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EMPLOYEE STOCK OPTION PLAN AND FIRM PERFORMANCE: A QUANTILE REGRESSION APPROACH

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Abstract

The study attempts to investigate the effect of employee stock option plans (ESOPs) on the financial performance of Indian non-finance companies. The study employed the quantile regression (QR) model to examine the effect of ESOP on the financial performance of sample companies. The empirical findings suggest that the effect of equity-based payment is positive at the higher performance levels. This indicates that the firms adopted stock-based compensation schemes in their early stage of growth may cause a declining financial performance in compared to the matured firms. Moreover, the findings indicate that the industry plays a significant role in deciding the equity-based compensation and depict a positive impact of ESOP on firm performance. The employee based compensation is also found to be positively associated with the company performance, while the performance is measured through market measures. The findings may be attributed due to the direct linkage of equity-based option schemes to the market performance measures.

1. INTRODUCTION

The foundation of equity-based compensation plans mainly focuses on reducing agency problem that typically arises between the shareholders and the managers. The theory developed by Jensen and Meckling (1976) described that, in the case of public companies, the management is separated from ownership, and there is a difference of interests between managers and owners. The managers always inclined to be opportunistic and undertake responsibilities to achieve their personal goal at the expenses of owners. Employee stock options are devised to match the interests of managers with owners. Several academic literatures studied the effects of Employees Stock Option Plans (ESOPs hereafter) on corporate financial performance. Most of these studies target the developed markets like the United States. Conversely, very few studies covered the emerging markets and the literature on ESOP in India is rather scant. The existing empirical research indicated contradictory results on the subject. There are few studies find that the ESOPs influence the financial results positively while others find a negative effect.

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The researchers argued that the ESOPs provide incentives to employees and motivate them to work hard, thus enhancing firm performance. Previous studies using the American and European market data offer mixed results. Cin and Smith (2002), Kumbhakar and Dunbar (1993) and Jones and Kato (1995), and found a higher productivity in ESOP firms than others firms. Others, Conte *et al.* (1996) and US GAO (1987) found a negative impact of ESOP on firm performance. Blasi *et al.* (2003) reviewed the existing literature on ESOP and concluded that the research outcomes are contradictory and give diverse views on the relationship between ESOP and corporate performance.

The conflicting research findings might be due to the difficult experience in the collection of a sample or the research methodology used or the figures used for the ESOP and firm performance study. The present study assumes that the influence of ESOP on firm performance is not uniform across companies and follows a non-monotonic relationship. The prior studies- Ittner *et al.* (2003), Murphy (2003), Anderson *et al.* (2000), Matolcsy (2000) and Zhou (2000) used various segments to study the non-uniform effect of ESOPs on performance. The limitation of segment-wise analysis, motivated the author to observe the non-uniform based linkage between ESOP and financial performance using a quantile regression model. The model is used for analyzing the financial results and ESOP relationship in various performance phases of sample firms. The non-uniform or non-monotonic relationship of ESOP and firm performance at different quantile levels are comparable to the company's life-cycle principle. Generally, firms exhibit better (worst) performance during their growth (decline) stages. As per the life-cycle theory, the corporate strategies are different for growth and decline stages. The present study argues that the ESOPs be corporate strategic decisions taken at various business phases to enhance performance. ESOPs may motivate the executives to take more (less) risky investment decisions, which may enhance (reduce) the bankruptcy costs and, in turn, improve (diminish) profitability. Kabir *et al*. (2013) empirically found this impact of executive stock compensation on bond borrowing costs. Other researchers; Billett *et al.* (2010) and DeFusco *et al.* (1990) investigated the bond pricing and equity- based compensation. They found that the prices of the bonds decline with the news of equity-based executive compensation.

The study focused on Indian context and attempted to provide a new dimension to the ESOP on corporate performance relationship. The MNCs and the firms in the Information Technology (IT) sector in India started the ESOP schemes in early 2000. In the technology sector, ESOPs are issued to all levels of employees, whereas non-technology companies issue ESOPs only to top executives. An ESOP is a tax-qualified option scheme that gives the right to the employees to purchase employer's stock at a specified price (mostly at fair market value) during a specified period once the options are vested. The corporate strategy towards stock-based compensation plans varies from company to company. The IT companies in India issue ESOPs to motivate and retain employees, whereas the non-IT companies compensate remuneration through ESOPs. The companies issue ESOPs in India, follow the disclosure guidelines (1999) specified by Securities and Exchange Board of India (SEBI).

The present study contributes to the existing literature in different ways. First, the study investigates the relation between ESOPs and performance both from accounting and market performance measures. Second, to the best of author's knowledge, this research is the first empirical study to capture the non-uniform impact of ESOPs on the business performance of Indian firms. Third, the study takes a longer time horizon to explore the impact of ESOPs on firm performance.

The rest of the paper will proceed as follows. Section 2 discusses the existing literature on ESOP and firm performance relationship. Section 3 deals with the methodology and data. Section 4 includes the empirical results. The last section 5 represents the summary of research finding and conclusion.

