Exploring the link between the option grants and performance gains of Japanese firms

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Abstract

This paper examines the potential benefits of option grants in the unique Japanese business environment. While the performance impact of stock options has got controversies in the research literature, this paper investigates why some firms are able to get better results from options than the others. The link between the option grants and performance gains is traced out by using the cross sectional data of 1612 listed companies of Tokyo Stock Exchange from 1997 to 2004. Empirical analyses explore how the performance gains are maximized when the option grants are used in association with the monitoring needs, risk and capital structure of firms. Findings suggest that a good match between the company's requirements and the potential benefits of option grants plays an important role in defining the positive effect of options on the firm performance.

Key words: Stock options; Japan; Risk; Monitoring needs; Capital structure, Firm performance

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1. Introduction

Before the amendments of the commercial code of Japan in 1997, stock option based compensation was not possible in Japan. After these amendments, there has been an increasing trend towards the adoption of option based compensation in Japanese companies[1]. This increasing use of options may indicate that Japanese companies are able to utilize the potential benefits of option based compensation (Uchida, 2005; Kato et al., 2005). However, the previous literature on option grants has raised questions about the ability of option based compensation to create a real value for firms (i. e., Meulbroek, 2001; Bens et al., 2002; Hall and Murphy, 2002; Oyer, 2004). This paper analyzes the performance impact of option grants in Japanese companies by tracing out the sources of values creation in this form of compensation. Most of the previous literature has used the data of US companies to examine the performance effect of option based compensation. While a number of these studies favor the option grants for better firm performance (i. e., Jensen and Meckling, 1976; Milgrom and Robert, 1992; Mehran, 1995; Himmelberg et al., 1999; Core and Guay, 1999), several others present doubts about the ability of options to improve the firm value (Yermack, 1995; Aboody and Kasznik, 2000; Carpenter and Remmers, 2001). Investigating the use of stock options in unique Japanese business environment may reveal new insights about the issue. Recently, a few studies have

[1] Data from Daiwa Securities show an increasing use of stock option based compensation in Japanese companies (see, table 1).

indicated a positive impact of option-grants on the performance of Japanese firms (i. e., Hassan and Hoshino, 2006). However, it is still unclear why some firms are able to get better results from option grants than the others. This paper addresses these questions with a comprehensive analysis of option-based compensation and the firm performance in Japan. The findings of study shed light on how and when this form of compensation can create a positive value for a firm.

We start by investigating the basic question of whether there is an improvement in the economic value of firms after the adoption of stock option plans. Following Hassan and Hoshino (2006) multiple measures of firm performance are used to see the changes both in the market value and the profitability of a firm after the adoption of stock option plans. Changes in the dividend policy and executive ownership are also considered to examine the confidence of executives on the effectiveness of option grants for the firm value. However, while Hassan and Hoshino (2006) use the data of electronics industry in Japan, we use cross sectional data of all the listed companies on Tokyo Stock Exchange, from 1997 to 2004.

After this initial analysis, a worth investigating issue is that if option grants can help to boost the firm performance, where these performance gains come from? In other words, if adoption of a stock option plan improves the firm performance there can be two further propositions. First, the positive effect of option grants may increase with an increase in the number of option grants and second, this positive effect may also vary with the changes in some other factors. In order to test these propositions, we take the cross sectional data of those listed companies who adopted stock option based compensation from 1997 to 2004. To analyze the former, we try to find out the

association of option-grant intensity with the performance gains of these firms. To analyze the later, we trace out the relationship of option grant intensity and firm performance with reference to the economic determinants of granting options. The testable prediction here is that option grants can create greater positive effect if the firm conditions (i.e., monitoring requirements, retention and sorting needs, and capital structure)[2] are more suitable for the use of stock options.

The findings of study can help to understand under what conditions greater option grant intensity can have a larger positive impact on the firm performance. As the study is focused on the Japanese business environment, this may also help to explain how stock options have helped Japanese companies to recover after the burst of bubble economy.

The remainder of the paper is organized as follows. Section two presents the theoretical background of study. Section three is about the data, sample characteristics and methodology. Section four analyzes the changes in operating performance, changes in abnormal returns and the behavior of management after the adoption of stock option plans. Section five examines the relationship between the intensity of stock options and the performance of the adopting firms. Section six investigates the sources of increase in the performance of adopting firms. Section seven concludes the study and section eight presents the limitations of the analyses.

2. Theoretical background

[2] Companies are more likely to use stock option based compensation when their monitoring requirements, retention and sorting needs, and capital structure are suitable for the use of option grants (see, for details, Hassan and Hoshino, 2008).

Options grants are frequently discussed in the research literature as an incentive to align the interest of managers with that of shareholders (Jensen and Meckling, 1976; Demsetz and Lehn, 1985). According to the economist model of human behavior the separation of ownership and control require some incentive for the managers to act in the best interest of owners (Holmstrom, 1979). Based on this model, the idea of equity incentives for managers is theoretically supported by a number of researchers (e. g., Milgrom and Roberts, 1992: Gaver and Gaver, 1993; Core and Guey, 1999). The ability of option grants to reduce the monitoring cost can increase the profit margins and thus increase the firm's performance (Baker et al., 1988; Hall and Liebman 1998; Himmelberg et al., 1999). Firms with disperse organizational structure can benefit from option grants as an effective tool for control (Morck et al., 1988; McConnell and Servaes, 1990). Another positive feature of option grants is presented in the form of an attraction and retention mechanism for quality personnel (e. g., Fudenberg et al., 1990; Kole, 1997; Hale, 1998). Option-based compensation is also presented as a motivation tool encouraging managers to put extra efforts and take advantage of available growth opportunities (Demsetz and Lehn, 1985; Milgrom and Robert, 1992; Guay, 1999). In addition to the idea of increase in the firm performance after the adoption of stock options, some recent studies have tried to establish an association between the intensity of option incentives and the hypothesized economic motivations of granting options (Bryan et al., 2000; Hanlon et al., 2003).

While the idea of option grants is logically convincing and theoretical research has provided useful insights, the empirical findings are divided on the issue. On the one hand, a number of researchers have supported the use of option grants for a better firm

performance (e.g., Lambert and Larcker, 1987; Core and Guey, 2001; Kadia and Mazumdar, 2002 and Ittner et al., 2002). On the other hand, several studies have pointed towards the hidden costs associated with the option grants. For instance, Aboody and Kasznik (2000) argue that option-based compensation is not successful to fairly distribute the rewards and thus unable to serve as a motivation for extra efforts.

The control of management over the information disclosure and its timing is also one of the major concerns of researchers about misuse of stock options (Jenter, 2001; Meulbroek, 2001; Hall and Murphy, 2002). Yermack (1997) argues that managers may select the investments that can increase the short-term stock price at the cost of intrinsic firm value. Influence of management on the inside-directors has also raised questions about the value of options for the company (Hermalin and Weisbach, 1998; Shivdasani and Yermack, 1999). Similarly, the chances of re-pricing the options can also decrease the usefulness option grants (Yermack, 1995). Option grants can lead towards manipulation of accounting record and information disclosure by the grantees to increase the share prices at the cost of long-term financial health of a firm (Carpenter and Remmers, 2001; Bens et al., 2002). According to another point of view, due to the risk associated with option-based compensation the value of such compensation perceived by managers may be significantly lower than the cost to the company (Carpenter, 1998; Aggarwal and Samwick, 1999).

Contradictory views about the performance impact of option grants invite for a comprehensive analysis of the issue to find out the economic significant of such compensation for the companies. Furthermore, if firms are able use option grants for value creation, it is important to know what factors contribute to maximize these gains.

