Executive bonus compensation and financial leverage: do growth and executive ownership matter?

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Abstract

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Purpose: This study examines the impact of executive bonus compensation on a firm's financial leverage policy and the extent to which this compensation–leverage relation is moderated by firm growth and executive ownership.

Design/method/approach: Using data from 213 non-financial and non-utility UK FTSE 350 firms for the period 2007-2015, generating a total of 1,784 firm-year observations, panel econometric methods are employed to test our model.

Findings: Drawing insights from agency theoretic view, we uncover that managerial cash bonus compensation is negatively and significantly related to financial leverage. However, stock bonus compensation has a positive and significant impact on leverage. We also observe that compensation–leverage is moderated by both firm growth and executive ownership. Our results remain robust to alternative econometric models.

Originality/value: While this paper builds on the risk-motivated argument of executive bonus compensation literature, it is the first – to the best of our knowledge – to explore the bonus compensation-corporate financial leverage and, particularly, examine the extent to which firm growth and corporate executive ownership matter in this relationship.

Keywords: Executive bonus compensation; leverage; UK.

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1. Introduction

Executive compensation has garnered a great deal of attention from both academics and non-academics. This narrative stems in part from flaws in various corporate compensation practices which were revealed following the 2007-2008 global financial crisis. It is therefore not surprising that shareholder votes on executive compensation have been introduced in several countries within Europe (see e.g. Ferri and Maber, 2013). Broadly, prior scholarly work suggests that executive bonus compensation can be used as a tool in aligning the interests of corporate managers with those of shareholders (Balafas and Florackis, 2014; Kaplan and Rauh, 2010; Ortiz-Molina, 2007). Indeed, effective bonus compensation policies, such as incentive-based pay, could persuade firm executives to employ costly effort to enhance the future growth opportunities of their firms, thereby eliminating the agency conflicts between managers and shareholders, and this eventually creates shareholder value. Accordingly, the agency problem between corporate managers and shareholders is minimised through optimal compensation incentives (Balafas and Florackis, 2014; Grout and Zalewska, 2010; Ortiz-Molina, 2007; Jensen and Meckling, 1976). Notwithstanding the growing theoretical and empirical interest in executive bonus compensation, our understanding of the strategic implication of executive bonus compensation is far from complete. Results from prior scholarly advances have been mixed and unclear. Thus, in this study, we examine the influence of both cash bonus compensation and stock bonus compensation on a firm's financial leverage policy by using panel data of 213 non-financial and non-utility UK FTSE 350 firms for the period 2007-2015. Examining these executive bonus compensations on firm capital structure decision is important because it provides important insight into how top management incentives affect firms' key strategic decision – capital structure decision. Further, we seek to understand the extent to which the executive bonus compensation–leverage relation is conditional on firm growth and executive ownership. In the UK, a series of corporate governance reforms have been initiated to curb lavish executive bonus compensations (Cho *et al.*, 2019; Conyon *et al.*, 2001). In spite of these reforms, excessive executive bonus is regarded as one of the main factors that led to the collapse of many UK institutions during the 2007-2008 financial crisis (von Ehrlich and Radulescu, 2017). Thus, the UK presents a unique context for testing how executive bonus compensation drives a firm's financial leverage policy

By way of preview, the evidence obtained in this study shows that executive cash bonus compensation negatively impacts firm leverage. This suggests that incentives for executives to adopt excessive financial leverage are lessened through the adoption of cash bonus. In effect,

executives with cash bonus incentives are motivated to generate enough cash flow which enables the firm to sponsor corporate activities with internally generated funds. Thus, this reduces the likelihood of bankruptcy conflict as a result of less usage of debt within the capital structure of the firm. However, our analysis reveals that executives' stock bonus compensation has a positive and significant influence on a firm's financial leverage. This suggests that stock–based bonus induces executives to allow greater debt levels in the capital structure of their firms. Also, we find that growth opportunity negatively moderates both cash bonus compensation–leverage and stock bonus compensation–leverage relationships. Further, we observe that executive ownership negatively moderates the stock-based bonus–leverage relationship. This suggests that stock-motivated executives with large ownership stakes prefer to keep a lower leverage ratio in the firm's capital structure to minimise their personal and economic risks resulting from the firm's possible bankruptcy risk (Grossman and Hart, 1982). Additionally, because debtholders and other lenders are likely to monitor and restrain managerial activities, stock-incentivised executives with more ownership stakes may have an opportune incentive to lower debt levels to prevent external control (Brailsford *et al*., 2002). Indeed, we conduct several tests to ascertain the robustness of our results. First, we measure both executive cash and stock bonus compensations by using alternative proxies. Second, in addition to OLS estimation, we use the fixed effects model to deal with time-invariant covariates. Finally, we address the issue of endogeneity and reverse causality by using both predicted model approach and three-stage least squares (3SLS) estimations. Our results remain robust to all these tests and alternative estimations used to analyse the data.

We make primary contributions to the literature in the following ways. First, we contribute to the literature on financial leverage (e.g. Danso *et al*., 2019; Chen *et al*., 2010; Zhang and Kanazaki, 2007) and also that examining the executive bonus compensation-corporate policy nexus (e.g. Haque and Ntim, 2020; Chu *et al*., 2020; Zhang *et al*., 2019; Kini and Williams, 2012; Lin *et al*., 2011). While this paper builds on the executive bonus compensation literature, it is the first – to the best of our knowledge – to explore the bonus compensation-corporate financial leverage and, particularly, examine the extent to which firm growth and executive ownership matter in this relationship with specific emphasis on UK FTSE 350 firms. Our second contribution stems from the role of firm growth opportunity in the bonus compensation-financial leverage relationship. Here, we demonstrate the significant role of a firm-level characteristic in explaining the bonus compensation-leverage relationship. Our third contribution is in relation to the moderating role of executive ownership. Here, we demonstrate that executive ownership is crucial in curtailing or

lowering a firm's use of financial leverage. As executives' residual interests increase, they become conscious of the firm's idiosyncratic risk, and hence decrease the leverage level, which is suggestive of managerial opportunism (Brailsford *et al.*, 2002). Thus, stock-motivated executives with higher ownership stakes tend to lower the firm's bankruptcy probability.

The remainder of the article is structured along these lines: section 2 reviews related literature. Section 3 considers data and empirical methods. Section 4 presents and discusses results, and, finally, section 5 concludes.

