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ORIGINAL PAPER

Determinants of executive pay in small private firms–initial evidence from Germany

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Abstract
This paper provides initial evidence on executive pay in small private limited liability firms in Germany. More than 80% of the firms report fewer than 50 employees. We find that executive pay increases with firm size and variable pay. We also find weak evidence that executive pay is lower in the presence of female executives, and increases with profitability. Surprisingly, variable pay is related in an inverted U-shape to total salary. Significant executive ownership (> 25%) is associated with higher compensation. Executive pay varies widely by region. Some, but not all results are in line with efficient contracting theory. In sum, we provide novel evidence on executive pay in small private firms outside the U.S.

Keywords Executive pay · Private firms · Germany · Executive ownership

JEL Classification L31 · M41 · G32

1 Introduction

We know very little about executive pay in small privately held firms outside the U.S. This is partly because private firms are not required to disclose information on executive pay, and they are reluctant to disclose it voluntarily, given the sensitive nature of such information (Wasserman 2006; Edmans et al. 2017). Similarly, the literature on executive compensation in family firms focuses on publicly listed

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firms (e.g., Cieślak 2018; Croci et al. 2012). With publicly listed firms, executive compensation especially varies with regard to performance-based pay (Edmans et al. 2017). However, evidence on executive pay in private firms may still be warranted because private firms are an integral part of the economy, accounting for more than 99.5% of all firms, employing about two-thirds of the labor force, and generating approximately half of all pretax profits (Bar-Yosef et al. 2019; Cole and Mehran 2016).

The fact that small privately held firms have been largely overlooked so far might also be related to the assumption that performance-based executive compensation is not relevant in their case (Michiels et al. 2012). Indeed, ownership and control are usually vested in the same people, given that many small private firms are run by a manager-owner (Hope and Vyas 2017). Moreover, in the case of private firms where ownership and control are in different hands, agency problems are not assumed to be severe because private firms typically exhibit concentrated ownership (Uhlaner et al. 2007). In the case of concentrated ownership, direct monitoring is less costly than with dispersed ownership, and may often be cheaper than providing incentives in the form of a compensation package (Farrell and Winters 2008). Hence, we may expect executive compensation to be very different in private firms than in publicly listed firms. In the absence of agency problems, executive pay should not be performance-based.

The economic importance of private firms and their specific agency setting are important motives for conducting this study, but not the only ones. Since executive compensation in private firms has been little explored, we are also simply interested in whether executive and governance characteristics are associated with executive pay in a similar fashion as with publicly listed firms. For instance, we want to find out whether we can also observe differences in executive pay when there are female executives, even though female executives are more common in smaller private firms than in larger private firms (Ernst and Young 2021). Finally, we believe that past studies have not taken sufficient account of the fact that owner-managers of small firms receive not only compensation from employment, but also dividend income from the shares they hold; they are also partly able to substitute employment compensation by dividend income, and vice versa (Ke 2001). Farrell and Winters (2008) and Cole and Mehran (2016) use the National Survey of Small Business Finance (NSSBF), which includes the total amount of executives' compensation without specifying its components and whether it includes dividend income. Wasserman (2006) defines executive compensation by the sum of the fixed salary and bonuses, but not dividend payments.

This paper provides survey data-based evidence on the level and determinants of executive pay in small German private firms. Germany is the largest European economy, with a strong focus on small and medium-sized private firms, making it ideal for studying private firms' executive compensation outside the U.S. Executive pay includes a fixed salary, bonuses, dividend distributions, and compensation by shares. We compiled a new dataset by sending out an online survey to randomly chosen private limited liability firms with fewer than 500 employees and sales of less than €50 million, numbering 16,162 in total. Since private firms tend to be extremely secretive about executive compensation (Wasserman 2006), we designed

the questionnaire to be as anonymous as possible. 211 firms responded, and about two-thirds of them provided their firm name.

We have four main findings. First, firms with female executives pay less than firms with male executives only, but the difference is not robustly significant. Second, despite negligible information asymmetries and the multiple-stakeholder orientation that characterizes Germany (Aguilera and Jackson 2010; Gomez-Mejia et al. 2005), we find that 67% of the firms in our dataset pay variable compensation. Third, the variable pay component is related in an inverted U-shape to total salary. Executives with a share of variable pay exceeding 70% receive significantly *less* total compensation than executives with medium levels of variable pay (> 20–70%). We do not observe this pattern for publicly listed firms. Both the first and the third result are novel for private firms.

Fourth, we find that executive pay in German private firms increases with firm size and executive ownership, and partly also with firm performance as measured by the incidence of positive net income. However, return on assets (ROA, net income divided by lagged total assets) is not significantly associated with executive compensation. For a small subsample, we find that executive pay is positively associated with EBITDA/total $assets_{t-1}$ such that executives still have tax-saving incentives. Some of the previous literature on private firms found a positive relation between firm performance and executive pay in the U.S. and the United Kingdom (e.g., Watson et al. 1994; Farrell and Winters 2008; Michiels et al. 2012), but others did not (Cole and Mehran 2016; Bengtsson and Hand 2011). Note that the tax-saving issue of performance measures has not been addressed in previous literature.

While some results, e.g., with regard to firm size and performance, are in line with agency theory, others are not. Executives holding at least 25% of the shares receive higher pay than other executives, but we do not find profitability to be robustly different between these two groups. More surprisingly, we find the variable pay component to be related in an inverted U-shape to total salary. This result will only be in line with agency theory if non-standard assumptions apply (e.g., risk-seeking preferences of managers). Stewardship theory (Lin, 2005; Wasserman 2006) may be more suitable to explain our finding. Executives of smaller firms might be more intrinsically motivated and more willing to share the burdens and benefits of varying firm performance with their employees, especially when there are financing constraints.

This paper contributes to the literature in several ways. First, to the best of our knowledge, it is the first scientific analysis on the determinants of executive pay in European small private firms. About 83% of our sample firms have fewer than 50 employees and median sales are less than €2 million. Comparable previous studies are based on the NSSBF survey conducted in 1993 and 2003 in the U.S. (see Cole and Mehran 2016; Farrell and Winters 2008; Michiels et al. 2012).[1] Outside

[1] Other studies on private firms have conducted surveys on larger U.S. entities controlled by private equity investors (Bengtsson and Hand 2011; Jackson 2013; Cronqvist and Fahlenbrach 2013). Wasserman (2006) analyzed a proprietary dataset of U.S. private technology firms provided by three consulting and audit firms. Ke et al. (1999) and Ke (2001) investigated chief executive officer (CEO) compensation with private U.S. insurance firms.

the United States, we only found evidence on executive pay in private firms in Denmark (Banghøj et al., 2010), the United Kingdom (Watson et al. 1994; Conyon and Nicolitsas 1998), Italy (Brunello et al. 2001), and Argentina, Brazil, and Chile (Gallego and Larrain 2012). However, those studies investigate larger private firms, where information asymmetries and agency problems are more similar to those of publicly listed firms.[2]

Second, in contrast to other private-firm studies, e.g., in the U.S. (Cole and Mehran 2016; Farrell and Winters 2008; Michiels et al. 2012), we have data on variable pay and executive gender, and are able to derive novel findings. Our results are of interest to academia and businesses alike, because we contribute to opening the "black box" of private firm compensation.

In what follows, Sect. 2 develops the research questions and Sect. 3 addresses the research design. Section 4 presents the results and Sect. 5 concludes.

2 Research questions on the determinants of private firms' executive compensation

We draw on the insights of agency theory, more specifically, efficient contracting theory (Jensen and Meckling 1976; Jensen and Murphy 1990). Agency theory assumes that shareholders do not run the business, that they are unable to observe executives' actions, and that executives maximize their individual utility. Hence, executives might make decisions that reduce shareholder value, e.g., by perk consumption. Jensen and Meckling (1976) suggest that shareholders may monitor the management in order to mitigate agency problems of equity. With dispersed ownership, individual owners bear the costs of monitoring, but share the benefits with other shareholders, resulting in a "rational apathy" equilibrium where no shareholder has an incentive to monitor the management. Consequently, Jensen and Meckling (1976) argue that performance-based compensation is necessary to align the management's and shareholders' interests.

With small private firms, the setting might be different. First, small private firms are often run by a manager-owner such that ownership and control are usually vested in the same people (Hope and Vyas 2017). Second, even when ownership and control are separate entities, ownership is typically concentrated, which tends to overcome the rational apathy scenario described above (Michiels et al. 2012). Thus, direct monitoring is less costly than with dispersed ownership, and possibly often cheaper than providing incentives in the form of a compensation package (Farrell and Winters 2008). Thus, considering the "classical" agency conflict between shareholders and management, we may not necessarily expect executive compensation

[2] In our sample, 83% of the firms have fewer than 50 employees and median sales are €1.9 million. Cole and Mehran (2016) report mean sales of $1.9 million for the NSSBF sample in 2003. In Banghøj et al. (2010), mean sales were $169 million; in Watson et al. (1994) £12.3 million; in Conyon and Nicolitsas (1998), median sales amounted to £13.3 million. Gallego and Larrain (2012) reported median total assets of $840 million. Sample firms in Brunello et al. (2001) have 1,350 employees on average.

to be related to measures of information asymmetry, such as with firm size or firm complexity.

However, the basic conflict might rather arise between controlling and non-controlling shareholders (Jensen and Meckling 1976). Executives who hold significant shares might be able to extract rents from other, non-controlling shareholders (Morck et al. 1988). In our sample, this scenario is realistic, given that in 85% of the firms, executives hold at least 25% of the shares, which empowers them to block important decisions under corporate law. This decision power is likely to undermine monitoring efforts by non-controlling shareholders. Still, non-controlling shareholders will reasonably try to align incentives in the form of performance-based compensation, if possible (Janakiraman et al. 2010). Risk-averse executives consider variable compensation as an imposition of additional risk and, therefore, require higher total pay. With larger firms, we expect information asymmetries and agency problems to be more pronounced such that there is greater need for variable pay. Total pay should increase then as well. Information asymmetries are likely to increase with firm size for several reasons: larger firms tend to operate and produce in more (geographical) markets, have more layers of hierarchy and thus, tend to be more complex than smaller firms.[3] This reasoning is supported by evidence showing that CEO pay increases with firm size, as measured by the number of employees, total assets, or sales (Watson et al. 1994; Cole and Mehran 2016; Conyon and Nicolitsas 1998; Farrell and Winters 2008; Bengtsson and Hand 2011; Wasserman 2006).

