

## **Reading between the lines of the compensation report: Does excessive CEO pay matter?**

### **Abstract**

This paper examines the relationship between the readability of the compensation report and the chief executive officer's (CEO) excessive compensation. Two competing hypotheses are presented. The first is based on the opportunistic view that managers with excessive pay obfuscate executive compensation disclosures. The second is based on legitimacy theory, whereby managers with excessive pay prefer to explain the pay through a more readable compensation report. Based on a sample of UK FTSE 350 firms between 2011 and 2019, we find that the compensation report in cases of excessive CEO pay is more readable in line with the legitimacy theory. The results are driven by CEOs that are overpaid rather than underpaid. We run various robustness tests and found similar results. The findings have implications for regulators and investors who seek to understand the role of compensation in disclosure decisions.

**Keywords:** Compensation, disclosure, readability, corporate governance

**JEL:** G30; J33; M12

*Reflecting on Enron's stunning collapse, Michigan Democrat John Dingell said: "One way to hide a log is to put it in the woods. What we're looking at here is an example of superbly complex financial reports. They didn't have to lie. All they had to do was to obfuscate it with sheer complexity--although they probably lied too." (Maas and Chretien, 2012).*

## 1. Introduction

The complexity of the narrative disclosures of the annual reports has been of interest to academics, policymakers and practitioners due to their importance in revealing and explaining the firm's financial and non-financial performance to shareholders (Bushee et al., 2018; Lee, 2012; Miller, 2010; Rennekamp, 2012; Tan et al., 2014). Another concerning issue for shareholders is that of the firm's executive's compensation, which has been criticised as excessive (e.g., New York Times, 2021). In the UK, the government enacted the 2013 Reforms focusing on executive compensation disclosure and shareholder rights.

The current study uses a recent period in which the 2013 reforms were enacted to empirically investigate whether the readability of firms' compensation reports is associated with excessive compensation. This paper analyses the effect of excess chief executive officer (hereafter, CEO) pay on the readability of compensation reports using a UK FTSE 350 sample between 2011 and 2019. We measure the readability of the compensation report using four readability indices commonly used in prior studies: Flesch Reading Ease, Fog, wordcount and the report's length (Hooghiemstra et al., 2017; Laksmana et al., 2012; Li, 2008).

The UK is a useful setting for studying obfuscation in the context of executive compensation for three important reasons. First, the board of directors is exclusively responsible for preparing the compensation report which suggests that board directors can obfuscate excessive CEO pay by reducing the readability of a compensation report. Second, since introducing the Directors' Remuneration Report Regulations in 2013, compensation reports should include information on a firm's policy on executive compensation and the details of individual executive compensation packages. Although the content of the compensation report is regulated, the 2013 Reforms do not address how the information should be presented. Unlike the US, no 'plain English' rule requires information in reports to be disclosed in a readable fashion in the UK. Directors are given considerable discretion to vary the report's readability level, allowing them to 'obfuscate' excessive CEO pay. Third, the 2013 Reforms, which acts as a backdrop for this study, allow us to focus on a period whereby the reporting environment is expected to be more transparent in terms of compensation information, thus allowing us to test the relationship in a period that does not suffer from lack of disclosure.

Our results show that the compensation report is more readable when CEO pay is excessive. This suggests that the new spirit and direction taken by the UK Government through regulatory changes is useful. This study extends previous work conducted in the US (Hooghiemstra et al.,

2017) and the UK (Lakshmana et al., 2012) by focusing on the compensation report more recently with a more transparent environment. It also contributes to the literature on textual analysis and compensation-related disclosures.

The remainder of the paper is organised as follows. Section 2 reviews prior literature and provides background information on executive compensation disclosure. Section 3 develops our hypotheses. Section 4 discusses the methodology and the empirical model. We present our results and analysis in Section 5, and Section 6 concludes.

## **2. Background and prior literature**

### *2.1. Institutional background*

Corporate UK has long been confronted with the issue of executive compensation. For at least the last two decades, regulation has been introduced to curb executive compensation that sometimes rose faster than firm performance and the average worker pay (Hildyard, 2019). The practice of “reward for failure” has been pointed out by investors and the public pushing regulators to take action in the form of the Greenbury Report (Pettrin, 2015). Historically, disclosure in the compensation report has not been enough to make an informed judgement on the fairness of the rewards vis-à-vis the performance.

