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## *Investigating the Effects of Managerial Compensation Incentives on Investment and Financing Decisions*

### *Summary*

Primarily, the agency concern has long been shared by both academics and non-academics alike as a fundamental causative element affecting the way corporate managers conduct business operational activities on behalf of their principal(s). Such divergence of interests among managers and shareholders widely held by corporations may consequently affect corporate value maximization via poor investment selections and inappropriate financing choices. This study aims to investigate how executives' compensation influence investment activities, and, the extent to which inefficient compensation (excess) pay induces investment distortions, financial leverage and the extent to which compensation excess affect suboptimal financing decision.

### *Introduction*

The establishment of modern corporations has intensified the concern by atomistic shareholders and other stakeholders on the quality of management decisions. Consistent with this notion, managerial compensation contract is seen as one of the partial mechanisms to minimize managerial incentive problems (Jensen and Meckling, 1976; Holmstrom, 1979). It suggests that the board of directors can design executives' compensation incentives to influence managers to take decisions in the best interests of shareholders, thereby increasing firms' profits, cash flow and, or corporate value.

Significantly, given managers substantial incentives to increase corporate value, they may tend to implement second-best, value-maximizing investment and financing decisions, which in turn, determines the probability distribution of a firm's cash flow, profits and stock returns. It is conceivable that there is a link between the level and the nature of managerial compensation incentives and corporate decisions (i.e. investment and financial leverage) if indeed managers respond appropriately to their compensation packages.

Under the agency theoretic framework, two main competing theories exist to explain the linkage between managerial compensation scheme and the efficiency of corporate decisions.

These are; optimal contracting theory (Jensen and Meckling, 1976; Holmstrom, 1979) and managerial power theory (Bebchuk and Fried, 2003; Weisbach, 2007).

A significant amount of research has considered managerial policies and compensation links under the optimal contracting theory (e.g. Coles et al. 2006; Strobl, 2014) among others. Specifically, Coles et al. (2006) argue that by rewarding executive stock-based compensation induces efficient managerial investment and financial leverage decisions, thereby aligning both the principal(s) and the agent interests. Still, under the optimal assumption, Strobl (2014) also demonstrates that shareholders through the boards can purposely over-compensate managers to induce them to overinvest. In contrast, Bebchuk and Fried (2003) demonstrate manager's influence over their pay settings, particularly in a firm with weak governance system. In such an environment, managers are more likely to make decisions that suit their own parochial interests. Support for this hypothesis is often fuelled by stories in both print and electronic media that highlight some of the more egregious cases of managerial compensation, with minimal firm value effects. For instance, Feito-Ruiz and Renneboog (2017) provide evidence to suggest that managers' excess pay negatively affects stock valuation following takeover investment decisions and argue that this evidence is consistent with managerial power hypothesis.

#### *Aims and Objectives of the study*

Essentially, the implications of the above discussions have guided the direction of the present scholarly work. Specifically, this study anticipates achieving two primary related objectives. We empirically assess how executives' compensation influence; i) investment activities, and, the extent to which inefficient compensation (excess) pay induces investment distortions (over investment and under investment incentive), and, ii) financial leverage, and, the extent to which compensation excess affect suboptimal financing decision. As indicated, this current study is motivated substantially by the implications of the prior literature (e.g. Coles et al. 2006; Strobl, 2014; Feito-Ruiz and Renneboog, 2017); however, it seeks to contribute to the existing literature on the impact of managerial compensation on investment and its concomitant financing decisions in the following ways.