However, when we assume the executives-shareholder conflict to be more prevalent than the conflict between non-controlling and controlling shareholders for small private firms, we may not expect a significant association between executive pay and firm size. We summarize the ambiguous theoretical predictions in the following research question:

Research Question 1: Is executive pay in private firms associated with firm size?

According to agency theory, executive pay is expected to increase with firm performance, given that sufficiently informative performance measures are available (Holmström, 1979; Gomez-Mejia et al. 2005). However, with private firms, there is a lack of market-based performance measures. With regard to accounting-based performance measures, German private firms have relatively strong tax-related incentives to manage net income because taxable income is closely tied to net income in financial statements. This questions the informativeness of accounting-based measures and their usefulness for performance-based compensation. Empirical evidence on private firms is mixed as well: Some studies found CEO pay to increase with accounting profitability (Farrell and Winters 2008; Michiels et al. 2012; Gao and Li 2015), while others did not find a significant association (Ke et al. 1999; Bengtsson and Hand 2011; Cole and Mehran 2016).

[3] It also seems reasonable to assume that total pay is generally higher in more complex firms because it takes more effort to steer a more complex firm, generating higher opportunity costs for which the manager needs to be compensated.

The weak theoretical support and the mixed empirical evidence lead us to posit the second research question as follows:

Research Question 2: Is executive pay in private firms associated with accounting profitability?

The effect of executive ownership on executive compensation is not clear-cut. Efficient contracting theory predicts that higher executive ownership provides incentives to increase shareholder value, rendering incentive-based pay less necessary (Jensen and Meckling 1976). However, according to the managerial power hypothesis, higher executive ownership may make it easier for controlling shareholders to extract rents ("entrenchment"), also by excessive pay (Morck et al. 1988; Bebchuk and Fried 2006), even though extracting rents might be easier with dispersed than with concentrated ownership. Significant executive ownership enhances executive power and may impair effective monitoring by the board (Elmagrhi et al. 2020). Even in the German two-tier system, where the board of executives is a separate entity to the supervising board of directors, this argument might be still relevant. Efficient contracting theory suggests another theoretical reason why executive ownership results in higher pay: risk aversion (Jensen and Meckling 1976). Significant ownership increases the non-diversifiable risk and consequently, the risk-averse executive will ask for higher compensation. To date, only limited and quite mixed evidence for private firms exists: While some studies have shown that CEO pay decreases with CEO ownership (Wasserman 2006; Cole and Mehran 2016), other studies have found a positive association (Ke 2001; Farrell and Winters 2008). However, in contrast to Farrell and Winters (2008), Cole and Mehran (2016), and Wasserman (2006), we explicitly account for the fact that owner-managers of small firms receive not only compensation from employment, but also dividend income from the shares they hold. Dividend income may substitute for low compensation from employment. Since the theoretical predictions and empirical findings are mixed, we posit:

Research Question 3: Is executive pay in private firms associated with significant executive ownership?

We define significant ownership as when executives hold more than 25% of the firm's shares. The 25% threshold is important in the Stock Corporation Act (*Aktiengesetz*) because some decisions need a 75% majority (e.g., decisions on the dismissal of supervisory board members, changes in the statutes, or changes in equity capital, see, e.g., Sections 103, 179, 182, 222 *Aktiengesetz* and Section 53 of the Limited Liability Firms Act (*GmbH-Gesetz*)). Even if a simple majority is required, we deem a voting share of $\geq 25\%$ to provide power to influence corporate decisions. In contrast to the above literature, we also aim to investigate the link between executive pay and accounting performance in order to get a better understanding of whether executives with strong voting power are able to extract rents.

Furthermore, we investigate whether executive pay is lower when there is at least one female executive in the board compared to the case where there are only

male executive board members. From an agency theory perspective, there is no compelling argument as to why boards with female executives should receive lower pay. It is hard to find literature that relates directly to our research question. However, we draw on insights from the literature that finds evidence of a gender pay gap in publicly listed firms (e.g., Kulich et al. 2011; Carter et al. 2017; Beck et al. 2020). This gender pay gap may be attributed in part to female risk aversion, (a lack of) gender diversity on corporate boards, a relative lack of experience, or imperfect information about female productivity at the time of appointment (Carter et al. 2017; Homroy and Mukherjee 2021).

We were unable to find evidence of a gender pay gap in the literature on private firms. However, unlike in the case of publicly listed firms, there is evidence suggesting that female executives are more common in smaller private firms than in larger ones (Ernst and Young 2021). Thus, we may expect more gender diversity on private firms' corporate boards than on the boards of publicly listed firms, suggesting that the gender pay gap might be less relevant.[4]

Our survey design does not allow us to identify a gender pay gap since we lack data on *individual* executive pay and on the gender of the respondents. For the sake of anonymity, we asked for information on average executive pay and whether or not there are female executives in the firm.

Research Question 4: Do private firms with at least one female executive exhibit different levels of executive pay than private firms with male executives only?

We now turn to the association between variable and total compensation which, to the best of our knowledge, has not yet been analyzed for private firms (Cole and Mehran 2016; Wasserman 2006; Michiels et al. 2012; Gao and Li 2015). A higher level of variable pay imposes more compensation risk on the executive (Jensen and Meckling 1976; Carter et al. 2017). Given that executives are risk-averse, they will rationally ask for a premium when there is compensation risk. Hence, the level of variable pay should be positively associated with total executive compensation. Variable pay may also serve as a screening device for unobservable entrepreneurial talent (Lazear 2000). More talented executives will accept variable compensation if there is a sufficiently large reward for good performance. Again, total executive compensation should be higher with variable pay than without. The theoretical reasoning is supported by empirical evidence for publicly listed firms showing that total executive compensation varies considerably more strongly with variable pay than with fixed salary (Carter et al. 2017).

However, the managerial power hypothesis predicts that powerful CEOs will obtain more pay with lower pay-for-performance sensitivity (Bebchuk and Fried 2006), especially with poor governance (Fahlenbrach 2009; Elmagrhi et al., 2020). We do not have data on the size, quality, or incentives of the board of directors, but if there are indeed private firms with poor governance, we may not necessarily

[4] There is literature showing that a gender-diversified *board of directors* does not significantly affect executive compensation (e.g., Adams and Ferreira 2009 and Sarhan et al. 2019).

expect a positive association between the share of variable compensation and total executive pay.

In addition, in contrast to publicly listed firms, private firms often face financing constraints. If this is the case, the fixed component of executive pay tends to be small, and executive pay rather varies with firm performance. In addition, in the case of private firms, executives of smaller firms might also be more intrinsically motivated and more willing to share the burden and the benefits of varying performance with their employees, as suggested by stewardship theory (Lin, 2005; Wasserman, 2006). Both financing constraints and the stewardship role of executives may distort the positive relation between executive pay and the level of variable pay that we observe with publicly listed firms. Unfortunately, we were unable to find related evidence for private firms. Thus, we aim to analyze the following research question:

Research Question 5: Does executive pay in private firms increase with the level of variable pay?

3 Research design

3.1 Survey design

We sent out an online survey to German corporations in October 2019 using the software Questback. The survey comprised questions about general firm information and executive characteristics, as well as questions regarding executive compensation (see supplementary information in the paper's online version). Generally speaking, we requested information referring to the preceding fiscal year 2018. Knowing that (German) private firms are reluctant to provide executive compensation data, we designed the questionnaire to be as anonymous as possible, taking the following precautions:

- The questionnaire did not require the respondent to supply the firm's name unless they chose to.
- We promised to use the data for scientific purposes only.
- We did not ask for specific CEO pay; rather, we requested average executive pay.
- We did not ask for exact numbers on compensation issues; rather, we offered intervals.
- Nor did we ask for exact figures for other firm-related issues, making it credible that we would not be able to track the firm in the Dafne database (Bureau van Dijk) or the Federal Gazette (*Bundesanzeiger*); for example, with regard to the number of employees, we offered the intervals 50–<100, 100–<200, 200–<300, and so on.

To increase the response rate, we asked closed-form questions, promised to send the study results to responding firms, and noted that ten respondents randomly chosen from those that disclosed their firm name would receive €50 Amazon gift cards.

Furthermore, the survey was limited in length so that the total time needed to complete the survey was not supposed to exceed 5 min. In fact, the average response time was 7.5 min, although some firms did not fully complete the questionnaire.

We pretested the questionnaire with ten subjects from private business and academia. Using their feedback, we slightly modified the questionnaire. We distributed the link to the online survey via email, which also briefly explained the goal of the study. We set a response deadline of one month and sent two reminders to improve the response rate.

3.2 Data selection and representativeness

In the first step, we selected corporations from the Dafne database[5]. We excluded firms from the financial sector, publicly listed firms, and firms without an email address. Furthermore, we selected private limited liability firms with fewer than 500 employees and sales of less than €50 million. We did this for two reasons: first, larger private firms have agency problems similar to publicly listed firms (Bonacchi et al. 2019), and second, we aimed to make our results more comparable with the aforementioned studies based on the NSSBF surveys addressing firms with fewer than 500 employees.

We were left with 104,200 firms, from which we randomly selected 16,162. Some of the email accounts provided in Dafne were not valid; therefore, we ultimately invited 15,106 firms to participate in the survey, of which 211 responded. Executives responded in 93% of the surveys.[6] The response rate is 1.4%, which is more or less comparable to other online surveys (e.g., Gassen and Schwedler 2010: 1.9%), but relatively low (Sax et al. 2003). We surmise that the sensitivity of the subject is the main reason for the low response rate. It can also be explained by the surveying procedure (e.g., anonymous email, little incentivization) and the surveyed population (high opportunity costs of executives). Still, in absolute numbers, the sample offers a unique data set to address small private firms' executive compensation patterns outside the United States.