2. Literature review

From the agency theoretic view, corporate top executives are often portrayed in the literature as being self-interested and risk-averse (Jensen and Meckling, 1976; Fama, 1980; Shleifer and Vishny, 1989). Motivated by their risk aversion, executives are likely to have an incentive to make less risky decisions that pose minimal risk exposure to their interests. An executive's risk-related incentive may have important implications for optimal corporate policies and the ultimate value for risk-neutral shareholders. For example, a risk-averse executive may fail to sponsor a valuable investment project with debt because an increase in a firm's leverage exacerbates financial distress and possible bankruptcy risks, which the executive would prefer to avoid. This is because such a policy may potentially amplify his/her personal and economic risks (Jensen and Meckling, 1976). Anticipating this, shareholders may design executives' bonus compensation in such a way that it can influence executives to make value-enhancing decisions (Coles *et al.*, 2006; Kini and Williams, 2012). Stemming from this, literature suggests that stock-based bonus compensation rather than cash-based bonus compensation gives executives the correct incentive to maximise firm value by reducing the executives' risk-related incentive problem (Jensen and Murphy, 1990). This is because, by rewarding risk-averse executives with stock-based bonus compensation, they bear part of the costs of their actions, which in turn causes them to optimally borrow to sponsor corporate activities, particularly when internal sources are insufficient. In contrast, cash bonus compensation incentives discourage executives' risk-taking appetite (Coles *et al.*, 2006; Berger *et al.*, 1997). This is unsurprising, given that, by keeping a firm's leverage below the optimal level, the firm is likely to generate excess cash flow, albeit lower interest payment, thereby making it easy for shareholders to apply more cash bonuses to reward executives. Consistent with this view, John and John (1993)

contend that firms with lower leverage are likely to safeguard bondholders' interests, which can lead to lower future costs of debt finance. Broadly speaking, the distinctive nature of bonus compensation components poses different risk-related incentives to executives and this in turn influences how they make corporate decisions (Cassell *et al*., 2012; Kini and Williams, 2012).

In a related manner, Kabir *et al*. (2013) further broaden the discussion on executive bonus compensations by investigating how different compensation components affect a firm's cost of debt. Their evidence shows that CEOs' pension benefit and cash bonus compensation decrease bond yield spread while stock options increase cost of debt. They conclude that bondholders are fully aware of both risk-taking and risk-avoiding incentives created by these components of executive compensation. Along the same lines, Cassell *et al*. (2012) observe that CEOs with more inside debt compensation (defined as pension benefits and restricted incentives) display lower levels of risk-seeking behaviour. They make this suggestion after their empirical findings reveal that executives with large inside debt holdings prefer investment and financial policies that are less risky. Kim *et al*. (2011) also suggest that chief financial officer's (CFO's) stock options compensation is more sensitive to the firm's stock market crash risk and that the relationship is more pronounced for those firms with a high level of financial leverage. Kini and Williams (2012) make a further extension by suggesting that senior executives with stock-based compensation carry out more risky firm activities to increase their chance of promotion to the rank of CEO.

Along similar lines, Ryan and Wiggins (2001) argue that shareholders of firms with growth opportunities tend to reward executives with more stock-based and less cash-based compensation to influence them to embark on quality corporate policies. This outcome is echoed in the work of Humphery-Jenner *et al*. (2016) which posits that shareholders of growth-potential firms use more stock-based bonus compensation to exploit executive overconfidence incentives. In the same vein, Core *et al*. (1999) observe an increasing relationship between firm growth opportunities and executive compensation.

Relatedly, the literature further indicates that, in firms where executives own large stakes, shareholders use less incentive compensation to align their interests with those executives (Core *et al*., 1999; Ryan and Wiggins, 2001; Hartzell and Starks, 2003). Other authors also suggest that executives with large ownership stakes can easily influence the firm's board to gain higher salaries and bonuses (Cheung *et al*., 2005; Weisbach, 2007) and that these executives are more likely to pursue policies that suit their own interests (Gormley and Matsa, 2016; Brick *et al*., 2012). For

instance, Gormley and Matsa (2016) observe that executives' incentive to play it safe increases when they hold large stakes in the firm and one avenue they often adopt is to lower the firm's risk (Florackis and Ozkan, 2009; Berger *et al*., 1997). Clearly, based on this evidence, it is plausible that executive ownership may dynamically interact with executive bonus compensation to affect corporate policies.

Indeed, despite the various theoretical and empirical explanations reviewed above, we have little understanding of the effects of executive bonus compensation on firm leverage policy as results from prior scholarly advances have been mainly mixed and unclear. Thus, we seek to shed light on this and the extent to which this relationship is dynamically affected by the firm's growth opportunity and executive ownership.

3. Method

3.1. Data

We use data from UK FTSE 350 firms spanning 2007 to 2015. Specifically, the dataset was obtained from two sources: we manually collected data on top three executives' (CEO – chief executive officer, CFO – chief financial officer and COO – chief operating officer) compensation (i.e. salary, cash bonus and stock bonus), executives' ownership stakes, and other corporate governance variables (large stakeholders and non-executives' ownership) from the firms' annual reports, whilst accounting and financial data were sourced from the COMPUSTAT database. Further, because firms operating in financial and utility industries tend to have different capital structures and often face other regulatory constraints which may implicitly affect executives' decisions, we excluded these firms from our analysis (see Coles *et al*., 2006; Chava and Purnanandam, 2010; Kini and William, 2012). Thus, we based our analysis on a total number of 1,784 firm-year observations for 213 firms operating in nine industries over a nine-year period. The choice of the sample period was driven by the availability of the dataset.

3.2. Measurement of variables

3.2.1. Dependent variable – financial leverage

Financial leverage (LEV) was used as our dependent variable. This variable was measured as the ratio of total book value of debt to the book value of total assets (Coles *et al*., 2006; Florackis and Ozkan, 2009; Chava and Purnanandam, 2010).

3.2.2. Independent variables

Two independent variables are tested in this study. These are cash bonus compensation (*CB*) and stock bonus compensation (*SB*). Consistent with Kabir *et al*. (2013), we measure the cash bonus compensation (CB) variable as annual cash bonus scaled by total sales, whilst the stock bonus compensation variable is measured as the sum values of performance stock and deferred stock (*DS*) scaled by total sales. As an alternative measure for robustness check, we scaled each bonus compensation component, cash bonus compensation (*CB2*) and stock bonus compensation (*SB2*), by total compensation (defined as the sum of annual salary, cash bonus and stock bonus). This is consistent with prior works (Kabir *et al*., 2013; Kini and Williams, 2012; Coles *et al*., 2006).