We start by investigating the initial preposition about the performance gains after the adoption of option-based compensation. We compare the performance of the adopting and non-adopting firms by using the cross sectional data of 1612 listed companies of Tokyo Stock Exchange from 1997 to 2004. We use both the operating performance measures and abnormal returns to see the performance gains after the adoption of stock option plans. Using abnormal returns in addition to the operating performance measures helps to analyze any inflation in performance due to a favorable accounting treatment of options. The operating performance measures that we use include changes in the number of employees, changes in sales volume, changes in operating-income, changes in net-income, and the return on asset ratio of the firm after the adoption of an option-based compensation plan. Abnormal returns are initially used as 'annual rate of return on company's stock'. Next this rate of return is adjusted for the industry rate of return and the market portfolio rate of return of the Tokyo Stock Exchange. Using these additional measures of abnormal returns reduces the chances of results being affected by industry or market trends.

Several, previous studies on the performance effects of stock options have concentrated on comparing the option grants and subsequent performance measures (Lambert and Larcker, 1987; Aboody 1996; Rees and Stott, 1998; Core and Guey, 2001). Unlike these studies, we analyze the behavior of management after the option grants in addition to investigating the effect option grants on the firm performance. For this purpose, we analyze the changes in the executive ownership and changes in the dividend policy of the company after the adoption of option based compensation. The testable prediction is that any negative change in these measures may reflect the chances of

misuse of options by the self-serving managers. This study is also different in the sense that it uses the most recent and long-term data to analyze the effect of option grants on the firms' value in Japan (i.e., a cross sectional data of 12,896 firm-year observations of the companies listed on Tokyo Stock Exchange, from 1997 to 2004).

If stock options are able to create a positive impact on the firm's performance, a logical question is how a company can maximize these benefits? Whether it is possible for all the companies to get positive abnormal returns simply by granting more options? Or the performance gains are associated with some of the determinants of granting options. In order to address these issues, first we examine the association of option grants intensity with the performance gains and then analyzed the performance gains in relation to the determinants and motives of granting options. We propose that a greater use of stock options can produce a better firm performance when it matches with the economic determinants of granting options. We use the growth opportunities, level of risk on firm's stock and cash flow constraints of the company to see how the performance gains change with the presence of these factors.

As our analysis focuses the Japanese data, it has important implications for the Japanese companies. While discussing the use of stock options in the Japanese companies there are two major considerations. First, Japanese companies are generally more skeptical about the change and the adoption of stock options in such companies involve a great deal of uncertainty about the outcomes (i.e., negative side of option grants may override the positive side). Second, the potential benefits of stock options[3] may well

[3] Hassan and Hoshino (2008) explain the benefits option grants as a performance based compensation, a retention mechanism for potential employees and improvement in the capital market orientation of a firm.

match with the requirements of Japanese companies after the burst of bubble economy[4], which implies that stock options are complementing firms' needs and thus have a positive effect on the performance. The findings of this study can help to clarify these uncertainties and make it possible to understand how and when stock options can be used to maximize the performance gains in the changing business environment of Japan.

3. Data, sample and methodology

We use the cross sectional data of 12,896 firm-year observations from 1997 to 2004. This sample includes 1,612 listed companies of the Tokyo Stock Exchange. Information about the announcements of stock option plans is obtained from 'Daiwa Securities'. We include all the stock option plan announcements from 1997 to 2004. This database also provides information about the number of options granted in an option plan, exercise price and the vested exercise period.

There are 1,938 stock option plan announcements among the sample companies from 1997 to 2004. Table 1 shows the distribution of stock option plans among the sample companies in different years. First column shows the number of companies having first time stock option plan announcement in a given year. Second column presents the number of companies with at least one stock option plan announcement and last column shows the number of companies with at least one stock option plan in effect in a given year. It is evident from the table that use of stock options has been increasing since 1997. The first time adoption of stock options are increasing at a decreasing rate,

[4] After the burst of bubble economy in Japan, the traditional employment structure in Japanese companies is in a state of flux. This make it necessary for the companies to adopt an open system of corporate governance in which firms can regain profitability with a capital market orientation and commitment to the shareholders (See, for details, Hassan and Hoshino, 2006).

which is explainable as total number of non-adopting companies is decreasing every year. Nevertheless, the number of companies with stock option plans in effect continues to increase with an increasing rate.

Financial data and information about board-member ownership is collected from 'Nikkei Economic Electronic Database System' (NEEDS). Data about the firm's annual stock returns, industry returns and annual dividend payment are collected from the 'Japan Securities Research Institute' (JSRI) CD-ROM database[5].

Table 1

Distribution of stock option plans across different years among the sample companies[a]

Year	Number of companies with first time stock option announcement	Number of companies with at least one stock option announcement	Number of companies with at least one stock option plan in effect
1997	112	112	112
1998	72	108	184
1999	287	364	471
2000	180	392	638
2001	207	473	823
2002	162	492	969
2003	117	496	1064
2004	98	464	1154

[a]Table displays the distribution of 1,938 stock option plan announcements among the listed companies of Tokyo stock exchange from 1997 to 2004. First column shows the number of companies in a given year with first time option plan announcement. The number of companies with at least one stock option plan announcement in a given year is shown in the second column. Last column presents the number of companies with at least one stock option plan in effect during a given year.

[5] CD-ROM database 'Stock investment rate of return' is published every year by the 'Japan Securities Research Institute' (JSRI), (Information about the database are available at http://www.jsri.or.jp/).

We address three research questions in this study. First, whether 'the firms using stock options' (adopting sample) demonstrate better performance than 'the firms that do not use stock options' (non-adopting sample)?[6] For this purpose, we use the cross sectional data of all the listed companies of Tokyo Stock Exchange from 1997 to 2004. We use the regression analyses to see the post adoption changes in these performance measures and the behavior of management.

Our second research question addresses the relationship of the intensity of stock options and the performance gains of adopting companies. For this purpose we use the cross sectional data of all 'the adopting firms' from 1997 to 2004. We investigate this relationship with a regression analyses by including the 'board-member ownership' and 'amount of executive bonuses' as additional independent variables. This setting helps to find out how these two traditional instruments can be used in combination with the option grants to formulate an optimal employment contract in Japanese companies.

Third research question that we address is where the performance gains of option grants come from? We analyze whether it is possible for all firms to achieve positive abnormal returns by simply granting more options, or there is a systematic association between the gains from option grants and the determinants of stock options. Three determinants of option grants (i.e., growth opportunities, level of risk associated with the company stock and cash flow constraints) are considered to define the sources of performance gains for an adopting firm. For this purpose, cross sectional data of all the adopting firms from 1997 to 2004 are used in a regression analysis.

[6] A firm-year observation is included in the 'contracting sample' when the firm has a stock option plan announcement in a given year, otherwise the observation is included in the non-contracting sample.

4. Post adoption changes in the firm performance and the behavior of management

Companies in Japan have been increasingly adopting the option based compensation since 1997. A possible reason of this increasing use is to overcome the gap created by the changes in the traditional corporate governance structure after the burst of bubble economy[7]. The potential benefits of stock options can provide a performance based compensation system as well as a mechanism to retain valuable employees (Hale, 1998). Similarly, option based compensation can also play a screening role to attract the most suitable employees to work with the firm (Oyer and Schaefer, 2005; Ittner at al., 2002). As these benefits are compatible with the requirements of Japanese firms after the burst of bubble economy, it is plausible to assume that option grants can have a positive effect on the performance of these companies. After the burst of bubble economy in Japan, the role of 'main bank' decreased gradually (Ahmadjian, 2001). The problem of non-performing loans in Japanese banks limited the ability of banks to remain a primary source of financing in the '*keiretsue'* structure. Thus, firms need a capital market orientation to fulfill the financing needs and a higher stock price become much important than before. A potential benefit of stock options is that management takes care of stock prices. Apart from these benefits option grants can also provide a better monitoring mechanism, a pear pressure for better performance and ease in managing the cash flow problems. Thus, we hypothesize that the use of stock options has a positive effect on the

[7] For instance, Ahmadjian (2001) and Kato (2001) explain the transformations in the traditional corporate governance structure of Japanese companies.

performance of Japanese firms. First, we analyze the changes in the operating performance measures on the basis of following hypothesis:

Hypothesis: H-1.1: The operating performance of firms increase after the use of stock option based compensation.

