

CORPORATE GOVERNANCE, FIRM PERFORMANCE AND EXECUTIVE PAY: A COMPARISON OF DEFENSE AND NON-DEFENSE FIRMS

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Abstract

How to cite this paper:

Lemennicier, B., Hermet, J., & Duraisamy, P. (2019). Corporate governance, firm performance and executive pay: A comparison of defense and non-defense firms. *Corporate Governance and Sustainability Review*, 3(2), 8-17. <http://doi.org/10.22495/cgsrv3i2p1>

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ISSN Online: 2519-898X

ISSN Print: 2519-8971

Received: 22.03.2019

Accepted: 22.05.2019

JEL Classification: M120, L210, G30, G34

DOI: 10.22495/cgsrv3i2p1

This study analyses pay-performance relationship and pay structure of executives and tests whether the pay structure of CEOs differs across firms in the defense and non-defense sector using econometric methodology. The empirical results based on ordinary least squares, Probit and Tobit methods show that on an average, executives in the defense firms earn more than their counterparts in the non-defense sector. However, when we control for governance structure, firm performance and other characteristics, the difference in executives' remuneration vanishes. The important determinants of executive pay are the legal system, firm performance measured by Return on Assets (ROA), whether the CEO is also Chairman of the board, and size of the firm. The estimates of the determinants of restricted stock awards showed that firm performance, governance and other characteristics significantly influence the likelihood of obtaining restricted stock awards and also the value of the stock award.

Keywords: Corporate Governance, Executive Compensation, Firm Performance, Defense Industry

Acknowledgements: This work is the outcome of a study commissioned and funded by the Delegation for Strategic Affairs of the French Ministry of Defense. It is managed by the Secretariat General for Administration (Economic Observatory of Defense), with the assistance of the Directorate General for Armaments. We thank APTUS society, represented by Daniel Coudroyer, for his moral and financial support, Sylvain Moura, Marc Antoine Kleinpeter Observatory of Defense (OED) of the Ministry of Defense for their material and intellectual inputs and Ingrid Deleuze the DGA for their valuable comments on the project report. The authors wish to thank Enrico Colombatto of ICER, Giovanni Ramello and participants of the doctoral seminar of the IEL (Institutions, Economics and Law) of the Collegio Carlo Alberto in Turin for their comments and suggestions.

1. INTRODUCTION

The question of how governance of firms can improve their performance has been widely discussed by economists over the past several decades. There is a voluminous theoretical and empirical literature examining the interrelationship between governance structure, firm performance and executive compensation. Shleifer and Vishny (1997) provide a comprehensive review of theoretical

and empirical studies and the empirical evidence reported by them are based on the studies for USA, Germany, Japan and Russia. Subsequently, Barkema and Gomez-Mejia (1998) and Devers, Cannella, Reilly and Yoder (2007) reviewed the studies mostly relating to the Western world. A recent review by Sun, Zhao and Yang (2010) is primarily confined to studies on executive compensation in Asian countries.

In this study, we focus on the impact of governance and firm performance on executive compensation in the defense firms in comparison with the firms from a “peer group” of non-defense sector. The operating environment of the firms in defense industry is different from those in other sectors. The main consumers of the defense products are the governments. The sale of defense equipment depends upon lobbying and negotiation. The demand for the goods produced by these firms also depends upon the governments’ defense budget allocation which in turn is determined by internal and external security threats. The market for the goods produced by defense industry is not as competitive as that of any other industry and hence the defense firms may not be able to operate efficiently. We are not aware of any study examining the determinants of executive pay in the defense industry which is quite important in the context of ever-increasing budget allocation to the defense sector in many developed and developing countries. Hence this study would be a significant value addition to the existing literature.

The legal system may also influence executive compensation. It is believed that the “Anglo-Saxon laws” are more conducive to business and quick to respond to changing business environment than the “common laws” prevailing in many countries. We also examine whether Anglo-Saxon legal system has any impact on the executive compensation.

The rest of the paper is structured as follows: Section 2 reviews the theoretical and empirical literature pertaining to corporate governance and executive compensation and summarizes the stylized facts; Section 3 describes the data base; Section 4 presents the methodology and empirical model used in the study; Section 5 discusses the empirical results; finally, Section 6 reports the main limitations, implications and conclusions.