3.2.3. Control variables

Also, we accounted for the following control variables: salary (*SAL*), measured as annual salary scaled by total sales; natural logarithm of total sales to proxy for firm size (*SZ*); growth opportunities, defined as market value of assets to book value of assets to proxy for growth (*GR*); return on assets (*ROA*), defined as EBITDA scaled by total assets; stock return, which shows the firm's annual stock return (*STKR*) over the fiscal year; cash holdings (*CH*), defined as cash and cash equivalence scaled by total assets; cash flow (*CF*), defined as free cash flow scaled by total assets; financial distress (Z-score, ZSC), to proxy for probability of bankruptcy; tangibility, defined as net investment in property, plant and equipment (*TAN*); and research and development (*R&D*), measured as R&D expenses scaled by total assets. Again, our model also accounted for executives' ownership (*EO*), measured as percentage of stock ownership held by executives. This is because a firm's shareholders tend to consider executives' ownership levels when designing executives' compensation incentives (Ryan and Wiggins, 2001; Core *et al*., 1999). Other governance variables were also included in our models: large shareholders' ownership (*LO*), measured as percentage of equity ownership greater than 3%; and non-executive ownership (*NEO*), measured as the percentage of non-executives' ownership. The inclusion of governance variables is in the spirit of prior works (e.g. Florackis and Ozkan, 2009; Ryan and Wiggins, 2001; Core *et al*., 1999). The acronyms and definitions of all the variables are provided in Table I.

[Table I about here]

3.3. Model specification

In this section, we model the empirical relationship between executive bonus compensation and financial leverage. Specifically, we employed the following Ordinary Least Squares (OLS) regression model:

$$LEV_{it} = \alpha + \beta_1 CB_{it} + \beta_2 SB_{it} + \beta_3 X_{it} + \varepsilon_{it} \quad \ldots\ldots (1)$$

In equation (1), *LEV* is the financial leverage, while *CB* and *SB* are executives' cash bonus compensation and stock bonus compensation and X_{it} (control variables) respectively. Definitions of all the variables are provided in Table I. In estimating equation (1), we initially use an OLS regression approach where independent variables are lagged by one year to minimise the potential reverse causality problem. In equation 2, we estimate the fixed effects (FE) model as an alternative specification for robustness checks.

$$LEV_{it} = \alpha + \beta_1 CB_{it} + \beta_2 SB_{it} + \beta_3 X_{it} + \theta_i + \delta_t + \mu_{it} \quad \ldots\ldots (2)$$

Further, in equations 3 and 4, we also adopt a predicted model approach and a simultaneous system of equations (using 3SLS) technique respectively, to account for possible endogeneity issues (Kini and Williams, 2012; Coles *et al.*, 2012; Coles *et al.*, 2006).

We set up our predicted model as follows: in eq. (3i) and (3ii) we regress lagged cash bonus (CB_{it}) and/or stock bonus (SB_{it}) on their determinants (i.e. controls as defined in Table I) to obtain predicted values for each bonus component which is then included in the leverage equation (i.e. 3iii).

$$CB_{i,t-1} = \alpha + \beta X_{i,t} + \varepsilon_{i,t} \quad \ldots\ldots (3i)$$

$$SB_{i,t-1} = \alpha + \beta X_{i,t} + \varepsilon_{i,t} \quad \ldots\ldots (3ii)$$

$$LEV_{i,t} = \alpha predictedCB_t + \alpha predictedSB_t + \beta X_{i,t} + \varepsilon_{i,t} \quad \text{(3iii)}$$

Also, our simultaneous systems of equations model is presented as follows:

$$CB_{i,t} = \alpha + \beta LEV_{i,t} + \beta IV_{i,t} + \beta X_{i,t} + \varepsilon_{i,t} \quad \text{(4i)}$$

$$SB_{i,t} = \alpha + \beta LEV_{i,t} + \beta IV_{i,t} + \beta X_{i,t} + \varepsilon_{i,t} \quad \text{(4ii)}$$

$$LEV_{i,t} = \alpha CB_t + \alpha SB_t + \beta X_{i,t} + \varepsilon_{i,t} \quad \text{(4iii)}$$

In the first stage, equations (4i) and (4ii), we include leverage (*LEV*), instrumental variable (*IV)* for each bonus model (CB_{it} - *industry-median cash bonus and SBit* – industry-median stock bonus) together with other controls. Also, we simultaneously account for each bonus component in the respective first-stage equations. Again, the obtained predicted values for each bonus component are then included in the leverage equation (4iii).

[Tables 2 & 3 about here]

4. Results and discussion

4.1. Summary statistics and bivariate correlations

In Table II, we present the summary statistics of the variables used in this study. A few findings are worth pointing out. The average value of cash bonus compensation (*CB*) is 0.59 and has a standard deviation of 21.14. This variable has a minimum value of 0.00 and a maximum value of 116.91, signifying a high degree of heterogeneity, while stock bonus (*SB*) mean (standard deviation) is 1.57 (54.54) with 0.00 and 357.45 for minimum and maximum respectively. Also, the average value of leverage (*LEV*) is 0.29. This variable has minimum and maximum values of 0.00 and 2.71 respectively. This low leverage figure may reflect the fact that the investigated firms are mainly equity financed.

In Table III, we present the correlation between all the variables used in this study. In general, the evidence obtained from the correlation matrix, as well as the descriptive statistics, suggests that our

sample does not seem to suffer from any serious issues such as multicollinearity, limited variation and heterogeneity or large outliers.

4.2. Univariate analysis

Table IV shows univariate mean and standard deviation comparisons of the variables used by leverage quartiles. To perform this, we segregated firms into quartiles based on their leverage levels and tested whether variable characteristics differ across low-leverage (1st quartile) and high-leverage (4th quartile) levels. The mean of salary in low-leverage firms is lower than that in high-leverage firms while the mean of cash bonus compensation (*CB*) in low-leverage firms is lower than that in high-leverage firms. For the cash bonus, it is plausible to argue that high cash bonus firms are likely to be more profitable and that they are likely to attract the confidence of debt market, hence higher leverage level. However, the mean differences marginally missed out on significance. The mean of stock bonus compensation (*SB*) in low-leverage firms is lower than that in high-leverage firms, implying that more stock bonus executives use a higher leverage ratio.

