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## Determinants of CEO compensation in the FTSE100 constituent firms

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**Abstract:** The main objective of this paper is to examine the determinants of CEO compensation in the UK public listed companies. Our analysis, based on the sample drawn from the FTSE100 constituent firms, suggest that firm financial performance measured by return of assets (ROA), influence CEO compensation with the impact being most pronounced for the CEO total compensation. Results further suggest that corporate governance characteristics such as board size and CEO role duality have direct implications for CEO compensation. These attributes, however, differentially determine the various components of CEO compensation. Although the results of this research help to elucidate the importance of corporate outcomes, board attributes and CEO traits in explaining the determinants of CEO compensation in the UK public listed companies, these findings have important economic implications for the corporate sector, regulators, investors, market analysts, academics and the public, which extend beyond the UK market.

**Keywords:** CEO compensation; firm performance; governance mechanisms; FTSE100; UK.

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**Biographical notes:** Tasawar Nawaz's research involves interpretive and positivist dimensions in the areas of inclusive finance, corporate governance and ethics, Islamic banking and finance, socially responsible investment, and third-sector (charity) organisations, among others.

Aoxing Pang reads finance at Plymouth Business School. His research interests include corporate governance, executive compensation and financial markets.

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### 1 Introduction

Spectacular rise in executive compensation in recent years has once again brought the CEO compensation thesis under intense scrutiny (Ozkan, 2011; Mishel and Wilfe, 2019). Anecdotal evidence link CEO compensation to corporate performance outcomes and submit that CEOs collect lucrative compensation packages when firms achieve higher

economic performance (see, Abdalkrim, 2019; Dias et al., 2020; Ozkan, 2011, among others). The relationship between firm performance and CEO compensation is viewed from an agency perspective in which the proponents have argued that, due the separation of ownership and control, attractive compensation is an engaging proxy to mitigate the principal-agent problem (Alchian and Demsetz, 1972; Jensen and Meckling, 1976). Financially well-rewarded agents will strive to work in the best interest of the shareholders as they see their financial interest being aligned with those of the shareholders' wealth maximisation objectives. These theoretical and empirical studies maintain that offering appropriate pay-for-performance compensation for CEO is conducive to healthy economic development.

Earlier research contends that value creation in today's knowledge-intensive economy requires diversified organisational resource i.e. financial, physical and intangible resources (Nawaz et al., 2020) and particular, the human capital (Nawaz, 2019, 2021). Executives such as the CEO and board of directors bring certain human capital resources which when combined with other organisational resources translate into higher economic outcomes. This is in line with the resource dependence theory (Pfeffer and Salancik, 1978), which links executive attributes to the organisational performance and suggests that agents shall be rewarded with attractive compensation packages to avoid the brain drain and to sustain profitability and market share (see, Hillman et al., 2009). Finkelstein and Boyd (1998) stress that board of directors are duty bound to implement a reward system that strategically aligns organisational performance with agents' financial reward. Financial reward is a prodigious motivator. Agency theory tenets argue that when managers do not have sufficient motivation to pursue the long-term value of the enterprise, conflicts of interest will befall. An important solution is to use well-designed compensation contracts to link the interests of managers and shareholders (Gibbons and Murphy, 1990). Despite the theoretical significance, the empirical evidence, including the above-cited studies, have produced mixed results and call for further investigation.

A concurrent literature stream suggests to include the corporate governance features when studying CEO compensation (see, Abdalkrim, 2019). The argument here is that, an efficient governance mechanism erected at the corporate board level will enhance the monitoring function thereby controlling agents' behaviour as well as mitigating the principal-agent problem. Particularly, the board attributes such as the board size is considered as important determinants of CEO compensation (Firth et al., 2006). At the crux of these studies is the argument that corporate boards have the fiduciary responsibility to safeguard the interests of the principals while negotiating contract with the agents (Nawaz, 2020). Compensation is one of the major components of an agent's contract, which is negotiated with the board of directors. Therefore, board of directors have the delegated responsibility to approve CEO compensation and this delegation mechanism has direct implications for CEO compensation. Accordingly, we also analyse how corporate board's delegation mechanism affect CEO compensation.

Besides, the managerial power theory (e.g., Bebchuk and Fried, 2003; Young and Buchholtz, 2002) contends that CEOs disapprove mechanisms that link their compensation to corporate performance outcomes and strive to implement different strategies such as using lower risk and higher flexibility that result in additional benefits for them, i.e. when CEOs assume greater power within the firm, they tend to exercise the bestowed upon power to influence board decisions to break the conditional contract between compensation and firm performance. In support, the empirical evidence submits

that CEO characteristics such as role duality and tenure have direct implications for CEO compensation (e.g., Brick et al., 2006; Kang, 2017).