In 2013, the UK introduced a new set of reforms to restore a tighter relationship between pay and performance, avoiding rewards for failure and giving more power to shareholders. The 2013 Reforms rely on dual voting rights, a binding vote on the compensation policy and a non-binding vote on the implementation of the compensation policy. Moreover, the 2013 reforms require the inclusion of an annual statement summarising the financial year, a single total figure of compensation for each director and the directors’ compensation policy. The common theme in the compensation-related regulation is that the framework provides what should be disclosed without saying how it should be disclosed. Hooghiemstra et al. (2017) show that the wording of the compensation report is the sole responsibility of the non-executive directors on the board. This suggests that preparers of the compensation report are given discretion over the presentation, wording and readability of the report. As such, the non-executive directors can make an excessive and disproportionate compensation package hard to decipher by affecting the readability of the compensation report.

## *2.2.Theoretical background*

Originally, the concept of readability was first defined by linguistics and communications researchers. The definition of Dale and Chall, (1949) highlighted the importance of not only the information conveyed and the reader's knowledge, but also the structure of the information or the way it is presented to readers. In the context of accounting, readability measures the ability of the reader to decipher the intended message (Loughran and McDonald, 2016). Examining readability is relevant for accounting researchers for multiple reasons. First, readability assesses the quality of the information provided by preparers (Cheung and Lau, 2016). It evaluates the usefulness of information for shareholders and stakeholders. Second, it enables them to rely on the information provided by firms to make decisions, as readability is the ability to integrate and interpret relevant information in their decision making process (Hassanein et al., 2019; Loughran and McDonald, 2016). Third, readability assesses the obfuscation hypothesis and top managers' inherent motivations to produce complex accounting disclosures (Gosselin et al., 2021). Managers might be tempted to distort information through providing complex disclosures. The study of readability may therefore reveal management's attempts to influence users' perceptions.

The extant literature suggests that the disclosure complexity is the result of meso (i.e., firm characteristics, communications), macro (i.e., IFRS, language, country characteristics), and micro (i.e., manager compensation) factors (Gosselin et al., 2021). According to the agency theory, executive pay should reconcile the executives' and shareholders' interests. The interests of the executives and the shareholders can converge if there is enough incentive alignment in the form of compensation policies (Shapiro, 2005). Research suggests that the compensation committee, on behalf of shareholders, can align the interests of the executives and shareholders by designing a compensation contract that is more outcome-based (e.g. bonuses, equity ownership, long term incentive plans) than behaviour-based (e.g. salary) (Eisenhardt, 1989; Shapiro, 2005; Van Puyvelde et al., 2012). Such contracts effectively mitigate the executives' self-interest as the preferences are aligned and the rewards for both parties are contingent on the same decisions. However, studies have shown that executives receive huge pay packages that are hard to explain looking at the related performance (van Essen et al., 2015). Hildyard (2019) shows that while the median FTSE350 CEO pay increased by 82% between 2003 and 2014, the median FTSE-350 company generated no more than a 1% return on invested capital per year.

The presence of executive influence on the compensation committee explains this view. According to the managerial power theory, this influence stems from social and psychological sources like collegiality, team spirit, conflict avoidance mentality, friendship and loyalty (Bebchuk and Fried, 2004). These confer some power to the CEO in the design of their own compensation. As a result, it is not unreasonable to think that due to their power, CEOs could receive excessive pay packages. In cases where sympathetic boards grant CEOs those unjustified pay packages, the boards want to make it less evident in the compensation report. This is because boards are supposed to act in a fiduciary relationship and would not want to be questioned or receive negative publicity that could harm their future employment (Bebchuk and Fried, 2004). Therefore, one way for the compensation boards to satisfy a powerful CEO without alarming the public is to make use of their discretion in reporting compensation matters (Hooghiemstra et al., 2017; Laksmana et al., 2012).

On the other hand, the legitimacy theory simply suggests that managers use annual report content to ensure stakeholders' approval. Firms can maintain or repair their legitimacy by producing readable annual reports to mitigate information asymmetry and narrow the legitimacy gap. Therefore, the legitimacy theory not only focuses on information revelation but also on revealing information that the stakeholders can understand before legitimising the actions of companies. Moreover, the UK Government's new direction for compensation disclosure promotes the improvement of transparency and clarity to enhance communication with shareholders. As such, the combination of societal expectations and regulatory requirements could instil a change in firms' reporting behaviour regarding transparency and clarity.