First, unlike Coles et al. (2006) who limit their investment data to only research and development and capital expenditure (i.e. plant, property and equipment), this study extends the data coverage to include fixed intangible assets expenditure and other fixed assets acquisition activities. In fact, the exclusion of these major investment projects: fixed

intangibles and other fixed assets activities are more likely to overestimate the sensitivity of performance – pay relationship, especially in our attempt to uncover managerial risk behaviour or attitude to investments given certain types of compensation incentives. For instance, Lewellen and Lewellen (2016) argue that capital expenditure (defined as net PPE) does not represent a fair overview of the firm’s overall capital expenditure activities. Therefore, studying the impact of executive compensation incentives on corporate investment within the context of only R&D and PPE (i.e. two measures for investment by Coles et al.) is likely to overestimate the average executive pay on corporate investment activities. This makes the current study much urgent to provide comprehensive investment coverage (R&D, capital expenditure, other fixed assets or acquisitions, fixed intangibles) in a single study using the U.K datasets.

Second, we make an important extension to Coles et al. (2006) and Feito-Ruiz and Renneboog (2017) findings. Specifically, the study examines the extent to which executive pay excesses induce investment distortions. In fact, Coles et al. (2006) implicitly assume a symmetrical relationship between executives’ pay and firm investment activities. This strong assumption seems implausible especially if managers give consideration to the differing risks associated with the types of investment projects. For example, Feito-Ruiz and Renneboog (2017) conclude that executive excess compensation induces suboptimal (overinvestment) incentive. Indifferent to Feito-Ruiz and Renneboog (2017), Strobl (2014) also demonstrates theoretically that the corporate boards of directors may intentionally offer stock-based compensation to encourage overinvestment incentive. We aim to contribute to this relatively new literature by looking at the extent to which managerial excess compensation leads to investment distortions. This is one of the novel paths of his study.

Third, the study also adds to the literature on the link between financial leverage and executive compensation incentives. Also, applying both stock-based and cash-related incentives, we are able to provide direct evidence on the extent to which excesses in compensation incentives impact the conservative debt policy of the U.K firms. This evidence would partly enhance our understanding of the documented low leverage position of the U.K companies (Rajan and Zingales, 1995; Antoniou et al. 2008). The current scholarly study is the first to consider this issue from this perspective by directly looking at how executive pay excess induces suboptimal leverage (under or overleverage).

Finally, in terms of methodology, the study applies a research technique similar to Coles et al. (2006) but makes further improvement. Specifically, different from Coles et al. (2006) under-identification restriction procedure, this study adopts over-identification estimation approach by controlling other governance variables, which can affect managerial compensation settings (Mallin et al. 2015; Newton, 2015; Joubert and Fakhfakh, 2012). Therefore, accounting for governance mechanisms within executive pay and the investment empirical model is particularly important for the UK firms that have witnessed significant corporate governance reforms. Again, differences in corporate governance among the U.S and U.K makes it suitable to present U.K own evidence.

We structure the rest of the section as follows: section (2) highlights the relevant literature on investment and or financial leverage and managerial compensation, while section (3) discusses methodology sections.

#### *Executive compensation and investment activities.*

One of the main aims of the empirical study is to look at how executive compensation incentives influence corporate investment. A significant amount of literature has variously exhausted the interaction among executive compensation incentives and firm observable investment activities (e.g. Coles et al. 2006; Strobl, 2014; Ozkan, 2012; Chen et al. 2017), among others. We specifically review the literature that has direct relevance to the investment – compensation nexus.

Coles, Daniel and Naveen, (2006) provide evidence on the relation between CEOs compensation incentives and corporate policies (investment) using U.S dataset. Applying three-stage least square regression technique to the data, they report a positive and significant association between cash compensation and capital expenditure (CAPEX), while R&D shows a negative coefficient. The stock-based incentives (measured as vega and delta) show an increasing function between both vega and delta on R&D expenditure, but a negative link between CAPEX and stock-based incentives. The authors suggest that given managers more vega component in their compensation portfolio induce them to invest more in riskier assets, including more investment in firm innovation activity and less capital expenditure investment. Also, regarding delta incentives, the paper attributes it to the alignment hypothesis, where managers seek to satisfy the interest of shareholders when a large component of their

compensation is equity-based incentives. On the cash compensation, they postulate that managers become more wary to increase firm risk (e.g. R&D) particularly when they are given cash incentives. This lends credence to the managerial risk aversion assumption (Fama, 1980).