We build a unique hand-built dataset, belonging to 71 FTSE100 (the Financial Times Stock Exchange 100 Index) non-financial firms, listed on the London Stock Exchange for the period 2011–2018. Our analysis depicts the main determinants of CEO compensation in the FTSE100 firms.

The paper is structured as follows. In Section 2, we discuss the background, related literature and underpinning theoretical frameworks relative to the research hypotheses. Data, sample technique, and research variables are discussed in Section 3. Section 4 provides results and analysis, followed by the discussion in Section 5 while the paper concludes in Section 6.

## **2 Background and development of hypotheses**

### *2.1 Theoretical perspectives*

The agency theory perspective contends that the agents are risk averse, and their interests may conflict with the interests of the principal (see Alchian and Demsetz, 1972; Jensen and Meckling, 1976). The lack of trust between the CEO i.e. agent and shareholders i.e. principals potentially lead to an increase in agency costs. In order to reduce agency costs and conflict of interest between the two parties, the board of directors formulate appropriate compensation contracts for the CEOs to align the interests of the agents with those of the shareholders. Such improved alignment dawns firm performance and maximises shareholder wealth, as well as reward for the CEO (Gomez-Mejia et al., 1987).

On the other hand, resource dependence theory argues that companies rely on resources, and resources and power have a certain connection. By directly linking power and resource dependence, company performance can be improved and shareholder wealth can be maximised (Pfeffer and Salancik, 1978). The theory argues that it is important for the firms to obtain resources normally. The board of directors or the CEO can provide the company with necessary resources through their contacts with the external environment or cooperation with external economic agents (Hillman et al., 2009). The theory further suggests that knowledge, skills, experience, and connections that a CEO or the board members bring to a company have direct implications for corporate outcomes. Relatedly, the management power theory assumes that the greater the power of managers, the more benefits they assume (Bebchuk and Fried, 2003). Young and Buchholtz (2002) note that CEOs pour scorn on mechanisms that link their compensation to firm performance. When CEOs assume power in the company, they tend to exploit their power – by influencing the board of directors – to break the link between compensation and firm performance.

In sum, the aforementioned theoretical frameworks emphasise the importance of agents' in effectively managing the organisation and delivering the ultimate objective, i.e. shareholders' wealth maximisation. Equally, these theoretical perspectives argue for an effective monitoring mechanism essential to control the agents and to keep their interests aligned with the principals.

## 2.2 *Firm performance and CEO compensation*

The relationship between CEO compensation and firm performance is a controversial issue. Previous studies submit mixed evidence on the relationship between CEO compensation and firm performance. For example, Brick et al. (2006) observe that firm performance has a positive impact on CEO compensation whereas Rost and Osterloh (2009) report a negative relationship between firm performance and CEO compensation and Capezio et al. (2011) contend that firm performance has no significant impact on CEO compensation.

Some studies argue that higher compensation is an incentive for executives, which emboldens them work in the best interest of their shareholders by using the available resources at their disposal in an efficient manner. An efficient allocation of organisational resources then translates into increased firm performance. A counter argument is that, higher compensation may reduce executives' efficiency as they find a comfort zone with higher financial reward. Higher compensation gap between executives and employees can potentially reduce firm performance.

Empirically, the relationship between CEO compensation and corporate outcomes such as performance have received widespread attention (Bebchuk and Fried, 2003; Bodolica et al., 2007; Elleuch Hamza and Lourimi, 2014; Firth et al., 2006; Ibrahimy and Ahmad, 2013). Berrone and Gomez-Mejia (2009) studied 469 US firms for the 1997–2003 period and reported a significant positive relationship between firm performance and CEO compensation. Likewise, Fong et al. (2010) tested the hypothesis with 908 US firms for 1990 to 1999 period and found that the CEO's overpayment is related to the growth of company profits (i.e. ROA), implying that firm performance is positively related to CEO compensation. Sun and Cahan (2009) support these claims with the empirical evidence and argue that the higher the firm's financial performance, the higher the CEO compensation.

By contrast, other studies argue that firm performance is not the main determinant of executive compensation. Factors such as weak corporate governance structure, insufficient management experience, agency problems and bureaucracy, can potentially lead up to higher compensation (McConvill, 2005). Yet others warn of the agency problem when determining the best CEO compensation contract and link this to weaker governance mechanisms (Rost and Osterloh, 2009).

The mixed results can largely be attributed to the use of different datasets, sample variations, economic backgrounds, and firm performance proxy measure, among other macro- and micro-economic variations. The observed mixed results call for further investigation into the matter. Based on the above discussions, we extend the following hypotheses.

Hypothesis 1 ( $H_1$ ) There is a significant positive relationship between firm performance and CEO total compensation.