### *3. Hypothesis development*

Regulators have expressed concern over the convoluted language used in firms' disclosures (Bushee et al., 2018; Loughran and McDonald, 2014). As the use of complex language increases the opaqueness of the disclosure, managers can use complex language to obfuscate the real nature of the firms' performance (Li, 2008) or hide excessively and inappropriate high compensation packages awarded to executives and thus, shareholders may find it hard to decipher all relevant information about the compensation reward process so as to judge the appropriateness of the compensation and ascertain the pay-performance relationship on one hand (Li, 2008). On the other hand, the use of complex language could

simply translate the complexity of the information provided (Bloomfield, 2008; Bushee et al., 2018). Research has shown that shareholders are not concerned about the exorbitant compensation awarded to executives as long as the economic performance justifies such pay (Ferri and Maber, 2013; Hooghiemstra et al., 2017). Therefore, it is not unreasonable to believe that to avoid shareholders' outrage, overpaid executives, through their managerial power, may take advantage of the information asymmetry between them and the shareholders, to manage outsiders' impressions and obfuscate an unjustified compensation package. This could be done by manipulating the readability of the annual compensation report in accordance with the incomplete revelation hypothesis. From the above discussion, we derive the following hypothesis, stated in the alternative form:

*H1a: The compensation report readability is negatively associated with excess CEO compensation.*

Legitimacy theory relies on the assumption that to ensure operations are successful, managers must make their organisations appear to be in conformance with community expectations (Deegan, 2019). Shareholders mostly rely on the compensation reports for all compensation-related details when they are unsure about the acceptability of the CEO package. Because CEO pay packages tend to be complex, processing the information in the compensation reports may require substantial time and effort from shareholders (Buck et al., 2003). Although heuristics could alleviate the complexity faced by shareholders it remains a cumbersome task which ultimately affects say-on-pay voting decisions. Thus, to avoid a huge voting dissent percentage, managers could legitimise their actions to influence public perception and this would result in compensation reports that are easy to read. Moreover, the UK Government's new direction for compensation disclosure promotes the improvement of transparency and clarity to enhance communication with shareholders. As such, the combination of societal expectations and regulatory requirements could instil a change in firm reporting behaviour in terms of transparency and clarity. Considering the above discussion, the following hypothesis is stated in alternative form:

*H1b: The compensation report readability is positively associated with excess CEO compensation.*

## **4. Research design**

### *4.2. Sample selection and data collection*

Our sample period covers nine years, from 2011 to 2019. Our beginning year is selected as talks and consultations about the introduction of the 2013 compensation reporting regulations started in 2011 (Department for Business Innovation & Skills, 2011). Our initial sample comprises the FTSE 350 companies. The FTSE 350 Index which lists companies based on their market capitalisation, represents an appropriate source of data due to its size and the fact that it is a requirement for companies listed on the index to provide a compensation report and executive pay details. In line with prior research, firms in the financial and utility sectors are excluded due to their differences in financial structures and corporate governance rules (Yermack, 1996). Our final sample consists of 198 firms and 941 firm-year observations. Table 1 shows the sample selection criteria, while table 2 shows the sample distribution.

((Table 1))

((Table 2))

In table 2, we can see that the largest number of firms in the sample belong to the industrial sector (30%) followed by consumer service firms (29%) and consumer goods firms (14%). The remaining observations (30%) belong to basic materials, health care, oil and gas, and the technology sectors.

### *4.3. Variable measurement*

#### *4.3.1. Measurement of readability*

The dependent variable for this study is readability scores and we focus on the compensation report rather than the full annual report in line with studies such as Laksmana et al. (2012). The scores are obtained from the Lancaster University's Corporate Financial Information Environment – Final Report Structure Extractor (CFIE-FRSE) desktop application. The application relies on Natural Language Processing (NLP) techniques commonly used in the US to investigate the characteristics of corporate disclosures (El-Haj et al., 2014). From the application, readability metrics such as the Fog score (FOG), the Flesh Reading Ease score (FRES), the wordcount (LENGTH1) and the report length (LENGTH2) of the compensation report are obtained. Table 3 outlines the variables definitions and data sources.