We use five different measures of operating performance. First measure that we use is the change in number of employees. It is calculated as the percentage change in the number of employees of a firm *i* in a given year *Y+1* as compared to the previous year *Y* when stock options were granted. It is denoted as $EMCH_{i(Y,Y+1)}$.

Second measure of operating performance is the change in sales volume. It is calculated as the percentage change in the sales volume of a firm *i* in a given year *Y+1* as compared to the previous year *Y* when stock options were granted. It is denoted as $SACH_{i(Y,Y+1)}$.

Third measure is the change in operating income. It is calculated as the percentage change in the operating income of a firm *i* in a given year *Y+1* as compared to the previous year *Y* when stock options were granted. It is denoted as $OPCH_{i(Y,Y+1)}$.

Fourth measure that we use as operating performance is the change in net income. It is calculated as the percentage change in the net income a firm *i* in a given year *Y+1* as compared to the previous year *Y* when stock options were granted. It is denoted as $NICH_{i(Y,Y+1)}$.

Finally, we use the profitability of firm as a measure of operating performance. It is presented as the return on asset ratio of a firm *i* during the year *Y+1*, where options were granted in the year *Y*. It is denoted as $ROA_{i,Y+1}$.

To analyze the effect of stock options on the operating performance measures, we combine these variables in the estimating Eq. 1 It is presented as below.

$$SO_{iY} = \propto + \beta_1 EMCH_{i(Y,Y+1)} + \beta_2 SACH_{i(Y,Y+1)} + \beta_3 OPCH_{i(Y,Y+1)} + \beta_4 NICH_{i(Y,Y+1)} + \beta_5 ROA_{i,Y+1} + \mu.$$

Eq. 1

where SO_{iY} represents a dummy variable having value one when firm *i* announces a stock option plan in the year *Y* and zero otherwise. α is a constant and β_1 to β_5 present the coefficients of different variables. μ is a standard error factor.

When we use operating performance measures a major concern is that improvements in these measures may appear because of the favorable accounting treatment of stock options (Crystal, 1991). In order to eliminate this concern we rely on the abnormal returns of a firm to counter check any value creation as a result of stock option plan announcement. Thus, our next hypothesis follows as below.

Hypothesis: H-1.2: The abnormal returns of firms increase after the use of stock option based compensation.

Three different measures of abnormal returns are used to test this hypothesis. First we use annual rate of return on company stock as a measure of abnormal return. Annual rate of return on the stock of firm *i* during the given year *Y+1* is denoted as $ARR_{i,Y+1}$, where stock options were granted in the year *Y*. Data about ARR are obtained from JSRI CD-ROM database and is given as $ARR_{i,Y+1} = \left[\frac{\bar{P}^i_{Y+1}}{\bar{P}^i_Y}\right] - 1$, where $\bar{\bar{P}}^i_Y = \frac{1}{2}\sum_{y \in Y} \bar{P}^i_y$, ($\bar{P}^i_y$ is the market adjusted stock price of firm *i* during the month *y).*

Stock prices are also subject to vary with an industry trend or general market trend, which make it difficult to exactly measure the performance consequences of stock

options (Bebchuk et al., 2001). We have tried to filter out these effects by adjusting the ARR on a company stock with the overall industry returns and with the 'market portfolio returns' of Tokyo Stock Exchange. Thus, our next two measures of abnormal returns are the company returns adjusted for the industry returns and the company returns adjusted for the market portfolio returns of Tokyo Stock Exchange. Stock return of the firm *i* adjusted for industry return during the year *Y+1* is denoted as $ARRIND_{i,Y+1}$. It is calculated as $ARRIND_{i,Y+1} = ARR_{i,Y+1} - RIND_{Y+1}$, where $RIND_{Y+1}$ is industry's rate of return during the year *Y+1*. It is obtained from JSRI CD-ROM database and is given as $\frac{1}{N'}\sum_{i}^{N'} ARR_{i,Y+1}$, where, N' is the total number of firms in the industry.

Similarly, stock return of a firm *i* related to the market portfolio return of Tokyo Stock Exchange during the year *Y+1* is denoted as $ARRMKT_{i,Y+1}$. It is calculated as $ARRMKT_{i,Y+1} = ARR_{i,Y+1} - RMKT_{Y+1}$, where $RMKT_{Y+1}$ is the market portfolio return of Tokyo Stock Exchange during the year *Y+1*. It is obtained from JSRI CD-ROM database. We include three measures of abnormal returns, alternatively, in Eq. 1 and it takes the following form.

$$SO_{iY} = \propto + \beta_1 EMCH_{i(Y,Y+1)} + \beta_2 SACH_{i(Y,Y+1)} + \beta_3 OPCH_{i(Y,Y+1)} + \beta_4 NICH_{i(Y,Y+1)} + \beta_5 ROA_{i,Y+1} + \beta_6 (ARR_{i,Y+1}, ARRIND_{i,Y+1}, ARRMKT_{i,Y+1}) + \mu.$$

Eq. 2

Examining the behavior of management in response to the option grants may help to reveal expectations of managers about the efficiency of option grants. It may also help to point towards any chances of misuse of options. In this regard we use two indicators. These are change in the ownership level of managers and change in the dividend policy of the company.

A higher level of executive ownership also plays the role of equity incentives. The level of ownership should increase gradually when stock option based compensation is used. However, Ofek and Yermack (2000) observe that executives may sell their existing stocks when new options are issued, which shows a pessimistic view of executives about the ability of option grants to create a real value for the firm. On the other hand, if executives maintain the ownership level or there is an increase in it, this may indicate that they expect a sustainable increase in the firm value, rather than a temporary rise of stock prices, as a result of stock option based compensation. Thus, a decrease in the ownership level shows a negative behavior on the part of executives in response to option grants.

Another important indicator of the behavior of managers can be the change in dividend policy. Since executive stock options are not dividend protected, a reduction in the dividend payout after the adoption of option plans may help to boost the stock price temporarily to maximize the gains on options (Lambert et al., 1989). Thus, a decrease in the dividend yield after the option grants, may point towards the chances of misuse of stock options. One the basis of preceding discussion, our next two hypotheses follows as below.

Hypothesis: H-1.3: The level of executives' ownership does not decrease after the use of stock options.

Hypothesis: H-1.4: The dividend yield on company stock does not change after the use of stock options.

Change in the top executives' ownership is captured with a measure of percentage change in the board-members' ownership of firm *i* during the year (*Y+1*) as compared to

the previous year *Y* when stock options were granted. It is denoted as $DIROWNCH_{i(Y,Y+1)}$.