CEOs tend to claim the credits for higher firm performance. Tentatively, CEO may renegotiate their salaries and demand higher increase in salary when they observe higher firm performance. Conversely, it is hard to determine if firm performance is direct result of CEO's effort and not determined by the market forces. Therefore, CEO must not be compensated for short-term firm performance. We explore this relationship further:

Hypothesis 1a (H<sub>1a</sub>) There is a significant relationship between firm performance and CEO salary-based compensation.

Corporate board may consider performance-based bonuses to retain the CEO in the shorter run. Therefore, we expect a positive relationship between firm performance and CEO bonus awards.

Hypothesis 1b (H<sub>1b</sub>) There is a significant positive relationship between firm performance and CEO bonus-based compensation.

### 2.3 *Corporate governance and CEO compensation*

#### 2.3.1 *Board size*

Corporate board is an important determinant of CEO compensation. Given its significance, many researchers have studied the impact of corporate board such as the board size on CEO compensation. Precisely, scholars have studied whether large board size strengthen or weaken corporate governance by controlling CEO power and their remuneration, but there is no consensus on the direction of the relationship (Lin et al., 2014). However, the significance of retaining the human capital is well recognised – both for home and host country – in the literature (see Nawaz, 2017b).

Theoretically, the resource dependence theory argue for larger corporate boards (Forbes and Milliken, 2008). The thesis is that larger boards can strengthen corporate governance by reducing CEO control and increasing board power, which can effectively control CEO's salary or increase the sensitivity of compensation performance (Nawaz, 2017a). Equally, large boards may provide the organisation with more knowledge, skills, expertise and resources. On the other hand, Lin et al. (2014) believes that a large board of directors does not serve significant advantages. The smaller board maintain efficient communication, coordination and decision-making process thus are better for the company's daily operations. Conyon and Peck (1998) explain that coordination problems make it hard for the board to use their skills effectively, which in turn reduces work efficiency. Interestingly, Ozkan (2007) found that due to the inefficiency of large boards, large boards were related to higher CEO salary in the UK. Since we consider listed companies in our sample, corporate boards of listed companies have larger sense of responsibility as their personal reputation is on stake while directing a public listed company. Accordingly, we expect large board to relate negatively with CEO compensation.

Hypothesis 2 (H<sub>2</sub>) There is a significant negative relationship between board size and CEO total compensation.

Hypothesis 2a (H<sub>2a</sub>) There is a significant negative relationship between board size and CEO salary-based compensation.

Hypothesis 2b (H<sub>2b</sub>) There is a significant negative relationship between board size and CEO bonus-based compensation.

#### 2.3.2 *CEO duality*

CEO duality, when the CEO also assumes the role of board's chair, may give rise to conflict of interest as it diminishes supervisory ability of the board of directors (Eklund,

2015; Sarim, 2020). According to the principles of organisation theory, when the CEO leads the board, the company's management can quickly make a unified decision, thereby establishing an effective and clear decision-making process, and improving work efficiency hence, firm performance. However, Bebchuk and Fried (2003) argue that when managers have relatively greater power, compensation is less sensitive to firm performance. When the company has CEO duality, managers will have greater power. According to the management power theory a dual CEO has more power to influence the board's decision on CEO compensation (Capezio et al., 2011). Since role duality entails certain powers to the CEO, we expect a significant positive relationship between CEO role duality and CEO compensation.

Hypothesis 3 (H<sub>3</sub>) There is a significant positive relationship between CEO duality and CEO total compensation.

Hypothesis 3a (H<sub>3a</sub>) There is a significant positive relationship between CEO duality and CEO salary-based compensation.

Hypothesis 3b (H<sub>3b</sub>) There is a significant positive relationship between CEO duality and CEO bonus-based compensation.

### 2.3.3 *CEO tenure*

Another important aspect in determining CEO's compensation is CEO tenure, which refers to the CEO years of experience in the company and experience as a lead executive. Pfeffer and Salancik (1978) interpret the CEO's tenure as CEO's power, because as their tenure in the company increases, their power increases too.

The empirical evidence is mixed. For example, Randoy and Nielsen (2002) report a negative relationship between CEO tenure and CEO compensation in Sweden and Norway whereas Bebchuk and Fried (2003) contend that larger tenured CEOs tend to have more power to set their own salary level and salary structure, and even make their salary independent of firm performance. Cremers and Palia (2011), however, found CEO tenure to relate positively with CEO compensation and CEO overall performance sensitivity. Faulkender and Yang (2010) add to the debate that longer tenured CEOs are better able to control the organisational resources and better equip to allocate these resources into profitable economic activities in an efficient manner. Longer serving CEOs are equally better at running the day-to-day operations of the company, foster decision-making and implementation process, and even have the right to decide their own compensation. With these arguments, we expect a positive relationship between CEO tenure and CEO compensation.

