Firm performance and CEO pay: Evidence from Indian manufacturing

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Abstract

CEO compensation considerations have gained prominence in recent times, especially in the wake of the subprime turmoil. Using cross-section data on Indian manufacturing firms for 2007, the paper explores the association between executive compensation and firm performance and concludes that pay for performance sensitivity estimates are significant although small in magnitude.

JEL classification: G 30, G 32, L 25

Key words: CEO compensation, profits, manufacturing, India

1. Introduction

CEO compensation is an issue which has been widely discussed and debated in the US corporate world. More recently, the subprime episode in the US has diverted attention towards the compensation excesses to US executives, including banks. This was clearly elucidated by the Bank for International Settlements (2009), wherein it observed the following:

> Compensation schemes further encouraged managers to forsake long-run prospects for short-run return. In some cases, profits calculated with complex mathematical models were used to determine rewards even when markets for the assets underlying the calculations did not exist and so they could not be sold. Equity holders (because of limited liability) and asset managers (because of their compensation system) were unduly rewarded for risk-taking: they received a portion of the upside, but the downside belonged to the creditors (or the government!)… The result was herding that caused arbitrage to fail. In the end, the overall difficulty in distinguishing luck from skill in the performance of asset managers, combined with compensation based at least in part on the volume of business, encouraged managers and traders to accumulate huge amounts of risk (BIS Annual Report, 2009, p.8).

In this context, the article briefly reviews the extant literature and explores the association between executive compensation and firm performance in India. The reminder of the analysis proceeds as follows. An overview of the relevant literature is followed by the estimation strategy and summary hypothesis. The penultimate section discusses the results followed by the concluding remarks.

2. Executive compensation models

The problem of how best to compensate the executive is a classic application of the principal-agent theory. In this setup, the collection of owner-shareholders (the principal) desires the executive (the agent) to maximize shareholder value, but cannot explicitly evaluate the executive's reaction function. Central to the problem is the fact that the goals of the executive may be at variance with those of shareholders. For instance, a manager may be more interested in amassing and defending personal power rather than pursuing profit-maximizing strategies (see, for example, Bebchuk and Fried, 2003).

Jensen and Murphy (1990) conducted an early empirical examination of the pay-performance sensitivity with the objective of testing the predictions of agency theory. The study estimated the *total effect* of incentive mechanisms, including performance-based salary and bonuses, stock ownership and threat of dismissal. The baseline representation of the model is:

$$w = a + b\,\pi \qquad \textbf{(1)}$$

where w is total executive compensation, a is the guarantee (or safe) component of compensation and b is the sensitivity of compensation to performance, π being the firm performance measure. Jensen and Murphy (1990) found that, although a

positive statistical relationship existed between firm performance and executive pay (i.e., $b>0$), the total pay-for-performance sensitivity was, at best, limited.

Garen (1994) took issue with this conjecture, noting that the optimal value of b varies by firm and accordingly, an aggregate measure of this variable will yield value that are biased downwards. Specifically, Garen (1994) considered a standard example when the executive has the utility function $U=-\exp[-\rho(wk\mu^2)]/\rho$, where ρ is the coefficient of absolute risk aversion, and μ is the mean of the random normally-distributed π, and k is the curvature of the executive's disutility of effort. In this case, the optimal b is given by expression (2) according as:

$$b = (1 + k\,\rho\,\sigma^2)^{-1} \qquad \textbf{(2)}$$

where σ^2 is the variance of π. By substituting plausible values for the model parameters, Garen (1994) illustrated that Jensen and Murphy (1990) estimates may indeed be consistent with agency theory.

Owing to the fact that the optimal values of b vary greatly with functional form and other standard assumptions, research suggested that a more appropriate test of agency theory would be to construct an optimal contract model and derive the comparative static predictions for b. In a key extension of Jensen and Murphy (1990), this optimal contract took on board the effect of the risk associated with such contracts when executives are risk averse. This is a clear outcome of (2), where b is an inverse function of both the level of risk aversion and the risk of performance measure.