2. LITERATURE REVIEW

Several studies have examined theoretically as well as empirically the issues pertaining to Chief Executive Officer’s (CEOs) pay or compensation¹. We summarize and present the theoretical arguments and empirical evidence below.

2.1. Firm performance and executive compensation

Corporate governance deals with the ways in which the providers of finance to firms assure themselves of getting a return on their investment (Shleifer & Vishny, 1997). The shareholders rely on corporate managers to adopt policies that maximize the value of their shares. However, managers may also engage in activities that maximize their own well-being. Thus, there is a conflict of interest between the investors and managers of the firm. This is what is widely referred to as principal-agent problem or agency model². The essence of the agency problem is

the separation of ownership and control of the firm. In these situations, agency theory predicts that compensation policy will be designed to give the manager incentives to select and implement actions that increase shareholder wealth (Jensen & Murphy, 1990a, 1990b). The agency model has been used to examine the pay-performance relationship of executives. The evidence is quite mixed. Some studies which examined cross sectional variation in executive compensation and performance of the firms report a positive relationship (Murphy, 1985, Benston, 1985). Studies by Core et al. (1999) and Rose and Shepard (1997) find that current as well as past-year firm performance positively and significantly influence CEO compensation, especially the stock-based compensation. The tests of pay-performance sensitivity based on the changes in the remuneration of executives and change in the shareholders’ wealth in current and previous period show a weak positive or inverse relationship (Jensen & Murphy 1990a, Griffith, 1999).

2.2. Volatility of the stocks and executive pay

Aggarwal and Samwick (1999) argue that the executives in firms with more volatile stock prices will have less performance-based compensation. The fixed share should therefore be sensitive to price volatility as a reflection of economic fluctuations. High volatility in share prices should motivate the CEOs to prefer a higher fixed component in their remuneration package. However, the type of contract the firms enter into with CEOs depends upon the firm’s skill requirements, competition among firms and the acquired skills of the potential managers.

2.3. Governance structure and executive pay

The role of the governance structure on executive’s compensation is studied by looking at the composition of the Board of Directors of firms. The Board plays an important role in the executive’s compensation. The Board not only hires and fires executives but also monitors their performance and fixes their compensation. Several interesting findings emerge from the literature on this issue.

Studies show evidence that the executives’ salary levels are higher if the CEO is also the chairman of the board (Crystal, 1991; Main, O’Reilly & Wade, 1995; Core, Holthausen & Larcker, 1999; Goyal & Park, 2002). Crystal (1991) argues that if the CEO becomes the chairman of the board, then monitoring becomes more difficult, because the CEO essentially has the power to hire or remove other nonexecutive directors. Such board members take the role of passive advisors, especially on matters concerning CEO compensation. Main, O’Reilly, and Wade (1995) find that if the CEO is appointed before the other directors are, then compensation levels will be higher than they are if the CEO is appointed after the board of directors. They argue that when the CEO is also Chairman, he receives higher remuneration due to additional/greater

¹ Pay and compensation are used interchangeably and it refers to annual basic salary, bonus and other compensations such as stock-options etc.. The measurement of executive’s pay used in this study is given in Section 3.

² There are other modalities by which the managers are made to function in the interest of shareholders and not purely on their own personal interest : (i) Hiring persons with high ethical values and who are loyal to the firm (ii) Well defined contractual arrangements for the decision making process (iii) Partly delegating the decision making powers to large shareholders to

overcome the agency problem, Demsetz (1988) and (iv) Outsource the control to outsiders such as institutional investors, banks, mutual funds, etc., who are in the business. However, all these involve transaction costs and the solution is what Coase (1937) points out, that is, internalize the external transactions.

responsibilities³. Evidence also shows that the composition of the board, that is, presence of more outside members to total members, has a negative influence on executive compensation. Although independence of the board increases with inclusion of outside members, the actual impact on decision making depends on the time taken to learn about the actual functioning of the firm which is usually longer compared to the inside directors of the firm (Duchin, Matsusaka, & Ozbas, 2010)⁴. Core, Holthausen, and Larcker (1999) find that the proportion of non-executive directors is positively correlated with CEO compensation. However, Fama and Jensen (1983) argue that as the proportion of non-executive board members on the board increases, CEO compensation tends to fall because of better monitoring.