2. REVIEW OF LITERATURE

The findings of numerous studies on the equity-based compensation and firm performance reported inconclusive results. Some authors opined a positive relation between the ESOP and financial results of the firms, while others suggested the reverse.

Several existing literatures support the view that the executive stock options enhance corporate performance and productivity. They advocated that the stock-based incentive plans improve mutual monitoring, retain talented executives and bring quality employees to the organization (Kim & Ouimet, 2014; Hochberg & Lindsey, 2010; Oyer, 2004; Ittner *et al.*, 2003; Sesil *et al.*, 2002, Jones & Kato, 1995; Lazear, 1986). The findings of Sesil *et al.* (2001) show that those American companies issue ESOPs, perform better than their industry peer companies. In the similar line, Hillegeist and Penalva (2004) reported a positive and significant impact of ESOPs on business results while return on assets (ROA) and Tobin's Q measures are taken as the performance indicators. Duffhues *et al.* (2003) and Duffhues and Kabir (2008) studied the impact of executive stock compensation plan on firm performance in the European market. They considered the return on equity (ROE) and return on assets (ROA) as the performance variables, and found a positive linkage between ESOP and financial performance. Ozkan (2009) studied 390 British companies from FTSE index and found a positive relation between ESOP and firm performance while measuring from the stock return and ROA. Lanouar and Elmarzougui (2007) conducted the first study on French market on ESOP and firm performance. Their findings suggest a strong relationship between the ESOP and market performance in CAC 40 index companies. Hamouda (2006) examined the effect of ESOPs on the performance of the firm with the sample companies in SBF 120 index. Taking ROE, total shareholder return and return on capital employed (ROCE) as performance measures, he found that over a two-year following the ESOPs, there is no impact of ESOPs on the shareholders' total return. He also reported a negative effect of ESOPs on ROE during the same period. However, Hamouda supports a positive effect of ESOP on ROCE, particularly when the stock options are benefiting the executives of the firm. In the academic literature, it is argued that ESOP's help in developing corporate culture motivate employees to participate and promote teamwork and cooperation. The studies conducted by (Kim and Ouimet, 2009; Craig, 1993; Weitzman and Kruse, 1990) support this argument that the ESOPs positively affect the corporate performance and corporate culture. Li *et al.* (2015) performed a relationship study on stock-based CEO incentive and the performance of the firm in the United States market. He used the quantile regression model and found a positive correlation between the stock-based CEO incentive and the performance at the higher quantile regions.

Some studies show a future negative performance after the stock compensation plan execution. Core *et al.* (1999) argued that the excess compensating firms perform poorly relative to the firms compensate less. They suggested that the enterprise with poor governance structure tries to compensate more by stock option schemes. The similar results are also reported by Brick *et al.* (2006) and Cheng and Farber (2008). Idi Cheffou (2007) conducted research on 101 companies listed in Paris stock exchange. He used ROA, ROE, and Tobin's Q as performance variables and found that the accounting performance indicators are not affected by the ESOP compensation to CEOs. However, he reported that the market measure (Tobin's Q) and ESOP compensation are positively related.

Bulan *et al.* (2010) studied the ESOP and firm productivity with 917 sample American manufacturing firms over a period from 1992 to 2003. He concluded that there is no significant effect of ESOPs on the business performance. The accounting performances are negatively associated with the stock option compensations. Sanders and Hambrick (2007) examined the executive stock compensation and the firm financial performance from excess return approaches. Their findings suggest that the excess stock compensation leads to an extreme variation of the company's market performance.

Many researchers investigated the executive stock compensation plans and firm's market performance linkage. Cormier *et al.* (1999) studied the ESOP and the financial performance of 67 Canadian companies. They suggested that, over a period of 268-days, the stock market returns improve with ESOP announcement. Hassan and Hoshino (2007) investigated the stock compensation announcement and stock market returns with Japanese companies listed on Tokyo Stock Exchange. They found that the operating and the stock market performances are positive after the declaration of stock compensation plans. In the Japanese market, Kato *et al.* (2005) also reported a positive market

reaction to the executive stock compensation announcement. Langmann (2007) examined the German companies ESOPs and market performance and found a 1 percent positive market return on the initial day of announcement of executives plans. In the similar line, Brickley *et al.* (1985) tried to investigate the announcement effect of ESOPs on the stock returns. Their findings suggest that the investors' positively response to the adoption of long-term stock compensation plans, and the stock returns are positive. DeFusco *et al.* (1990) found the similar results like Brickley *et al.* (1985) on the connection between the ESOP adoption and equity returns. Mehran (1995) supported the findings of Brickley *et al.* (1985) and DeFusco *et al.* (1990) while examining the executive compensation and firm value maximization. He suggested that, per se, executive compensation does not align with the business value maximization, but while the compensation is equity based, the firm performance is positive. Gerety *et al.* (2001) studied the market reaction to the compensation plans declared for the directors. They applied the same methodology of Brickley *et al.* (1985) and DeFusco *et al.* (1990) and found an insignificant association between the stock compensation announcement and market return. They concluded that the shareholders are not benefited from such declarations. Frye (2004) investigated the connection between the executive stock compensation and firm performance with different time period data. Interestingly, he found that the relationship between stock-based compensation and ROA is positive in one period (the early 1990s), while negative in another period. Similarly, Aggarwal and Samwick (2006) found that the Tobin's Q varies in different incentive stages offered to the executives.