Hypothesis H4 (H<sub>4</sub>) There is a significant positive relationship between CEO tenure and CEO total compensation.

Hypothesis 4a (H<sub>4a</sub>) There is a significant positive relationship between CEO tenure and CEO salary-based compensation.

Hypothesis 4b (H<sub>4b</sub>) There is a significant positive relationship between CEO tenure and CEO bonus-based compensation.

### **3 Data, sample, and research variables**

#### *3.1 Data and sample*

We started data collection by identifying the firms listed on the London Stock Exchange. We excluded financial firms due to different reporting mechanism and revert our focus on the non-financial firms. Our sample consists of 71 firms for the 2011–2018 periods. We hand-collect data on corporate governance from 568 annual reports. We extract financial data from various Bloomberg and DataStream.

#### *3.2 Dependent variables*

Our main variable of interest is the CEO compensation. We use three diverse proxies namely; CEO total compensation, salary-based compensation, and total bonus-based compensation. CEO total compensation consists of salary, long-term bonus, short-term bonus or loyalty bonus, pension compensation, social security, and incentive measures (stock options, stock-based awards, long-term incentive plans or conditional stock awards). Eklund (2015) and Sun and Cahan (2009) contend that CEO total compensation is better proxy because some firms may only have a basic salary without any bonus plan, but they have the power to adjust the CEO total compensation to reward the CEO. Sun and Cahan (2009) recommend the use of logarithmic transformation of the dependent variable as it has two advantages. First, after conversion, the dependent variable is more likely to show a normal distribution, which is also the main assumption of regression analysis. Second, after the conversion, the difference in the level of CEO compensation can be reduced. Therefore, it reduces the influence of heteroscedasticity. Following these recommendations, we transform our dependent variables, using the natural logarithm.

#### *3.3 Independent variables*

Our main independent variables include firm performance, measured by the return of assets (ROA) and corporate governance mechanisms including board size (log of total directors on the board), CEO duality (dummy variable, CEO duality = 1), and CEO tenure (computed in total number of years). We also control for firm-specific control variables, which include firm size (log of total assets), firm risk (beta), variance of a firm's stock price relative to its market portfolio, and institutional ownership (proportion of outstanding shares held by institutional investors) as suggested by the earlier literature (e.g., Bebchuk and Fried, 2003; Eklund, 2015; McCann, 2016; Nawaz et al., 2014, 2020; Nawaz, 2021, among others).

#### *3.4 Descriptive statistics*

Table 1 presents the descriptive statistics and correlation analysis for all the variables included in the analysis. As can be seen in column two of Table 1, our main variable of interest i.e. CEO compensation has a mean value of 15.13, 13.68, and 13.75 for total CEO compensation, CEO salary-based compensation, and CEO bonus-based compensation, respectively. The minimum and maximum values of –9.53 and 32.07 with an average value of 6.81 show the firm profitability trends measured by ROA during the study period.



**Table 1** Descriptive statistics and correlation matrix

	Mean	Std. dev.	Min.	Max.	VIF	CEO comp.	CEO Sal.	CEO bon.	ROA	Board size	CEO duality	CEO tenure	Firm size	Inst. ownership
CEO comp.	15.130	0.777	12.91	17.15		1.000								
CEOSal.	13.681	0.371	12.88	14.67		<i>0.4102</i>								
CEOBon.	13.753	1.247	11.05	15.64		<i>0.2933</i>	<i>0.2323</i>							
ROA	6.813	7.506	-9.53	32.07	1.39	<i>0.0191</i>	<i>-0.2514</i>	<i>-0.1039</i>						
Board size	10.776	2.260	6	17	2.43	<i>0.3601</i>	<i>0.3782</i>	<i>-0.2699</i>						
CEO duality	0.011	0.106	0	1	1.03	<i>0.0289</i>	<i>-0.0104</i>	<i>0.0613</i>	<i>-0.0328</i>	<i>0.0047</i>				
CEO tenure	5.050	4.403	0.17	24.58	1.88	<i>0.1065</i>	<i>-0.1515</i>	<i>0.0267</i>	<i>0.1203</i>	<i>0.0633</i>	<i>0.0478</i>			
Firm size	9.757	1.966	5.85	14.69	1.31	<i>0.4033</i>	<i>0.2197</i>	<i>0.2348</i>	<i>-0.2811</i>	<i>0.645</i>	<i>-0.0569</i>	<i>-0.1427</i>		
Inst. ownership	90.101	21.829	40.59	138.19	1.26	<i>-0.2826</i>	<i>-0.2933</i>	<i>-0.1299</i>	<i>-0.006</i>	<i>-0.3549</i>	<i>0.0277</i>	<i>-0.0929</i>	<i>-0.3198</i>	
Beta (risk)	1.049	5.024	-12.93	15.73	1.05	<i>0.0242</i>	<i>0.0931</i>	<i>0.0143</i>	<i>-0.0703</i>	<i>0.0478</i>	<i>0.0357</i>	<i>-0.0354</i>	<i>0.0944</i>	<i>0.0325</i>

Notes: Research variables are defined as follows:

*Dependent variables:* we use three proxy measures for CEO compensation. (1) CEOComp. is the log of total CEO compensation, (2) CEOSal. is the log of total CEO salary, and (3) CEOBon. is the log of total CEO bonuses.