2.4. Firm ownership pattern and executive remuneration

Fama and Jensen (1983) report that combining ownership and control allows concentrated shareholders to exchange profits for private rents. Demsetz (1983) is also of the view that owners may choose non-pecuniary consumption and thereby draw scarce resources away from profitable projects. On the other hand, Anderson and Reeb (2008) show evidence that family owned firms perform better than nonfamily firms and that family ownership provides an effective organizational structure. The findings of studies on the effect of family ownership on firm's performance are rather mixed. Rau, Werner, and Schell (2018) based on their study of firms in Germany find that innovation output decreases over the generations, but if the third and later generation owner-managers are not only legal owners but also have high levels of psychological ownership, then they are highly successful and innovative as their earlier generation of owners. A study of Italian wine companies by Marsigalia, Giovannini, and Palumbo (2019) shows that a long history of generational successions is likely to exert a positive influence on the firm's returns and also in terms of brand image, reputation and cumulative know-how. Thus, if family ownership improves firm's performance, then shareholdings of the family in the firm is expected to be positively related to executive pay.

2.5. Wage contract and restricted stock awards

The wage contract for the executives which involves risk sharing between shareholders and managers consists of two parts: a fixed part (basic salary) independent of fluctuations in output of the firm and a variable component comprising (i) bonus, commission and other incentives based on performance of the firm and (ii) stock options,

golden parachutes, "restricted" awards, pension and other retirement benefits.

The composition of the compensation package of the executives is also equally important as the level of compensation depends on firm performance. It can be paid directly (via bonus/commission) or indirectly (via stock option). Studies show that the share of performance-based executive compensation has been increasing over the years and it ranges from one-half to five-sixth of the total compensation (Jensen & Murphy, 1990a).

A common argument against stock option is that it is easier to hype stock price over a short period than to build a long-term value. Options are inherently speculative, and they can be exercised into cash when the share price is attractive. Option is just another form of currency and not highly sensitive to performance as measured by changes in market value of equity (Jensen & Murphy, 1990a; Paul, 1992; Sloan, 1993).

In this study, we examine (i) pay-performance relationship and (ii) structure of pay of the executives, especially, the stock awards to executives, and their relationship with performance and governance of the firm. We also test whether there is any difference between firms in the defense sector and "peer group" firms from non-defense sector. The selection of firms from the two groups and data sources are discussed in the following section.

3. DATA BASE

The study uses data from two categories of firms namely defense and a peer group from non-defense sector. The Defense News, a weekly newspaper, publishes the top 100 defense companies every year based on revenue from defense sector and these top 100 companies of 2009 are selected for the study⁵. The reason for choosing the year 2009 is that it is the latest year for which the required data was available when the study was initiated. A group of 100 non-defense firms is also included as control group. Each defense firm provides a list of firms considered as "peer groups" in their "Proxy Statement" submitted to the US Securities and Exchange Commission (SEC) (www.sec.gov). From this list, one of the non-defense firms operating in the same country of the defense firm was randomly selected. The data for these 200 firms on firm characteristics, governance structure, market performance and CEOs remuneration were collected from Thomson Reuters for the year 2009. Some of the firms in the defense sector did not report executives' compensation and data for other variables used in this study in their annual reports submitted to the SEC. We could get all the required information only for 54 defense firms and hence the study is restricted to 108 firms, 54 in each of defense and non-defense categories. The sample of firms is spread over several countries, some from the Anglo-Saxon region and the rest from other

³ Christensen, Kent and Stewart (2010) estimated the impact of the dual role of CEO and Chairman of the Board on the performance of the firm in Australia using performance indicators such as Tobin's q and return on equity (ROE) or assets (ROA). However, the evidence is not conclusive.

⁴ Many authors are skeptical about the likely impact of the independence of the board on the performance of the firm. Bhagat and Black, (2002) and Hermalin and Weisbach (1998) find no significant correlation between independence and sales performance of the firm (Cited in Duchin, Matsusaka, and Ozbas, 2010)

⁵ The Defense News Top 100 for 2009 Annual survey reports was published on June 28, 2010. See http://special.defensenews.com/top-100/charts/rank_2009.php (accessed on May 27, 2012).

countries. The list of defense firms and the firms selected from the “peer group” non-defense firms and their geographical location are given in Appendix Table A.1

4. METHODOLOGY AND EMPIRICAL MODEL

Based on the review of literature discussed in Section 2, we specify the following empirical model to test the relationship between governance structure and firm performance on executive’s compensation⁶:

$$\log(\text{CEO Pay})_i = \beta_0 + \beta_1(\text{Defense})_i + \beta_2(\text{Anglo-Saxon})_i + \beta_3(\text{Performance})_i + \beta_4(\text{Governance})_i + \beta_5 X_i + u_i, \quad i = 1, \dots, N(\text{firms}) \quad (1)$$