$ADIVYD_{i(Y,Y+1)}$ presents the change in the annual dividend yield of the firm *i* in the year *Y+1* as compared to the year *Y* when stock options were granted. Annual dividend yield of firm *i* during the year *Y+1* is obtained from JSRI, CD-ROM database. It is calculated as $\frac{\frac{1}{2}[D_Y^i + D_{Y+1}^i]}{\bar{P}_Y^i}$. We expand the Eq. 2 by including $DIROWNCH_{i(Y,Y+1)}$ and $ADIVYD_{i(Y,Y+1)}$ and it takes the following form.

$$SO_{iY} = \propto + \beta_1 EMCH_{i(Y,Y+1)} + \beta_2 SACH_{i(Y,Y+1)} + \beta_3 OPCH_{i(Y,Y+1)} + \beta_4 NICH_{i(Y,Y+1)} + \beta_5 ROA_{i,Y+1} + \beta_6 (ARR_{i,Y+1}, ARRIND_{i,Y+1}, ARRMKT_{i,Y+1}) + \beta_7 DIROWNCH_{i(Y,Y+1)} + \beta_8 ADIVYD_{i(Y,Y+1)} + \mu.$$

Eq. 3

Descriptive statistics of variables are shown in table 2. Sample consists of 12,896 firm-year observations of the companies listed on Tokyo stock exchange (Between 1997 and 2004). There are 1,938 stock option plan announcement events between 1997 and 2004. $EMCH$, $SACH$, $OPCH$ and $NICH$ are the percentage change in the number of employees, sales volume, operating income and net income of a company in a given year as compared to previous year. ROA is the return on assets ratio of firm in a given year. ARR is the annual rate of return on company stock during a given year. $ARRIND$ and $ARRMKT$ are the rates of return on the company stock in a given year adjusted for industry rate of return and market-portfolio rate of return of Tokyo stock exchange for that year. $DIROWNCH$ is the percentage change in the board-member ownership in a given year as compared to previous year. $ADIVYD$ is the annual dividend yield on the company stocks in a given year. To avoid the effects of outliers, variables are winsorized at the 1st- and 99th-percentiles.

Table 2

Descriptive statistics of variables used in the analyses (full sample)

Variables	*EMCH*	*SACH*	*OPCH*	*NICH*	*ROA*	*ARR*	*ARRIND*	*ARRMRK*	*DIROWNCH*	*ADIVYD*
Mean	-7.31	-3.82	7.96	-2.00	0.84	-0.81	-4.67	-7.44	10.25	1.05
Median	-9.21	-6.17	21.31	18.29	0.89	-0.65	-7.40	-10.30	11.00	0.95
St. Deviation	12.48	17.98	70.22	84.77	4.22	35.97	30.75	37.09	51.433	0.98
Minimum	-40.85	-46.99	-172.13	-169.45	-19.00	-162.60	-169.50	-178.30	-204.53	0.00
Maximum	61.48	96.33	194.94	154.94	12.00	157.20	126.10	128.40	204.52	4.01
Skewness	0.18	0.86	-0.23	-0.83	-0.38	-0.03	0.13	0.06	-0.05	0.73

4.1. Regression analyses

In this part we use estimating equations 1, 2 and 3 to analyze the multivariate changes in the observed factors after the announcement of an option plan. Co-linearity statistics and correlation matrix are shown in table 3. There are no signs of co-linearity and the values of the tolerance levels do not suggest the exclusion of any variable. The results of binomial logistic regressions are presented in table 4. The dependent variable is the announcement of stock option plan in all panels. It takes the value one if the firm announces a stock option plan in the observation year and zero otherwise.

In panel-one operating performance measures are used. The results support our *hypothesis H-1.1* by showing significant improvements in number of employees, sales volume and profitability of the company after the announcement of the stock option plan. Though operating income and net income could not get the significant level, both of these show positive predicted sign. These findings are consistent with the previous studies (e. g., Lambert and Larcker, 1987; Core and Guey, 2001) showing positive effect of options on the operating performance of firms.

However, in addition to the operating performance measures it is worth investigating how option grants affects the abnormal returns of firms. Therefore, in panel 2, 3 and 4 we use three measures of abnormal return alternatively. All three measures of abnormal returns show significant improvements, meanwhile the results of operating performance measures remains unchanged in these panels. The findings are in line with the idea of using stock options for incentive alignment presented in previous studies (e.g., Jensen and Meckling, 1976; Holmstrom and Milgrom, 1987; Hall and Liebman, 1998). Consistent results of three different measures of

Table 3

Co-linearity statistics and correlations matrix of independent variables

	Co-linearity statistics	Correlations matrix							
Variable label	Tolerance	*EMCH*	*SACH*	*OPCH*	*NICH*	*ROA*	*ARR*	*DIROWNCH*	*ADIVYD*
EMCH	0.76	1.00							
SACH	0.71	0.54**	1.00						
OPCH	0.92	0.01	-0.16**	1.00					
NICH	0.92	0.15**	0.25**	0.02	1.00				
ROA	0.79	0.33**	0.32**	0.07*	0.24**	1.00			
ARR	0.88	0.11*	0.18*	-0.10	0.11*	0.19**	1.00		
DIROWNCH	0.97	0.17**	0.14*	0.00	0.07	0.14**	-0.05	1.00	
ADIVYD	0.92	-0.13**	-0.14*	0.09*	-0.7*	0.00	0.20**	-0.08**	1.00

*significant at the 5 percent level; **significant at the 1 percent level

Table 4

The performance impacts of stock option plan announcements in Japan[a]

Variable label	Panel-l	Panel-2	Panel-3	Panel-4	Panel-5	Panel-6	Panel-7	Panel-8
Intercept	-1.482***	-1.254***	-1.176***	-1.17***	-1.323***	-1.116***	-1.128***	-1.132***
	(-39.18)	(-21.393)	(-20.21)	(-20.07)	(-25.00)	(-17.10)	(-17.18)	(-17.18)
EMCH	0.048***	0.073***	0.074***	0.074***	0.067***	0.073***	0.074***	0.074***
	(17.02)	(12.69)	(12.73)	(12.77)	(14.56)	(12.55)	(12.52)	(12.55)
SACH	0.012***	0.021***	0.022***	0.022***	0.021**	0.022***	0.023***	0.023***
	(7.28)	(8.78)	(9.28)	(9.15)	(9.72)	(8.75)	(9.32)	(9.18)
OPCH	0.001*	0.002*	0.001*	0.001	0.001	0.002*	0.001	0.001*
	(2.93)	(3.78)	(2.78)	(2.70)	(2.72)	(4.22)	(2.92)	(2.81)
NICH	0.002	0.001	0.001	0.002	-0.001	-0.001	-0.001	0.001
	(3.97)	(2.67)	(3.34)	(3.58)	(3.73)	(2.57)	(3.21)	(3.45)
ROA	1.77**	0.360	1.220	1.509*	2.486*	0.615	1.349*	1.638**
	(4.48)	(0.36)	(5.80)	(1.50)	(2.58)	(0.63)	(1.33)	(1.60)
ARR		0.010***				0.011***		
		(15.93)				(16.44)		
ARRIND			0.004***				0.004**	
			(5.20)				(5.18)	
ARRMKT				0.003**				0.003***
				(4.85)				(4.76)
DIROWNCH					0.001	0.001*	0.001	0.001
					(0.96)	(0.91)	(1.02)	(0.99)
ADIVYD					-0.041	-0.112*	-0.037	-0.030
					(1.45)	(-3.95)	(-1.29)	(-1.06)
Pseudo R-square	0.119	0.168	0.148	0.148	0.151	0.172	0.150	0.150
Log likelihood	-3,055.9	-2,224.5	-2,335.4	-2,332.1	-2,241.1	-2,203.9	-2,314.23	-2,315.2
Chi-square	699.75***	684.48***	477.07***	476.29***	266.38***	379.41***	504.90***	503.47***
N	12,896	12,896	12,896	12,896	12,896	12,896	12,896	12,896

* significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level

Note: numbers in parentheses report the *Z*-statistics computed on the bases of robust standard errors

[a] Sample consists of 12,896 firm-year observations of the companies listed on Tokyo Stock Exchange (between 1997 and 2004). The dependent variable is the announcement of a stock option plan in the year *Y*. For adopting firms, the dependent variable is set equal to one when the firm announces a stock option plan in the observation year and zero otherwise. For non-adopting firms, the dependent variable is set to zero for all years the firm appears in the sample. The performance measures are calculated for the year *Y+ 1*. Panel 1 shows the results of operating-performance manures. Panel 2, 3 and 4 includes three different measures of abnormal returns, alternatively. Panel 5 to 8 includes annual dividend yield ratio and changes in the board-member ownership in addition to the performance manures.

abnormal returns rule out the possibility of results being affected by an industry or market trend in stock prices. A related thing is consistency in the results of operating performance measures and abnormal returns, which is not compliant with the thought that favorable accounting treatment of stock options can falsely improve the operating performance measures (i. e.,Crystal, 1991 and Matsunga et al., 1992).

