Employee Stock Options: Financing Constraints Explanation

Pavlo Tsebro

Abstract

Prior literature suggests three explanations for granting stock options as a form of compensation to non-executive employees. Broad-based option grants can be used as an incentives tool, a sorting mechanism, and a means of assisting with employee retention. An alternative explanation is that financially constrained firms use broad-based option grants as a form of self-financing. Using empirical data on broad-based option grants, a financial constraints index and individual variable proxies for financial constraints, we examine the relationship between option grants and the severity of financial constraints to which the firm is subject. We find that direct financial benefits to the firm from the use of option grants are possible. However, sorting is more likely reason for using broad-based option grants, while self-financing is a positive side effect of sorting.

I. Introduction

Broad-based stock option compensation has received extensive attention in compensation literature. Core, Guay (2001) and Oyer, Schaefer (2005) formulate three possible reasons for using broad-based stock option (BBSO) grants in public companies: firms are using these plans as incentives; firm-wide stock option plans are used as a sorting mechanism; and options can be used for retaining employees. Moreover, Oyer, Schaefer (2005) consider the financial constraints hypothesis as an incomplete form of the sorting explanation and the authors suggest that the financing hypothesis should be researched jointly with the sorting hypothesis on firm-wide option grants.

This study investigates whether the decision to compensate non-executive employees with a combination of cash and stock options can be a significant economic factor for financially constrained firms. This objective is further detailed in the specific research questions: do public firms use firm-wide stock option grants as one form of internal financing; which firm characteristics can be proxy for financing constraints and explain the intensity of the BBSO grants; do firms preserve their employees' compensation quality when they retain cash resources by partially substituting stock options for payment in cash?

The magnitude of company-wide stock option grants is examined with empirical tests utilizing a panel of the financial-constraint proxy variables. Additionally, firm-wide option grants are examined in the models using one of the existing indexes measuring the intensity of

Dr. Pavlo Tsebro, Assistant Professor, College of Management, Lawrence Technological University, 21000 West Ten Mile Road, Southfield, MI 48075-1058, Email: ptsebro@ltu.edu ,Tel: 248.204.3073, Fax: 248.204.3099.

financial constraints, namely, the SA (size-age) index from Hadlock, Pierce (2010). Consistent with prior literature (Core, Guay (2001), Oyer, Schaefer (2005)) we find that the sorting mechanisms in option grants and the financial-constraints explanation cannot be easily separated in empirical models, and that both hypotheses should be studied jointly. The financing-constraints explanation for option grants can simply be a positive side-effect of the sorting processes in non-executive compensating structures used by the firms.

II. Literature Review

Stock option grants have become a common form of compensation since the 1990s (Mehran (2001), Murphy (1999), Ittner et al. (2003)), and substantial research effort has been devoted to explaining the growth in popularity of the stock options over this period. The works by Core, Guay (2001) and Kedia, Mozumdar (2002) are the earliest large-scale studies on the motivating factors behind BBSO grants. These two studies examine firm-specific characteristics that explain decisions made by firms to extend option grants to non-executive employees. Lazear (1999) is one of the first studies on sorting models in option-based compensation literature. The author agrees that improved performance is the outcome of a heightened employee effort, but he extends the argument, stating that a greater sensitivity of employees' pay to performance attracts higher-quality workers. Oyer, Schaefer (2003) and Oyer (2004) follow this insight with an examination of the role of option grants in employee retention. If a firm's valuation is tied to its employees' outside employment options, then non-cash compensation schemes will help retain employees who might otherwise pursue opportunities outside the firm. Since option grants typically have a vesting period of a few years, leaving the company earlier will result in higher costs to the employees. Therefore, options should increase the willingness of better qualified, higher paid employees to stay with the company for longer periods. Oyer, Schaefer (2005) slightly redefine earlier conclusions on the sorting and retention functions of BBSO grants. They question the incentivizing role of option-based compensation and support earlier findings that sorting and retention are the only factors in firm-wide option grants. However, since non-executive employees have little effect on a firm's valuation, even a slight level of risk aversion would discourage these employees from accepting option-based compensation. This makes the sorting explanation of option grants counterintuitive. Oyer, Schaefer (2005) conclude that the firm can benefit by using stock options as a sorting mechanism to attract only the optimistic employees. If employees value the firm's stock options above their market value, then the firm can reduce its overall compensation expenses by substituting options for some of the cash pay.