Moreover, the findings on other firm characteristics are largely consistent with most of the extant literature (Florackis and Ozkan, 2009; Antoniou *et al*., 2008). For instance, Florackis and Ozkan (2009) show that low-leverage firms normally have lower tangible assets (*TAN*), higher performance (return on assets – *ROA* and stock return – *STKR*), higher cash holdings (*CH*), higher cash flow (*CF*) and higher growth (*GR*) than high-leverage firms. Again, it is also observed that low-leverage firms usually have larger R&D spending than high-leverage ones. The reported mean differences are all significant.

The table further revealed that the mean values of executive ownership and large shareholders in low-leverage firms are higher than that of high-leverage ones, implying that managers and large shareholders become risk-cautious as their residual interests go up (Florackis and Ozkan, 2009).

In brief, the univariate analysis shows how cash bonus and stock bonus compensation and other firm characteristics behave across different leverage levels.

[Table IV about here]

4.3. The effect of executive bonus compensation on leverage

In Table V, we present the empirical results of our baseline regression model of the effect of cash bonus (*CB*) and stock bonus (*SB*) compensations on leverage (*LEV*). We employ two main estimation methods in testing our model: ordinary least squares (OLS) and fixed effects. Our main results are based on OLS models: 1, 3 & 5, while models 2, 4 & 6 (alternative specification – FE) are used for robustness purposes. Specifically, Model 1 shows that the relationship between cash bonus compensation (*CB*) and financial leverage (*LEV*) is negative and statistically significant at the 1% level. The coefficient estimate for this variable is -0.310 and has a t-statistics of -2.13, suggesting that an increase in cash bonus compensation (*CB*) is associated with lower firm leverage. This finding supports the assertion that shareholders' usage of earning-based cash bonus compensation induces executives' risk-reduction incentive, leading to lower firm leverage (Coles *et al*., 2006; Harris and Raviv, 1979). With regard to stock bonus compensation (*SB*) in Model 3, the coefficient estimate is positive and statistically significant. Specifically, the coefficient is 0.792 (t-statistics 2.06), implying that higher stock bonus (*SB*) compensation influences executives' risk-taking incentive to increase firm leverage, which supports Kini and Williams' (2012) contention. Our results remain qualitatively similar across the FE models. Moreover, in models 5 and 6, we include both cash bonus (*CB*) and stock bonus (*SB*) compensation and our results further collaborate what is already reported in models 1 - 4.

Turning to the control variables, salary (*SAL*) is positive and significant, suggesting that executives show less risk-averse behaviour as their salary increases. This is unsurprising because salary forms the base pay upon which compensation from other risk-related bonuses largely depends. Cash flow (*CF*), asset tangibility (*TAN*), executive ownership (*EO*) and non-executive ownership (*NEO*) are positive and significant, whilst growth (*GR*), stock return (STKR), cash holdings (*CH*) and bankruptcy risk (*ZSC*) are significantly negative.

[Table V about here]

4.4. Robustness checks

Our results presented in Table V show that both cash bonus (*CB*) and stock bonus (*SB*) compensations differently affect firm financial leverage. In this section, we further test if indeed our results are robust to alternative measures of our independent variables and different econometric

specifications. We begin with Table VI, where we use alternative measures of our independent variables. Specifically, we measure our alternative independent variables (*CB2* and *SB2*) as cash bonus compensation scaled by total compensation (i.e. *CB2*), and also *SB2* as stock bonus compensation scaled by total compensation. We observe that the coefficient estimates on cash bonus compensation (*CB2*) and stock bonus compensation (*SB2*) are qualitatively similar to the main results in Table V.

Further, in Table VII, we again re-estimate our model using the predicted approach. In this method, the lagged of each compensation bonus variable (i.e. lagged *CB* and *SB*) is first regressed on the determinants (variables are defined in Table I) to obtain predicted cash bonus (*CB*) and stock bonus (*SB*) compensation values, and then the predicted values are included in the leverage model, similar to Coles *et al*. (2006). As shown, the predicted model reports a cash bonus (predicted *CB*) sign that is still negative, while stock bonus compensation (predicted SB) shows a positive sign; both results are similar to our main results reported in Table V.

Furthermore, despite our attempt to deal with the endogeneity problem by employing different specifications, fixed effects (FE) and predicted models, the issue of direct causation is still a major concern, as we note there are hypotheses that suggest leverage drives a firm's compensation policy (Duru *et al*., 2005; Ryan and Wiggins, 2001). For instance, it is argued that shareholders of a high-leverage firm tend to structure executives' compensation to include more cash bonuses and fewer stock bonuses in an attempt to reduce executives' risk-taking activities (Duru *et al*., 2005; John and John, 1993). Also, high-growth firms often tend to use more stock bonus and less cash bonus compensation to reward managers (Guay, 1999), while firms with high cash reserves are likely to reward managers with more cash bonuses and fewer stock-based ones (Core and Guay, 1999). These intuitive arguments are likely to complicate the direct causation of executives' compensation on leverage. Thus, to further account for the possibility that leverage and executive compensation are simultaneously determined, we estimate simultaneous systems of equations in which the jointly determined variables – leverage, cash bonus and stock bonus compensations – are simultaneously estimated. In the simultaneous systems of equations, the first-stage equation, i.e. each compensation component (*CB/SB*), is regressed on leverage, instruments and other determinants (i.e. controls defined in Table I) to obtain the predicted values of bonus compensations (*CB, SB*), and is then included in the second-stage equation, i.e. the leverage model. Consistent with other empirical studies (e.g. Coles *et al*., 2006; Kini and Williams, 2012), we use contemporaneous values of cash bonus and/or stock bonus compensation variable instead of lagged values. Again, our findings

obtained in Table VII (simultaneous systems of equations – 3SLS) show that the signs of the coefficient of the independent variables *CB* and *SB* remain qualitatively similar to the results already reported in Table V. In short, the 3SLS results suggest that our earlier findings are not plagued by endogeneity problems and that the main results reported in Table V are robust to an alternative econometric specification.