*Independent variable:* firm performance is the main independent variable, measure by the return on assets (ROA).

*Corporate governance attributes:* Board size is the log of total directors on the board, CEO duality is a dummy variable that takes the value of 1 if the CEO assumes dual role i.e. CEO and chair of the board, and zero otherwise, and CEO tenure is computed in total number of years.

*Firm control variables:* Firm size is computed as the log of total short- and long-term assets, Beta (risk) is the variance of a firm's stock price relative to its market portfolio, and Institutional ownership is the sum of total proportion of outstanding shares held by institutions to total outstanding shares.

No. of observations = 421.

Variables significant at  $p < 0.05$  and  $p < 0.01$  are in italics.

Turing to corporate governance features, it can be seen that the minimum board size is 6 while the maximum board size is 17 with an average of 10.78 board size. Interestingly, only frictions of the sampled companies have CEO role duality with an average 5.05 CEO-tenure. Finally, focusing on the firm-related control variables, the average values for firm size, institutional ownership and firm risk i.e. beta are 9.76, 90.10, and 1.05, respectively.

The correlation matrix is illustrated in columns 7 to 17 in Table I. The analysis suggests no major issue of multicollinearity. To ensure that there is no multicollinearity in our models, we conduct the variance inflation factors (VIFs) test. Results are reported in column six of Table 1. As can be seen, the maximum value for a VIF score is 2.43 for board size whereas the minimum VIF score is 1.03 for CEO role duality. These results show that the observed values are lower than the conventional value of 10, which confirms that the multicollinearity does not exist in our models.

## 4 Analysis and results

### 4.1 Econometric modelling

We use various versions of the following three equations to analyse the determinants of CEO compensation. Independent variables remain consistent across all models whereas the dependent variables changes in each of the listed models.

#### 4.1.1 Model 1: CEO total compensation

$$\begin{aligned} CEOComp. = & \alpha + \beta_1 ROA + \beta_2 Board\text{-}size + \beta_3 CEO\text{-}duality + \beta_4 CEO\text{-}tenure \\ & + \beta_5 Firm\text{-}size + \beta_6 Institutional\text{-}ownership + \beta_7 Beta + \varepsilon \end{aligned}$$

#### 4.1.2 Model 2: CEO salary-based compensation

$$\begin{aligned} CEOSal. = & \alpha + \beta_1 ROA + \beta_2 Board\text{-}size + \beta_3 CEO\text{-}duality + \beta_4 CEO\text{-}tenure \\ & + \beta_5 Firm\text{-}size + \beta_6 Institutional\text{-}ownership + \beta_7 Beta + \varepsilon \end{aligned}$$

#### 4.1.3 Model 3: CEO bonus-based compensation

$$\begin{aligned} CEOBon. = & \alpha + \beta_1 ROA + \beta_2 Board\text{-}size + \beta_3 CEO\text{-}duality + \beta_4 CEO\text{-}tenure \\ & + \beta_5 Firm\text{-}size + \beta_6 Institutional\text{-}ownership + \beta_7 Beta + \varepsilon \end{aligned}$$

### 4.2 Firm performance and CEO total compensation

We first present regression results, in Table 2, extracted using Model 1 in which the dependent variable is total CEO compensation. It can be seen that R-squared is 0.275, which means that 27.5% of the independent variable can explain the change in total compensation. The adjusted R-squared is 0.266, which shows that the model fits well. In addition, the F statistics is 29.516, and the p-value is less than 0.05, which indicates that the relationship between the variables in the model is clear and highly significant. The results show that the coefficient of firm performance (ROA) is 0.024, and the p-value is

0.000 less than 0.05, suggesting with 99% confidence that firm performance has a significant and positive impact on CEO total compensation. Thus, we accept our hypothesis (H<sub>1</sub>) for CEO total compensation.