The dependent variable, namely CEOs pay consists of: (i) basic pay (fixed component) and (ii) variable component comprising of bonus, annual compensation, value of stock option and other benefits. We use two measures of the dependent variable namely basic pay and total pay. Following the human capital theory, a semi-logarithmic form is used to specify the executive wage or compensation function. The sample of firms are spread over several countries and hence the salary structure is likely to differ from country to country. We also specify the dependent variable as the share of variable components to total pay.

The explanatory variables include (i) a set of dummy variables for defense firms, Anglo-Saxon countries, and a set of variables capturing (ii) firm performance (ii) governance and (iii) control variables (X).

The dummy variable for defense firms takes the value of 1 if the firm is from defense sector and 0 otherwise. This enables us to test whether there is pay difference among the executives of the defense and non-defense firms. The legal system in the Anglo-Saxon countries is believed to be more conducive for business environment. We test this by introducing a dummy variable for Anglo-Saxon countries which takes the value of 1 if the firm is in USA, Canada, UK and Ireland and 0 for firms from other countries (France, Germany, Norway, Sweden, Netherlands, Luxembourg, Italy, Japan and Singapore) where the common law prevails.

The firm’s performance is measured using the ROA (Net Revenue/Total Assets) and Tobin’s q measured by the ratio of market capitalization to the total value of assets as reported in the financial statements. The Tobin’s q does not exert a statistically significant effect and hence it is not included in the final analysis. The variance of the share prices of the firm in the last five years is also included.

The variables representing governance structure are: (i) the share of outside members to total members in the board of directors and (ii) whether CEO is also Chairman of the board of directors.

A set of control variables (X) is included to capture the firm structure and the environment in which the firms are operating: They are (i) share of family ownership and (ii) firm size measured by number of workers⁷.

The “restricted stock award” is an incentive some firms offer to encourage the executives to work in the interest of the firm and the shareholders. The executives will take more risk in order to increase the performance of the firm. To study whether the firm’s performance has any impact on the restricted stock awards, the following model is specified and estimated:

$$(\text{Stock Award})_i = \beta_0 + \beta_1(\text{Defense})_i + \beta_2(\text{Anglo-Saxon})_i + \beta_3(\text{Performance})_i + \beta_4(\text{Governance})_i + \beta_5 X_i + u_i, \quad i = 1, \dots, N(\text{firms}) \quad (2)$$

The dependent variable namely restricted stock award is measured as (i) a dummy variable which takes the value of 1 if the CEO is given restricted stocks based on the performance of the firm and 0 otherwise and (ii) the value of the stock award in US dollars. The explanatory variables included in the model are the ones defined above.

The executive compensation - indent to be added model (equation 1) with log of salary and log of total compensation as dependent variables is estimated by ordinary least squares method. Only 49% of the firms in the sample are compensating the executives with restricted stock awards. The dependent variable in the stock option model (equation 2) is either a dichotomous variable (stock award dummy) or truncated variable (value of stock option). The appropriate methods for these specifications of the model are maximum likelihood Probit and Tobit methods which are applied in this study.

5. DESCRIPTIVE ANALYSIS

The average annual compensation received by the executives under the various components in the defense and non-defense firms and also for the combined sample of all firms are given in Table 1. The executives in our sample received an annual compensation of US \$6.8 million during the year 2009. The defense firms pay a slightly higher remuneration (US \$7.2 million) than the non-defense firms (US \$6.3 million). The annual salary component to total pay is 13.6% and 15.4% in defense and non-defense firms respectively. Thus the defense firms pay more on variable component than the non-defense firms. The share of restricted stock option to total compensation is about 26% for the executives in both defense and non-defense firms.

⁶ Testing pay-performance sensitivity, an implication of the agency theory as proposed in Jensen and Murphy (1990b), Garen (1994), Aggarwal and Sawmick (1999) and others, requires panel data and hence not attempted in this study.

⁷ The CEO characteristics such as education and tenure in the firm are also tried but found the effect is not statistically significant. As there is not much variation in the level of education of the executives, the effect of education turns out to be not significant.