[Tables VI & VII about here]

4.5. Executive compensation and leverage – the role of growth

The evidence presented above suggests that executives' bonus compensation impacts on firm leverage policy. However, literature suggests that firms with more growth potential tend to use less cash bonus but more stock bonus compensation to incentivise executives (Guay, 1999; Ryan and Wiggins, 2001). Thus, in this section, we examine the role of firm growth in the executives' bonus compensation–leverage relationship. We follow existing studies (e.g. Florackis and Ozkan, 2009; Coles *et al*., 2006) and use market-to-book as our measure of firm growth (*GR*). The growth variable (GR) is interacted with both cash bonus and stock bonus compensation (*CB* and *SB*) and then they are included in our regression models. The results of this analysis are presented in Table VIII (models 1 and 2). The results reveal that the estimated coefficient on the interaction term (*CB x GR*) is negative and statistically significant. This finding suggests that, ceteris paribus, executives of growth-opportunity firms with cash bonus compensation tend to decrease firm leverage. Also, we observe that the interaction term for *SB x GR* is negative and significant. A possible explanation could be that, as executives receive more stock bonus (*SB*) compensation in a growth firm, they become worried about their increased residual interests and are likely to lower the firm's risky borrowings in an attempt to safeguard these residual interests (Berger *et al*., 1997; Brounen *et al*., 2006; Florackis and Ozkan, 2009). Therefore, this makes it financially prudent for stock-motivated executives in such growth-opportunity firms to sponsor corporate activities with equity finance rather than debt (leverage) finance.

4.6. Executive compensation and leverage – the role of executive ownership

The key motive of compensation is to induce executives to increase firm value by selecting optimal policies including leverage (e.g. Kini and Williams, 2012; Coles *et al*., 2006). That is, through

compensation, executives and shareholders' interests are properly aligned. The literature further indicates that, in firms where executives own large stakes, shareholders use less incentive compensation to align their interests with those executives (Ryan and Wiggins, 2001; Hartzell and Starks, 2003). Others also argue that executives with large ownership stakes can easily influence the board for higher salaries and bonuses (Cheung *et al.*, 2005; Weisbach, 2007) and that such executives are more likely to pursue policies that suit their own interests (Gormley and Matsa, 2016; Brick, Palmon and Wald, 2012). For instance, Gormley and Matsa (2016) observe that executives' incentive to play it safe increases when they hold large stakes in the firm and one avenue they can adopt is to lower the firm's risk via lower leverage (Florackis and Ozkan, 2009; Berger *et al.*, 1997). Based on the above argument, in this section, we examine the extent to which executive ownership moderates the executive bonus compensation–leverage relationship. Specifically, we construct executive's ownership variable (*EO*) as the percentage of stock ownership held by executives (defined in Table I) (Florackis and Ozkan, 2009; Ryan and Wiggins, 2001). We interact the executive ownership (*EO*) variable with the independent variables (cash bonus – *CB* x *EO* and stock bonus – *SB* x *EO*) and include them in our regression model. The results of this are presented in models 3 and 4 of Table VIII. We find the coefficient of *CB x EO* is negative but statistically insignificant, whilst in Model 4 we observe that the interaction term (*SB x EO)* is negative and it is both economically and statistically significant *(coefficient -4.835 t-statistics 5.00)*. This suggests that stock-motivated executives with large ownership stakes may prefer to keep a lower leverage ratio in the firm's books. This is not surprising, given that, if the firm has a higher leverage ratio, this risks executives' private incentives associated with their undiversified shareholdings or ownership, thus they have incentives to reduce leverage as their holdings increase. Another possible legitimate explanation is that, if an executive has a large ownership stake, this may lead to an increase in the executive's opportunism, and hence decreased debt levels (Brailsford *et al.*, 2002). This evidence is suggestive of executives' risk preference effect, where they play it safe to protect their private interests (Gormley and Matsa, 2016).

[Table VIII about here]

5. Conclusion and implications

In this paper, we examine how executive bonus compensation affects firm financial leverage policy and the extent to which this relationship is conditional on firm growth and executive ownership. We observe that the executives' cash bonus compensation–leverage relationship is negative and significant across all our models, while executive stock bonus compensation shows a positive effect on leverage. Significantly, the results are robust to all our adopted econometric specifications, including three-stage least squares (3SLS), which accounts for the simultaneous determination of executive compensation and the firm's leverage policy. From the theoretical perspective, our results offer support for the risk-related argument under the optimal compensation theory (Coles *et al.*, 2006; Kini and Williams, 2012). Further, our study shows that both a firm's growth and its executive ownership matter in this compensation–leverage linkage. Beyond the theoretical perspective, the results show that executive cash bonus can assist firms to reduce leverage. This finding is particularly crucial for firms in mitigating the probability of bankruptcy. That is, for firms to reduce excessive financial leverage, this study shows that executive cash bonus compensation cannot be ignored.

Notwithstanding these useful findings, there are a few limitations worth noting. First, our study is based on UK FTSE 350 firms. Although the UK shares many characteristics with other developed economies, this is not enough to provide a basis for the generalisation of our findings. It is important to point out that there are certain institutional differences across different economies. There is a possibility that the executive compensation bonuses–financial leverage relationship might differ from other developed contexts. Thus, future studies can offer further insight by extending our findings to both emerging and developed economies. Future studies may also consider whether the 2007-2008 financial crisis matters in this executive compensation–financial leverage relationship. Also, comparison of studies along industrial lines can be carried out to understand how the executive bonus compensation–financial policies relationship matters across different industries.