The findings accommodate our prediction of a positive reaction from investors and shareholders in response of option grants. While the Japanese corporate governance system is in a state of flux, the use of stock options is being able to address long waited requirement of the shareholders in Japanese companies to include their interests in the company decisions. Moreover, as companies are trying to access international venture capital, which require a better stock price, the stock options provide a necessary incentive for management to keep eye on stock prices.

In panels 5, 6, 7 and 8 of table 4 we include two additional variables about the behavior of management in response to the option grants. These are changes in the executives' ownership and changes in the dividend yield. Manipulation of accounting records to give temporary rise to stock prices implies that managers should minimize the risk by reducing their ownerships. Similarly, the distrust of management on stock options should result a decrease in the executive ownership. However, we are able to get a significant positive coefficient of ownership change in the regression 5 and positive values in other three regressions. This is compliant with the proposition of Yermack (1995) that level of executive ownership should increase with the option grants when executives see options as an effective value creation tool. Similarly, an improvement in the performance measures and increase in executive ownership is able to explain that equity incentive can create an optimal employment contract with a combination of the

existing equity ownership (e. g., Demsetz and Lehn, 1985; Himmelberg et al., 1999). Findings may also indicate that executives in Japan have perceived stock options an effective way of creating sustainable value for the firm. Most of the previous studies reporting such misuses have used the data of US companies (e.g., Tufano, 1996; Aboody and Kasznik, 2000; Carpenter and Remmers, 2001; Bens et al., 2002). Our findings are consistent with the suggestions of Kato et al. (2005) that a well designed stock option plan can increase the firm value in the current business environment of Japan.

A reduction in the dividend may help to give temporary rise in the stock prices to increase gains from stock options (e.g., Lambert et al., 1989). We are not able to observe any such changes in the dividend policy of the adopting firms in our sample. Thus our results are not supporting the suspicions that self serving managers can exploit option grants to increase their personal wealth at the cost of intrinsic firm value. In the unique Japanese business environment the legacy of long-term faithfulness with the firm in the Japanese company culture, might have reduced these misuses. While option grants are comparatively new in Japan such misuses cannot be completely ruled out in future. However, whether the traditional company culture can continue to prevent this will mainly depend upon how other factors take their positions when the option grants make their way farther in this business environment.

5. The intensity of stock options and performance of the adopting firms

The evidence from the previous section indicates improvements in the performance measures following the announcement of a stock option plan. However, it is interesting to investigate whether the firm performance is a function of option-grant intensity? In other words,

if the adoption of an option plan positively affects the firm's value, increasing the amount of option grants may increase this effect. Therefore, it is reasonable to hypothesize as follows.

Hypothesis: H-2.1: The greater the intensity of option grants, the stronger the positive effect on the firm's performance.

While discussing the effect of pay structure on the firm's performance, it is important to note that the ownership of the company's stock by the top executives can also serve as an alternative equity incentive for the top executives. In other words, when top executives possess a significant number of company stocks, the need of stock options as an equity incentive is minimized (Jenter, 2001). Thus, the companies with a low level of executive ownership are stronger candidates for the option grants. On the other hand, when companies offer stock options more frequently the top executives' ownership level is expected to increase (Yermack, 1995). Other things being equal a greater ownership of the company stock helps to increase the firm's performance. Therefore, it is reasonable to propose that a higher level of executive ownership positively affects the firm's performance.

Hypothesis: H-2.2: The higher the level of executive-ownership, the better the firm's performance.

Bonuses are another instrument widely used in Japanese companies to provide incentives to top management. A significant portion of the Japanese executive compensation comes from bonuses (Kato and Kubo, 2006). It is plausible to hypothesize that in Japanese business environment, an optimal employment contract can have a combination of stock options, stock ownership, and bonuses for the executives.

Hypothesis: H-2.3: The higher the amount of executive bonus, the better the firm's performance.

Barber and Lyons (1996) explain that in tests examining the association between some event and subsequent firm performance, it is important to control the past performance. The firms performing better are expected to have an edge in the subsequent accounting periods.

Hypothesis: H-2.4: Firm's past performance has a positive effect on the subsequent performance.

In order to test the above four hypotheses additional variables are defined as follows. Stock option grant intensity of a firm is calculated as the ratio of option grants to the total outstanding shares. It is presented as $SOGRANT$. Executive ownership level is the total number of shares held by the directors. It is presented as the percentage of total outstanding shares. It is coded as $DIROWN$. Top executive bonuses are presented as the bonus amount paid to directors scaled by the total annual sales of the company during a given year. It is denoted as $DIRBONUS$. The lagged value of return on equity of the firm is used as a control for the past performance. It is denoted as ROE. The empirical settings for the regression analyses are presented in Eq. 4.

$$(ARR_{i,Y+1}, ARRIND_{i,Y+1}, ARRMKT_{i,Y+1}) = \propto + \beta_1 SOGRANT_{i,Y} + \beta_2 DIROWN_{i,Y} + \beta_3 DIRBONUS_{i,Y} + \beta_4 ROE_{i,Y} + \mu, \quad \textit{Eq. 4}$$

where $(ARR_{i,Y+1}, ARRIND_{i,Y+1}, ARRMKT_{i,Y+1})$ present the simple annual rate of return, rate of return adjusted for industry return and rate of return adjusted for market portfolio return of Tokyo Stock Exchange respectively, for the firm *i* during the year *Y+1*. $\propto$ is a constant and β_1 *to* β_4 stands for the coefficients of different variables. $SOGRANT_{i,Y}$ is the option-grant intensity of firm *i* during the year *Y*. $DIROWN_{i,Y}$ is the board-member ownership as a percentage of total outstanding shares of the firm *i* during the year *Y*. $DIRBONUS_{i,Y}$ is the amount of bonuses paid to directors scaled by the total sales of firm *i* during the year *Y*. $ROE_{i,Y}$ is the return on equity of firm *i* in the year *Y* and μ is a standard error factor.

In order to analyze the association of *SOGRANT* with the performance gains, we use a reduced sample of the 1938 stock option announcements from 1997 to 2004. Table 5 presents the number of option plan announcements and the average of the amount of option grants as a percentage of total outstanding shares in different years. With an exception of 2001, the average option grant rate has an increasing trend. Greater average option-grant intensity in the year 2001 may be due to the reaction of the companies in response to the second amendments in the commercial code of Japan, which unrestricted the limits on the number of options that can be offered as stock options.

Table 5

Average amount of option grants across different years[a]

Year	Number of option plan announcements	Average amount of option grants
1997	74	1.52
1998	74	1.33
1999	244	1.28
2000	261	1.15
2001	321	3.69
2002	338	1.75
2003	322	1.56
2004	304	1.82

[a] The amount of option grants is computed in terms of the percentage of total number of outstanding shares of a company.

5.1. Regression analyses

In this part we investigate the multivariate changes in the performance by using regression analyses according to Eq. 5. We use the linear regressions for this purpose. Table 6 presents the descriptive statistics of the variables used in the regression. Table 7 shows the correlation matrix and co-linearity statistics of dependent variables.