Away from the U.S settings, Chen, Chen and Yang (2017) consider managerial incentives and research and development linkage. Using firms listed on the Taiwan Security Exchange and Taipei Exchange, their evidence shows that R&D expenditure and equity and cash incentives are positively associated. They employ two-stage least squares estimator to the data and regressing the dependent variable (R&D expenditure) on the tested variables (equity and cash incentives) and other determinants of R&D, they report a significant increase in the relationship between R&D activity and compensation packages. On the control factors (e.g. CEO ownership, leverage, size, market-book, free cash flow, CEO tenure, institutional ownership), CEO holdings and leverage show both positive and negative relation to the R&D investment respectively. Overall, these findings may portray that CEOs are motivated to invest more in risky R&D activities particularly when agency problem is severe.

Other empirical studies examine specific events, such as acquisitions (e.g. Ozkan, 2012; Girma and Wright, 2006; Datta, Iskandar-Datta and Raman, 2001). For instance, using the U.K datasets, Ozkan (2012) finds a positive and significant correlation between CEOs compensation scheme (cash bonuses, salaries, stock options) and the investment dummy (key explanatory defined as cross-border M&As), when she regressed dependent variable on compensation incentives and other control variables. In contrast, Girma and Wright (2006) find a weak correlation between executive compensation and merger activity using U.K data. Collectively, the reported findings show that managers pay special attention to their compensation components when taking investment decisions (M&As, PPE and R&D).

#### *Managerial compensation incentives and firm leverage*

The main intention of this section is to draw on the literature that demonstrates how debt financial and compensation structure policies relate which will help to understand the extent to which an implied risk of the firm through corporate leverage policies feedback and the design of executive compensation scheme occur.

Ortiz-Molina (2007) examined the effects of financial leverage (i.e. straight and convertible debts) on executive pay incentives of the largest publicly traded companies in the U.S for the period 1993 – 1999. Analysing final sample consisting of 1,652 CEOs data and a total of 7,499 firm-year observations, and provides an interesting revelation by reporting an economically significant effect among leverage and the structure of CEOs pay packages. In this research, the variables of interest were defined as follows; dependent variable; CEO compensation portfolio as the change in firm specific-wealth and the key explanatory variables; market leverage and book leverage. Employing both median regression (MR) and two-stage least absolute deviation (2SLAD) estimation techniques, he reports a statistically significant negative relationship between CEOs pay performance sensitivity and leverage after controlling for other control factors. The negative coefficient estimates using 2SLAD estimator are much larger in magnitude, which suggest the existence of simultaneity bias in leverage and compensation relation.

Further, the author later finds convertible debt coefficient positive and significant, while straight debt maintains a strong inverse relation when he makes two leverage classifications (convertible and straight debt). The author explains this to show that in a highly-levered firm, stock options incentives become less effective in mitigating the shareholder-bondholder conflict of interests as shareholders anticipate minimizing the cost of debt financing.

Overall, these results imply that financial structure and executive compensation practices interact in a unique manner to attenuate the agency cost of debt.

Coles, Daniel, and Naveen (2006), empirically investigated the link between managerial incentives and risk-taking (book leverage). Measuring the key explanatory variables for executive compensation incentives include the following: delta (i.e. defined as the change in the dollar value of total executive wealth for a percentage change in stock price), vega (defined as sensitivity of executive wealth to a change stock return volatility), Cash compensation (salary and bonus), and define the dependent variable (book leverage) as the book leverage scaled by total assets.

Applying the different estimation strategies, and in particular three-stage least squares (3SLS), they find a positive and significant relation between vega and book leverage across all specifications after controlling for other determinants of leverage. The result suggests a manager's preference to increase firm leverage when their vega incentives component

increases, but the delta component and book leverage are negatively related. The result is consistent with Brockman, Martin and Unlu (2010) findings. Also, cash compensation is negative and significant, postulating a decrease in book leverage following an increase in executive cash incentives. In short, Coles et al. (2006) evidence suggests that the executive compensation structure provides enough explanation for our understanding of how the firm observed financial leverage behaviour.