Aggarwal and Samwick (1999) exploited these results to develop a linear approximation of the optimal contract. Executive compensation was regressed on

firm performance, the variance of firm performance, the interaction between firm performance and its variance and a set of dummy variables. In this specification, the median pay-for-performance sensitivity (i.e., median value of *b*) was found to be US $14.5 per US $1000 of shareholder value.

While work on this aspect as been underway in the Western literature, limited research has been forthcoming on this aspect in the Indian context for two main reasons. First, until recently, corporate balance sheets were exceedingly opaque with limited information being provided on executive compensation. Second and more importantly, the accounting irregularities in the US and elsewhere have heightened the awareness about optimally designing board structures and executive compensation to ameliorate the agency problems between management and stakeholders. These developments have, as a consequence, prompted the need for greater transparency in the annual accounts of corporate entities. In one of the early studies, Sen and Sarkar (1996) examined the intra- and inter-firm differences in managerial characteristics (such as age, experience, qualification and remuneration) for large firms. The evidence suggested the existence of a tournament structure (increasing pay differentials in hierarchies) of salaries and an increase in mean age as one graduates upwards along the hierarchy. The study was, however, confined to a small number of firms for the year 1990-91, coinciding with the onset of reforms, which limited the empirical appeal of the model. Subsequently, two studies, Ghosh (2006) and Parthasarathy *et al.* (2006) have attempted to examine this aspect in some detail. The former exploits cross-sectional time series data for 1997-2002 and finds CEO

compensation to be significantly and positively affected by firm return on asset, CEO chairmanship, CEO age and years of education and R & D intensity. The latter, on the other hand, utilizes cross-sectional data for 2005 and finds CEOs, who are promoters (owners) receive higher pay.

3. Data and methods

We base our analysis on the *Prowess* database, generated and maintained by the Centre for Monitoring the Indian Economy (CMIE) and after filtering, we have a maximum of 324 firms.[1]

Specifically, for executive *i* in firm *j*, we estimate the following equation using OLS methodology:

$$w_{ij} = \alpha_o + \alpha_1 \pi_j + \alpha_2 \sigma_j^2 \pi_j + \alpha_3 \eta_j + \alpha_4 [Controls]_j + \varpi_i \quad \textbf{(3)}$$

with the pay for performance sensitivity being given by (4) according as:

$$\partial w_{ij} / \partial \pi_j = [\alpha_1 + \alpha_2 \sigma_j^2] \equiv b \quad \textbf{(4)}$$

where *w* is compensation, π is firm performance and σ is the standard deviation of firm performance. From agency theory and (1) and (2), we expect $\alpha_1>0$ and $\alpha_2<0$. Additionally, following Aggarwal and Samwick (1999), we include a stock price variance term (η^2) not interacted with firm performance to control for any relationship that might exist between compensation and variance in firm returns beyond the pay-performance sensitivity.

[1] The composition of the sample is as follows. 38 firms (food and beverages), 39 (textiles), 41 (chemicals), 44 (metal and metal products), 16 (automobiles), 21 (auto ancillaries), 20 (rubber and plastic), 27 (electronics), 44 (electrical and machinery) 11 (paper and wood) and 10 (Others).

The dependent variable in the specification is total executive compensation, defined as the aggregate of salary and other perquisites paid to the CEO/Managing Director of the company.

We consider two firm performance measures: Return on Asset (RoA) and Market to book value ratio (MBVR). The former is an accounting and the latter is a market-based measure of performance.

Among the firm-specific controls, we employ firm size and leverage; evidence suggests that the level of compensation is usually correlated with these variables. In addition, we include dummies to account for firm ownership category. Sample firms belong to four ownership categories: business group entities (*Group*) comprising 65% of the sample, stand-alone private firms (*Indian*), accounting for 21% of the sample, foreign private firms (*foreign*) - 8% of the sample and the remaining firms being in the State domain (*state*). Finally, we include dummies to account for the type of industry.