The Fog Index is the most commonly applied readability measure in the literature. The index measures readability by combining the average length of the sentences with the number of complex or big words. Thus, the Fog Index is mathematically obtained as follows:

$$\text{Fog Index (FOG)} = 0.4 (\text{average number of words per sentence} + \text{percentage of complex words})$$

The Fog Index computation returns a grade level estimating the number of formal education years required to understand the text instantly. Hence, lower (higher) values of the Fog Index translate into more (less) readable documents. Li (2008) and Ajina, et al. (2016) provide some interpretation ranges as follows: unreadable if Fog Index >18, difficult if between 14 and 18, ideal if between 12 and 14, acceptable if between 10 and 12 and childish if between 8 and 10.

Just like the Fog Index of readability, the Flesch Reading Ease consists of the average sentence length and the percentage of polysyllabic words (three or more syllables). The mathematical representation is as follows:

$$\text{Flesch Reading Ease score (FRES)} = 206.835 - (1.015 * \text{words per sentence}) - (84.6 * \text{syllables per word})$$

The score obtained is related to reading ease approximately as follows: 90–100 (5th grade); 80–90 (6th grade); 70–80 (7th grade); 60–70 (8th and 9th grade); 50–60 (10th–12th grade); 30–50 (college years); and 0–30 (college graduate) (Lakshmana, et al., 2012). Unlike the Fog Index of readability and most readability indices, the higher the reading score, the easier a piece of text is to read.

The remaining two measures include the number of words in the compensation report (LENGTH1) and the report length i.e. the number of pages (LENGTH2).

#### 4.3.2. Excessive pay

Similar to previous studies, we measure excessive CEO pay (scaled by 1,000,000) using the residuals from a model in which we regress actual CEO pay on several economic determinants (Lakshmana et al., 2012) to disentangle the justified portion of CEO pay and the unexplained portion of CEO pay using the following model:

$$\text{CEOPAY}_{it} = a + \beta_1 \text{FSIZE}_{2it} + \beta_2 \text{MTB}_{it} + \beta_3 \text{ROA}_{it} + \beta_4 \text{BSIZE}_{it} + \beta_5 \text{BIND}_{it} + \beta_6 \text{DUAL}_{it} + \varepsilon_{it} \quad (1)$$



FSIZE2 proxies for firm size and complexity with the natural logarithm of sales at the end of each fiscal year. Growth opportunities are measured by the market-to-book ratio (MTB) computed as the market value of the firm divided by its book value measured at the end of fiscal year. Firm performance is measured using the return on assets at the end of the fiscal year (ROA). Larger firms tend to have more complex operations requiring the expertise of talented and qualified executives who demand huge pay packages. In the same vein, firms with high growth potential tend to be more complex resulting in executives demanding huge pay packages. In accordance with the agency theory, firm performance should be positively related with CEO pay. Yermack (1996) argues that the agency problem is exacerbated when the CEO is also the chairman. Thus, we control for CEO duality (DUAL) using a dummy variable that equals 1 if CEO is chairman and 0 otherwise. When the CEO holds the chairman position, he may influence the remuneration committee into awarding him some unjustified pay packages. On one hand, Yermack (1996) and Core et al. (1999) show that larger boards are less effective. This results from the lack of communication and coordination which negatively affects the decision-making process of the board. On the other hand, it is reasonable to believe that smaller are more prone to CEO influence as there are only a few people to control. Thus, we include board size (BSIZE) defined as the natural logarithm of 1 + the total number of directors on the board. We also include a board independence variable (BIND) defined as the proportion of outside directors as the managerial power theory suggests that non-independent directors should be more loyal to the CEO. It is important that the board be free of any CEO influence so they can appropriately design the pay packages in the best interest of shareholders.

OVERPAID measures the excessive part of a CEO's actual compensation, above the expected compensation level (i.e. a positive residual). We split our sample into overpaid and underpaid sub-samples in further analyses. CEO pay data is collected from Bloomberg.