Compared to the large dataset of private firms in the Dafne database,[7] smaller firms are slightly undersampled: almost 83% of the sample firms have fewer than 50 employees; this is the case with 87% of firms in the Dafne database (see Fig. 3 in Appendix B). With regard to firm size as measured by the number of employees, we found a correlation of 99.9% between our sample and the basic population in Dafne.

[5] Dafne is a database by Bureau van Dijk. It contains general, corporate governance, and financial accounting data of German publicly listed and private firms with up to ten years of history. It can be used to research individual companies or to search for companies with specific attributes.

[6] Eight responses (4%) were sent by a non-managing shareholder. The remaining responses were from people who were neither an executive nor a shareholder.

[7] To check how representative our sample is, we compared it to a "full Dafne sample," which we assumed to reflect the population of German private firms. The "full Dafne sample" consists of all German, solvent, private limited liability companies with fewer than 500 employees and less than €50 million in sales (excluding firms from the finance sector) that are available in the Dafne database.

With regard to geographical distribution, the correlation coefficient between the Dafne database and our sample is also relatively high (89.1%).[8] We received relatively many responses from firms located in Berlin. Berlin is a start-up hotspot, which may drive results to some extent. We therefore also provide results excluding firms from Berlin.

Considering the industry distribution of the basic population, the correlation coefficient amounts to 74.5%. Firms from the information & communication industry are overrepresented, while the sample has relatively few firms from the construction and trade sectors. Thus, we also present results excluding firms from the information & communication industry.

3.3 Variable description and regression model

Following the literature (Cole and Mehran 2016; Gallego and Larrain 2012; Michiels et al. 2012), we employed an OLS model including all firm and executive characteristics mentioned in the survey. The pivotal variable is TOTAL_COMP. In the survey, we asked for the average total executive compensation before taxes per executive in 2018. Executive pay includes a fixed salary, bonuses, dividend distributions, and stock grants, but no other components. We offered intervals (< €100,000; €100,000 – 200,000; €200,000 – 300,000; €300,000 – 400,000; €400,000 – 500,000; > €500,000). Hence, TOTAL_COMP is a categorical variable. For further analyses, we used the midpoint of each compensation interval (TOTAL_COMP_MID), e.g., for €100,000 – 200,000, it is €150,000. For compensation > €500,000, we assume €500,000.

Most of our independent and control variables also stem from the survey. #EMPL reflects the number of employees in 2018; it is a categorical variable because, again, we offered intervals. Because this variable is highly skewed, we introduced a dummy variable that takes the value of 1 if the firm has more than 50 employees in 2018, and 0 if not (≥ 50 EMPL). We use this variable to proxy the firm's size and to address Research Question 1.

In the survey, we did not ask for total assets, sales, or profitability because we wanted to keep the survey as anonymous as possible. If available, we obtained such data from the Dafne database or the Federal Gazette for the subsample of 133 firms that provided their name. Return on assets (ROA; net income divided by lagged total assets) is often used in a public firm setting (e.g., Ntim et al. 2015), but this may be less suitable for German private firms because taxable income is based on net income. Moreover, ROA is skewly distributed in our sample. Therefore, we proxy profitability by a dummy variable that takes the value of 1 if the firm disclosed positive net income in 2017, and 0 if not ($PROFIT_{t-1}$). We use this variable to test Research Question 2.

[8] For each of the 16 German federal states, we determined the share of firms that are headquartered there – within the sample of our study as well as within the "full Dafne sample". Then, we calculated the correlation of these shares per federal state between the two samples. The correlation with respect to industry distribution is calculated in a similar way.

OWNER_MAN proxies significant executive ownership (Research Question 3) and is a dummy variable that takes the value of 1 if the executive board holds more than 25% of the firm's shares, and 0 if not. As mentioned above, the 25% threshold is critical because it grants significant power to block important decisions. If there was at least one woman on the executive board, the dummy FEMALE takes the value of 1 (and 0 if not). This dummy is used to test for Research Question 4.

Moreover, we analyze Research Question 5 by applying the share of variable pay (in %) as an independent variable, SH_VAR_COMP.[9] Scatterplots and preliminary descriptive analyses suggest a non-monotonic relationship of SH_VAR_COMP and total compensation. For this reason, we also include a quadratic term SH_VAR_COMP^2. In a second specification, we measure variable compensation by a dummy variable VAR_COMP that takes the value of 1 if the executive's compensation contains a performance-based (variable) component, and 0 if not. These independent variables account for H5.

Following the literature on executive pay in private firms, we control for other firm and executive characteristics, including executive age (Cole and Mehran 2016), family ownership (Gallego and Larrain 2012), the number of owners (Farrell and Winters 2008; Michiels et al. 2012), and industry affiliation and location (Watson et al. 1994; Bengtsson and Hand 2011).

We include the number of owners in 2018 (#OWNER), which is also measured as a categorical variable and, due to skewness, is winsorized at the 1% level. Family firm status is represented by FAM_FIRM, a dummy variable that takes the value of 1 if a family owns the majority (> 50%) of the firm's shares (and 0 if not). The dummy variable BOARD indicates whether the firm has a board of directors (*Aufsichtsrat, Beirat*) or not. We asked for the age of the executive who responded to the survey, and again offered intervals. The resulting categorical variable is AGE. NORTH_EAST is a dummy variable that takes the value of 1 if the firm is domiciled in the north (Bremen, Hamburg, Lower Saxony, and Schleswig–Holstein) or east (Berlin, Brandenburg, Mecklenburg-West Pomerania, Saxony, Saxony-Anhalt, and Thuringia) of Germany. Finally, we include industry dummies based on firms' survey responses (construction, craft, information & communication, manufacturing industries, services, trade, other).

Overall, we employed the following regression model:

$$\begin{aligned} TOTAL\_COMP\_MID_i = & \alpha_0 + \alpha_1 \geq 50 EMPL_i + \alpha_2 PROFIT_{t-1,i} + \alpha_3 OWNER\_MAN_i \\ & + \alpha_4 FEMALE_i + \alpha_5 SH\_VAR\_COMP_i + \alpha_6 SH\_VAR\_COMP_i^2 \\ & + \sum_{j=7}^{J} \alpha_j Controls_{j,i} + \varepsilon_i \end{aligned} \tag{1}$$

Given that information on the previous year's profit is only available for a subgroup, the inclusion of this variable reduces the sample size by almost 40%. Therefore, we run an additional model without the variable PROFIT$_{t-1}$:

[9] In the survey, we ask for the share of fixed pay of the executive's total compensation. The share of variable pay is 100% minus the share of fixed pay.

$$TOTAL\_COMP\_MID_i = \beta_0 + \beta_1 \geq 50EMPL_i + \beta_3 OWNER\_MAN_i + \beta_4 FEMALE_i + \beta_5 SH\_VAR\_COMP_i + \beta_6 SH\_VAR\_COMP_i^2 + \sum_{j=7}^{J} \beta_j Controls_{j,i} + \varepsilon_i \quad (2)$$

In order to answer our research questions, we interpret the regression coefficients α_1/β_1 (for Research Question 1, RQ1), α_2 (for RQ2), α_3/β_3 (for RQ3), α_4/β_4 (for RQ4), and α_5/β_5 and α_6/β_6 (for RQ5), respectively.

We tested whether our main model (1) fulfills the assumptions for running an OLS. Ramsey's Regression Specification Error test is insignificant, meaning that we cannot reject the null that our model has the correct functional form. The Breusch–Pagan/Cook–Weisberg test for heteroskedasticity is insignificant as well, so that we can assume homoscedasticity. Nevertheless, we employ robust standard error estimates. Since we analyze a cross-section, autocorrelation should not matter. Our relatively small sample is large enough for the normal distribution assumption of the error terms not to be violated.[10] We checked the histograms and can confirm that. We also checked the descriptive statistics (especially standard deviation, range, minimum, and maximum) to ensure that our exogenous variables show sufficient variation. The mean VIF of our model is 3.83, suggesting that we do not have a problem with multicollinearity. Lastly, there is the potential problem of endogeneity, which is always difficult to rule out. Typical sources of endogeneity are omitted variables and simultaneity (Wooldridge 2010). We include a set of control variables, covering all relevant variables. Nevertheless, we cannot rule out the existence of unobservable variables such as managerial ability, which might drive our results. Simultaneity might be an issue for some exogenous variables as well, but at least for our independent variables we consider it unlikely that decisions on firm size, executive ownership, and the presence of a female executive will be taken simultaneously with the decision on total compensation. With respect to profitability, we focus on the previous year's profit or loss to circumvent this problem.

4 Empirical results on the level and determinants of executive compensation and discussion

4.1 Descriptive statistics

Figure 1 shows that 122 of the 211 firms reported an executive pay of less than €100,000. However, the distribution is skewed, with some executives earning much more. Executive pay seems to be higher for comparable U.S. private firms. Cole and Mehran (2016) report an average CEO salary of $108,300 for small private firms from the 2003 NSSBF sample, while Farrell and Winters (2008) and Michiels et al.

[10] The rule of thumb is that this assumption usually causes only problems for small sample sizes with fewer than 50 observations. Even with the model in (1), we have 112 observations.