**Table 2** The impact of firm performance on CEO total compensation

<i>Coefficients</i>				
<i>Model</i>	<i>Unstandardised coefficients</i>		<i>t-ratio</i>	<i>Significant</i>
	<i>B</i>	<i>Std. error</i>		
1 (Constant)	12.928	0.255	50.68	0.000***
ROA	0.024	0.004	6.092	0.000***
Board size	0.038	0.015	2.494	0.013**
CEO duality	0.5	0.24	2.075	0.038**
CEO tenure	0.02	0.006	3.335	0.001***
Firm size	0.164	0.02	8.29	0.000***
Inst. ownership	-0.003	0.001	-2.476	0.014**
Beta	0.002	0.005	0.373	0.709
<i>Model summary</i>				
R <sup>2</sup>				0.275
Adjusted R <sup>2</sup>				0.266
F-Stat.				29.516
F-Significant				0.000***
Dependent Variable: CEO total compensation (CEOComp)				
Predictors: (Constant), ROA, Board-size, CEO-duality, CEO-tenure, Firm-size, Inst. ownership, and Beta.				

Note: Robust t-statistics in parentheses\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.

The analysis suggests diverse relationships between corporate governance variables and CEO compensation. The coefficient of board size is 0.038, and the p-value is 0.013, it is less than 0.05, suggesting that board size has a significant positive impact on CEO total compensation. Thus, we reject hypothesis (H<sub>2</sub>) that larger board related negatively with CEO total compensation. The coefficient of CEO duality is 0.500 with the p-value 0.038 lower than 0.05, suggesting a significant positive relationship between CEO role duality and CEO total compensation. The results provide support for hypothesis (H<sub>3</sub>). The coefficient for CEO-tenure is 0.020 with the p-value of 0.001, which is less than 0.05. Thus, hypothesis (H<sub>4</sub>) that there is a significant positive relationship between CEO tenure and CEO total compensation is accepted.

As for firm-specific control variables *viz.* firm size, institutional ownership, and risk, the coefficient of firm size is 0.164 with the p-value 0.000, which shows that there is a significant and positive relationship between firm size and CEO total compensation. Similarly, the coefficient of institutional ownership is -0.003, and the p-value is 0.014, it is less than 0.05, so institutional ownership has a significant and negative impact on CEO total compensation. Lastly, the coefficient for beta is 0.002, but the p-value of beta is 0.709 higher than 0.05, there is no significant relationship between risk and CEO total compensation.

### 4.3 Firm performance and CEO salary-based compensation

Next, we use Model 2 with total salary-based compensation as the dependent variable. Results reported in Table 3 show that the R-squared for the model is 0.45; meaning 45% of the independent variable can explain the change in total compensation. The adjusted R-squared is 0.5, which shows that the model fits well. In addition, the F statistic is 65.01, and the p-value is less than 0.05, which indicates that the relationship between the variables in the model is clear and highly significant. It can be seen that firm performance (ROA) with a 0.0004 coefficient value and the p-value is 0.792, suggest no statistically significant relationship between ROA and CEO total salary. Thus, we do not have enough statistically significant support to accept or reject hypothesis (H<sub>1a</sub>).

**Table 3** The impact of firm performance on CEO salary-based compensation

<i>Coefficients</i>				
<i>Model</i>	<i>Unstandardised coefficients</i>		<i>t-ratio</i>	<i>Significant</i>
	<i>B</i>	<i>Std. error</i>		
2 (Constant)	12.595	0.105	119.2	0.000***
ROA	0.0004	0.002	0.263	0.792
Board size	0.027	0.006	4.227	0.000***
CEO duality	0.124	0.099	1.25	0.212
CEO tenure	-0.009	0.002	-3.771	0.000***
Firm size	0.082	0.008	9.968	0.000***
Inst. ownership	-0.002	0.001	-2.999	0.003***
Beta	0.005	0.002	2.038	0.042**
<i>Model summary</i>				
R <sup>2</sup>				0.45
Adjusted R <sup>2</sup>				0.5
F-Stat.				65.01
F-Significant				0.000***
Dependent variable: CEO total salary (CEOSal.)				
Predictors: (Constant), ROA, Board-size, CEO-duality, CEO-tenure, Firm-size, Inst. ownership, and Beta.				

Note: Robust t-statistics in parentheses\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.

The coefficient of board size is 0.027 with the p-value is 0.000, suggest a significant positive relationship between board size and CEO total salary, rejecting hypothesis (H<sub>2a</sub>). CEO role duality has a coefficient 0.124 with the p-value of 0.212, suggesting no statistically significant relationship between CEO duality and CEO total salary. Thus, there is not enough statistical support to accept or reject hypothesis (H<sub>3a</sub>). CEO tenure has a coefficient value of -0.009 with the p-value of 0.000, suggesting a significant negative relationship between CEO tenure and CEO total salary, rejecting hypothesis (H<sub>4a</sub>).