#### *4.3.3. Control variables*

We include several variables to control for factors that may affect readability. The first is board size following (Nadeem, 2021). We measure board size (BSIZE) as the natural logarithm of 1 + the number of members on the board measured at the end of each fiscal year. The evidence on the board size remains equivocal. We include an auditor attribute dummy variable (BIG4) which equals 1 if the auditor is a Big 4 accounting firm and 0 otherwise. Studies show that big 4 auditors are associated with higher financial reporting quality (Balsam et al., 2003; Nadeem,

2021). We also include CEO duality (DUAL) using a dummy variable that equals 1 if CEO is chairman and 0 otherwise. When the CEO holds the chairman position, he may influence the compensation committee into awarding him some unjustified pay packages. We also include board independence (BIND) defined as the proportion of outside directors as the managerial power theory suggests that non-independent directors should be more loyal to the CEO. It is important that the board be free of any CEO influence so they can appropriately design the pay packages in the best interest of shareholders. We capture firm size (FSIZE1) as a control variable as larger and complex firms generally have longer reports (Li, 2008). Firm size is measured as the natural logarithm of total assets at the end of each fiscal year. Firm complexity (COMPLEX) is measured as the sum of receivables and inventory scaled by total assets. We include capital intensity (CAPINT) measured as the net property, plant, and equipment scaled by total assets and R&D intensity (RDINT) measured as total R&D scaled by total assets following Nadeem (2021). Complex firms tend to have more to say resulting in more complex reports. We also add the market-to-book ratio (MTB), the return on assets (ROA) and the current ratio (CR) defined as the ratio of current assets to current liabilities to represent growth opportunities and firm performance as specified above. Laksmana et al. (2012) argue that there is a negative association between firm age and the information asymmetry. Older firms tend to be more known, resulting in less information asymmetry and a higher probability of a readable compensation report being presented. Thus, we include firm age (FIRMAGE) as a control variable defined as the natural logarithm of 1 + the difference between the fiscal year and the foundation year. We control for leverage (LEV) as research suggests that highly levered firms produce complex reports. Boards can use their discretion to produce complex reports and avoid violating their debt covenants. Leverage is measured as total liabilities divided by total assets.

#### *4.4. Regression model*

We examine the relationship between the readability of the compensation report and management obfuscation using the following regression model:

$$READ_{it} = \alpha + \beta_1 OVERPAID_{it} + \beta_2 UNDERPAID_{it} + \sum \beta_k CONTROLS_{kit} + \varepsilon_{it} \quad (2)$$

The READ variable represents the readability measures. By including both OVERPAID and UNDERPAID variables in the regression model, the study examines the impact of firms with CEO pay above or below the expected pay on the readability of the compensation report. The control variables are as explained in section 4.2.

## 5. Results and analysis

### 5.2. Descriptive statistics

Table 4 presents the descriptive statistics. In the table, we see that the Fog score (FOG) for the average firm in our sample is higher than 18 indicating that an average compensation report is unreadable. Similarly, the mean Flesch score (FRES) of 43, suggesting that the compensation report is, on average difficult to read and mostly understood by at least college graduates. These results are in line with Hooghiemstra et al. (2017) who report a Fog average higher than 17. The median ROA suggests that more than half of the sample firms are profitable which is in line with Hooghiemstra et al. (2017). On average, firms report that 63% of their board members (BIND) are deemed independent which could alleviate CEO power. In the same vein, only 1.4% of the sample firms have a CEO who is also the chair (DUAL). We also report that Big4 accounting firms audit almost all firms in our sample.

((Table 4))

We perform several diagnostic tests which are untabulated. The results of the Breusch–Pagan–Godfrey (BPG) test suggest that heteroscedasticity is not a problem. Multicollinearity diagnostics using Variance Inflation Factor (VIF) indicate no severe multicollinearity.

### 5.3. Main results

We first present the fixed effect regression results when including both the OVERPAID and UNDERPAID variables in the model in Table 5. y including both OVERPAID and UNDERPAID variables in the regression models the study examines the impact of firms with CEO pay above or below the expected pay on the readability of the compensation report. The coefficients of OVERPAID are non-significant for all readability measures. Furthermore, the coefficients of FOG, LENGTH1 and LENGTH2 are negative while the coefficient of FRES is positive. These suggest that firms that overpay their CEOs tend to produce compensation reports that are easy to read and brief. These results contradict those of Hooghiemstra et al. (2017) and Lakshmana et al. (2012) who report a positive association between CEO overpayment and the readability of the compensation report in line with the obfuscation theory. Our results align with the legitimacy theory and hence H1b. Bigger firms (FSIZE1) and firms with bigger growth potential (MTB) produce longer and less readable compensation reports.