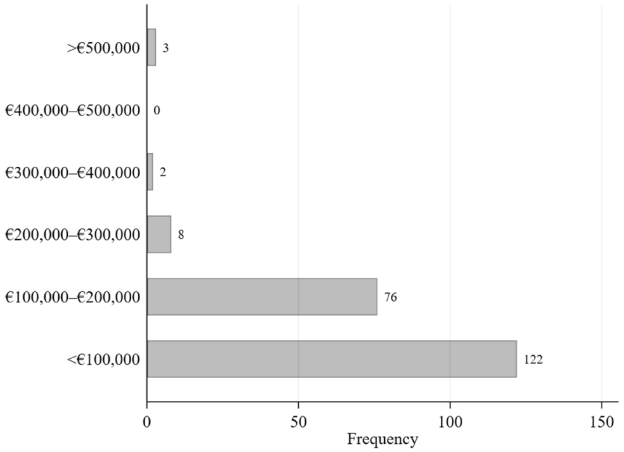

Fig. 1 Distribution on the Level of Executive Compensation (N = 211)

(2012) document a mean CEO salary of about $175,000 with varying subsamples of the NSSBF database.

Summary statistics in Table 1 show that more than 75% of the sample firms have fewer than 50 employees. The median levels of total assets (€759,300) and sales (€1,875,000) suggest that there are 10–20 employees in the median firm. In the survey, we did not ask for total assets, sales, or profitability. If available, we obtained such data from the Dafne database or the Federal Gazette for the subsample of 133 firms that provided their name.

Furthermore, in 85% of the firms, executives hold at least 25% of the shares. The median firm has three owners. Moreover, 42.2% of the firms are owned by a family, about 10% have a board of directors, and 36.5% have a female executive. The median executive age is between 51 and 60 years. Accounting profitability (ROA; net income divided by lagged total assets) varies significantly, with a mean of 17.2% and a median of 5.6% (winsorized at the 1% and 99% levels). More than 75% of the firms reported a profit in the previous fiscal year. Table 10 in Appendix A depicts univariate correlations, which suggest no severe multicollinearity problems.

Finally, we find that executives receive variable pay in more than two-thirds of our sample firms (N = 142, 67.3%). The proportion is slightly higher in firms in which executives hold at least 25% of the stock (68.3%). Thus, performance-based pay is relatively common. We also asked for the share of fixed/variable pay in total compensation. For many firms, the share of variable pay is low and does not exceed 20% (see Fig. 2). However, for 51 of the 142 firms, the share of variable pay amounts to more than 70% of total compensation (see Fig. 2). This high level of variable pay is somewhat surprising, because we expected incentive alignment to be limitedly necessary in private firms. Table 2 shows that high levels of variable pay are rather common in smaller firms.

Table 1 Summary statistics

Variable	*N* =	Mean	Standard deviation	Minimum	First quartile	Median	Third quartile	Maximum
TOTAL_COMP (in €1,000)	211			0–100	0–100	0–100	100–200	> 500
VAR_COMP	211	0.6730		0	0	1	1	1
SH_VAR _COMP	211	31.6114	36.1282	0	0	15	65	95
#EMPL	209			0–49	0–49	0–49	0–49	200–500
OWNER_MAN	211	0.8531		0	1	1	1	1
FEMALE	211	0.3649		0	0	0	1	1
#OWNER	211	3.4834	3.2210	1	2	3	4	24
FAM_FIRM	211	0.4218		0	0	0	1	1
BOARD	209	0.1005		0	0	0	0	1
AGE	197			≤ 30	41–50	51–60	51–60	> 60
ROA_{t-1}	121	0.1724	0.6164	− 0.5906	0.0049	0.0560	0.1691	4.5748
$PROFIT_{t-1}$	123	0.7561		0	1	1	1	1
TOTAL ASSETS in €1,000	125	1,880.7	2,732.4	111.8	406.7	759.3	2,235	20,100
SALES in €1,000	44	3,907.4	6,435.8	161.1	994.1	1,875	4,438	38,700

This table shows descriptive statistics on the survey sample. We collected data on ROA_{t-1}, $PROFIT_{t-1}$, total assets, and sales from the Federal Gazette (https://www.bundesanzeiger.de/pub/de/) and from the Dafne database, if available. For a definition of variables, see Table 9 in Appendix A.

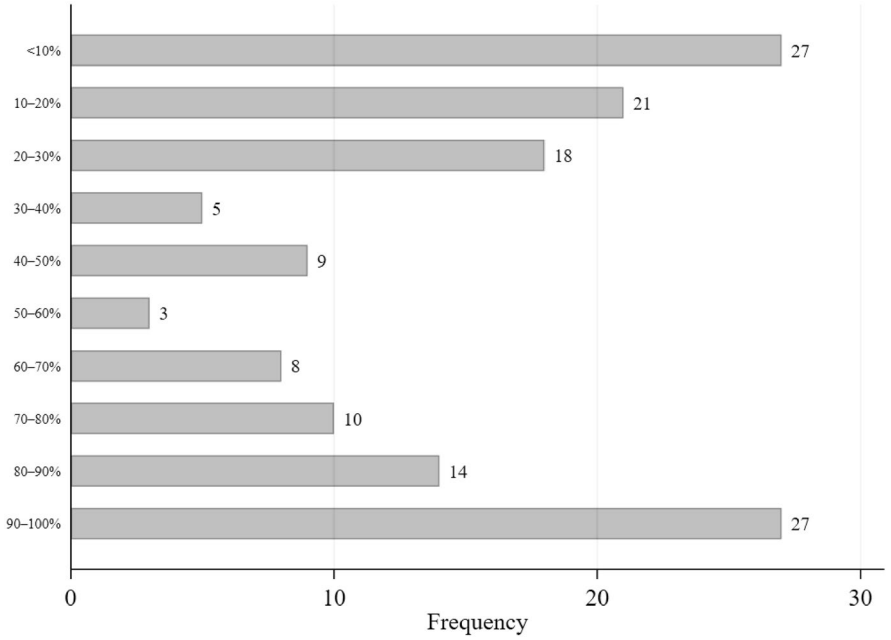

Fig. 2 Share of Variable Pay in Relation to Total Compensation (N = 142)

Table 2 Shares of variable compensation with different firm sizes

#Employees Share of variable pay	< 50 (N = 173)	50−100 (N = 23)	> 100 (N = 13)
0%	55 (32%)	5 (22%)	8 (62%)
> 0−20%	39 (23%)	6 (26%)	2 (15%)
> 20−70%	34 (20%)	6 (26%)	3 (23%)
> 70%	45 (26%)	6 (26%)	0
Total	173	23	13

This table shows how the share of variable pay is distributed with respect to firm size (proxied by the number of employees)

4.2 Results on research questions 1–3

To test our research questions with multivariate analyses, we employ OLS models (1) and (2) (with and without profitability) as well as some modifications. The main dependent variable is TOTAL_COMP_MID, which generally reflects the midpoint of the respective total compensation interval, e.g., for the €100,000–200,000 interval, the midpoint is €150,000. Table 3 reports the results.

Columns 1 and 2 include the variable $PROFIT_{t-1}$, which indicates whether a profit was reported in the preceding fiscal year. Recall that we were able to measure

Table 3 Determinants of executive compensation: multivariate analysis

	Pred. sign	TOTAL_COMP_MID Coeff (t-value)							TOTAL_COMP_MID2 Coeff (t-value)	
		Subsample with information on $PROFIT_{t-1}$		Full sample			Full sample without Berlin firms	Full sample without the information & communication industry	Full sample	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
≥ 50 EMPL	+/−	24,163 (1.34)	23,040 (1.54)	47,233*** (2.66)	40,068** (2.53)	34,007*** (2.59)	36,356** (2.43)	23,718** (2.38)	33,090** (2.21)	28,471** (2.31)
$PROFIT_{t-1}$	+/−	35,691** (2.43)	25,688* (1.86)							
OWNER_MAN	+/−	44,603*** (2.65)	52,478*** (3.46)	42,168*** (3.56)	46,655*** (3.87)	40,301*** 3.99	43,185*** (4.18)	39,591*** (3.78)	39,837*** (3.95)	35,052*** (4.13)
FEMALE	+/−	−14,243 (−0.77)	−19,395 (−1.23)	−16,904 (−1.33)	−19,596* (−1.78)	−17,751** (−2.09)	−14,076 (−1.58)	−15,705* (−1.58)	−16,451 (−1.64)	−15,034* (−1.96)
VAR_COMP	+	43,477*** (3.49)		44,758*** (4.52)						
SH_VAR _COMP			4,403*** (3.54)		4,042*** (4.78)	4,240*** (5.92)	3,611*** (5.55)	4,174*** (5.37)	3,381*** (4.25)	3,527*** (5.24)
SH_VAR $_COMP^2$			−43.77*** (−3.00)		−40.66*** (−4.21)	−42.93*** (−5.38)	−35.71*** (−4.89)	−42.30*** (−4.81)	−33.80*** (−3.72)	−35.50*** (−4.74)
AGE		−45.53 (−0.06)	208.7 (0.27)	−20.38 (−0.04)	124.81 (0.24)				111.1 (0.25)	
BOARD		35,776 (1.35)	35,697* (1.80)	29,372 (1.62)	29,669** (2.06)	34,564*** (3.21)	47,916*** (3.86)	36,774*** (3.00)	23,878** (1.98)	29,045*** (3.18)
FAM_FIRM		22,039 (0.94)	23,415 (1.14)	4,298 (0.30)	2,561 (0.20)				2,618 (0.23)	
#OWNER		1,364 (0.79)	1,998 (1.49)	966.5 (0.68)	1,265 (0.98)				1,054 (0.99)	

Table 3 (continued)

Pred. sign	TOTAL_COMP_MID Coeff (t-value)							TOTAL_COMP_MID2 Coeff (t-value)	
	Subsample with information on $PROFIT_{t-1}$		Full sample			Full sample without Berlin firms	Full sample without the information & communication industry	Full sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
NORTH_EAST	−30,875* (−1.72)	−27,818 (−1.56)	−37,392*** (−3.13)	−29,881** (−2.52)	−26,209*** (−2.74)	−29,883*** (−3.26)	−22,416** (−2.07)	−24,886** (−2.29)	−21,798** (−2.52)
Constant	25,851 (0.55)	2,984 (0.06)	39,878 (1.29)	57,770 (1.45)	41,958*** (3.53)	40,303*** (3.26)	41,393*** (3.32)	50,150* (1.89)	64,927*** (6.37)
Industry dummies	included	included	included	included	–	–	–	included	–
Robust standard errors clustered at firm level	included	included	included	included	included	included	included	included	included
N =	112	112	184	184	207	185	184	184	207
Adj. R^2 in %	9.5	23.4	14.8	26.6	30.5	29.7	28.0	23.2	27.2
F-Stat. (Prob > F)	2.84 (0.0009)	5.29 (0.0000)	3.74 (0.0000)	6.89 (0.0000)	13.89 (0.0000)	13.85 (0.0000)	15.90 (0.0000)	5.68 (0.0009)	11.39 (0.0000)

