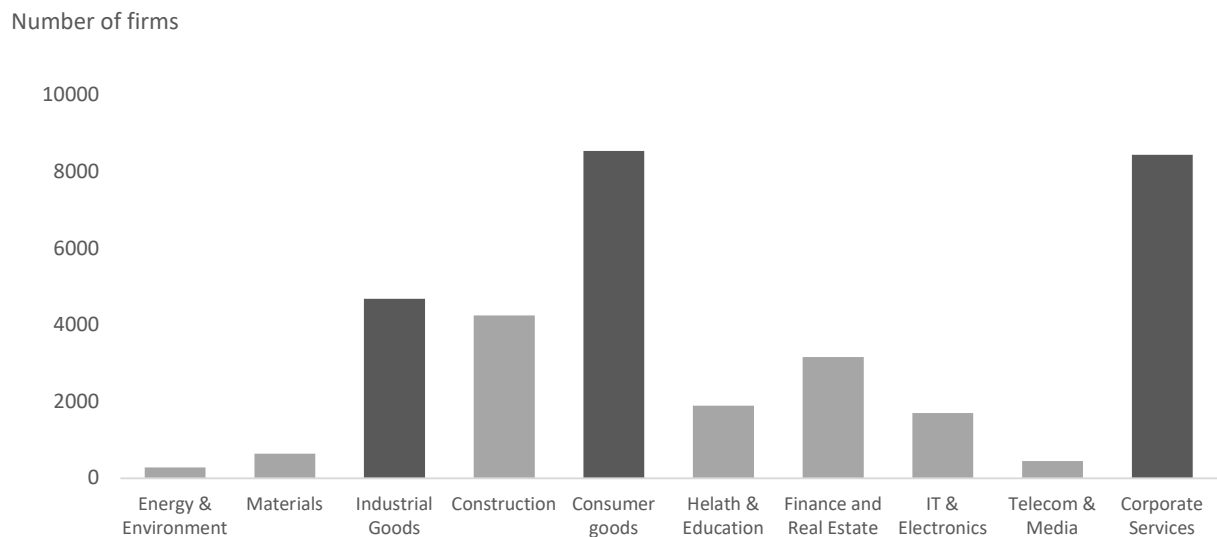
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Appendix

Appendix A: Sample firms by industry



Appendix B: Detailed data handling

Purpose	Description	Number of observations
Extracting relevant data	Serrano exclusion of all organisations other than limited liability corporations	N/A
Extracting relevant data	Serrano exclusion of subsidiaries	9,740,044
Dataset creation	Merger of Bisnodes Financial Statements and Serrano	9,740,044
Ease of handling	Exclusion of all observations with less than 10 employees	1,007,531
Dataset creation	Merge of non-consolidated and consolidated financials into the same observations	335,496
Excluding organisations	Second exclusion of all organisations other than limited liability corporations	333,508
Annualising the data	Splitting observations into months	3,117,335
Annualising the data	Recompiling observations into years	N/A
Excluding missing data	Removal of observations without compensation data	260,386

Appendix C: Sensitivity difference large listed firms and unlisted SMEs, time fixed effects

	<i>Dependent variable: $\Delta \ln$ (Compensation)</i>				
	(1)	(2)	(3)	(4)	(5)
$\delta * \Delta ROA$ (scaled to %)	-0.002 (0.001)				-0.001 (0.002)
$\delta * \Delta ROA$ lagged (scaled to %)	0.0003 (0.001)				0.001 (0.002)
$\delta * \Delta \ln$ (Assets)	-0.012 (0.048)				0.002 (0.062)
$\delta * \Delta \ln$ (Assets) lagged	0.098* (0.051)				0.088 (0.068)
$\delta * \Delta \ln$ (Sales)		0.076 (0.062)			0.063 (0.089)
$\delta * \Delta \ln$ (Sales) lagged		0.073 (0.052)			0.009 (0.080)
$\delta * \Delta \ln$ (Op. Profit)			0.019 (0.019)		0.004 (0.024)
$\delta * \Delta \ln$ (Op. Profit) lagged			0.042** (0.018)		0.004 (0.025)
$\delta * Profitable$				-0.031 (0.028)	-0.003 (0.044)
$\delta * Profitable$ lagged				0.020 (0.034)	
<i>LargeListed</i>	0.014** (0.006)	0.007 (0.007)	0.021*** (0.007)	0.036 (0.031)	0.007 (0.044)
<i>n</i>	10430	10514	7937	11976	7862
<i>Time Fixed Effects</i>	Yes	Yes	Yes	Yes	Yes

Note: The table shows only the interaction term between a dummy set to 1 for large and listed firms and variables of (1)-(4) OLS regressions of a single explanatory variable and its lagged equivalent as well as (5) the full regression of all explanatory variables. Coefficients are presented as the main figures, with standard errors in brackets below. A positive coefficient indicates that large and listed firms are more prone to varying cash compensation as compared to unlisted SMEs. Standard errors are heteroskedasticity robust and clustered at a firm level. * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$