In literature on BBSO grants, the authors have examined alternative reasons behind firm-wide option grants. Murphy (1999) hypothesizes that behavioral factors motivate option-based pay. Oyer, Schaefer (2006) suggest two possible explanations for company-wide option grants: BBSO grants can be simply a form of self-financing by firms facing external financing constraints, and these plans can also be attractive due to the favorable accounting treatment of the stock options.

Oyer, Schaefer (2005) summarize prior studies in the compensation literature and formulate three major justifications for firm-wide stock option grants. Firstly, options may provide incentives to workers. If an employee's wealth is tied to the firm's value, this may help overcome potential agency problems and align employees' actions with the shareholders' interests. Secondly, options help firms retain skilled and highly qualified workers. Deferred compensation, offered in the form of options, makes it too costly for such employees to leave the firm. Thirdly, option grants induce sorting among employees. Employees will have varying beliefs regarding the value of a firm's option grant. If employees' opinions about firm's prospects are not homogeneous, the more optimistic workers will put a higher value on the options and decide to accept cash-plus-options compensation. In this case, firms can reduce current compensation expenses by using options instead of cash-only pay to compensate their more optimistic employees.

In this study we investigate whether firm-wide option grants can be used as a form of self-financing by larger public companies under existing financial constraints. Most of the existing studies on the BBSO plans focus on the relationship between stock option grants and subsequent valuation effects or changes in firms' operational performance. Relatively few studies in existing literature directly address the financing hypothesis for broad-based option grants. Core, Guay (2001) is among the earliest studies that investigates relationship between financing constraints and company-wide option grants. Their work was followed by Kedia, Mozumdar (2002), Holland, Elder (2006), and Oyer, Schaefer (2003, 2005, 2006), who all address the financing hypothesis behind BBSO grants as a stand-alone research question.

III. Methodology

A. Financial Constraints

Oyer, Schaefer (2005), using the sign of cash flow and cash flow levels relative to the firm's capital, report inconclusive results as to whether firms might be using BBSOs as a financing mechanism. Kedia, Mozumdar (2002) use dividend payouts, interest coverage and carry-forward of the operating losses as the financing-constraints proxies and find a strong relationship between option grants and losses being carried forward. In Bergman, Jenter (2007), broad-based option grants are shown to have a positive relationship with high levels of cash but they are not significantly related to the levels of leverage and debt service. The authors conclude that the financing-constraints hypothesis should be considered together with the sorting hypothesis: financial constraints alone cannot explain option-granting behavior on the part of firms, and employees' optimism is a necessary condition for the firms to implement option-based compensation as a financing instrument. A financially constrained firm can issue options only when employees are optimistic about the firm's prospects. When the firm is more likely to become distressed, as measured by relatively higher levels of debt and debt service, employees are likely to be pessimistic and option grants may not be optimal to the firm. Core, Guay (2001),

using debt service level and cash flow shortfall to proxy for financing constraints, provide mixed evidence on whether a financial motivation is a significant factor behind BBSO grants.

Hadlock, Pierce (2010) introduce an SA (size-age) Index to measure financial constraints as an alternative to more traditional KZ index from Kaplan, Zingales (1997) and a number of various sorting algorithms based on firm-specific characteristics measuring constraints. The SA Index has a few advantages over competing metrics: it is quantitative in nature and is based on firm size and age – two parameters that are relatively more exogenous than financial and accounting firm-specific characteristics. Unlike other comparable financial constraints indexes, the SA Index also appears to be more robust across various samples of data. The level of the SA Index is determined with the algorithm proposed in Hadlock, Pierce (2010), Equation 1, where TA is the book total assets; Age is the number of years the firm is on Compustat without missing stock price observations.

$$SA = \left(-0.737 \times \log[TA] + 0.043 \times \log^2[TA] - 0.040 \times Age \right) \quad (1)$$

The variable of interest in this study is the level of options granted to non-executive employees, NEO. It is used as a dependent continuous variable in the multivariate regression tests explained below. The NEO variable is reconstructed from the option grants to the top five executives available on the ExecuComp database. ExecuComp provides data for each of the top five executives: the number of options granted, their market and Black-Scholes values and a ratio of the grant size to the individual executive over the total options granted to all employees of that particular company. The percentage of the grant allocated to the particular executive is used to determine amount of the total options granted within the company for a given year.