This table shows multivariate OLS regression results on the determinants of executive total compensation. Columns 1 and 2 show results with all variables, including whether there was a profit in the year before or not ($PROFIT_{t-1}$). We have data on $PROFIT_{t-1}$ for only about 60% of all firms, so sample size is smaller when including this variable. Columns 3–9 depict results for the full survey sample, including firms without data on the net income from the previous year. Columns 1 and 3 employ the binary variable VAR_COMP, indicating whether there is variable executive pay or not. Columns 2 and 4–9 use SH_VAR_COMP instead, that is, the share of variable pay to total executive pay. Columns 5–7 and 9 exclude industry affiliation and control variables that are insignificant in each regression. Columns 6 and 7 show results without Berlin firms and without firms from the information & communication industry, respectively; both ignore industry affiliations and insignificant control variables. Columns 8 and 9 present results with the dependent variable TOTAL_COMP_MID2, in Column 8 for the full sample including industry affiliation, in Column 9 excluding industry affiliation and other insignificant variables. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test. For a definition of variables, see Table 9 in Appendix A

firm profitability for the subset of firms that mentioned their name. Columns 3–9 depict regressions without the $PROFIT_{t-1}$ variable, such that we are able to use the total survey sample. Sample size varies, because not all the firms provided information on all control variables.

When including the information on the previous year's profit, the firm size shows no significant effect on total compensation. However, when the sample size increases because $PROFIT_{t-1}$ is excluded, we find a positive and highly significant coefficient of ≥ 50 EMPL in all other specifications, indicating that total compensation is higher in larger firms. Results in columns 3–9 suggest that executive pay is about €30,000 higher in firms with more than 50 employees than in smaller firms. This evidence suggests that executive pay in private firms is positively associated with firm size (Research Question 1).

Columns 1 and 2 show that executive pay is higher when a profit rather than a loss is reported. This result remains when we drop industry affiliation and other insignificant control variables (not tabulated). When we use ROA instead of $PROFIT_{t-1}$, the sign is positive but not significant (not tabulated). This might be explained by opposing motives of private firms. When compensation is related to ROA, executives have little incentive to augment depreciation expenses or impairment losses, both of which tend to reduce the actual tax burden.

Thus, a profitability measure that does not distort tax-saving incentives might be more suitable in private firms' executive compensation, such as EBITDA/lagged total assets. Only with 14 firms in our sample we find sufficiently detailed data in the profit and loss statement to be able to calculate EBITDA. It transpires that executive compensation is higher in firms with a higher EBITDA/lagged total assets ratio, even when we adjust for firm size and industry (see Table 4). Overall, we find non-robust evidence that executive pay in private firms is positively related to accounting profitability (Research Question 2).

When executives hold at least 25% of the shares (OWNER_MAN = 1), total compensation per executive is on average about €40,000 higher than in other firms (see Table 3). Thus, executive pay in private firms is positively related to significant executive ownership (Research Question 3).

We obtain the same qualitative results when we drop observations from Berlin or from the information & communication industry (the largest subgroup in their respective group) or when we employ TOTAL_COMP_MID2 as the dependent variable (Columns 8–9 in Table 3). This variable is measured as TOTAL_COMP_MID, with the only difference that we assume a compensation of €75,000 for the €0 – 100,000 interval. Given that according to the Federal Statistical Office of Germany, the mean gross salary in Germany was €49,200 in 2021, it might be too conservative to assume that managers receive "only" €50,000 total compensation.

The interesting question arises as to whether executives who hold at least 25% of shares exhibit higher levels of variable pay or better performance than other executives. If this is the case, these two factors may contribute to explaining the higher compensation levels. However, the results in Table 5 imply ambiguous evidence. Panel A of Table 5 indicates that executives with significant shareholdings exhibit slightly higher levels of the variable to total pay (32.0% vs. 29.2%), but the

Table 4 Total compensation and adjusted accounting performance

Panel A: Test statistics on total compensation with above or below median prior year's EBITDA (scaled by lagged total assets)		
	Mean total compensation	t-statistics, unequal variances (p value)
EBITDA/lagged total assets ≤ subsample median	64,285.71	0.42
EBITDA/lagged total assets > subsample median	135,714.30	(− 0.004)
Panel B: Test statistics on total compensation (adjusted for firm size) with above or below median prior year's EBITDA (scaled by lagged total assets)		
	Adjusted mean total compensation	t-statistics, unequal variances (p value)
EBITDA/lagged total assets ≤ subsample median	54,000	0.24
EBITDA/lagged total assets > subsample median	122,000	(0.811)
Panel C: Test statistics on total compensation (adjusted for firm size and industry mean) with above or below median prior year's EBITDA (scaled by lagged total assets)		
	Adjusted mean total compensation	t-statistics, unequal variances (p value)
EBITDA/lagged total assets ≤ subsample median	4,000	− 2.30**
EBITDA/lagged total assets > subsample median	50,285.71	(− 0.041)

This table shows the t-statistics of (adjusted) total compensation for firms with above/below median ratio of EBITDA to lagged total assets. EBITDA is calculated as prior year's (hence, 2017) profit or loss plus interest expenses plus taxes plus depreciation and amortization expenses. This data is only available for 14 observations in our sample. In Panel B, total compensation is adjusted for firm size, i.e., for large firms (≥ 50 employees) we deduct the size effect on compensation as suggested by our results in Table 1, Column 1 (minus 24,000 €). In Panel C, we adjust for size and industry by deducting the size effect (as in Panel B) and by additionally deducting the industry-specific median of total compensation. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test. For a definition of variables, see Table 9 in Appendix A

Table 5 Executive ownership, variable pay, and accounting performance

Panel A: Test statistics on the extent of variable pay with executive ownership

	Mean ratio of variable pay to total pay	Full sample, t-statistics, unequal variances (p-value)
≥ 25% exec. ownership (N = 180) vs	0.320	0.42
< 25% exec. ownership (N = 31)	0.292	(0.339)

Panel B: Test statistics on total executive compensation and profitability (measured as prior year's ROA), only for subsample with significant executive ownership (≥ 25%)

	Mean total executive pay	Full sample, t-statistics, unequal variances (p-value)
ROA_{t-1} > median (N = 54) vs	113,889	0.24
ROA_{t-1} ≤ median (N = 51)	109,804	(0.811)

Panel C: Test statistics on total executive compensation (adjusted for firm size and industry mean) and profitability (measured as prior year's ROA), only for subsample with significant executive ownership (≥ 25%)

	Adjusted mean total executive pay	Full sample, t-statistics, unequal variances (p-value)
ROA_{t-1} > median (N = 54) vs	41,074	0.35
ROA_{t-1} ≤ median (N = 51)	35,176	(0.729)

Panel D: Test statistics on total executive compensation and profitability (measured as occurrence of a profit in the prior year), only for subsample with significant executive ownership (≥ 25%)

	Mean total executive pay	Full sample, t-statistics, unequal variances (p-value)
$PROFIT_{t-1}$ = 0 (N = 27) vs	83,333	2.52
$PROFIT_{t-1}$ = 1 (N = 77)	121,429	(0.014)

Panel E: Test statistics on total executive compensation (adjusted for firm size and industry mean) and profitability (measured as occurrence of a profit in the prior year), only for subsample with significant executive ownership (≥ 25%)

	Adjusted mean total executive pay	Full sample, t-statistics, unequal variances (p-value)
$PROFIT_{t-1}$ = 0 (N = 27) vs	6,370	2.85
$PROFIT_{t-1}$ = 1 (N = 77)	49,558	(0.006)

Panel A exhibits test statistics for the mean ratio of variable pay/total pay, depending on whether there is significant executive ownership (≥ 25%) or not. Panel B, C, D and E show test statistics for the subsample of significant executive ownership (≥ 25%) and address the question of whether executive compensation depends on ROA and on whether positive net income was reported or not, respectively. In Panels C and E, total compensation is adjusted for the industry mean and for firm size, i.e., for large firms (≥ 50 employees) we deduct the size effect on compensation as suggested by our results in Table 1, Column 1 (minus 24,000 €). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. ROA_{t-1}: net income divided by lagged total assets. We were only able to observe net income and to calculate ROA for firms that disclosed their name

Table 6 Existence and share of variable pay and executive compensation

Panel A: Descriptive statistics

Salary	N =	< €100 k	€100– < 200 k	€200– < 300 k	≥ €300 k
Variable pay					
Fixed pay only	69	53	15	1	0
With variable pay	142	69	61	7	5
Of which ≤ 20%	48	30	16	2	0
> 20%-70%	43	6	28	5	4
> 70%	51	33	17	0	1
Total	211	122	76	8	5

Panel B: Test statistics

	t-statistics, unequal variances (p-value)	Mann–Whitney z-statistics (p-value)
Fixed pay only vs. variable pay	− 4.57***	− 3.98***
	(0.000)	(0.000)
Variable pay		
≤ 20% vs. > 20–70%	− 5.78***	− 6.71***
	(0.000)	(0.000)
> 20–70% vs. > 70%	4.41***	5.16***
	(0.000)	(0.000)

This table reports univariate test statistics on how fixed pay and variable pay and different levels of variable pay are associated with total executive compensation

difference is not significant.[11] Panels B and C show that the total pay of executives with significant shareholdings is not significantly associated with profitability as measured by ROA (net income divided by lagged total assets). However, executives reporting a positive net income receive significantly more pay, see Panels D and E.