It is evident from the above review that there is no uniform association between ESOPs and corporate performance. In order to study the relationship between the stock-based compensation on different levels of financial performance with the Indian companies, the present study uses quantile regression methodology. The study sets the hypothesis that the effects of ESOP/total compensation are positive on firm performance with the sample Indian companies.

3. METHODOLOGY AND DATA

3.1. Empirical model

In this section, first, the OLS and LAD models are discussed and then the QR model is presented in detail.

Let (y_{it}, x_{it}) $I = 1, 2,\ldots,N$ and $t = 1, 2,\ldots,T$ be a sample drawn. Where, I and t denote the ith firm and the tth period respectively. The dependent variable, y_{it} represents a company's performance (either accounting or market), and x_{it} is a (K X 1) vector of y_{it}. Considering that the distribution of y_{it} is linear in x_{it}, the regression equation is formulated as follows.

$$y_{it} = x_{it}' \cdot \beta + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where β is the unknown coefficient parameter need to be determined

It is evident that the non-quantile model (equation 1 above) is potentially limited owning to the use of constant loading in each identified determinant of the dependent variable. The coefficient results in the equation 1 are fixed between the good and bad performance of the firms. As per the following method, the vector β values can be estimated.

$$\min \sum_i (\varepsilon_{it})^2 = \sum (y_{it} - x_{it}' \cdot \beta)^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The sum of the absolute errors can further be minimized with estimation of vector β value under least absolute deviations (LAD) with the following model:

$$\min \sum_i | \varepsilon_{it} | = \sum_i | y_{it} - x_{it}' \cdot \beta | \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The equal weight average of the error terms is estimated by the above equation 2 and 3. In OLS and LAD optimization method, $x_{it}'\cdot\beta$ represents the conditional mean and median respectively. The limiting factor of OLS and LAD estimation is that both give only one central tendency measure (mean or median) of the dependent variable like firm performance. The behavior of the business performance in the tail region is not taken into account both in OLS and LAD techniques.

As mentioned earlier, the present research uses Quantile Regression (QR) model developed by Koenker and Bassett (1978), because of the limitations in other traditional models explained above. The QR model will explain the asymmetric relation between the ESOP and performance in the tail region (i.e., with high and low firm quantile performance levels).

Now, assuming that the θth quantile of the explained variable (y_{it}), is linear in x_{it} , the model for conditional QR can be defined as:

$$\begin{aligned} &y_{it} = x_{it}'\cdot\beta_\theta + \varepsilon_{\theta it} \\ &Quant_\theta(y_{it} \mid x_{it}) \equiv \inf\{y : F_{it}(y \mid x)\theta\} = x_{it}'\cdot\beta_\theta \\ &Quant_\theta(\varepsilon_{\theta it} \mid x_{it}) = 0 \end{aligned} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where, $Quant_\theta(y_{it} \mid x_{it})$ denotes the θth conditional quantile of y_{it} on the regressor vector $x_{it}'\cdot\beta_\theta$, which is to be estimated for different values of θ in (0,1) and $\varepsilon_{\theta it}$ is the error term assumed to be drawn from the differentiable distribution function $F_{\varepsilon\theta}(\cdot \mid x)$ and differentiable density function $f_{\varepsilon\theta}(\cdot \mid x)$. The value $F_{it}(\cdot \mid x)$ represents the conditional allocation of the dependent variable on *x*. Differentiating the values of θ from 0 to 1 explain the distribution of *y* conditional on *x*. The estimated values of β_θ can be obtained using the following model:

$$\begin{aligned} &\min \sum_{it:\varepsilon_{\theta it}>0} \theta \times \mid \varepsilon_{\theta it} \mid + \sum_{it:\varepsilon_{\theta it}<0} (1-\theta) \times \mid \varepsilon_{\theta it} \mid \\ &= \sum_{it:y_{it}-x_{it}'\cdot\beta_\theta>0} \theta \times \mid y_{it} - x_{it}'\cdot\beta_\theta \mid + \sum_{it:y_{it}-x_{it}'\cdot\beta_\theta<0} (1-\theta) \times \mid y_{it} - x_{it}'\cdot\beta_\theta \mid \end{aligned} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The linear programming technique is used to solve the minimization problem arises from the above model.

The special attribute of QR technique is that it includes the total dependent variables that are conditional on the independent variable. Comparing OLS and LAD (equation- 2 & 3 above) reveals the superior properties of QR technique. The notable one is that the estimator vector β_θ varies with the θ. The behavior of different θ allows one to explain the characteristic of the non-uniform estimator vector β_θ in several performances regions. While comparing LAD with QR (equation 3 & 5), it reveals the case of 0.5 quantile-varying estimators.