The results of the regression analyses are presented in Table 8. Consistent with the univariate analyses, the increases in the option-grant intensity has a positive association with the firms' abnormal returns. The results do not change when the dependent variable is adjusted for industry rate of return and market-portfolio rate of return of Tokyo Stock Exchange in panel-2 and panel-3, respectively. These results are compatible with the previous studies (e.g., Bryan et al., 2000: Hanlon et al., 2003; Core and Guey, 2001) that explain the association between the intensity of options and the firm's performance. While result support the preposition that greater use of option grants can increase the positive effect on the firm's performance, it may not be appropriate to conclude that a company can increase the benefits simply by granting more options. We propose that option grants can work better when companies' requirements and potential benefits of option grants match with each other. We have explored this preposition further in the next section.

A related finding is the better firm performance with a higher level of executive ownership. This is in line with the previous studies (i.e., McConnell and Servaes, 1990; Ittner et. al., 2002; Jenter, 2001) suggesting a positive effect of executives' equity ownership on the firm performance. Option grants and equity ownership of top executives have several benefits in common (Jenter, 2001). Thus, an increase in the abnormal returns with a higher level of executive ownership sustain with the idea of using option grants for better firm performance.

Table 6
Summary of descriptive statistics of independent variables (reduced sample) [a]

Variable	Description	Mean	Median	Std. Dev.	Min.	Max.	Skewness
SOGRANT	Option grant rate	1.53	0.86	1.80	0.02	10.19	0.98
DIROWN	Executive ownership	0.12	0.10	0.11	0.00	6.00	0.89
DIRBONUS	Executive bonus	0.07	0.03	0.11	0.00	0.61	0.73
ROE	Return on equity	5.04	4.79	12.82	-52.02	55.03	0.20
RD_RATIO	Research and development	0.01	0.008	0.01	0.00	0.04	0.66
RISK	Risk associated with the company stock	10.12	9.93	5.83	2.48	26.56	0.48
CASHCON	Cash flow constraint	0.10	0.00	0.31	0.00	1.00	1.01

[a] The reduced sample consists of 1,938 stock option plan announcements (between 1997 and 2004). *ROE* is return on equity ratio of a firm to present the past performance of the firm. *DIROWN* present the ownership of the top executives. It is the percentage of board-member ownership. *DIRBONUS* is the amount of bonus paid to executives as a percentage of total sales. *SOGRANT* is the amount of option grants as the percentage of total outstanding stocks of firm. *RD_RATIO* is R&D expanse scaled by the total assets of the company. RISK present the risk associated with the company stock. It is the standard deviation of the monthly stock returns of a company during the observation year. *CASHCON* is presented as a dummy variable taking value one if the firm does not announces any dividend during the observation year and zero otherwise.

Table 7

Co-linearity statistics and correlations matrix of independent variables (reduced sample)

Co-linearity statistics			Pearson correlations matrix						
Variable label	Tolerance	VIF	*SOGRANT*	*DIROWN*	*DIRBONUS*	*ROE*	*RD_RATIO*	*RISK*	*CASHCON*
SOGRANT	0.83	1.19	1.00						
DIROWN	0.89	1.11	0.22**	1.00					
DIRBONUS	0.92	1.08	0.09**	0.11**	1.00				
ROE	0.85	1.17	0.11**	0.23**	0.25**	1.00			
*RD*_RATIO	0.95	1.04	-0.17**	-0.09**	-0.08*	-0.08**	1.00		
RISK	0.82	1.20	0.29**	0.22**	-0.01	-0.008	-0.04	1.00	
CASHCON	0.82	1.20	-0.22**	-0.23**	-0.17**	-0.19**	-0.14**	-0.22**	1.00

*significant at the 5 percent level; **significant at the 1 percent level

Table 8

Option-grant intensity and the performance of firms[a]

Variable label	*ARR*	*ARRIND*	*ARRMKT*	*ARR*	*ARR*	*ARR*	*ARR*
Intercept	-1.58*	-4.93***	-6.815***	13.88***	-6.02***	-6.37***	9.98*
	(-1.18)	(-3.58)	(-4.42)	(-2.83)	(-3.58)	(-2.26)	(1.68)
SOGRANT	0.14***	0.16***	0.16***	0.10**	0.08*	0.10	0.15**
	(6.04)	(6.88)	(6.57)	(7.37)	(6.85)	(2.08)	(2.48)
DIROWN	0.17***	0.17***	0.13***	0.10***	0.15***	0.10***	0.14***
	(7.00)	(7.15)	(5.46)	(4.56)	(6.34)	(4.45)	(5.99)
DIRBONUS	0.003	0.001	0.00	0.01	0.005	0.01	0.004
	(0.11)	(0.11)	(0.01)	(0.57)	(0.22)	(0.43)	(0.16)
ROE	0.29***	0.26***	0.21***	0.31***	0.28***	0.28***	0.30***
	(12.05)	(10.82)	(8.68)	(13.02)	(12.03)	(12.11)	(12.24)
*RD*_RATIO				0.05*	0.05*		
				(2.26)	(2.03)		
RISK				0.19***		0.06*	
				(8.00)		(1.93)	
CASHCON				-0.03			-0.08
				(-1.53)			(-1.28)
RD_RATIO× SOGRANT					0.13***		
					(3.51)		
RISK× SOGRANT						0.37***	
						(6.62)	
CASHCON× SOGRANT							0.04
							(0.61)
R-square	0.161	0.153	0.121	0.23	0.20	0.25	0.197
F-value	73.41***	69.42***	47.72***	66.09***	65.22***	85.16***	62.62***
N	1938	1938	1938	1938	1938	1938	1983

* significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level

Note: numbers in parentheses are *t*-statistics computed on the bases of robust standard errors

[a] The sample consists of 1,938 stock option plan announcements (between 1997 and 2004). In first three columns dependent variable takes three forms. *ARR* is the rate of return on the company stock. *ARRIND* is the rate of return on the company stock adjusted for industry rate of return, and *ARRMKT* is the rate of return on company stock adjusted for market-portfolio rate of return. In last four columns dependent variable is set as *ARR*. All the independent variables are lagged one year.

Though the coefficient of *DIRBONUS* does not get to a significant level, a positive trend is evident. The reason behind might be that bonus is associated with the past performance and may not translate into the subsequent year performance.

Traditionally, executive compensation in Japan relies on equity ownership and bonuses as incentives for better performance. With the restructuring of the traditional business model and increasing use of stock options it is important to examine how these traditional practices will adjust with the new contracting technologies. Results indicate that incentive effect of traditional practices is not disturbed because of option grants. The findings accommodate the idea that an optimal employment contract in the Japanese environment may include the combination of stock options, stock ownership, and executive bonuses.

While the requirements of the Japanese companies after the burst of bubble economy make it possible to assimilate the changes in the form of option-based pay, this does not mean that Japanese business model is going to transform completely into the US model. The benefits of traditional employment practices are sustainable and these unique characteristics can have a successful combination with the new contracting technologies. Thus, the modifications in the Japanese business practices may develop the Japanese business model into a unique shape that is different from both traditional model and US model.

6. Sources of increase in the firm performance

While the results of previous section show a positive association of the option-grant intensity with performance measures, it is not clear where these positive effects come from. It is important to analyze, whether it is possible for all firms to achieve positive abnormal returns by simply granting more options, or there is any systematic association between the gains from

option grants and the determinants of using the stock options. To include these aspects, we analyze the performance gains of option grants in relation to three different determinants of using option grants.