Table 1. Average compensation of executives in defense and non-defense firms during the year 2009

Compensation Type	Defense		Non-Defense		All Firms	
	Amount (in US \$)	% to Total	Amount (in US \$)	% to Total	Amount (in US \$)	% to Total
Salary	986779	13.6	980349	15.4	983564	14.5
Bonus	711035	9.8	772945	12.1	741990	10.9
Other Remuneration	86947	1.2	85617	1.3	86282	1.3
Total	1784761	24.7	1838911	28.9	1811836	26.7
Restricted Stock Value	1881543	26.0	1684575	26.5	1783059	26.2
All Other Compensation	3563475	49.3	2839320	44.6	3201398	47.1
Total Annual Compensation	7229780	100.0	6362806	100.0	6796293	100

Source: Authors computation

The distribution of the total compensation of the executives are given in Figures 1.1 to 1.3 for all, defense and non-defense firms respectively. The distributions are skewed as we observe in any wage

distribution. The variance of the executives' pay of the defense firms are slightly higher than the non-defense firms.

Figure 1. The distribution of the total compensation of the executives

Figure 1.1. Distribution of executives annual total compensation

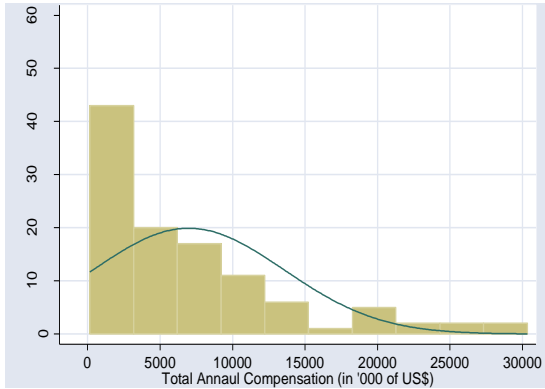


Figure 1.2. Distribution of executives annual total compensation - Defense Firms

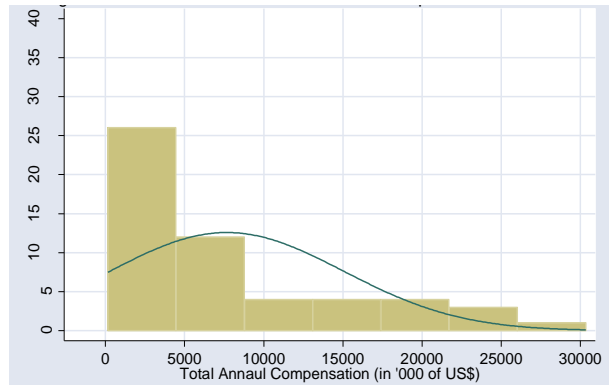
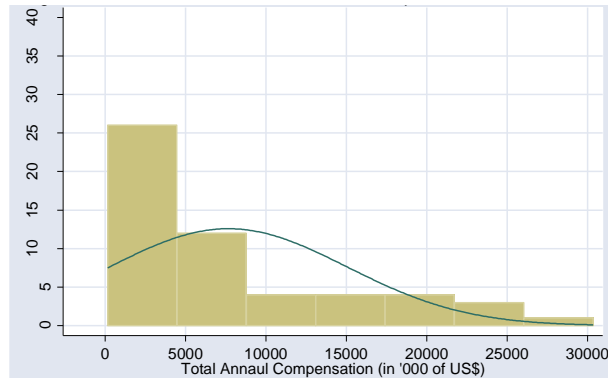


Figure 1.3. Distribution of executives annual total compensation - Non - defense Firms



Source: Constructed using the authors' data base.

Table 2 gives the description of variables used in the regression analysis along with their means and standard deviation. The means of the variables indicate certain interesting findings. 61% of the firms are found to be offering restricted stock awards to their executives and it amounts to US \$ 1.8 billion. A majority (84%) of the firms are from

Anglo-Saxon countries. The external members in the board constitute 42%, which is quite high. In a majority (52%) of the firms, the CEOs are also the Chairmen of the Board of Directors and thus have more powers to make decisions. Many of the firms in our sample are large sized as evident from the average number of workers (49,511).