A relatively recent U.K evidence is provided by Kabir, Li and Veld-Merkoulova (2010), who examined the effects of managerial compensation on the cost of debt finance using FTSE All-Share Index data for the period 2003 – 2006. The dependent variable is the cost of debt; as the yield spread of corporate bond, estimated as the difference between firm's bond and U.K government bond of comparable maturity, and constructing the parameter of interests (e.g. salary, cash bonus, stock options, pension, restricted stock and stock) as a proportion of total CEO pay incentives. Applying OLS estimator and regressing yield spread on pay incentives and other control variables, the authors reveal some interesting results. With their relatively small firm-year observations (150), they report that CEOs debt-like incentives (defined as pension plus deferred rewards) are negatively related to the firm's cost of debt. They argue that the CEOs long-term deferred incentives in the form pensions induce them to be cautious and adopt a more conservative risk management style, which, in turn, naturally aligns CEOs interest with other debt holders. On cash bonus - yield spread relationship, they show a negative link across all different estimators. With this, they argue that bondholders pay attention to CEO's cash bonus to show the firm's ability to honour the debt covenants (e.g. constantly meeting annual debt interest payments).

They also document that stock options and stock grants are positively related to the bond yield spread. The authors highlight that the debt markets strongly respond to the CEOs stock options incentives, which suggest that shareholders use options and stock incentives to align shareholder-agent interests, thereby jeopardising bondholders' welfare (benefit). Further, the authors split stock options (performance-vested options and traditional options) and run separate regression, their evidence indicates that the CEOs with performance-based options pay a relatively higher cost of borrowing than traditional options executives.



## *Methods*

This section outlines data sample collection techniques and procedures based on the research objectives. We obtained accounting and financial data for the UK FTSE 350 firms from the COMPUSTAT database. The firm specific characteristics allow us to measure and estimate the required variables needed for the study. Also, executives (CEO, CFO and chief operating officer) financial compensation incentives, including salary, cash bonuses, deferred stock grants, performance stock grants, stock option grants and other executives' characteristics (age, ownership) are all hand-collected from the respective companies' annual report covering 2006 - 2015 inclusive. We also obtained large stakeholders ownership and non-executives directors ownership structure from the annual report. The sampled period enables the study to cover both the bull and bear markets. Such labour – intensive activity enhances our rich dataset as well as the study's originality. We also de-select companies operating in both financial and utilities industries to minimize heterogeneity in the capital structure. Again, utility firms are heavily regulated, which in essence may constrain managerial decisions regarding investment and financial decisions as well as the way managers are compensated. Moreover, consistent with Ntim et al. (2017), firms with data less than four consecutive years are automatically discarded. With this filter, we had an initial total observation of 1987 of 214 firms operating in the FTSE 350 index. Overall, our early total observations 1,987 can be seen as the maximum data to be utilized in our panel data setting.

## *Analytical strategy*

We adopted a multiple estimation approaches which are dependent on the research question of the study. Explicitly, we adopt a system of equation preferably three-stage least squares method (3SLS) to analyse the relationship. This approach is effective in dealing with the issue of endogeneity, which can make our coefficient estimates biased, and inconsistent (Wooldridge, 2009). We apply generalised method of moments for robustness testing. On the investment / leverage distortion and managerial pay excesses, we use probability models (probit model) to analyse the linkage. Detailed analysis of the various approaches will be devoted to the respective sections.

## Current Progress/ Participation in the BAM Conference And Beyond

Up until the BAM conference, data analysis will be completed and the preliminary findings presented at the conference. The feedback from the conference will be integrated to improve the research study for publication in a peer-reviewed journal.

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