[Table 1 about here]

4. Results and discussion

Table 2 presents the regression results with the alternate measures of firm performance detailed above. In the first specification (Model 1), the coefficient on firm performance and its interaction with performance variance have highly statistically significant coefficients signs that are consistent with the expectations of agency theory. In terms of magnitudes, the sensitivity for CEO pay-for-performance is 0.032, which is statistically significant at 0.01 level.

Among the control variables, the relation between firm size and executive pay is positive and significant, as hypothesized by Garen (1994). The sign on *Leverage* is not significant at conventional levels, suggesting that debt pressure does not exert any disciplinary influence on pay. Finally, all the ownership dummies are consistently significant across all specifications, which suggest that CEO remuneration is typically higher across firms in these ownership groups *vis-à-vis* state-owned firms (the omitted category).

In the second specification, we include a dummy variable to ascertain if institutional shareholding exerts any perceptible influence CEO pay. More specifically, the variable *Dy_banker* is a dummy, which equals one if a firm has a banker on its board, either from a commercial bank or from a financial institution. If nominee directors, being representatives of institutional shareholders and creditors, exert a dampening influence on CEO pay, the coefficient on this variable would be negative. Looking at Col. (2), the coefficient on this variable is not significant.

The riskiness of the firm's investment opportunity set could have a bearing on CEO pay (Garen, 1994). In particular, firms with high R&D intensity could stand to benefit if the project fructifies, and therefore, entail higher CEO pay. To examine this possibility, we include the R&D/Asset ratio as an explanatory variable in the baseline specification. Looking at the coefficient on this variable, the results indicate that the coefficient on this variable is positive and significant at 0.10 level.

[Table 2 about here]

5. Concluding remarks

The literature on executive compensation in India is limited. Using data on manufacturing firms, the paper demonstrates that pay-performance sensitivity estimates are significant with signs predicted by agency theory. We also test the Jensen-Murphy (1990) proposition which supports the fact that there exists a relationship between variance in firm returns and the sensitivity of executive pay to firm performance.

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Table 1: Definition and Summary Statistics

Variable	Definition	Mean	Median	Max
Remun	Aggregate of salary and other perquisites adjusted for inflation (in 000s)	99.495	43.597	1982.818
Π	Firm performance, defined as RoA (=net profit/Asset)	9.348	7.240	34.158
η	Standard deviation in daily closing stock price over the year	83.309	24.610	1046.35
Size	Natural logarithm of real sales	1.394	1.389	7.602
Age	Natural logarithm of number of years since firm incorporation	1.432	1.410	3.300
Debt	Borrowing/total asset	30.948	30.500	226.210
Group	Dummy =1, if a firm belongs to business group, else zero	0.575	1	1
Indian	Dummy =1, if a firm is Indian private, else zero	0.322	0	1
Foreign	Dummy =1, if a firm is foreign, else zero	0.069	0	1
State	Dummy =1, if a firm is state-owned, else zero	0.033	0	1

Table 2: Executive compensation regression results

Variable	Model 1	Model 2	Model 3
Intercept	7.677 (0.322)***	7.627 (0.353)***	7.708 (0.375)***
Performance	0.032 (0.012)***	0.034 (0.012)**	0.034 (0.012)***
Performance*Variance	-0.00009(0.00004)***	-0.00009(0.00003)***	-0.00009(0.00003)**
Stock price variance	0.0001 (0.002)	0.0002 (0.032)	0.0001 (0.001)
Size	0.298 (0.064)***	0.305 (0.060)***	0.304 (0.074)***
Leverage	-0.005 (0.003)	-0.004 (0.004)	-0.004 (0.003)
Dy_banker		0.192 (0.257)	
R&D/Asset			0.119 (0.066)*
Ownership dummies			
Group	2.688 (0.231)***	2.669 (0.287)***	2.592 (0.285)***
Indian	2.072 (0.297)***	2.099 (0.322)***	1.946 (0.344)***
Foreign	2.630 (0.382)***	2.472 (0.378)***	2.546 (0.404)***
Industry dummies	Yes	Yes	Yes
Observations	324	324	324
Pseudo R-square	0.266	0.269	0.277

Standard errors within brackets

***, ** and * denote statistical significance at 1, 5 and 10%, respectively