Table 2. Variable description and summary statistics

<i>Variables</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Dependent Variables				
Logarithm of Salary	13.67302	0.57413	11.28254	15.00943
Log (variable pay)	14.95139	1.31539	9.284799	17.185
Log (total pay)	15.31813	1.010811	11.9761	17.22773
Share of variable pay to total	0.733659	0.211776	0	1
Restricted Stock (in US \$)	1783059	2767401	0	1.47E+07
Restricted Stock dummy (1,0)	0.611111	0.489771	0	1
Explanatory Variables				
Defense Firm dummy (1,0)	0.5	0.502331	0	1
Anglo-Saxon Countries dummy (1,0)	0.842593	0.365882	0	1
Firm Performance				
ROA (Return on Assets)	6.589252	3.870308	-1.25	23.95
Variation in Share Price 2004-2009 (Standard deviation)	30.62945	81.96541	0.493939	766.0621
Governance				
% of External Members to Total Members of the Board	0.423255	0.114734	0	0.666667
CEO cum Chairman - dummy	0.518519	0.501986	0	1
Control variables				
Number of employees	49511	70099	1170	399409
log(number of employees)	9.988452	1.367346	7.064759	12.89774
% of share owned by family	2.70271	9.601551	0	50.55
# of firms	108			

Source: Authors computation

6. REGRESSION RESULTS AND DISCUSSION

6.1. The effect of governance and firm performance on executives pay

The OLS estimates of the impact of firm performance and governance structure on the salary and total compensation of the executives are given in Table 3. The results show that excepting Anglo-Saxon dummy and logarithm of number of employees, the variables representing firm performance, governance and other control variables do not exert a statistically significant effect on salary (fixed component) but most of these variables have significant effects on total compensation. This may be because the variable component of remuneration, which is about 85% of the total compensation, depends mainly on the performance and governance structure of the firm.

The results suggest that there is no difference in the salary or total compensation of executives across defense and non-defense firms when we control for performance, governance and firm characteristics. The effect of Anglo-Saxon dummy variable is positive and statistically significant at 1% which implies that the salary and total compensation structure of the executives working in

Anglo-Saxon countries are higher compared to other countries where common law prevails.

The regression estimates of the total compensation equation indicate that the ROA has the expected positive and statistically significant at 1 percent level. This implies that as the performance of the firm improves, it leads to an increase in the remuneration of the executives. Another variable, the share price variation, which captures the performance of the firm in the stock market does not exert a significant effect on the compensation of the executives.

The results suggest that an increase in the share of external members in the Board of Governors does not increase the compensation of the executives. However, if the CEO is also the Chairman of the Board of Governors, the compensation of the executives increases by 42%.

It is interesting to note that the size of the firm measured by the log of number of employees significantly (1% level) increases the remuneration of the executives. However, as the share of family ownership increases, the payment to the executives declines. This is perhaps because ownership and control are not vastly separated in family owned firms. Overall, the variables included in the model for total compensation explains 63% of the total variation.

Table 3. Impact of firm performance and governance on executive salary and total compensation

<i>Explanatory Variables</i>	<i>Log salary</i>		<i>Log total compensation</i>	
	<i>Coefficient</i>	<i>t' value</i>	<i>Coefficient</i>	<i>t-value</i>
Defense dummy (1,0)	-0.02461	-0.25	-0.05665	-0.43
Anglo-Saxon Country dummy (1,0)	0.575815	3.59	1.077171	5.06
Firm Performance				
ROA (Return on Assets)	0.000847	0.07	0.035089	2.1
Variation in Share Price 2004-2009 (Standard deviation)	0.000207	0.33	-0.00103	-1.23
Governance				
% of External Members to Total Members of the Board	-0.47807	-0.95	-0.01619	-2.06
CEO cum Chairman dummy	0.000847	0.07	0.367201	2.50
Control variables				
log(number of employees)	0.210037	5.65	0.446861	9.06
% of share owned by family	0.006696	1.13	-0.52421	-0.78
Constant	11.18101	25.31	9.814916	16.76
Adjusted R-square	0.322		0.628	
F-ratio	6.77		21.50	

Source: Authors' computation

6.2. Governance and performance on the executive's variable pay

Next, we examine the effects of governance and firm performance on variable pay of the executives. The OLS estimates are given in Table 4. The effects of the explanatory variables are as reported in the above

analysis. The important difference is the effect of variation in the share price which significantly (at 10% or better) reduces the variable component of executive pay. An increase in the variation in share prices reduces the variable compensation of the executives.