Overall, we find evidence supporting the view that executive pay increases with firm size, with positive net income, and with executive ownership (see Research Questions 1, 2, and 3). While the first two results are in line with efficient contracting theory, the third result is hard to interpret because the association between executive pay and accounting performance depends on the performance measure employed.

4.3 Results on research questions 4 and 5

We find compensation to be lower when there is at least one female executive; however, the coefficient is not robustly statistically significant (see Table 3).

[11] The literature on public firms suggests that pay-for-performance sensitivity increases with CEO shareholdings (e.g., Ntim et al. 2019). Even though variable pay is different to pay-for-performance sensitivity, our finding is not consistent with this evidence.

Table 7 Determinants of executive compensation: additional robustness checks, multivariate regressions

	Pred. sign	Coeff (t-value)		
		(1)	(2)	(3)
DEPENDENT VARIABLE		TOTAL_COMP_MID	LN(TOTAL_COMP_MID)	HIGH_TOTAL_COMP_MID
≥50 EMPL	+/−	34,007** (2.59)	0.288*** (3.29)	0.221*** (3.01)
OWNER_MAN	+/−	40,301*** (3.99)	0.316*** (3.39)	0.210** (2.55)
FEMALE	+/−	−17,751** (− 2.09)	−0.145** (− 2.21)	−0.109** (− 1.98)
SH_VAR_COMP	+	4,240*** (5.92)	0.0372*** (8.24)	0.0285*** (8.50)
$SH\_VAR\_COMP^2$		−42.93*** (− 5.38)	−0.00038*** (− 7.72)	−0.00030*** − 8.15
BOARD		34,564*** (3.21)	0.311*** (3.02)	0.221** (2.33)
NORTH_EAST		−26,209*** (−2.74)	−0.232*** (−3.26)	−0.176*** (−3.06)
Constant		41,958*** (3.53)	10.84*** (103.3)	0.0812 (0.90)
Industry dummies		–	–	–
Robust standard errors clustered at firm level		Included	Included	Included
N =		207	207	207
Adj. R^2 in *%/Pseudo* R^2 *in %*		30.5	37.0	*33.4*
F-Stat. (Prob > F)/*LR* Chi^2*(Prob* > Chi^2*)*		13.89	28.91	*29.68*
		0.0000	0.0000	*0.0000*

This table shows multivariate regression results on the determinants of total executive compensation with alternative compensation measures. For a definition of variables, see Table 9 in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test

Table 8 Determinants of executive compensation: Non-response bias

	Pred. sign	TOTAL_COMP Coeff (t-value)						
		Full sample	Quick response	Slow response	High filing grade	Low filing grade	Firm name disclosed	Firm name not disclosed
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
≥50 EMPL	+/−	40,068**	65,401**	24,281	24,230	73,628**	26,031*	86,792**
		(2.53)	(2.41)	(1.07)	(1.60)	(2.35)	(1.82)	(2.27)
OWNER_MAN	+/−	46,655***	27,704**	46,522	53,839***	28,800	50,579***	36,309
		(3.87)	(2.09)	(1.46)	(3.40)	(1.45)	(3.41)	(1.57)
FEMALE	+/−	−19,596*	−13,322	−33,354	−17,989	−23,664*	−18,349	−38,824**
		(−1.78)	(−1.21)	(−1.53)	(−1.14)	(−1.76)	(−1.19)	(−2.10)
SH_VAR_COMP	+	4,042***	3,517***	3,975***	4,220***	3,569***	4,289***	3,605***
		(4.78)	(3.84)	(2.65)	(3.45)	(4.45)	(3.51)	(4.38)
$SH\_VAR\_COMP^2$		−40.66***	−36.67***	−37.64**	−42.34***	−36.95***	−43.23***	−37.21***
		(−4.21)	(−3.97)	(−2.09)	(−2.97)	(−4.31)	(−3.06)	(−4.23)
AGE		124.1	−865.8	516.1	−424.7	−124.1	−367.7	−362.6
		(0.24)	(−1.46)	(0.50)	(−0.53)	(−0.18)	(−0.50)	(−0.45)
BOARD		29,669**	33,650*	28,217	34,940*	52,807*	32,573*	54,650*
		(2.06)	(1.72)	(0.90)	(1.88)	(1.89)	(1.77)	(1.93)
FAM_FIRM		2,561	−4,356	16,942	27,044	−17,433	25,407	− 7,516
		(0.20)	(−0.35)	(0.87)	(1.37)	(−1.05)	(1.33)	(− 0.38)
#OWNER		1,265	681.2	2,168	2,366	−2,801	2,169	− 1,150
		(0.98)	(0.39)	(0.90)	(1.64)	(−1.00)	(1.58)	(− 0.37)
NORTH_EAST		−29,881**	−36,137***	−29,806	−28,105	−35,917**	−28,092	−34,279**
		(−2.52)	(−2.87)	(−1.45)	(−1.56)	(−2.67)	(−1.62)	(−2.30)
Constant		23,307	81,734**	17,848	48,174	51,245	48,929	34,838
		(0.74)	(2.29)	(0.25)	(0.99)	(1.23)	(1.10)	(0.72)
Industry dummies		Included	Included	Included	Included	Included	Included	Included

Table 8 (continued)

Pred. sign	TOTAL_COMP Coeff (t-value)						
	Full sample	Quick response	Slow response	High filing grade	Low filing grade	Firm name disclosed	Firm name not disclosed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Robust standard errors clustered at firm level	Included	Included	Included	Included	Included	Included	Included
N =	184	90	90	116	68	122	62
Adj. R^2 in %	26.6	36.2	18.4	19.3	43.4	20.9	42.4
F-Stat. (Prob > F)	6.89 (0.0000)	3.41 (0.0002)	4.58 (0.0000)	5.03 (0.0000)	5.15 (0.0000)	5.45 (0.0000)	4.44 (0.0000)

This table shows multivariate OLS regression results on the determinants of executive total compensation when controlling for non-response bias. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively. Quick (slow) response: response time < median value (≥ median value). High (low) filing grade: number of responded questions ≥ median value (< median value). For a definition of variables, see Table 9 in Appendix A

The correlation table (Table 10 in the Appendix) suggests that female executives are more likely to be found in family firms or in larger firms, both of which are aspects that we control for. In contrast to Carter et al. (2017), we do not find a significant negative correlation between FEMALE and the level of variable compensation. Overall, we do not find compelling evidence that private firms with at least one female executive exhibit different levels of executive pay to other private firms (Research Question 4).

We cannot rule out that respondents deliberately tried to hide a pay gap between these two types of firms because they knew that the intention of the study was to examine determinants of executive compensation[12] However, since private firms' executive compensation has not yet been the subject of a public or political debate, and since our questionnaire was designed in the most anonymous way possible, we do not think that the intention of our study substantially affected the responses.

With regard to Research Question 5, Columns 1 and 3 in Table 3 indicate that executive compensation is higher with variable pay than with a fixed salary only. However, univariate statistics show that total compensation does not increase monotonically with the importance of variable pay. We split the sample into three subgroups of similar size, with low, middle, and high variable compensation, that is, variable pay $\leq 20\%$, $> 20\%$–70%, and $> 70\%$.

Table 6 shows that executives with a share of variable pay exceeding 70% receive significantly *less* total compensation than those executives with medium levels of variable pay (> 20–70%). Hence, the variable pay is related in an inverted U-shape to total salary, while with publicly listed firms, increases in total compensation are mainly associated with higher variable pay (Edmans et al. 2017). We checked whether this finding is driven by specific industries, but observed it in most industries. T-statistics indicate that smaller firms with up to 50 employees, and firms located in northeast regions are more likely than the respective corresponding firms to exhibit variable pay exceeding 70% ($p < 10\%$, not tabulated).

Multivariate regressions in Columns (2) and (4)–(9) in Table 3 explicitly consider the non-monotonic relationship between the share of variable compensation and total executive pay by the variables SH_VAR_COMP and SH_VAR_COMP^2. Both variables are highly significant, and their inclusion substantially enhances the model's explanatory power. Overall, the results lead us to reject a positive association between executive pay in private firms and the extent of variable pay (Research Question 5); instead, we find a non-monotonic relationship.

This latter result is surprising and hard to reconcile with rent extraction theory (Murphy 1999; Bebchuk and Fried 2006) because self-serving and risk-averse managers would prefer fixed to variable pay, and would accept higher levels of variable pay only if total pay increased. Agency theory predicts that executives with higher variable but lower overall pay must be risk-loving rather than risk-averse, and/or that performance measures must be sufficiently precise such that fixed pay becomes negligible and the variable pay mark-up is sufficiently small (Holmström 1979). Stewardship theory (Lin, 2005; Wasserman, 2006) may be more suitable to explain high variable pay with relatively low total pay. Particularly in the case of smaller firms,

[12] We are grateful to an anonymous reviewer for raising this point.

executives might be more intrinsically motivated and pursue the firm's goals rather than their individual objectives. Executives might then be more willing to share the burdens and benefits of varying firm performance with their employees, especially when there are financing constraints and when they are also owners of the firm.

Executive age, family firm status, and the number of owners do not have significant effects on executive pay in our dataset. Even though we observe the highest executive salaries in the services and information/communication sectors, and the lowest in trade (not tabulated), no industry effects are statistically significant at the 10% level in multivariate regressions, which led us to ignore them in some of the analyses. With most regressions, executive pay is higher when a board of directors exists, even when we control for firm size. Furthermore, firms in northern and eastern Germany tend to pay lower salaries. Qualitative results remain robust when we exclude firms from Berlin and from the information & communication sector (see Columns 6 and 7 in Table 3, respectively).

We further tested whether our results are robust when we measure the independent variable TOTAL_COMP_MID by its natural logarithm or in binary terms with a value of 1 if TOTAL_COMP equals or exceeds the median value, and with a value of 0 otherwise. Table 7 shows that the qualitative results remain the same; this also holds with the smaller sample where we have information on $PROFIT_{t-1}$ (not tabulated). The results on firm size and the share of variable pay are stronger than in Table 3 and the negative sign of FEMALE turns significant at the 5% level. Further analysis (not tabulated) also confirms that other control variables including industry dummies are generally not significant at the 10% level.