The present study uses the matrix bootstrap method to determine the coefficient's standard error in the quantile regression model. The study uses Koenker and Hallock (2001) proposed percentile method to construct confidence intervals for each parameter in β_θ.

3.2. Data

The study uses sample companies listed on National Stock Exchange (NSE) of India. The banking and financial service firms are excluded from the sample, due to their different nature of the capital structure. The research includes 157 Indian non-finance companies' data from 2005 to 2015. The ESOP and other financial information are obtained from CMIE database; a widely used database of India companies. The companies are selected by the availability of financial data for the entire period of 11-years i.e. from 2005 to 2015.

The existing literature suggests several proxy performance variables to analyse the business performance and ESOP relationship. The return on equity (ROE) is the popular accounting-based proxy measure of firm financial performance. The researchers like (Larcker *et al.* 2007; Matolcsy, 2000; Gaver & Gaver, 1998; Baber *et al.* 1998 and Sloan, 1993) strongly advocated for the accounting-based measure and stated that the performance appraisal and incentive schemes of executives are decided by accounting results. They argued that the banks and rating agencies examine a firm's accounting performance while extending corporate loans and assessing their repayment abilities. Other researchers including, Core *et al.* (2006); Gompers *et al.* (2003); Davis (1994); Lakonishok *et al.* (1994) and Fama and French (1992) opined that the investment strategies drawn from accounting variables carry superior return in compared to market-based indicators. Under this background, the present study followed the views expressed by earlier researchers and considered ROE as a proxy measure of financial performance of firms. In order to compare the results, some market parameters are also used to investigate the impact of ESOP adoption on market performance.

Table 1: Components of dependent/independent variables

Variables	Definition
Dependent Variable:	
ROE	Net Income after Tax/ Net Worth
Independent Variables:	
ESOP	Annual value of Employee stock option plan/Total Compensation paid
Debt Ratio	Total Term Liabilities/Total Assets
Firm Size	Natural Logarithm of total assets

Note: Data for 157 sample non-finance companies of NSE (National Stock Exchange) India for the period from 2005 to 2015. Indian companies started ESOP schemes from early 2000. The financial and ESOP data obtained from CMIE database, a widely used research database of Indian companies

The percentage of ESOP to total compensation ratio of each year is used in the study to avoid the heteroskedasticity problem. Along with the ESOP variable, the study includes two other control variables; debt ratio and the log of total assets as the proxy measures of leverage and size respectively. Table 1 includes the variables adopted in the study with their components of estimation. The summary statistics and correlation coefficient of those variables are presented in Table 2. The mean and median values of ROE are 14.05 percent and 14.46 percent respectively as depicted in the panel A of Table 2. The values indicate the symmetric distribution of ROE values.

Table 2: Dependent/independent variables summary statistics

Panel A: Summary statistics of dependent/independent variables

Variable	Mean	Median	Std. deviation	Minimum	Maximum
ROE	14.05	14.46	21.41	-159.15	97.80
ESOP/Total Comp.	0.018	0.008	0.029	0.001	0.23
Firm Size (ln TA)	9.53	9.27	1.52	6.53	13.43
Debt ratio	0.25	0.25	0.16	0.000	0.78

Panel B: Correlation coefficient of dependent/independent variables

Variables	ROE	ESOP/Total Comp.	Firm Size (ln TA)	Debt ratio
ROE	1			
ESOP/Total Comp	-0.043	1		
Firm Size (ln TA)	0.120	0.102	1	
Debt ratio	-0.271	0.019	0.156	1

Note: The data sources are same as Table 1

4. EMPIRICAL RESULTS

4.1. ESOP and firm performance (ROE)

Table 3 shows the empirical results of quantile model. For comparison purpose, the OLS results are also presented in the table. The study uses the multiple regression approaches and includes-ESOP/Total Compensation, firm size, and debt ratio as the explanatory variables simultaneously in the QR model. The present study observes the effect of ESOP/total employee payment on the financial performance of the firm. Therefore, the empirical results are only shown for the ESOP/total compensation at various quantile levels. The explanatory variables, firm size and debt ratio are taken as the control variable.

Table 3 depicts the estimated quantile values of ESOP/total employee compensation ratio with Lagrange Multiplier Chi-square values. The OLS estimation value for ESOP/total employee compensation is presented for comparison purpose. The OLS value estimation for ESOP/total compensation is -40.65 and the corresponding p-value is 0.47. This value shows a negative and insignificant association between employee equity option plan and financial performance. However, the limitation of OLS estimation is that it focuses only on the central tendency of the distribution and not focusing on the effect of employee stock option plan on different levels of performances. It is a single measure that shows the normal relationship between the ESOP/total employee compensation and firm performance. OLS does not demonstrate the impact of ESOP/total compensation on firm performance (ROE) in extreme regions.