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Table I: Description of variables

Dependent Variable	**Description**	**Literature**
Leverage (*LEV*)	Long-term debt plus short-term debt scaled by total assets	Danso *et al*. (2019), Coles *et al*. (2006), Chava and Purnanandam, (2010)
Independent variable		
Cash bonus (*CB*)	Cash bonus compensation scaled by total sales	Kabir *et al*. (2013)
Stock bonus (*SB*)	Stock bonus compensation scaled by total sales	Kabir *et al*. (2013)
Cash bonus (*CB2*)	Cash bonus scaled by total compensation	Kabir *et al*. (2013), Coles *et al*. (2006)
Stock bonus (*SB2*)	Stock bonus scaled by total compensation	Kabir *et al*. (2013), Coles *et al*. (2006).
Salary (*SAL*)	Salary scaled by total sales	Kabir *et al*. (2013), Kabir *et al*. (2013).
Salary (*SAL2*)	Salary scaled by total compensation	Kabir *et al*. (2013), Coles *et al*. (2006).
Total compensation	Sum of salary, cash bonus and stock bonus	Kabir *et al*. (2013), Coles *et al*. (2006).
Control variables		
Firm size (SZ)	Natural logarithm of total sales	Coles *et al*. (2006)
Growth (*GR*)	[Total Assets – Book Equity + Market Equity] / total assets	Floarackis *et al*. 2009; Chava and Purnanandam, 2010
Firm performance (*ROA*)	EBITDA scaled by total assets	Lartey *et al*. (2020), Florackis *et al*. (2009), Coles *et al*. (2006), Firth, Fung and Rui, (2006)
Annual stock return (*STKR*)	Annual stock return	Coles *et al*. (2006)
Cash holdings (*CH*)	Cash and cash equivalence scaled by total assets	
Cash flow (*CF*)	Free cash flow scaled by total assets	Coles *et al*. (2006)
Research and development (*R&D*)	R&D expense scaled by total assets	Coles *et al*. (2006); Ryan and Wiggins, (2001)
Asset tangibility (*TAN*)	Net Property, Plant and Equipment / Total assets	Coles *et al*. (2006); Chava and Purnanandam, (2010)
Altman's z-score (*ZSC*)	[3.3 (EBIT / Total Assets) + 1.0 (Sales / Total Assets) + 1.4 (Retained Profits / Total Assets) + 1.2 (Working Capital / total assets)]	Chava and Purnanandam (2010)
Executives' ownership (%) (*EO*)	Total annual shareholdings of the three executives (CEO, CFO and Chief operating officer) divided by the firm's total common shareholdings	Florackis *et al*. (2009), Ryan and Wiggins (2001), Core *et al*. (1999)
Non-executives' ownership (%) *NEO*)	Total annual shareholdings of non-executive directors divided by the firm's total common shareholding	Mehran (1995)
Large ownership % (*LO*)	Total shareholdings of large owners (defined as ownership above 3%) scaled by the total number of common shareholdings	Florackis *et al*. (2009), Ryan and Wiggins, (2001), Core *et al*. (1999)

Table II: Descriptive statistics

	Mean	St. Dev.	Min	Maxi	25%	50%	75%	N
LEV	0.29	0.22	0.00	2.71	0.14	0.25	0.38	1606
CB	0.59	21.14	0.00	116.91	0.00	0.00	0.00	1748
SB	1.57	54.54	0.00	357.45	0.00	0.00	0.00	1748
SAL	1.13	38.84	0.00	268.18	0.00	0.00	0.00	1748
CB2	0.21	0.14	0.00	0.89	0.12	0.20	0.28	1748
SB2	0.45	0.21	0.00	0.98	0.34	0.48	0.59	1748
SAL2	0.34	0.18	0.00	1.00	0.23	0.31	0.41	1748
SZ	9.02	0.87	0.00	11.51	8.60	8.99	9.47	1675
GR	4.66	1.95	0.00	8.15	1.08	1.52	2.35	1746
ROA	0.10	0.19	-3.92	2.83	0.05	0.09	0.14	1712
STKR	0.06	0.49	-5.46	2.85	-0.13	0.09	0.30	1675
CH	0.09	0.10	0.00	0.74	0.03	0.06	0.12	1669
CF	0.14	0.19	-3.91	2.86	0.09	0.13	0.19	1647
R&D	0.01	0.03	-0.30	0.41	0.00	0.00	0.00	1743
TAN	0.24	0.23	0.00	0.94	0.05	0.17	0.37	1664
ZSC	1.52	1.24	-13.66	16.92	0.90	1.46	2.04	1740
EO	0.05	0.22	0.00	6.06	0.00	0.00	0.01	1720
NEO	0.02	0.11	0.00	3.51	0.00	0.00	0.00	1697
LO	39.82	18.94	3.00	97.80	25.34	38.17	52.22	1708
N	1748							

This table presents the descriptive statistics for the entire data used for the study. The sample comprises 213 UK FTSE 350 firms over the period 2007 to 2015. The variable descriptions are provided in Table I above.

Table III: Correlation matrix

	LEV	CB	SB	SAL	CB2	SB2	SAL2	SZ	GR	ROA	STKR	CH	CF	R&D	TAN	ZSC	EO	NEO	LO
LEV	1.00																		
CB	0.12*	1.00																	
SB	0.12*	1.00*	1.00																
SAL	0.12*	1.00*	1.00*	1.00															
CB2	-0.04	-0.01	-0.01	-0.01	1.00														
SB2	-0.04	0.00	0.00	0.00	-0.54*	1.00													
SAL2	0.08*	0.00	-0.00	0.00	-0.10*	-0.74*	1.00												
SZ	-0.28*	-0.17*	-0.18*	-0.18*	-0.15*	0.34*	-0.26*	1.00											
GR	0.02	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.20*	1.00										
ROA	-0.39*	-0.01	-0.02	-0.02	-0.05	0.06	-0.05	0.03	0.01	1.00									
STKR	-0.11*	0.03	0.03	0.02	0.12*	0.01	-0.09*	-0.02	0.02	0.24*	1.00								
CH	-0.17*	-0.02	0.00	-0.02	0.16*	-0.15*	0.01	-0.17*	0.07*	0.11*	0.00	1.00							
CF	-0.37*	-0.13*	-0.04	-0.12*	-0.05	0.06	-0.04	0.04	0.02	0.89*	0.22*	0.11*	1.00						
R&D	-0.12*	-0.01	-0.01	-0.01	0.02	-0.02	0.01	-0.03	-0.01	0.01	0.03	0.05	0.01	1.00					
TAN	0.09*	-0.03	-0.05	-0.02	-0.17*	0.04	0.10*	0.22*	-0.03	0.00	-0.06	-0.11*	0.09*	-0.08*	1.00				
ZSC	-0.52*	-0.03	-0.04	-0.04	-0.03	0.03	-0.02	0.15*	0.02	0.79*	0.16*	0.13*	0.78*	0.04	-0.00	1.00			
EO	0.00	-0.00	-0.01	-0.01	0.01	-0.16*	0.18*	-0.06	-0.00	-0.06	0.04	0.03	-0.05	0.00	0.06	-0.05	1.00		
NEO	0.00	-0.00	-0.00	-0.00	0.03	-0.10*	0.10*	-0.03	0.02	-0.09*	-0.02	0.06	-0.09*	-0.03	0.05	-0.04	0.56*	1.00	
LO	-0.02	0.01	0.01	0.01	0.14*	-0.37*	0.33*	-0.27*	-0.02	-0.01	-0.03	0.16*	0.02	-0.03	0.10*	0.03	0.29*	0.21*	1.00

This table presents the correlation matrix for the sample data. The sample and variable definitions are as described in Table I. * indicates significance at 1% level.