Table 4. Impact of firm performance and governance on variable pay and share of variable to total pay of the executives, 2009

Explanatory variables	Log (variable pay)		Share of variable pay to Total Pay	
	Coefficient	t'	Coefficient	t'
Defense dummy (1,0)	-0.14217	-0.76	-0.05039	-1.51
Anglo-Saxon Country dummy (1,0)	1.684895	5.44	0.160138	2.98
Firm Performance				
ROA (Return on Assets)	0.049113	2.14	0.006438	1.52
Variation in Share Price 2004-2009 (Standard deviation)	-0.00222	-1.93	-0.0004	-1.91
Governance				
% of External Members to Total Members of the Board	-0.64516	-0.67	0.16402	0.97
CEO cum Chairman - dummy	0.496949	2.41	0.07213	1.94
Control variables				
log(number of employees)	0.474648	6.91	0.047803	3.84
% of share owned by family	-0.02583	-2.04	-0.00685	-3.45
Constant	8.609038	10.58	0.022109	0.15
Adjusted R-square	0.585		0.438	
F-Ratio	17.22		10.45	

Source: Authors' computation.

6.3. The effects of firm performance and governance on stock option of the executives

The maximum likelihood Probit and Tobit estimates of the determinants of the restricted stock option award to executives are given in Table 5. The Probit estimates show that the executives of the defense firm are less likely to receive restricted stock award compared to their counterparts in non-defense firms. The estimates show that the chance of receiving as well as the amount of restricted stock awards received by the executives in Anglo-Saxon countries is higher compared to non-Anglo-Saxon countries. The effect of RoA in the preferred Probit and Tobit models is not statistically significant even at the 10% level. However, the variation in the stock prices emerges as an important determinant of the probability of being offered restricted stock award

and the amount of award and its coefficient is statistically significant at the 1% level. An increase in the standard deviation of stock prices in the last five years by one percent reduces the chances of getting a restricted stock award by 1.2% which is about 25.3 thousand US dollars as per the Tobit estimates. The presence of external members in the board reduces while the CEO also being the Chairman of the board increases the value of restricted stock award. The size of the firm, measured by number of workers, has a statistically significant effect (at 5% or above) on the restricted stock award which implies that the larger the size of the firm the higher the changes of obtaining and also higher the value of stock awards. An increase in family shareholding reduces the chances of getting restricted stock awards.

Table 5. The effect of firm performance and governance on the restricted stock award of the executives, 2009

Explanatory Variables	Restricted Stock Award Dummy		Restricted Stock Value (in 1000s of US \$)		Restricted Stock Value (in 1000s of US \$)	
	Probit		OLS		Tobit	
	Marginal Effect	t'	Marginal Effect	t'	Marginal Effect*	t'
Defense dummy (1,0)	-0.522353	-3.4	-175.5	-0.37	227.9	-1.54
Anglo-Saxon Country dummy (1,0)	0.7252462	4.16	2164.5	2.86	1535.3	4.55
Firm Performance						
ROA (Return on Assets)	-0.0286367	-1.54	109.8	1.84	7.7	0.28
Variation in Share Price 2004-2009 (Standard deviation)	-0.0120017	-2.64	-1.1	-0.38	-25.3	-3.01
Governance						
% of External Members to Total Members of the Board	-0.3916011	-0.52	-4767.0	-2.0	-2765.2	-2.33
CEO cum Chairman dummy	0.3293381	1.93	1237.0	2.36	466.8	1.84
Control variables						
Log (number of employees)	0.1229511	1.97	991.2	5.64	-21.2	5.88
% of share owned by family	-0.0161274	-1.67	-33.4	-1.19	489.0	-1.23
Constant			-9062.2	-4.34		
Adjusted R-square/Pseudo R ²	0.545		0.383		0.064	
F-ratio			8.5			

Note: The underlying marginal effects are computed from Probit model and presented in the table. In the case of Tobit model, the marginal effects are the expected value of the dependent variable conditional on being greater than zero.

Source: Authors' computation.

7. CONCLUSIONS

The study examines the determinants of CEO's pay focusing on the role of governance structure, performance, size, family ownership pattern in top 54 defense firms and an equal number of firms in the "peer group" of non-defense firms in the world. The results based on descriptive and econometric analysis show that though the average pay received by the executives differs between defense and non-defense firms, when we control for the variation in governance, performance and other factors, there is no statistically significant difference in executive's pay between the two types of firms. The executive pay is higher in Anglo-Saxon countries compared to other countries with a common law.