The study assumes that the employee stock option plan is non-uniform at different levels of firm performance and employed QR model to study the effect. The empirical results summarized in Table 3 show that, at the lower quantile levels of firm performance (ROE), the effect of employee stock option plan is negative. Interestingly, while moving higher the quantile levels, the impact of employee stock option on firm performance (ROE) is wider and reaches the highest at the central quantile level. The estimated values of ESOP/total employee compensation are significant as per Lagrange Multiplier probability value except the values at 0.05 and 0.10 quantile levels. The results support the hypothesis that the effect of ESOP/total compensation is positive on firm performance. It is reported that, as we are moving up the quantile levels beyond central quantile, the extent of the negative impact of employee stock option/total compensation on firm performance declines. The ESOP/total compensation variable shows positive estimated values at the quantile levels from 0.75 to 0.90. At the highest quantile level (0.95 quantile) the ESOP/total compensation depicts a negative impact on firm performance.

4.1.1. Implications

The study reflects two aspects of financial performance and employee compensation. First, the fluctuating behavior of financial achievement (ROE) is strongly related to the growth/decline phases of the firm. As per the life-cycle theory, the firms witness a robust and positive return on equity during their growth phase in contrast to the decline stage. The positive return phase motivates the management to adopt new corporate strategies to sustain the growth. Second, the adoption of employee stock option as a business strategy aims at retaining executives and solve agency problem. The employee stock option plans motivate executives to take extra risk of investment and align the goal of the shareholders (owners) and the company. Accordingly, the present study assumes that the employee stock option schemes positively influence financial performance of the firms.

The results depicted in Table 3 show that the effect of employee's equity-based compensation is positive at the higher ROE levels. The estimated values of ESOP/total compensation are positive from 0.75 to 0.90 ROE quantile regions. The effect of employee equity option on financial performance is negative from 0.15 to 0.65 quantile levels. However, the intensity of negative impact reduces after central quantile level. These results indicate that the firms attempted to adopt stock-based compensation schemes in their early stages of growth (lower ROE quantile levels) may cause declining firm performance. The study argues that the decision of risky corporate investments may lead to more bankruptcy cost and results in a bad firm performance during the early stages of

growth. At the higher ROE quantile level (0.95 quantile), QR estimated value shows a negative figure. The findings indicate that at firm's mature life-cycle stage, the equity-based incentive plan has a little or negative impact on firm performance.

Table 3: ESOP/total employee compensation effect on ROE across quantile levels

Quantile	Estimated Value	Lagrange Multiplier Chi-square	Lagrange Multiplier Pr > Chi²
0.05	-60.05	5.14	0.16
0.10	-73.54	7.48	0.06
0.15	-80.68	49.26	< 0.0001
0.20	-80.84	120.37	< 0.0001
0.25	-79.25	208.59	< 0.0001
0.30	-79.47	321.00	< 0.0001
0.35	-82.32	478.83	< 0.0001
0.40	-84.63	573.37	< 0.0001
0.45	-84.71	699.69	< 0.0001
0.50	-85.99	901.09	< 0.0001
0.55	-68.43	1095.51	< 0.0001
0.60	-42.48	1248.66	< 0.0001
0.65	-15.05	1468.81	< 0.0001
0.70	-6.36	1606.72	< 0.0001
0.75	2.80	1083.07	< 0.0001
0.80	5.33	1017.83	< 0.0001
0.85	9.92	1148.10	< 0.0001
0.90	8.18	1511.07	< 0.0001
0.95	-16.00	3647.35	< 0.0001
OLS	-40.65 (0.47)		

Note: The OLS, denotes Ordinary Least Square. The value in the in the parentheses denotes the p-value for OLS coefficient estimate. The Pr.Chi^2 values across different quantiles are at 5 percent significant level. The data sources are identical to Table 1

Figure 1 shows the pattern of behavior of quantile varying values of ESOP/total compensation at different performance stages. It clearly indicates that at the higher performance (ROE) quantile levels, the equity-based compensation has a positive impact on than the lower levels. This trend is not reported by the OLS estimate, which shows a single value taking the whole distribution sample.