B. Non-executive Option Grants

Oyer, Schaefer (2005) introduce method to determine the level of option grants to non-executive workers. They show that CEOs typically receive a relatively greater number of options than the other employees at the firm, so they consider option grants to executives ranked second through fifth. They make the assumption that the highest-paid 10% of the employees at the company receive an average grant one-tenth as large as the average executive in the second through the fifth rank. Therefore, this extra 10% and grants to the top five executives are subtracted from the total grants to obtain an estimate of the option awards to non-executive employees. Equation 2 represents an algorithm for the total option grants value calculation in a given year. Option grants to the executive employees are subtracted from the total grant value in Equation 3, which provides a resulting value for the NEO continuous variable (see variables description in the Data section below). The NEO levels are scaled by the level of sales. Only positive values of the calculated NEO variable are included in the final test sample. However, inclusion of the small but positive values of the NEO in the sample may lead to misclassification of the option grants. Relatively small grants may be classified as non-executive options, when in

fact these may represent option awards to the lower-ranked executives in the company. To account for this possibility we additionally test the models in Equations 4 and 5 on the reduced samples. Three reduced samples exclude non-executive option grants representing 10%, 20% and 30% or less of the total grants in a given year respectively.

$$Total\_Options = \frac{\sum_{i=1}^{5} BLKSHVAL_i}{\sum_{i=1}^{5} PCTTOTOPT_i} \quad (2)$$

$$NEO = Total\_Options - 1.1 * \sum_{i=2}^{5} BLKHSVAL_i - BLKSHVAL_i \quad (3)$$

C. Regression

The model in Equation 4 is used as the base model of this study. The level of the non-executive option grants variable is tested on the panel of the financial constraints proxy variables from the prior literatures. NEO and all independent variables, except for the SA Index, Size and Age are scaled by sales. The SA Index is a calculated index variable, Size is a natural logarithm of the total assets and Age is defined as a natural logarithm of the firm age measured in years. The models in Equations 4 and 5 and all the robustness tests are performed using multivariate robust regression with the MM estimation method by Yohai (1987). The choice of robust regression methodology is motivated by two important factors. We find a presence of heteroscedasticity in the sample data and, while appropriate instruments for the error correction are available and it is possible to obtain heteroscedasticity-consistent errors for the model parameter estimates, the presence of outliers in the data make an application of the robust regression methodology the most appropriate. For all the tests in this study, we find contamination levels (the percentage of the data points in the sample identified as outliers) to be around 9-14% depending on the model specification and sub-sample selection. The traditional approach in the prior literature is to use winsorized or truncated samples. However, it is not possible to identify multidimensional x-space outliers correctly by truncating or winsorizing data; moreover, truncation further reduces sample size and removing legitimate observations from the sample cannot be logically justified.

Additional tests to validate results of the base models are performed with controls for the time and industry effects by using year dummy variables and the first two digits of the SIC codes in the base models. Results appear to be qualitatively similar across both methodological approaches and are reported in Table III.

$$NEO = f(SA, Cash, CAPX, Total\ Debt, FCF, Dividends) \quad (4)$$

Alternatively, the model in Equation 5 combines only individual variables from the previous studies on firm-wide option grants, including the Size and Age variables, which are the component variables of the SA Index in Equation 4.

$$NEO = f(Size, Age, Cash, CAPX, Total\ Debt, FCF, Dividends) \quad (5)$$

Independent variables specified in the models from Equations 4 and 5 are used either in the earlier studies on the financial constraints hypothesis in option grants, or in more general models studying miscellaneous firm characteristics as determinants of the BBSO plans.