This suggests that the increasing number of details presented in the compensation report could confuse the readers.

((Table 5))

Since the main focus is on firms that overpay their CEOs, we rerun the regressions using subsamples of firms that overpay their CEOs in Table 6. The coefficients of OVERPAID are significant when the FOG and FRES are considered as the dependent variable. The coefficient of OVERPAID using FOG is negative while the coefficient of OVERPAID using FRES is positive as expected since higher (lower) values of FOG (FRES) signify a complex compensation report. These results provide evidence that firms that overpay their CEOs do not obfuscate but rather disclose matters openly in compensation reports. This finding is in line with the legitimacy theory and suggests an improvement in transparency and clarity in firms reporting behaviour.

((Table 6))

The results in table 7 focus on the sample that underpay their CEOs. The coefficient on the UNDERPAID variable is not significant in any of the regressions. Therefore, the main results in table 5 are driven by the sample of CEOs that are overpaid.

((Table 7))

## **6. Conclusion**

This paper examines the relationship between the readability of the compensation report section and excessive compensation. Using a UK sample between 2011 and 2019, we find that in the case that CEOs are overpaid, the compensation report is more readable. This aligns with the legitimacy theory and contradicts the previous findings of obfuscation (Hooghiemstra et al., 2017; Laksmana et al., 2012). We use the introduction of the 2013 Reforms as a backdrop to test our hypotheses in a reporting environment that promotes increased transparency and clarity in compensation disclosures.

Our results contribute to the literature by extending previous work (Hooghiemstra et al., 2017; Laksmana et al., 2012) showing the effect of the change in institutional background in the UK on the readability of the compensation report even in case where executive compensation is excessive. Our findings are of relevance to the UK as they relate to the regulatory changes implemented and therefore may not be generalizable.

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Table 1: Sample selection criteria

Description	Number of firms
Initial sample	350
Less:	
Financial and utility firms	112
Less than three years presence on FTSE 350	14
Missing compensation and financial data	16
Missing readability data	10
<b>Final number of Firms</b>	<b>198</b>
<b>Firm-year observations</b>	<b>941</b>

This table explains the sample selection procedure starting from

Table 2: Industry distribution by number of firms

Industry Sector	Number of firms	Firm-year observations	Weight %
Basic Materials	15	69	7.58%
Consumer goods	28	150	14.14%
Consumer services	57	276	28.79%
Health care	16	81	8.08%
Industrials	60	291	30.30%
Oil & Gas	12	53	6.06%
Technology	10	21	5.05%
<b>Total</b>	<b>198</b>	<b>941</b>	<b>100.00%</b>

Table 3: Variable description

Variable	Description
FOG	Fog score obtained from the CFIE-FRSE application
FRES	Flesch Reading Ease score obtained from the CFIE-FRSE application
LENGTH1	The natural logarithm of the remuneration report wordcount obtained from the CFIE-FRSE application
LENGTH2	The natural logarithm of the remuneration report number of pages obtained from the CFIE-FRSE application
CEO PAY	Total awarded pay to CEO in a fiscal year obtained from Bloomberg
OVERPAID	Equal to the residual term from the estimation model of CEO total pay if the residual is positive, and zero otherwise
UNDERPAID	Equal to the absolute value of the residual term from the estimation model of CEO pay if the residual is zero or negative, and zero otherwise
FSIZE2	The natural logarithm of the sales for the fiscal year t
FSIZE1	The natural logarithm of total assets at the end of fiscal year t
MTB	The market value of the firm divided by its book value measured at the end of fiscal year t
ROA	Return on assets measured at the end of fiscal year t
DUAL	Indicator variable equals to 1 if CEO is chairman and 0 otherwise
BSIZE	The natural logarithm of 1 + the total number of directors on the board
BIND	Number of outside directors as a percentage of total executives as of the fiscal year-end
BIG4	Indicator variable which equals 1 if the auditor is a Big 4 accounting firm and 0 otherwise
COMPLEX	The sum of receivables and inventory scaled by total assets
CAPINT	The net property, plant, and equipment scaled by total assets
RDINT	The total R&D scaled by total assets
CR	The ratio of current assets to current liabilities
FIRMAGE	The natural logarithm of 1 + the difference between the fiscal year and the foundation year
LEV	The total liabilities divided by total assets