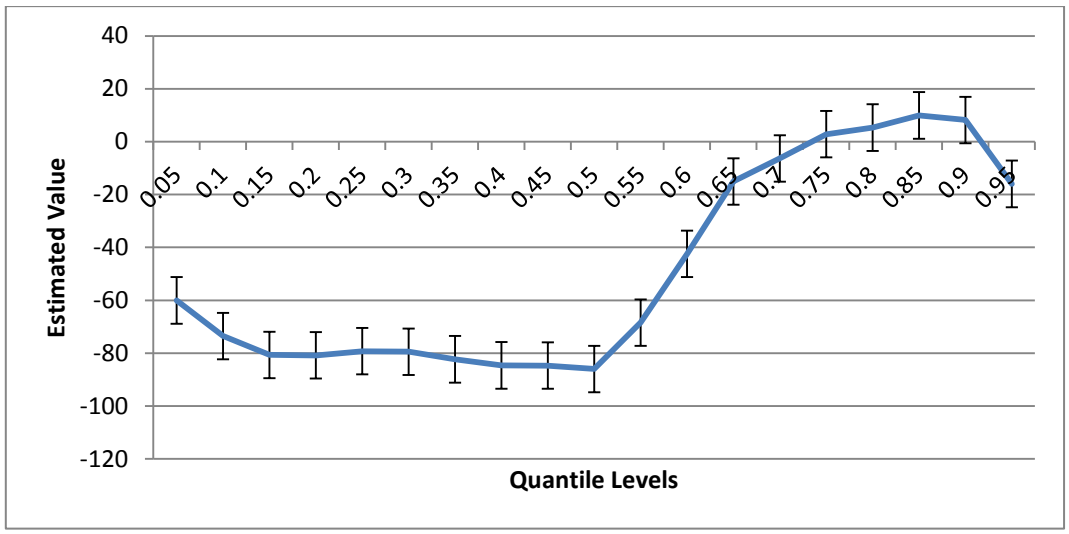

Figure 1: ESOP/Total employee compensation effect on ROE across quantile levels

4.2. Industry effect in ESOP and firm performance relationship

The industry dummy is used in the QR model to investigate the sector effect on ESOP/total compensation and firm performance relationship. The industry is adopted as a dummy variable because sometimes it influences the corporate decision on employee stock option plans. The industries are grouped into two categories i.e. manufacturing and services. In the empirical model, the company from manufacturing sector is represented with "1" and "0" otherwise. The industry dummy is included along with the other three original explanatory variables. It is notable that, in India, the enterprises in the service sector (IT and software companies) are the pioneer in launching ESOP schemes for all categories of employees.

The QR model results industry dummy variable are presented in Table 4. The OLS estimated value is negative (-18.61), and it is insignificant like the previous case (Table 3). Table 4 reveals a significant change of quantile estimate values of ESOP/total compensation. At higher quantile levels of ROE, the estimated values of ESOP/total compensation show a positive trend. The same pattern is also observed in the lower quantile regions (except 0.05 and 0.10). It indicates a positive effect of ESOP on business performance at the very early and central quantile phases. At the central quantile level (0.5), the value shows a negative impact on performance. However, at the quantile levels from 0.55 to 0.85, the equity-based stock option demonstrates a positive tendency. Similar to the previous case (Table 3), the estimated values of ESOP/total compensation represent a negative value at 0.90 and 0.95 ROE quantile levels. Table 4 depicts that the estimated values of ESOP/total employee compensation are significant as per Lagrange Multiplier probability value except the values at 0.05 and 0.10 quantile levels. The results support the hypothesis that the effect of ESOP/total compensation is positive on firm performance.

4.2.1. Implications

Table 4 shows the industry effect on the ESOP/total compensation relationship as per QR model. The results explain a positive association between equity-based compensation and financial performance (ROE). The positive effect of ESOP on firm performance is depicted at the lower quantile as well as higher quantile regions (except 0.05, 0.10, 0.45, 0.50, 0.90 and 0.95 quantile levels). The same indicates that industry plays a significant role in deciding the equity-based compensation and its impact on firm performance. This trend may be attributed to different facts of the Indian market. First, as mentioned earlier, the companies in the service industry pioneered the ESOP schemes in India and issued equity-based compensation incentives in their early stages of growth. The same is evident from the empirical results that at lower ROE quantile levels, the impact of ESOP is positive on firm performance. Second, during the stock market boom, the executives benefited more from the equity-based compensation plans and that may influence the subsequent year's positive firm performance regarding improved productivity. The impact of ESOP/total compensation is negative at the highest quantile level may be due to the potentially matured level of growth trajectory in the industry to compensate more to the employees with equity-based incentive schemes.

Table 4: ESOP/total compensation effect on ROE across quantile levels, with industry as a dummy variable

Quantile	Estimated Value	Lagrange Multiplier Chi-square	Lagrange Multiplier Pr > Chi²
0.05	-40.755	5.041	0.283
0.10	-56.630	5.342	0.254
0.15	64.163	36.743	< 0.0001
0.20	68.355	75.191	< 0.0001
0.25	69.045	158.530	< 0.0001
0.30	69.869	301.212	< 0.0001
0.35	71.324	473.352	< 0.0001
0.40	74.376	636.622	< 0.0001
0.45	-76.574	802.888	< 0.0001

0.50	-75.623	1041.729	< 0.0001
0.55	67.332	1201.131	< 0.0001
0.60	45.208	1489.859	< 0.0001
0.65	25.541	1769.749	< 0.0001
0.70	19.792	2000.461	< 0.0001
0.75	11.707	2157.523	< 0.0001
0.80	9.509	2088.812	< 0.0001
0.85	9.770	2417.427	< 0.0001
0.90	-6.415	3302.720	< 0.0001
0.95	-19.405	4206.745	< 0.0001
OLS	-18.61 (0.53)		

Note: The OLS, denotes Ordinary Least Square. The value in parentheses denotes the p-value for OLS coefficient estimate. The Pr.Chi^2 values across different quantiles are at 5 percent significant level. The data sources are identical to Table 1

4.3. Additional control variable and QR model

The price-to-book ratio is included as an alternative control variable along with the three original explanatory variables (ESOP/total compensation ratio, firm size and debt ratio). The objective of including price-to-book ratio is to review the biases of estimated values in QR model with the explanatory variables taken earlier. The estimated results are summarized in Table 5. The results depict the similar trend as of Table 3. The estimated values become positive at the higher quantile regions (0.75 to 0.90). The results show that, at 0.05 ROE quantile level, the impact of ESOP on financial performance is negative. The Lagrange Multiplier probability values except the values at 0.05 quantile levels are significant at 5 percent level.