The CEO who is also the Chairperson of the Board of Directors gets a larger variable component of total compensation and is more likely to get higher restricted stock awards. The increase in the share of external members in the board does not increase the salary (fixed component) but increases the restricted stock awards and thus total compensation.

The firm's performance, as measured by ROA, has a positive effect on the executive's total compensation. The variation in the share price during the last five years significantly reduces the

value of restricted stock awards which implies that the CEOs are risk averse and prefer not to link their variable compensation with the stock market performance of the firms. The size of the firm has a positive effect while the increase in the family shareholding reduces the total compensation of the executives. The limitations of the study are the small sample size of 108 firms from the defense and non-defense sectors and the data pertain to the year 2009. Further research using data from 2009 to a more recent year with a larger sample size and employing panel data models would be more insightful and rewarding. Another aspect worthy of research is to examine how the political and socio-economic settings of the countries influence the performance and executive pay of the defense firms.

The findings of our study imply that firms reward their executives based on their performance, return on assets, governance structure, legal system and country in which they operate. It can be inferred from the study that firms in the defense sector also remunerate their executives like the non-defense sector and this is amply evident from the econometric results that pay difference vanishes when we control for characteristics of firms. The methodology used in the study has scope for wider applications in this area.

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APPENDIX

Table A.1. List of sample firms from defense and non-defense sector

Serial no	Country	DEFENSE	Country	NON-DEFENSE (PEER GROUP)
1	USA	Lockheed Martin	USA	Dow Chemical
2	UK	BAE Systems	UK	Sainsbury
3	USA	Boeing	USA	Procter & gamble
4	USA	Northrop Grumman	USA	Caterpillar
5	USA	General Dynamics	USA	Johnson controls
6	USA	Raytheon Company	USA	3M Company
7	NL	EADS	Luxembourg	Arcelor Mittal
8	Italy	Finmeccanica	Japan	Suzuki motor
9	USA	L-3 Communications	USA	Danaher
10	USA	United Technologies	USA	Johnson & Johnson
11	USA	SAIC	USA	Automatic data processing
12	USA	ITT	USA	Emerson electronic
13	USA	KBR	USA	The Shaw group
14	USA	Honeywell	USA	Dupont
15	USA	CSC	USA	Xerox
16	USA	GE Aviation	USA	Chevron
17	USA	URS	USA	AECOM
18	USA	Textron	USA	Texas instrument
19	UK	Rolls-Royce	UK	Sabmiller
20	France	Safran	France	Rexel
21	USA	ATK	USA	Agilent technologies
22	USA	Harris	USA	Applied materials
23	Germany	Rheinmetall	Germany	Gea group
24	USA	Oshkosh	USA	Dover
25	USA	Rockwell Collins	USA	Flowserve
26	UK	Cobham	USA	Nacco
27	UK	Babcock International Group	USA	Crane
28	USA	CACI International	USA	Broadridge
29	Sweden	Saab	Suède	Scania
30	USA	Goodrich	USA	Parker Hannifin
31	Japan	Mitsubishi Electric	Japan	Nippon Steel
32	USA	ManTech International	USA	Unisys
33	UK	QinetiQ Group	UK	Briggs & Stratton
34	USA	Hewlett-Packard	USA	IBM
35	UK	Serco	UK	Rentokil
36	Singapore	Singapore Technologies Engineering Ltd	Singapore	Sembcorp
37	France	Dassault Aviation	France	Legrand (Wendel)
38	Norway	Kongsberg	Norway	AF gruppen
39	UK	GKN	USA	Tomkins
40	USA	Force Protection	USA	Milacron (en faillite depuis 2008-2009)
41	USA	Jacobs Engineering	USA	Foster Wheeler
42	USA	Fluor	USA	Murphy oil
43	USA	VSE	USA	CPI international
44	UK	Ultra Electronics Holdings	USA	Terradine
45	UK	Meggitt	USA	Triumph
46	UK	Chemring	USA	Graco
47	USA	Teledyne Technologies	USA	Ametek
48	USA	Curtiss-Wright	USA	Enpro industries
49	Canada	CAE	Canada	SNC lavalin
50	USA	Cubic	USA	CH2M hill
51	USA	FLIR	USA	Barnes
52	USA	AAR	USA	Cascade
53	USA	SRA International	USA	ICF International
54	Ireland	Accenture	Irland	CRH