Table IV: Managerial and firm characteristics by leverage quartiles

	Quartile 1	Quartile 4	t-test
CB	0.005	2.568	-1.16
	[0.025]	[44.131]	
SB	0.018	6.808	-1.19
	[0.122]	[113.82]	
SAL	0.007	4.889	-1.21
	[0.041]	[81.058]	
SZ	9.071	8.703	5.37***
	[0.737]	[1.141]	
GR	18.831	10.678	1.13
	[146.42]	[40.21]	
ROA	0.122	0.045	6.02***
	[0.097]	[0.236]	
STKR	0.117	0.006	3.51***
	[0.341]	[0.537]	
CH	0.112	0.067	7.15***
	[0.101]	[0.070]	
CF	0.160	0.097	4.34***
	[0.097]	[0.248]	
R&D	0.010	0.001	4.53***
	[0.041]	[0.003]	
TAN	0.209	0.281	-4.16***
	[0.203]	[0.282]	
ZSC	2.013	0.807	17.35***
	[0.946]	[1.098]	
EO	0.041	0.038	0.42
	[0.118]	[0.112]	
NEO	0.019	0.022	-0.53
	[0.076]	[0.067]	
LO	41.285	39.113	1.64*
	[19.930]	[18.629]	

This table provides univariate mean comparisons of both firm-specific and managers' incentives characteristics by book leverage (dependent variable) quartiles (normal font) and standard deviation (in square brackets). The t-statistics show the difference of means from the first (1^{st}) to the fourth (4^{th}) quartiles. Definitions for all the variables are shown in Table I. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Table V: The effects of executive compensation (CB and SB) on leverage

	(0LS) Model 1	(FE) Model 2	(OLS) Model 3	(FE) Model 4	(OLS) Model 5	(FE) Model 6
CB	-0.310**	-0.341***			-0.446***	-0.441***
	(-2.13)	(-4.30)			(-3.66)	(-5.26)
SB			0.792**	0.157*	0.328**	0.313***
			(2.06)	(1.87)	(2.16)	(3.55)
SAL	0.721***	0.437***	-0.278*	0.081	0.551***	0.186
	(3.57)	(3.16)	(1.91)	(0.52)	(3.77)	(1.20)
SZ	-0.014	-0.009	-0.025***	0.011	-0.013	0.007
	(-1.56)	(-0.40)	(-2.84)	(0.46)	(-1.54)	(0.30)
GR	-0.001	-0.004**	-0.001	-0.004*	-0.001	-0.004*
	(-0.43)	(-2.06)	(-1.34)	(-1.86)	(-0.48)	(-1.79)
ROA	-0.077	-0.033	-0.310***	0.096	-0.068	0.063
	(-0.62)	(-0.42)	(-3.05)	(1.16)	(-0.55)	(0.77)
SKTR	-0.013	-0.015***	-0.008	-0.014**	-0.013	-0.014**
	(-1.35)	(-2.70)	(-0.90)	(-2.53)	(-1.38)	(-2.43)
CH	-0.179***	0.068	-0.174***	0.092*	-0.180***	0.088
	(-3.17)	(1.23)	(-3.22)	(1.65)	(-3.24)	(1.60)
CF	0.223*	0.132**	0.195*	0.103	0.213*	0.115*
	(1.86)	(2.07)	(1.93)	(1.60)	(1.82)	(1.81)
R&D	-0.348**	0.182	-0.369**	0.191*	-0.341**	0.191*
	(-2.57)	(1.62)	(-2.69)	(1.69)	(-2.51)	(1.71)
TAN	0.046**	0.174**	0.071***	0.279***	0.050**	0.246***
	(1.97)	(2.55)	(3.18)	(3.90)	(2.17)	(3.48)
ZSC	-0.072***	-0.045***	-0.065***	-0.067***	-0.075***	-0.067***
	(-10.00)	(-4.09)	(-12.07)	(-5.26)	(-10.41)	(-5.33)
EO	0.072*	-0.127*	0.100**	-0.091	0.077*	-0.096
	(1.72)	(-1.69)	(2.38)	(-1.20)	(1.86)	(-1.29)
NEO	0.203***	0.251**	0.219***	0.270**	0.205***	0.271***
	(2.68)	(2.44)	(3.10)	(2.60)	(2.72)	(2.64)
LO	-0.001*	0.001	-0.001**	0.000	-0.001*	0.000
	(-1.71)	(0.10)	(-2.04)	(0.10)	(-1.62)	(0.11)
_Cons	0.471***	0.348*	0.586***	0.169	0.469***	0.211
	(5.50)	(1.71)	(6.68)	(0.81)	(5.52)	(1.02)
Year	YES	YES	YES	YES	YES	YES
Industry	YES	NO	YES	NO	YES	NO
N	1202	1202	1202	1202	1202	1202
R^2	0.268	0.180	0.291	0.168	0.272	0.191

This table shows the OLS estimation results of the effects of cash bonus (CB) and stock bonus (SB) on leverage. All variable definitions are described in Table I. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Table VI: Alternative measures of independent variables