Table 5: ESOP/Total compensation effect on ROE across quantile levels with control variable, PB ratio

Quantile	Estimated Value	Lagrange Multiplier Chi-square	Lagrange Multiplier Pr > Chi^2
0.05	-89.822	0.289	0.89
0.10	-105.189	23.650	< 0.0001
0.15	-112.902	77.558	< 0.0001
0.20	-114.658	139.232	< 0.0001
0.25	-116.659	248.098	< 0.0001
0.30	-119.969	336.462	< 0.0001
0.35	-129.513	475.483	< 0.0001
0.40	-125.689	597.598	< 0.0001
0.45	-126.904	695.018	< 0.0001
0.50	-119.485	843.048	< 0.0001
0.55	-108.768	977.474	< 0.0001
0.60	-91.526	1240.166	< 0.0001
0.65	-75.982	1432.082	< 0.0001
0.70	-62.013	1712.521	< 0.0001
0.75	40.272	2055.271	< 0.0001
0.8	38.061	2018.119	< 0.0001
0.85	32.664	1790.306	< 0.0001
0.90	27.581	1701.670	< 0.0001
0.95	-27.521	1957.890	< 0.0001
OLS	-54.79 (0.14)		

Note: The OLS, denotes Ordinary Least Square. The value in parentheses denotes the p-value for OLS coefficient estimate. The Pr.Chi^2 values across different quantiles are at 5 percent significant level. The data sources are identical to Table 1

4.4. ESOP and market performance

Initially, section 4 compares the impact of ESOP with the accounting based financial performance of the firm i.e. ROE. The present chapter undertakes the market-based measure as a proxy for firm performance to extend the findings arising from the accounting-based indicator. The prior studies conducted by Cormier *et al.* (1999); Hassan and Hoshino (2007); Kato *et al.* (2005) and Langmann (2007) and others found a positive relation between the equity-based incentive on firm's market performance. In the present paper, the author has taken the enterprise value/total assets ratio as the measure of market performance. The enterprise value {Market Capitalization + Borrowings + Paid up preference capital - (Cash and bank balance + Book value of marketable securities)} is considered as a better market measure of business performance at any given point of time. The explanatory variables are the same as taken in the earlier analysis (ESOP/total compensation, debt ratio, and firm size).

Table 6 summarizes the empirical result of the estimated values of ESOP/total compensation at different quantile levels. The results depict an entirely different trend than Table 3. The estimated values show a monotonic trend at all quantile levels. The ESOP/total compensation represents a positive estimation at all quantile levels of market performance (EV/TA), except at 0.35 quantile. The estimated value of OLS is positive (0.25) but insignificant at 5 percent level of significance. Table 6 shows that the estimated values of ESOP/total employee compensation are significant as per Lagrange Multiplier probability value in all quantile levels at 5 percent significant level. It supports the hypothesis that the effect of ESOP/total compensation is positive on firm performance.

Table 6: ESOP/total compensation effect on enterprise value across quantile levels

Quantile	Estimated Value	Lagrange Multiplier Chi-square	Lagrange Multiplier Pr > Chi^2
0.05	0.324	12.754	0.005
0.10	0.324	56.472	< 0.0001
0.15	0.318	131.295	< 0.0001
0.20	0.232	237.222	< 0.0001
0.25	0.111	374.253	< 0.0001
0.30	0.064	542.389	< 0.0001
0.35	-0.159	741.630	< 0.0001
0.40	0.030	869.153	< 0.0001
0.45	0.430	992.265	< 0.0001
0.50	0.804	1108.343	< 0.0001
0.55	1.018	1351.350	< 0.0001
0.60	1.083	1533.097	< 0.0001
0.65	1.183	1857.472	< 0.0001
0.70	2.287	2062.034	< 0.0001
0.75	4.211	1915.431	< 0.0001
0.80	6.134	2800.620	< 0.0001
0.85	7.021	2226.010	< 0.0001
0.90	7.653	2299.458	< 0.0001
0.95	8.491	1461.702	< 0.0001
OLS	0.25 (0.94)		

Note: The OLS denotes Ordinary Least Square. The value in parentheses denotes the p-value for OLS coefficient estimate. The $Pr.Chi^2$ values across different quantiles are at 5 percent significant level. The data sources are identical to Table 1

Figure 2 shows the pattern of behavior in quantile values of ESOP/total compensation at different performance stages. It clearly indicates that at various performance (market measure) quantile levels, the equity-based compensation is positively related to the financial results while measured from market indicators.