4.4 Self-selection bias

Survey studies commonly suffer from self-selection concerns (Bengtsson and Hand 2011; Cronqvist and Fahlenbrach 2013). Participation in the survey is voluntary, and thus, results might be driven by the characteristics of firms responding. We may have contributed to some selection because we had to provide some motivation and thus, a certain amount of information on the purpose of the study.

Three considerations led us to conclude that the selection bias did not materially affect our results. First, we designed the survey in the most anonymous way, such that even "worrisome" firms would be willing to respond. Second, our sample is representative regarding the distribution of firm size. Further, we controlled for industry and geographical location and thereby, to some degree, for related selection effects. We also examined whether results remain robust when we exclude firms from Berlin or from the information & communication industry, both of which are overrepresented in the survey sample.

We also conducted a nonresponse analysis by comparing the multivariate regression results (1) between respondents with below-median and above-median response times, (2) between respondents with a below-median and an above-median number of questions that have been responded, and (3) between firms that disclosed their name and those that did not. We assume that respondents who took more time,

responded to fewer questions, and did not disclose their name might be less interested in responding, and are more likely to resemble non-respondents than their counterparts.

Table 8 shows that our findings with regard to variable pay continue to hold for both more and less interested respondents. The FEMALE variable exhibits a significantly negative sign with less interested respondents which suggests that our results on Research Question 4 potentially would be more robust if more non-responding firms participated in the survey. In contrast, the OWNER_MAN variable transpires to be not significant with the groups of less interested respondents which suggests that our results on managerial ownership might be overstated. The results with regard to firm size (≥ 50 EMPL) are less robust than in the full sample, but not materially different between the groups of more and less interested respondents.

5 Summary

This study provides initial evidence on the determinants of executive compensation for small private firms in Germany. We find that executive pay is higher in larger firms and in firms reporting a profit, and it increases when there is a variable pay component. Despite negligible agency problems of equity, executives from about two-thirds of the sample firms receive variable pay. Variable pay may possibly be still important to provide incentives, but also to attract highly qualified executives, thus serving as a screening device (Lazear 2000). It may also be the case that small private firms simply "copy" executive pay patterns from public firms, possibly for legitimization reasons or to keep negotiation costs low.

Remarkably, we find variable pay to be related in an inverted U-shape to total salary. Executive pay is higher, but not robustly related to performance, when executives hold at least 25% of the shares. Furthermore, we find that private firms with female executives pay less, but the pay gap is not robustly significant. The latter two results are novel for private firms.

Our results should be interpreted with caution since we employ survey data implying a self-selection bias. Sample size is relatively small as well. Still, sample firms are fairly representative. Another limitation is that our small sample and the limited publicly available financial and non-financial information about sample firms does not allow to control for reverse causality (Ntim et al., 2015) and other concerns of endogeneity.

Further research could validate our results with a larger set of sample firms, possibly from other European countries as well. We also lack insights about the social processes of executive pay (Perkins and Hendry 2005) in private firms and about the performance measures used for executive compensation.

Appendix A

See Tables 9, 10.

Table 9 Definition of variables

	Definition	Data Source
Survey Data		
TOTAL_COMP	Average total executive compensation before taxes per executive in 2018, categorical variable, reported in compensation intervals. Executive pay includes a fixed salary, bonuses, dividend distributions, and stock grants, but no other components	Survey
TOTAL_COMP_MID	Midpoint in a compensation interval, e.g., for €100,000–200,000, it is €150,000. For compensation > €500,000, we assume €500,000	
TOTAL_COMP_MID2	Midpoint in a compensation interval, e.g., for €100,000–200,000, it is €150,000. For compensation > €500,000, we assume 500,000€. For the €0–100,000 interval, we assume €75,000	
Ln(TOTAL_COMP_MID)	Natural logarithm of TOTAL_COMP_MID	
HIGH_ TOTAL_COMP_ MID	Dummy variable that takes the value of 1 if TOTAL_COMP_MID equals or exceeds the median value, and 0 otherwise	
VAR_COMP	Dummy variable that takes the value of 1 if an executive's compensation contains a performance-based variable component, and 0 if not	Survey
SH_VAR _COMP	Midpoint in a ratio of variable pay to total pay (in %) interval, i.e., 0, 5, 15, 25, 35, 45, 55, 65, 75, 85, 95 (each in %)	Survey
#EMPL	Number of employees in 2018, categorical variable reflecting the interval of number of employees (≤50, 50–100, 100–200, 200–500)	Survey
≥50 EMPL	Dummy variable that takes the value of 1 if the firm had 50 or more employees in 2018, and 0 if not	Survey
OWNER_MAN	Dummy variable that takes the of value 1 if the executive board holds more than 25% of the firm's shares, and 0 if not	Survey
#OWNER	Number of owners in 2018, categorical variable, due to skewness winsorized at the 1% level	Survey
FAM_FIRM	Dummy variable that takes the value of 1 if a family owns the majority (> 50%) of the firm's shares, and 0 if not	Survey
BOARD	Dummy variable that takes the value of 1 if the firm has a board of directors (*Aufsichtsrat, Beirat*), and 0 if not	Survey
FEMALE	Dummy variable that takes the value of 1 if there is at least one woman on the executive board, and 0 if not	Survey

Table 9 (continued)

	Definition	Data Source
AGE	Age of the executive who responded to the survey, categorical variable reflecting the age interval (≤ 30, < 30 –40, < 40–50, < 50–60, > 60)	Survey
NORTH_EAST	Dummy variable that takes the value of 1 if the firm is domiciled in the north (Bremen, Hamburg, Lower Saxony, and Schleswig–Holstein) or east (Berlin, Brandenburg, Mecklenburg-West Pomerania, Saxony, Saxony-Anhalt, and Thuringia), and 0 if not	Survey
Industry dummies	Categorical variable based on industry clusters: 1 – construction, 2 – craft, 3 – other, 4 – information & communication, 5 – manufacturing, 6 – services, 7 – trade	Survey
Financial Data		
ROA_{t-1}	Net income in 2017 divided by lagged total assets, due to skewness winsorized at the 1% level	Dafne, Federal Gazette
$PROFIT_{t-1}$	Dummy variable that takes the value of 1 if the firm disclosed positive net income in 2017, and 0 if not	Dafne, Federal Gazette

Table 10 Correlation table

	TOTAL_ COMP	VAR_ COMP	SH_VAR_ COMP	>50EMPL	OWNER_ MAN (≥25%)	#OWNER	FAM_ FIRM	BOARD	FEMALE	AGE	ROA_{t-1}	$Profit_{t-1}$
TOTAL_ COMP	1	0.28***	0.23**	0.12	0.03	−0.05	−0.07	0.10	−0.07	−0.06	0.21**	0.23**
VAR_COMP	0.25***	1	0.82***	−0.07	0.01	−0.08	−0.07	−0.12	−0.09	−0.02	0.21**	0.22**
SH_VAR_ COMP	0.14**	0.61***	1	-0.05	0.03	-0.07	-0.06	-0.17*	-0.11	-0.05	0.20**	0.16*
>50EMPL	0.22***	−0.03	-0.04	1	−0.28***	−0.03	−0.10	0.26***	0.21**	0.03	0.02	−0.07
OWNER_ MAN	0.09	0.05	0.03	−0.13*	1	−0.34***	0.17*	−0.51***	−0.01	0.01	0.05	−0.07
#OWNER	0.04	0.04	-0.04	0.15**	−0.23***	1	−0.26***	0.30***	0.03	−0.09	−0.23**	−0.10
FAM_FIRM	−0.04	−0.06	-0.01	−0.11	0.11	−0.09	1	−0.25***	0.05	0.07	−0.26***	−0.10
BOARD	0.08	−0.07	-0.11	0.15**	−0.40***	0.28***	−0.22***	1	0.14	−0.05	−0.10	−0.01
FEMALE	−0.08	−0.06	-0.05	0.16**	0.04	0.10	0.21***	0.05	1	0.11	−0.15	−0.12
AGE	0.01	−0.05	-0.08	0.07	−0.04	0.07	−0.00	−0.04	−0.01	1	−0.14	−0.12
ROA_{t-1}	0.01	0.11	0.09	0.08	0.07	−0.09	−0.15*	−0.07	0.01	−0.10	1	0.72***
$Profit_{t-1}$	0.20**	0.19**	0.09	−0.07	−0.09	0.05	−0.08	−0.03	−0.09	−0.10	0.27***	1

Pearson correlation coefficients below the main diagonal, Spearman coefficients above. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. For a definition of variables, see Table 9 in the Appendix A

Appendix B

See Fig. 3.