Table 4: Descriptive statistics

<b>Variables</b>	<b>Mean</b>	<b>St.Dev.</b>	<b>Min</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>	<b>Max</b>
FRES	42.666	4.502	34.962	39.485	42.913	46.297	49.448
FOG	21.214	1.207	19.568	20.209	21.031	22.152	23.326
LENGTH1	9.170	0.342	8.557	8.938	9.213	9.458	9.621
LENGTH2	2.750	0.355	2.079	2.485	2.833	3.045	3.219
OVERPAID	1.100	0.947	0.001	0.309	0.822	1.732	4.727
UNDERPAID	-0.755	0.511	-2.884	-1.072	-0.701	-0.367	-0.003
FSIZE1	7.702	1.237	5.982	6.671	7.568	8.578	9.887
MTB	3.248	2.125	0.841	1.496	2.702	4.452	7.573
ROA	6.444	5.083	-1.357	2.722	5.782	10.119	15.151
BSIZE	2.281	0.162	2.079	2.079	2.303	2.398	2.565
BIND	63.392	11.112	44.444	55.556	63.636	72.727	78.571
COMPLEX	0.363	0.171	0.121	0.218	0.349	0.480	0.663
RDINT	0.011	0.020	0.000	0.000	0.000	0.010	0.062
CAPINT	1.413	0.729	0.536	0.816	1.226	1.874	2.789
CR	1.371	0.605	0.621	0.859	1.267	1.760	2.494
LEV	22.254	14.325	0.544	10.611	22.353	32.202	45.582
FIRMAGE	3.983	0.784	2.833	3.258	3.970	4.710	5.100
BIG4	0.991	0.092	0.000	1.000	1.000	1.000	1.000
DUAL	0.014	0.117	0.000	0.000	0.000	0.000	1.000

Note: Table 3 outlines definitions and data sources for all variables

Table 5: Fixed effect results

VARIABLES	(1) FOG	(2) FRES	(3) LENGTH1	(4) LENGTH2
OVERPAID	-0.052 (0.049)	0.028 (0.018)	-0.011 (0.015)	-0.065 (0.016)
UNDERPAID	0.041 (0.077)	-0.044 (0.029)	-0.013 (0.024)	-0.015 (0.026)
FSIZE1	-0.140 (0.133)	0.321 (0.499)	0.226*** (0.041)	0.235*** (0.044)
MTB	-0.053** (0.026)	0.128 (0.098)	0.018** (0.008)	0.020** (0.009)
ROA	0.010 (0.011)	0.021 (0.039)	-0.010*** (0.003)	-0.008** (0.004)
BSIZE	0.418 (0.368)	-1.474 (1.383)	0.0551 (0.114)	0.131 (0.122)
BIND	0.010** (0.005)	-0.083*** (0.018)	0.007*** (0.001)	0.007*** (0.002)
COMPLEX	0.047 (0.622)	-3.109 (2.338)	-0.277 (0.193)	-0.209 (0.207)
RDINT	-0.453 (7.549)	63.180** (28.380)	-2.265 (2.341)	-3.900 (2.509)
CAPINT	0.227 (0.141)	-1.478*** (0.530)	-0.037 (0.044)	0.010 (0.047)
CR	-0.051 (0.125)	0.352 (0.471)	0.114*** (0.039)	0.090** (0.042)
LEV	0.006 (0.005)	-0.008 (0.019)	0.006 (0.002)	0.001 (0.001)
FIRMAGE	0.887*** (0.264)	-3.060*** (0.993)	0.176** (0.082)	0.131 (0.088)
BIG4	-0.502 (0.374)	2.139 (1.408)	0.265** (0.116)	0.147 (0.124)
DUAL	-0.203 (0.361)	0.539 (1.359)	-0.003 (0.112)	0.008 (0.120)
Constant	17.390*** (1.589)	60.210*** (5.972)	5.910*** (0.493)	-0.532 (0.528)
Observations	941	941	941	941
R-squared	0.037	0.077	0.147	0.135