	(OLS) Model 1	(OLS) Model 2	(OLS) Model 3
CB2	-0.117*** (-3.34)		-0.069* (-1.63)
SB2		0.097*** (3.35)	0.059* (1.68)
SAL	-0.047 (-1.60)	0.016 (0.51)	-0.012 (-0.32)
SZ	-0.033*** (-3.31)	-0.035*** (-3.50)	-0.035*** (-3.51)
GR	-0.001 (-0.66)	-0.001 (-0.70)	-0.001 (-0.67)
ROA	-0.078 (-0.66)	-0.077 (-0.68)	-0.081 (-0.70)
STKR	-0.012 (-1.21)	-0.014 (-1.45)	-0.012 (-1.29)
CH	-0.172*** (-3.05)	-0.178*** (-3.13)	-0.170*** (-3.03)
CF	0.180 (1.60)	0.181* (1.65)	0.182* (1.65)
R&D	-0.362** (-2.54)	-0.369*** (-2.65)	-0.367*** (-2.60)
TAN	0.056** (2.31)	0.059** (2.45)	0.056** (2.32)
ZSC	-0.066*** (-8.20)	-0.065*** (-8.16)	-0.065*** (-8.19)
EO	0.077* (1.79)	0.087** (2.06)	0.081* (1.91)
NEO	0.191*** (2.65)	0.198*** (2.79)	0.194*** (2.71)
LO	-0.000 (-1.38)	-0.000 (-1.27)	-0.000 (-1.22)
_Cons	0.677*** (6.87)	0.604*** (6.43)	0.649*** (6.56)
N	1202	1202	1202
R^2	0.263	0.264	0.265

This table shows the OLS estimation results of our alternative measures of our independent variables (CB2 & SB2). All variable definitions are described in Table I. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Table VII: Executive compensation and leverage

	Predicted Model	Simultaneous Systems of Equations (3SLS)		
	LEV	(2nd LEV)	(1st Stage-CB)	(1st Stage-SB)
Predicted CB	-25.253*** (-11.18)			
Predicted SB	62.924*** (33.29)			
CB		-24.324** (-2.11)		3.066 (1.09)
SB		7.432*** (2.88)	0.346** (2.25)	
SAL	0.002 (0.01)	15.882 (1.56)	0.597*** (4.04)	-1.887 (-0.71)
SZ	0.198*** (6.46)	-0.056** (-2.47)	-0.001 (-0.59)	0.003 (0.48)
GR	-0.017*** (-9.84)	-0.015*** (-3.05)	-0.001** (-2.17)	0.002*** (7.06)
ROA	0.114** (2.17)	-1.350* (-1.83)	-0.047** (-2.28)	0.147 (0.77)
STKR	0.001 (0.03)	0.025 (0.87)	0.001 (0.72)	-0.004 (-0.60)
CH	-0.058* (-1.70)	-0.161 (-1.43)	0.003 (0.30)	-0.009 (-0.39)
CF	-0.147** (-2.19)	0.589 (1.20)	0.027 (1.48)	-0.084 (-0.71)
R&D	0.002 (0.04)	-0.596* (-1.78)	0.006 (0.20)	-0.016 (-0.19)
TAN	0.317*** (21.03)	0.001 (0.01)	-0.004 (-0.81)	0.012 (0.60)
ZSC	-0.023*** (-5.72)	-0.081*** (-3.73)		
EO	0.633*** (18.22)	0.078 (0.71)	0.001 (0.06)	-0.001 (-0.02)
NEO	0.461*** (11.09)	0.274** (1.98)	0.001 (0.04)	-0.002 (-0.06)
LO	0.001** (2.33)	-0.000 (-0.74)	0.000 (0.34)	-0.000 (-0.41)
LEV			0.015 (0.64)	-0.041 (-0.68)
Indus_medCB			0.001 (0.08)	
Indus_medSC				0.001

				(0.00)
Cons	-1.770***	0.954***	0.004	-0.0201
	(-6.22)	(4.71)	(0.11)	(-0.22)
Fixed Effects	YES	YES	YES	YES
R^2	0.876			
N	1185	1376	1376	1376

This table shows the simultaneous system of equations regression of book leverage and cash bonus results. The predicted signs for the variable of interest are shown in the book leverage model. The models included fixed effects in all estimations. The reported t-statistics based on robust standard errors are within parentheses. Cash bonus (CB) model includes leverage, controls and instruments (i.e. industry median_CB, two-year period log of ROA and STKR). Variable definitions are described in Table I. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Table VIII: Executive compensation on leverage - role of growth and executive ownership

	(OLS) Model 1	(OLS) Model 2	(OLS) Model 3	(OLS) Model 4
CB	-0.292*		-0.297**	
	(-1.76)		(-1.99)	
SB		0.219		1.074***
		(1.49)		(4.68)
SAL	0.815***	0.245*	0.741***	0.486***
	(3.19)	(1.68)	(2.70)	(3.16)
SZ	-0.0132	-0.0127	-0.0136	-0.0062
	(-1.49)	(-1.46)	(-1.55)	(-0.74)
GR	0.0029	0.0003	-0.0004	-0.0007
	(1.56)	(0.22)	(-0.44)	(-0.70)
ROA	-0.0693	-0.0384	-0.0764	-0.0390
	(-0.56)	(-0.32)	(-0.62)	(-0.34)
STKR	-0.0135	-0.0145	-0.0130	-0.0144
	(-1.41)	(-1.52)	(-1.35)	(-1.52)
CH	-0.173***	-0.179***	-0.179***	-0.199***
	(-3.09)	(-3.21)	(-3.20)	(-3.74)
CF	0.215*	0.195*	0.223*	0.207*
	(1.80)	(1.70)	(1.86)	(1.91)
R&D	-0.354***	-0.340**	-0.348**	-0.326**
	(-2.61)	(-2.52)	(-2.57)	(-2.49)
TAN	0.0475**	0.0524**	0.046**	0.052**
	(2.03)	(2.24)	(1.97)	(2.29)
ZSC	-0.0721***	-0.0743***	-0.0722***	-0.0737***
	(-9.85)	(-10.06)	(-9.98)	(-10.92)
EO	0.0677*	0.0766*	0.0719*	0.0950**
	(1.61)	(1.84)	(1.73)	(2.30)
NEO	0.193**	0.202***	0.203***	0.211***
	(2.51)	(2.66)	(2.67)	(2.79)
LO	-0.0005*	-0.0004	-0.0005*	-0.0004
	(-1.69)	(-1.62)	(-1.71)	(-1.52)
CB x GR	-0.111***			
	(-2.76)			
SB x GR		-0.0023**		
		(-2.59)		
CB x EO			-0.181	
			(-0.22)	
SB x EO				-4.835***
				(-5.00)
_Cons	0.460***	0.461***	0.469***	0.398***
	(5.30)	(5.40)	(5.50)	(4.81)
N	1202	1202	1202	1202
R^2	0.275	0.269	0.268	0.284

This table shows the OLS estimation results of the moderating role of firm growth and executive ownership. All variable definitions are described in Table I. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.