First determinant is the use of stock options as an alternative source of monitoring the performance. It is difficult to monitor and measure the performance of executives when the set of growth opportunities is larger for a firm. In high growth conditions managers need to put extra efforts to capitalize the growth opportunities and it is difficult to measure their performance by ordinary means. In such cases stock options can provide an alternative source of monitoring (Demsetz and Lehn, 1985; Jensen and Meckling, 1992; Smith and Watts, 1992). Based on this it is plausible to hypothesize that greater use of stock options can produce better resultant performance when firm has greater growth potential. R&D expense is a widely used variable in the research literature to capture the growth opportunities of a firm. We use this variable as R&D expanse scaled by the total sale of a firm during a given year. It is denoted as RD_RATIO. Interacting this variable with the $SOGRANT$ gives another variable to analyze how the performance gains from option grants change in association with the growth opportunities.

Second important use of option grants is to make the compensation package more attractive for certain type of employees. The performance gains of option grants may increase when firms need to attract and retaining the key employees. Firms with a high risk associated with their stock are more likely to utilize stock options to attract and retain less risk-averse and more optimistic employees (Ittner et. al., 2002). As the option grants link the pay with the performance of a firm, it become more attractive for those employees who have abilities and potential to increase the value of firm. Consequently, if the firm is able to successfully use the risk to attract and retain the most suitable employees, the use of option grants can create a greater

positive impact on the firm value. Risk associated with the company stock is used to present the greater chances of attracting the most suitable employees. Risk is measured as the standard deviation of the monthly returns on the company stock during the observation year. It is denoted as *RISK*. Interacting the *RISK* with the *SOGRANT* gives another variable to test how performance gains change when stock options are used in greater risk conditions.

Third, companies with cash flow constraints may be able to get better advantage of using stock options (e.g., Yermack, 1995; Core and Guey, 1999). Thus, it is predictable that such firms may show greater improvements in the performance when use option-based compensation. A zero dividend payment is used to present the cash flow constraints. It is measured with a dummy variable having value 'one' if firm has no dividend payment during the observation year and 'zero' otherwise. It is denoted as *CASHCON*. Interaction of *CASHCON* with the *SOGRANT* will produce another variable to test the performance gains of option grants for the firms having cash flow constraints.

The results of regressions with these interacting variables are presented in the last three columns of table 8. The results indicate that greater use of stock options by the firms with high growth potential can create greater positive impact on the performance. This is inline with the idea of using stock options to take advantage of growth opportunities. Similarly, evidence suggests the greater positive impact on the firm value, when stock options are used in high risk conditions. This is in agreement with the idea of using the risk of associated with the stock options to attract and retain the suitable employees. The results are also inline with the prediction of Oyer and Schaefer (2001) that firms make greater use of stock options to retain the potential employees when they are close competitors in the industry. In case of cash flow constraints the results cannot support the hypothesized prediction. This may be due to the fact that previous

year's positive cash flow leads the firms to initiate better starts in the next accounting period. Due to this reason, the firms with positive cash flow might be able to show greater improvements in the subsequent accounting year.

Overall these results are accommodating the hypothesized prediction that option grants can produce greater positive impacts on the firm performance when used in association with the economic determinants of option grants. Specifically, these results adequately explain how some firms are able to get better results from stock options than the others. These findings may also help to explain one of the reasons why some empirical findings produce contentious results about the performance gains of the option grants[8]. Likewise, it can explain why firms extensively use stock options at a time when there are high growth opportunities and reduce/stop using options when growth options are normalized. This also explain the why a lot of IT firms in US including Microsoft, used option grants during the IT boom and stop the practice when growth declined. Thus, an important finding of our analysis is that explaining the performance gains of option grants without considering the economic determinants can lead to an incomplete conclusion of the issue.

7. Conclusions and implications

This paper analyzes how stock options are affecting the firm performance in Japan. Nevertheless, stock options are comparatively new in Japan; the number of companies using this type of compensation is increasing every year. Most of the previous literature discusses the use of stock options with respect to the US companies. There are opposing views

[8] Though there are several other reasons of these contentious results such as misuse of stock options that are discussed earlier in this paper.

prevailing about the fundamental question of whether the option grants can really add value to a firm. Supporters of the incentive alignment idea advocate the use of stock options to induce managers for better performance (Jensen and Meckling, 1976; Milgrom and Robert, 1992; Mehran, 1995; Himmelberg et al., 1999; Core and Guay, 1999; Kedia and Mozumdar, 2002). The critics of stock options point towards the hidden costs of granting options and possibility of manipulating the accounting records, time and release of information to increase the wealth of executives at the cost of firm's intrinsic value (Yermack, 1995; Aboody and Kasznik, 2000; Carpenter and Remmers, 2001; Jenter, 2001; Meulbroek, 2001; Bens et al., 2002; Hall and Murphy, 2002). This analysis considers both of these contrary views to analyze the use of stock options in Japan, where companies are looking for a performance-based compensation system after the restructurings of traditional corporate governance system.

This analysis contributes to the research literature by adding the Japanese perspective in the debate of stock option grants and its effect on the firm performance. Specifically, the findings are helpful in understanding how stock options are helping Japanese companies to move from the traditional relationship-oriented style of management to the one that is more performance- and market-oriented. The analyses of multiple measures of firm performance indicate improvements in the firm performance following the option plan announcement. In the current business environment of Japan, option grants can serve as a useful tool to induce managers to take more notice of the share prices. The results of this analysis also indicate that behavior of Japanese management following the announcement of option plans is not opportunistic in terms of changes in the executive ownership and dividend policy. Overall, Japanese evidence does not support the predictions of using stock options by the self-serving managers to enrich themselves

at the cost of shareholders wealth. Additionally, an optimistic response from market suggests that investors and shareholders view stock options as an important tool to increase firm value

Evidence suggests that the performance gains from options increases with an increase in the option-grant intensity. However, firms can get maximum benefits from the options when option grants are used in association with the economic determinants of equity-based compensation. Executive ownership and bonuses also have a role to increase the firm performance. Therefore the combination of the option grants, executive ownership and bonuses may help to devise an optimal employment contract in the Japanese business environment.

To summarize the findings, it is important to note that stock options are provided to align the interests of management with the shareholders and thereby increase the firm value. Evidence suggests that the announcement of stock options in Japan does not necessarily means the manipulation of accounting earning to gain a temporary rise in the stock prices. On the other hand, our results indicate a positive and optimistic reaction from the stock market, investors and management, in response to the option plan announcement. With the transitions in the traditional corporate governance structure, option grants can help the companies to improve performance with a capital market orientation and commitment to the shareholders, which is necessary to regain the profitability and international competitiveness.

In this regard, it is important to note that while the results of our analysis do not indicate the manipulations of accounting earning or misuse of stock options to maximize the executive gains in the Japanese companies, it is difficult to rule out the possibility of such manipulations. In Japanese business environment however, the legacy of traditional lifetime employment philosophy might have helped to eliminate the opportunistic behavior at the cost of the firm's intrinsic value. Other unique institutional characteristics of the Japanese business environment

such as cross-shareholdings and peer-pressure may also have a role to reduce the misuse of stock options.

8. Limitations

This section acknowledges some of the limitations associated with this analysis. The findings of this analysis about the misuse of options may have limitations. While we cannot observe the misuse of options on the basis of changes in board-member ownership and dividend policy, there are possibilities of other misuses, such as timing and type of information disclosures, investment decisions, use of insider information and influence of management on the board members etc. Future research may analyze these aspects to see the efficiency of option grants on increasing the pay-performance sensitivity.

This analysis also has limitations concerning the availability of data. As it is not possible to get the precise data about the amount of options granted to a single manager or employees in Japan, we use the aggregate firm level measures. While analyzing the performance consequences of option-based compensation the amount of executive pay remains absent because of the non-availability of data. However, the scope of this analysis is concentrated on the impact of option grants on the firm performance, which is dealt adequately with the available data.

References

Aboody, D., 1996. Market valuation of employee stock options. Journal of Accounting and Economics 22, 357-391.

Aboody, D., and Kasznik, R., 2000. CEO stock option awards and corporate voluntary disclosures. Journal of Accounting and Economics 29, 73–100.