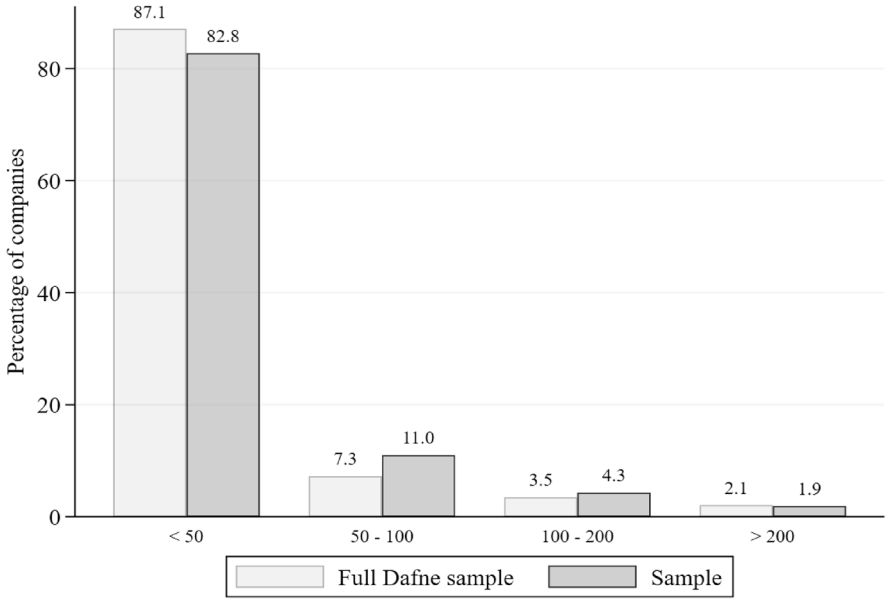

Fig. 3 Distribution of firms with regard to the number of employees in the sample and in the Dafne database

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Author contributions JB contributed to the study conception and design. MK prepared the material and collected the data. AG mainly performed the analysis, partly also MK. The first draft of the manuscript was written by JB and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

References

Adams R, Ferreira D (2009) Women in the boardroom and their impact on governance and performance. J Financ Econ 94(2):291–309

Aguilera RV, Jackson G (2010) Comparative and international corporate governance. Acad Manag Ann 4(1):485–556. https://doi.org/10.1080/19416520.2010.495525

Banghøj J, Gabrielsen G, Petersen C, Plenborg T (2010) Determinants of executive compensation in privately held firms. Accounting and Finance 50(3):481–510

Bar-Yosef S, Augusta CD, Prencipe A (2019) Accounting research on private firms: State of the art and future directions. International Journal of Accounting 54(2):1–75. https://doi.org/10.1142/S1094406019500070

Bebchuk LA, Fried J (2006) Pay without performance: Overview of the issues. Acad Manag Perspect 20(1):5–24. https://doi.org/10.5465/amp.2006.19873407

Beck D, Friedl G, Schäfer P (2020) Executive compensation in Germany. Journal of Business Economics 90:787–824. https://doi.org/10.1007/s11573-020-00978-y

Bengtsson O, Hand JRM (2011) CEO compensation in venture-backed firms. J Bus Ventur 26(4):391–411. https://doi.org/10.1016/j.jbusvent.2009.11.001

Bonacchi M (2019) Organizational structure and earnings quality of private and public firms. Rev Acc Stud 24(3):1066–1113. https://doi.org/10.1007/s11142-019-09495-y

Brunello G, Graziano C, Parigi B (2001) Executive compensation and firm performance in Italy. Int J Ind Organ 19(1–2):133–161. https://doi.org/10.1016/S0167-7187(99)00026-0

Carter ME, Franco F, Gine M (2017) Executive gender pay gaps: The roles of female risk aversion and board representation. Contemp Account Res 34(2):1232–1264. https://doi.org/10.1111/1911-3846.12286

Cieślak K (2018) Agency conflicts, executive compensation regulations and CEO pay-performance sensitivity: Evidence from Sweden. J Manage Governance 22(3):535–563. https://doi.org/10.1007/s10997-018-9410-3

Cole RA, Mehran H (2016) What do we know about executive compensation at small privately held firms? Small Bus Econ 46(2):215–237. https://doi.org/10.1007/s11187-015-9689-2

Conyon MJ, Nicolitsas D (1998) Does the market for top executives work? CEO pay and turnover in small UK Companies. Small Bus Eco. 11(2):145–154. https://doi.org/10.1023/A:1007908520404

Croci E, Gonenc H, Ozkan N (2012) CEO compensation, family control, and institutional investors in continental Europe. J Bank Finance 36(12):3318–3335. https://doi.org/10.1016/j.jbankfin.2012.07.017

Cronqvist H, Fahlenbrach R (2013) CEO contract design: How do strong principals do it? J Financ Econ 108(3):659–674. https://doi.org/10.1016/j.jfineco.2013.01.013

Edmans A, Gabaix X, Jenter D (2017) Executive compensation: A survey of theory and evidence. In: Hermalin BE (ed) The Handbook of the Economics of Corporate Governance. North-Holland, Amsterdam

Elmagrhi MH, Ntim CG, Wang Y, Abdou H, Zalata A (2020) Corporate governance disclosure index-executive pay nexus: the moderating effect of governance mechanisms. Eur Manag Rev 17(1):121–152

Ernst and Young, 2021. Frauen in Führungspositionen im deutschen Mittelstand, Spring 2021.

Fahlenbrach R (2009) Shareholder rights, boards, and CEO compensation. Review of Finance 13(1):81–113. https://doi.org/10.1093/rof/rfn011

Farrell K, Winters D (2008) An analysis of executive compensation in small businesses. The Journal of Entrepreneurial Finance 12(3):1–21

Gallego F, Larrain B (2012) CEO compensation and large shareholders; Evidence from emerging markets. J Comp Econ 40(4):621–642. https://doi.org/10.1016/j.jce.2012.02.003

Gao H, Li K (2015) A comparison of CEO pay–performance sensitivity in privately-held and public firms. J Corp Finan 35:370–388. https://doi.org/10.1016/j.jcorpfin.2015.10.005

Gassen J, Schwedler K (2010) The decision usefulness of financial accounting measurement concepts: Evidence from an online survey of professional investors and their advisors. European Accounting Review 19(3):495–509. https://doi.org/10.1080/09638180.2010.496548

Gomez-Mejia L, Wiseman RM, Dykes BJ (2005) Agency problems in diverse contexts: a global perspective. J Manage Stud 42(7):1507–1517. https://doi.org/10.1111/j.1467-6486.2005.00554.x

Holmström B (1979) Moral hazard and observability. Bell J Econ 10:74–91. https://doi.org/10.2307/3003320

Homroy S, Mukherjee S (2021) The role of employer learning and regulatory interventions in mitigating executive gender pay gap. J Corp Finan. https://doi.org/10.1016/j.jcorpfin.2020.101857
Hope O-K, Vyas D (2017) Private company finance and financial reporting. Account Bus Res 47(5):506–537. https://doi.org/10.1080/00014788.2017.1303963
Jackson R (2013) Private equity and executive compensation. UCLA Law Rev 60(3):638–677
Janakiraman S, Radhakrishnan S, Tsang A (2010) Institutional investors, managerial ownership, and executive compensation. J Acc Audit Financ 25(4):673–707. https://doi.org/10.1177/0148558X1002500409
Jensen MC, Meckling WH (1976) Theory of the firm: managerial behavior, agency costs and ownership structure. J Financ Econ 3(4):305–360. https://doi.org/10.1016/0304-405X(76)90026-X
Jensen MC, Murphy KJ (1990) Performance pay and top-management incentives. J Polit Econ 98(2):225–264. https://doi.org/10.1086/261677
Ke B (2001) Taxes as a determinant of managerial compensation in privately held insurance companies. Account Rev 76(4):655–674. https://doi.org/10.2308/accr.2001.76.4.655
Ke B, Petroni K, Safieddine A (1999) Ownership concentration and sensitivity of executive pay to accounting performance measures: Evidence from publicly and privately-held insurance companies. J Account Econ 28(2):185–209. https://doi.org/10.1016/S0165-4101(99)00021-X
Kulich C, Trojanowski G, Ryan MK, Haslam SA, Renneboog L-D (2011) Who gets the carrot and who gets the stick? Evidence of gender disparities in executive remuneration. Strateg Manag J 32(3):301–321. https://doi.org/10.1002/smj.878
Lazear EP (2000) Performance pay and productivity. American Economic Review 90(5):1346–1361. https://doi.org/10.1257/aer.90.5.1346
Lin YF (2005) Corporate governance, leadership structure and CEO compensation: Evidence from Taiwan. Corp Gov: Int Rev 13(6):824–835
Michiels A, Voordeckers W, Lybaert N, Steijvers T (2012) CEO compensation in private family firms. Fam Bus Rev 26(2):140–160. https://doi.org/10.1177/0894486512454731
Morck R, Shleifer A, Vishny RW (1988) Management ownership and market valuation. J Financ Econ 20:293–315. https://doi.org/10.1016/0304-405X(88)90048-7
Murphy K (1999) Executive compensation. In: Ashenfelter O, Card D (eds) Handbook of Labor Economics. Elsevier
Ntim CG, Lindop S, Osei KA, Thomas DA (2015) Executive compensation, corporate governance and corporate performance: A simultaneous equation approach. Manag Decis Econ 36(12):67–96. https://doi.org/10.1002/mde.2653
Ntim CG, Lindop S, Thomas DA, Abdou H, Opong KK (2019) Executive pay and performance: The moderating effect of CEO power and governance structure. Int J Human Res Manag 30(6):921–963. https://doi.org/10.1080/09585192.2017.1282532
Perkins SJ, Hendry C (2005) Ordering top pay: interpreting the signals. J Manage Stud 42(7):1443–1468. https://doi.org/10.1111/j.1467-6486.2005.00550.x
Sarhan AA, Ntim CG, Al-Najjar B (2019) Board diversity, corporate governance, corporate performance and executive pay. Int J Financ Econ 24(2):761–786. https://doi.org/10.1002/ijfe.1690
Sax LJ, Gilmartin SK, Bryant AN (2003) Assessing response rates and nonresponse bias in web and paper surveys. Res High Educ 44(4):409–432. https://doi.org/10.1023/A:1024232915870
Uhlaner L, Wright M, Huse M (2007) Private firms and corporate governance: An integrated economic and management perspective. Small Bus Econ 29(3):225–241. https://doi.org/10.1007/s11187-006-9032-z
Wasserman N (2006) Stewards, agents, and the founder discount: Executive compensation in new ventures. Acad Manag J 49(5):960–976. https://doi.org/10.5465/amj.2006.22798177
Watson R, Storey DJ, Wynarczyk P, Keasey K, Short H (1994) The remuneration of non-owner managers in small and medium-sized UK enterprises. J Manage Stud 31(4):553–568. https://doi.org/10.1111/j.1467-6486.1994.tb00630.x
Wooldridge JM (2010) Econometric analysis of cross section and panel data (2nd edit). MIT Press, Cambridge, MA