For the firm-specific control variables, the coefficient of firm size is 0.082 with the p-value 0.000, suggesting a statistical significant positive relationship between firm size and CEO total salary. On the other hand, the coefficient for institutional ownership is -0.002 with the p-value of 0.003, suggest a significant negative relationship with CEO

total salary. Third, firm risk or beta has coefficient value of 0.005 with the p-value of 0.042, suggesting a significant positive relationship between risk and CEO total salary.

#### 4.4 Firm performance and CEO bonus-based compensation

Finally, we test the relationship between firm performance and CEO bonus-based compensation, using Model 3. Results reported in Table 4 show that the R-squared is 0.076, which means that 7.6% of the independent variable can explain the change in total compensation. The adjusted R-squared is 0.063, which shows that the model does fit well. In addition, the F-statistic is 5.860, and the p-value is 0.000 less than 0.05, which indicates that the relationship between the variables in the model is clear and highly significant. The results show that the coefficient of firm performance (ROA) is  $-0.003$ , and the p-value is 0.668 higher than 0.05, suggesting that firm performance has no significant impact on CEO bonus compensation. Thus, we do not have enough statistically significant support to accept or reject hypothesis ( $H_{1b}$ ).

**Table 4** The impact of firm performance on CEO bonus-based compensation

Model	Coefficients			
	Unstandardised coefficients		t-ratio	Significant
	B	Std. error		
3 (Constant)	12.209	0.493	24.76	0.000***
ROA	-0.003	0.008	-0.429	0.668
Board size	0.053	0.029	1.838	0.066*
CEO duality	0.913	0.463	1.971	0.049**
CEO tenure	0.009	0.012	0.753	0.451
Firm size	0.09	0.039	2.326	0.020**
Inst. ownership	-0.002	0.002	-0.871	0.384
Beta	0.001	0.01	0.13	0.9
<i>Model summary</i>				
R <sup>2</sup>				0.076
Adjusted R <sup>2</sup>				0.063
F-Stat.				5.86
F-Significant				0.000***
Dependent variable: Total bonus compensation (CEOBon.)				
Predictors: (Constant), ROA, Board-size, CEO-duality, CEO-tenure, Firm-size, Inst. ownership, and Beta				

Note: Robust t-statistics in parentheses\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1.

The coefficient of board size is 0.053 with the p-value is 0.066, suggest a significant positive relationship between board size and CEO bonus award, rejecting hypothesis ( $H_{2b}$ ). CEO role duality has a coefficient 0.913 with the p-value of 0.049, suggesting a statistically significant positive relationship between CEO duality and CEO bonus compensation. Thus, we accept hypothesis ( $H_{3b}$ ). CEO tenure has a coefficient value of 0.009 with the p-value of 0.451, suggesting no significant relationship between CEO

tenure and CEO bonus compensation. Therefore, we do not have enough statistical support for hypothesis (H<sub>4b</sub>).

For the firm-specific control variables, the coefficient of firm size is 0.090 with the p-value 0.020, suggesting a statistically significant positive relationship between firm size and CEO bonus compensation. The coefficient for institutional ownership is -0.002 with the p-value of 0.384, suggesting no statistically significant relationship with CEO bonus compensation. Lastly, the coefficient for beta is 0.001 with the p-value of 0.900, suggesting no statistically significant relationship with CEO bonus compensation.

## 5 Discussion

The empirical analysis suggest various attributes as the determinants of CEO compensation i.e. CEO total compensation, CEO salary-based compensation, and CEO bonus-based compensation.

The statistically significant positive relationship between firm performance and CEO total compensation supplement earlier studies (e.g., Brick et al., 2006; Berrone and Gomez-Mejia, 2009). Equally, our results strengthen the argument that CEOs' compensation is directly linked with organisational outcomes such as the firm's financial performance, supporting earlier research (e.g., Abdalkrim, 2019; Dias et al., 2020; Firth et al., 2006; Ozkan, 2011, among others). These results further add to the debate that agency conflict is mitigated by aligning the agents' i.e. CEOs' economic interests with those of the shareholders, thereby extenuating the agency problem. Financial reward is a great motivator for the agents. Our results suggest that, financially well-rewarded agents are better motivated to maximise shareholders' wealth as they seek a slack for themselves thus; such CEOs strive to achieve higher profitability.

In addition to the CEO total compensation, we also test for the CEO salary- and bonus-based compensation in our analysis. Our analysis does not provide strong and statistically significant results to support the claims that firm performance is linked to CEO salary-based compensation or bonus-based compensation.

As for the corporate governance mechanisms, we anticipated a negative relationship between board size and CEO total compensation, arguing that larger board will perform additional scrutiny when compensating the agents, i.e. CEOs based on the corporate performance. Equally, forming a consensus on critical issues such as the CEO compensation is challenging in larger boards and at times, it is hard to get consent of the majority. Our results are consistent across three proxies of CEO compensation. However, these results are contrary to our theorising as the analysis suggests that larger boards tend to reward the CEO when the corporate achieve higher performance outcomes. These results however lend support to the earlier research (e.g., Ozkan, 2007; Lin et al., 2014).