Aggarwal, R., and Samwick, A., 1999. The other side of tradeoff: the impact of risk on the executive compensation. Journal of Political Economy 108, 65-1056.

Ahmadjian, C., 2001. Changing Japanese corporate governance. Working paper No. 188. Center on Japanese Economy and Business, Columbia Business School.

Baker, G. P., Jensen, M.C. and Murphy, K.J., 1988. Compensation and Incentives: Practice v/s Theory. Journal of Finance 43, 593-616.

Barber, B.M. and J.D. Lyon (1996), 'Detecting Abnormal Operating Performance: The Empirical Power and Specification of Test Statistics,' Journal of Financial Economics, Vol. 41, 359–99.

Bebchuk, L.A., Fried, J.M. and Walker, D.I., 2002. Executive Compensation in America: Optimal Contracting or Extraction of Rents. University of Chicago Law Review 69, 751-846.

Bens, D., Nagar, V. and Wong, F., 2002. Real Investment Implications of Employee Stock Option Exercises. Journal of Accounting Research (Supplement) 40, 359-393.

Bryan, S., Hwang, L. and Lilien, S., 2000. CEO Stock-Based Compensation: An empirical Analysis of Incentive-Intensity, Relative Mix, and Economic Determinants. Journal of Business 73, 661-693.

Carpenter, J.N., 1998. The exercise and valuation of executive options. Journal of Financial Economics 48, 127-158.

Carpenter, J., and Remmers, B., 2001. Executive stock option exercises and inside information. Journal of Business 74-4, 513-534.

Core, J.E., and Guay, W., 2001. Stock option plans for non-executive employees. Journal of Financial Economics 61, 253–287.

Core, J.E., and Guey, W., 1999. The use of equity grants to manage optimal equity incentive levels. Journal of Accounting and Economics 28, 151-184.

Crystal, G.S., 1991. "In Search of Excess: The Overcompensation of American Executives". Norton, New York.

Demsetz, H., and Lehn, K., 1985. The structure of corporate ownership: causes and consequences. Journal of Political Economy 93, 1155–1177.

Fudenberg, D., Holmström, B., and Milgrom, P., 1990. Short-term contracts and long-term agency relationships. Journal of Economic Theory 51, 1–31.

Gaver, J., and Gaver, K., 1993. Additional evidence on the association between the investment opportunity set and corporate financing, dividend, and compensation policies. Journal of Accounting and Economics 16, 125–160.

Guay, W., 1999. The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and the determinants. Journal of Financial Economics 53, 43–71.

Hale, J., 1998. Strategic rewards: keeping your best talent from walking out the door. Compensation & Benefits Management 14, 39–50.

Hall, B. and Liebman, J., 1998. Are CEOs really paid like bureaucrats? Quarterly Journal of Economics 113, 653–691.

Hall, B. and Murphy, K., 2002. Stock Options for Undiversified Executives. Journal of Accounting and Economics 33-1, 3-42.

Hanlon, M., Rajgopal, S. and Shevlin, T., 2003. Are executive stock options associated with future earnings? Journal of Accounting and Economics 36, 3-43.

Hassan, H. and Hoshino, Y., 2006. The performance impact of option grants in Japan. Japanese Journal of Administrative Sciences Vol. 20 27-41.

Hassan H. and Hoshino, Y., 2008. Beginning of stock option based compensation in Japan: a test of alternative theories. Journal of Financial Management and Analysis Vol 21 No. 2 (forthcoming)

Hermalin, B.E. and Weisbach, M.S., 1998. Endogenously Chosen Boards of Directors and Their Monitoring of the CEO. American Economic Review 88, 96-118.

Himmelberg, C., Hubbard, G., and Palia, D., 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. Journal of Financial Economics 53, 353–384.

Holmstrom, B., and Milgrom, P., 1987. Aggregation and linearity in the provision of inter-temporal incentives. Econometrica 55, 303–328.

Holmström, B., 1979. Moral hazard and absorbability. Bell Journal of Economics 10, 74-91.

Ittner, C.D., Lambert, R.A., and Larcker, D.F., 2002. The structure and performance consequences of equity grants to employees of new economy firms. Journal of Accounting and Economics 34, 89-127.

Jensen, M.C., and Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3, 305–360.

Jenter, D., 2001. Understanding High-Powered Incentives. Working paper, Harvard Business School.

Kadia, S., and Mazumdar, A., 2002. Performance effect of employees' stock options. Working papers, Harvard Business School.

Kato, H.K., Lemmon, M., Luo, M., and Schallheim, J., 2005. An empirical examination of executive stock options: Evidence from Japan. Journal of Financial Economics 78, 435-461.

Kato, T., and Kubo, Katsuyuki., 2006. CEO compensation and firm performance in Japan: Evidence from new panel data on individual CEO pay. Journal of the Japanese and International Economies 20, 1–19.

Kole, S.R., 1997. The complexity of compensation contracts. Journal of Financial Economics 43, 79–104.

Lambert, R., Larker, D., and Verrecchia, R., 1991. Portfolio considerations in valuing executive compensation. Journal of Accounting Research 29, 129-149.

Lambert, R.A. and Larcker, D.F., 1987. An analysis of the use of accounting and market measures of performance in executive compensation contracts. Journal of Accounting Research 25, 85–129.

McConnell, J. and Servaes, H., 1990. Additional Evidence on Equity Ownership and Corporate Value. Journal of Financial Economics 27, 593-612.

Matsunga, S., Shelvin, T., and Shores, D., 1992. Disqualifying dispositions of incentive stock options: Tax benefits versus financial reporting costs. Journal of Accounting Research 30, 37-76.

Mehran, H., 1995. Executive Compensation Structure, Ownership and Firm Performance. Journal of Financial Economics 38-2, 163-84.

Milgrom, P. and Roberts, J., 1995. Complementarities and Fit Strategy, Structure and Organizational Change in Manufacturing. Journal of Accounting and Economics, 19: 179-208.

Muelbroek, L., 2001. The efficiency of equity-linked compensation. Understanding the full cost of awarding executive stock option. Financial Management, Vol. 30.

Morck, R., Shleifer, A. and Vishny, R., 1988. Management Ownership and Market Valuation: An Empirical Analysis. Journal of Financial Economics 20, 293-316.

Ofek, E. and Yermack, D., 2000. Taking Stock: Equity-Based Compensation and the Evolution of Managerial Ownership. Journal of Finance 55, 1367–84.

Oyer, P. 2004. Why do firms use incentives that have no incentive effect. The Journal of Finance Vol 59 1619-1650.

Oyer, P., and Schaefer, S., 2005. Why do firms give stock options to all employees?: An empirical examination of alternative theories. Journal of financial Economics 76, 99-133.

Rees, L. and Stott, D., 1998. The Value Relevance of Stock-Based Employee Compensation Disclosures. Working paper, Texas A & M University.

Shivdasani, A. and Yermack, D., 1999. CEO Involvement in the Selection of New Board Members: An Empirical Analysis. Journal of Finance 54, 1829-1853.

Smith, C., and Watts, R., 1992. The investment opportunity set and corporate financing, dividends, and compensation policies. Journal of Financial Economics 32, 263–292.

Tufano, P., 1996. Who Manages Risk? An Empirical Examination of Risk Management Practices in the Gold Mining Industry. Journal of Finance 51, 1097-1137.

Uchida, K., 2006. Determinants of stock option use by Japanese companies. Review of Financial Economics vol. 15, issue 3251-169.

Yermack, D., 1995. Do corporations award CEO stock options effectively? Journal of Financial Economics 39, 237-269.

Yermack, D., 1997. Good timing: CEO stock option awards and company news announcements. Journal of Finance 52, 449–476.