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Table 3 outlines definitions and data sources for all variables

Table 6: Fixed effect regression results with OVERPAID sample

VARIABLES	(1) FOG	(2) FRES	(3) LENGTH1	(4) LENGTH2
OVERPAID	-0.015** (0.071)	0.067** (0.026)	-0.028 (0.019)	-0.022 (0.021)
FSIZE1	0.250 (0.281)	-0.569 (1.019)	0.164** (0.078)	0.290*** (0.082)
MTB	-0.051 (0.053)	0.185 (0.194)	0.001 (0.014)	0.018 (0.015)
ROA	0.003 (0.019)	-0.009 (0.069)	-0.013** (0.005)	-0.016*** (0.005)
BSIZE	0.303 (0.710)	-1.946 (2.574)	0.083 (0.197)	-0.004 (0.207)
BIND	0.007 (0.010)	-0.048 (0.036)	-0.001 (0.002)	-0.002 (0.002)
COMPLEX	0.672 (1.314)	-3.565 (4.760)	-0.236 (0.364)	-0.394 (0.383)
RDINT	11.050 (20.250)	-15.70 (73.38)	6.360 (5.618)	0.364 (5.902)
CAPINT	0.118 (0.241)	-0.736 (0.872)	-0.105 (0.066)	-0.087 (0.070)
CR	-0.065 (0.238)	-0.237 (0.862)	0.130* (0.066)	0.133* (0.069)
LEV	-0.012 (0.009)	0.00333 (0.0343)	-0.002 (0.002)	-0.002 (0.002)
FIRMAGE	1.879 (1.273)	-11.49** (4.611)	1.399*** (0.353)	1.293*** (0.371)
BIG4	-0.699 (0.704)	9.097*** (2.551)	0.375* (0.195)	0.128 (0.205)
DUAL	-0.372 (0.832)	2.995 (3.015)	-0.014 (0.231)	-0.178 (0.243)
Constant	11.520** (4.929)	92.680*** (17.860)	2.049 (1.367)	-4.405*** (1.436)
Observations	383	383	383	383
R-squared	0.083	0.166	0.209	0.206

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Table 3 outlines definitions and data sources for all variables

Table 7: Fixed effects regression results using UNDERPAID sample

VARIABLES	(1) FOG	(2) FRES	(3) LENGTH1	(4) LENGTH2
UNDERPAID	-0.046 (0.101)	-0.063 (0.391)	-0.053 (0.032)	-0.073 (0.035)
FSIZE1	-0.378* (0.204)	0.553 (0.789)	0.289*** (0.066)	0.265*** (0.070)
MTB	-0.038 (0.037)	0.015 (0.146)	0.037*** (0.012)	0.031** (0.013)
ROA	0.006 (0.015)	0.062 (0.060)	0.001 (0.00498)	0.001 (0.005)
BSIZE	0.847* (0.477)	-2.466 (1.840)	0.105 (0.153)	0.271* (0.164)
BIND	0.006 (0.006)	-0.068*** (0.026)	0.007*** (0.002)	0.007*** (0.002)
COMPLEX	-0.794 (0.823)	-2.584 (3.175)	-0.346 (0.263)	-0.312 (0.282)
RDINT	-6.110 (10.72)	104.2** (41.38)	-4.555 (3.434)	-5.264 (3.679)
CAPINT	0.328 (0.216)	-1.868** (0.833)	0.006 (0.069)	0.063 (0.074)
CR	-0.091 (0.173)	0.548 (0.668)	0.113** (0.055)	0.128** (0.059)
LEV	0.009 (0.007)	-0.006 (0.027)	-0.001 (0.002)	0.001 (0.002)
FIRMAGE	0.860*** (0.285)	-2.958*** (1.099)	0.087 (0.091)	0.038 (0.097)
BIG4	-0.342 (0.474)	0.580 (1.831)	0.241 (0.152)	0.244 (0.163)
DUAL	0.034 (0.494)	0.089 (1.907)	-0.030 (0.158)	-0.005 (0.170)
Constant	18.53*** (2.144)	60.78*** (8.276)	5.517*** (0.687)	-1.019 (0.736)
Observations	558	558	558	558
R-squared	0.048	0.079	0.169	0.166

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Table 3 outlines definitions and data sources for all variables