Results for the CEO role duality and CEO compensation are strong for CEO total compensation and CEO bonus-based compensation however; we did to find any statistical support for the CEO salary-based compensation. Nonetheless, the consistent results across two compensation proxy measures support our hypotheses that powerful CEOs i.e. when the CEO also lead the board, are highly rewarded when the firm performs well. These results add new insights and supplement the existing theoretical and empirical studies such as Eklund (2015). Similarly, the analysis suggests that long-tenured CEOs tend to have higher total compensation but lower salary-based compensation. Our results are consistent with the earlier literature (e.g., Cremers and

Palia, 2011). Longer serving CEOs develop their authority over the board as they gain internal knowledge related to the organisational resources, culture, internal efficiencies which are essential to implement any strategy, therefore, they are in a better position to negotiate a good financial deal i.e. compensation for themselves.

Among firm-related control variables, firm size has a statistically significant positive relationship with CEO compensation across all three models. The consistency in results suggests that larger corporations provide higher compensation to their agents, suggesting that larger companies offer higher financial rewards to their agents. Similarly, our analysis suggests that firms dominated by institutional investors tend to pay lower CEO compensation both, CEO total compensation and salary-based compensation. These results provide divergent insights to the earlier research such as Su et al. (2010), who found a U-shaped relationship between institutional ownership and CEO compensation. Our result that as institutional ownership increases, CEO compensation decreases. This is largely explained by the fact that institutional shareholders have larger say in the strategic planning concerning human capital resources and agency costs and CEO compensation is one of the main agency cost and a crucial decision for the corporate board, which institutional shareholders have direct influence on.

Lastly, we did not find strong statistical support for the corporate risk or beta, which is consistent with the earlier research such as Eklund (2015). The only significant result is for CEO salary-based compensation in which beta relates positively with CEO compensation, suggesting that CEOs are compensated if their strategies pertaining to corporate risk bring positive financial results. Complexed firms may face diversified risks. Such firms need higher executive skills to assess and mitigate those risks in order to remain competitive and profitable in the market, therefore, such firms tend to pay higher salary to attract and or retain the required executive talents.

## 6 Conclusions

The main objective of this paper is to examine the determinants of CEO compensation in the UK public listed companies. We draw our sample from the FTSE100 non-financial firms for the 2011–2018 period. We use three diversified proxies namely CEO total compensation, CEO salary-based compensation and CEO bonus-based compensation, to measure CEO compensation as the dependent variable. Similarly, we include independent variables *viz.* firm performance, measured by the ROA, corporate governance variables (i.e. board size, CEO role duality, and CEO tenure), and firm-related control variables such as firm size, institutional ownership, and corporate risk i.e. beta.

Our analysis suggests that CEO compensation is largely determined by firm performance i.e. higher financial returns (ROA) results in higher CEO compensation. Thus, we concluded that firms included in our analysis consider a pay-for-performance mechanism when formulating the CEO compensation packages. These results provide new empirical evidence and supplement the ongoing theoretical debate that pay-for-performance is an engaging proxy to mitigate the principal-agent problem (Alchian and Demsetz, 1972; Jensen and Meckling, 1976). Likewise, our results add new insights to the existing empirical literature (Abdalkrim, 2019; Dias et al., 2020; Ozkan, 2011) indorsing the argument that corporate performance is one of the main determinants of CEO compensation packages.

Additionally, our analysis suggests that large boards determine CEO compensation in the publically listed UK firms. Our finds are consistent with the earlier research e.g. Ozkan (2007, 2011). Similarly, we find that powerful CEOs such as CEOs who also lead the corporate board and longer serving CEOs receive higher compensation. Our results add new insights to the growing literature, which argues that CEOs with strong organisational positions such as role duality receive higher compensation compared to their counterparts (see, Brick et al., 2006; Kang, 2017; Lin et al., 2014).

Furthermore, our analysis suggests that larger firms tend to pay higher CEO compensation. However, we report that firms dominated by the institutional investors tend to pay lessor CEO compensation i.e. higher institutional ownership is negatively related to CEO compensation, these results provide an opposing view to the earlier findings of Croci et al. (2012), who found a positive relationship between institutional ownership and levels of CEO compensation. These results merit further investigation. A suggestive avenue for future research is to consider the institutional investors' and block equity shareholders' representation at the corporate board level and their impact of CEO compensation as block equity holders have direct implications for the level of CEO compensation (Croci et al., 2012; Su et al., 2010).

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