The results in Table 6 indicate that the effect of equity-based compensation on firm's market performance is positive in most of the market performance quantile levels. The same effect is higher after the central quantile (0.50) level. The findings may be attributed due to the direct linkage of equity-based option schemes to the market performance measures. The market always reacts on expected lines and the compensation through equity-based option plans imposes a positive reaction and results in a better market performance. The positive values at the higher quantile levels indicate that a small equity-based incentive plan may translate maximum shareholder wealth even at the mature life-cycle stage.

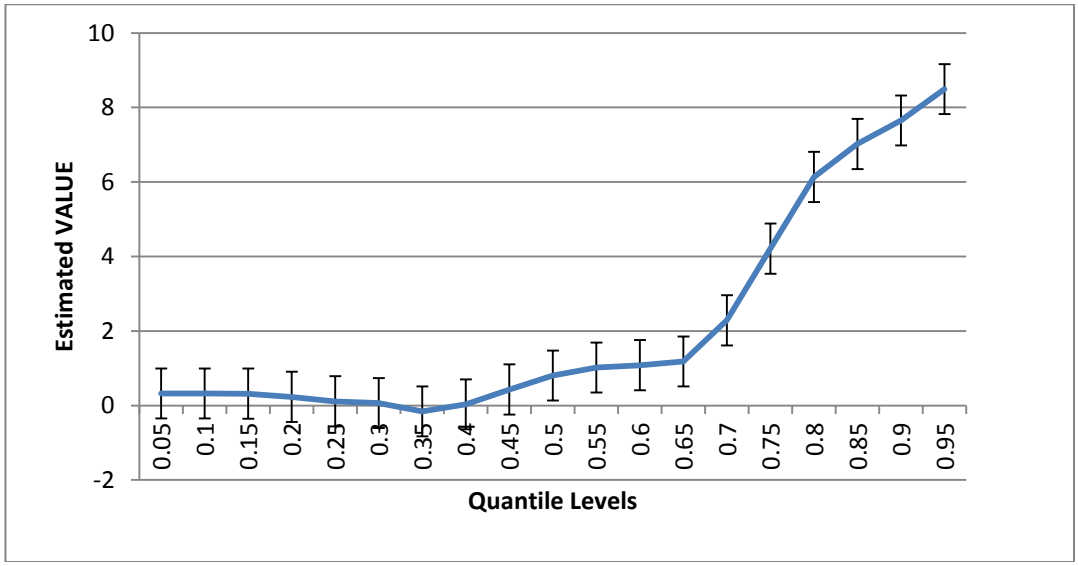

Figure 2: ESOP/total employee compensation effect on firm performance (EV/TA) across quantile levels

5. SUMMARY AND CONCLUSIONS

In the present paper, an attempt is made to study the effect of employee stock option plans (ESOPs) on the financial performance of Indian companies. The ESOP and other financial data of 157 non-finance Indian companies from 2005 to 2015 are used for empirical analysis. The study considered the return on equity as a proxy measure of financial performance. The OLS technique uses a single measure of central tendency and fails to identify the relation of equity-based incentive scheme on all levels of business performance. Because of this reason, the present study employed the quantile regression (QR) model to examine the effect of ESOP on the financial performance of sample companies. Initially, three explanatory variables are adopted for the quantile regression model. ESOP/total employee compensation is the explanatory variable compared with firm performance (ROE) while other two variables i.e. firm size (natural logarithm of total assets) and debt ratio are taken as the control variable in the QR model.

The empirical findings suggest that the effect of equity-based payment is positive at the higher quantile levels. The results imply the fact that the firms with high growth potential and profitability, the impact of equity-based incentives are positively related to firm performance. The results indicate that the firms adopt stock-based compensation schemes in their early stage of growth may cause a declining firm performance. The study argues that the decision of risky corporate investments may lead to more bankruptcy cost and results bad firm performance during the early stage of firm's growth.

The study tries to assess the industry effect on the ESOP and financial performance relationship as per QR model. The results describe a positive correlation between equity-based compensation and

performance (ROE). The empirical results depict a positive impact of ESOP on firm performance at the maximum quantile levels. It indicates that the industry plays a significant role in deciding the equity-based compensation. This trend may be attributed to different facts of the Indian market. First, the companies in the service industry pioneered the ESOP schemes in India and issued equity-based compensation incentives in their early stage of growth. The same is evident from the empirical results that at lower ROE quantile levels, the impact of ESOP is positive on firm performance. Second, during the stock market boom, the executives benefited more from the equity-based compensation that may influence subsequent year's positive firm performance by way of improved productivity.

The study investigated the impact of equity-based compensation on firm's market performance. The results reveal that the ESOP/total compensation is positive in most of the market performance quantile levels. The findings may be attributed due to the direct linkage of equity-based option schemes to the market performance measures.

This investigation on the equity-based compensation and firm performance is based on a small group of Indian companies. The findings of the study cannot be generalized in the Indian market. The comparison of businesses with and without ESOP component in their compensation package on their relative firm performance may be a topic for further research. The factors deciding the employee stock option plans and the extent of the solution to the agency problems may be another scope for subsequent studies.

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