IV. Data

Sample data were collected from the ExecuComp and Compustat databases over the period from 1992 to 2006. Proxy variables for the financial constraints come from the Compustat Fundamentals Annual files and comprise the book value of total assets, firm age, cash holdings, level of capital expenditure, level of total debt, free cash flow and common dividends. Non-executive option grants are a calculated variable reconstructed from the option grants data to the top five executives on the ExecuComp database using methodology by Oyer, Schaefer (2005). Due to the truncation and rounding of the ExecuComp options data, a reconstruction of the total grants can be imprecise in cases when option grants to the top executives represent only a small fraction of the firm-wide option grants. To measure the accuracy of the calculated non-executive options data, we estimate a level of non-executive option grants using reported options to each of the top five executives separately for each firm-year combination and calculate the standard deviation for the resulting estimates. All estimates with corresponding standard deviation of at least 10% or with data available for only one or two executives for a given firm-year are considered inconsistent and not included into the final sample.

The sample size is largely contingent upon data availability under the ExecuComp database. Since the percentage of the total option grant to a top executive (variable identifier PCTTOTOPT) is available through 2006 on the ExecuComp, the sample period ends in 2006. There are 157,854 individual observations on the compensation of the top five executives available on the ExecuComp over the 1992-2006 period. Out of this number, 88,964 observations have option grants data available on the individual top executives for each firm-year combination. After excluding observations with no options data and missing financials at the firm the base test sample has 14,271 unique firm-year observations with the non-executive option grants. To address a possible misclassification of executive options into non-executive awards, three abbreviated samples are also used in the tests. Estimated non-executive option grants representing 10%, 20% and 30% or less of the total options are deleted from the base sample. Three resulting samples have 14,149, 13,922 and 13,527 firm-year observations respectively. Definitions of the variables are summarized in Table I. Table II presents descriptive statistics of the sample variables.

V. Empirical Results

The model in Equation 4 uses the SA Index as an explanatory proxy variable for financial constraints. Hadlock, Pierce (2010) show that the SA Index is a robust measurement for the level of financing constraints. Alternatively, the model in Equation 5 is constructed on a panel of explanatory variables from prior literature, including component variables of the SA Index, size and age. Oyer, Schaefer (2005) and Core, Guay (2001) both use the signs and levels of cash flows; Kedia, Mozumdar (2002) utilize dividends, level of debt and debt service coverage; Bergman, Jenter (2007) use the levels of cash, debt and debt coverage as the proxy variables for financial constraints. The models in Equations 4 and 5 combine firm characteristics that appear to be the most consistent and robust indicators of existing financial constraints for the firms: levels of cash, total debt, free cash flows, capital expenditure and dividends.

Table III shows results for both models over the entire sample period: the columns labeled Model 1 and Model 2 report results for the base model tests, while the results in the Model 3 and Model 4 columns are for models with time and industry fixed effects. Moreover, squared terms for the SA Index and Age variables are added to the fixed effects models to account for the non-linearity of relationship between these two independent variables and the NEO levels. A test on the relationship between the Size and NEO variables does not identify any non-linearity, and non-linear terms for the Size variable are therefore not added to the base models. Years for individual observations are used to model time fixed effects, and the first two digits of the reported SIC codes for each firm-year observation are used to model industry fixed effects. Results are qualitatively identical across all model specifications: parameter estimates in the fixed effects models retain the same signs and statistical significance as the corresponding parameter estimates in the base models without fixed effects.

Younger and smaller firms tend to grant relatively more stock options to non-executive employees. This is supported in both model specifications: the SA Index is positively related to the NEO (smaller size and lower age are indicative of the greater financial constraints; the SA Index is designed in way that higher index levels correspond to the higher level of financial constraints), and the individual components of Size and Age are negatively related to the level of non-executive options. Moreover, non-executive option grants are non-linearly related to firm age, as measured directly by the Age variable or reflected in the SA Index. Squared terms for Age and the SA Index are statistically significant in both model specifications, and signs indicate that non-executive option grants levels are reduced at higher rates as firms get older.

Summarizing the results of the base model tests, the following conclusions can be made. It might not be possible to separate sorting factors from financial-constraints factors in option grants in empirical models. In fact, the financial constraints explanation of option grants can be conditional on sorting: more successful firms are able to attract optimistic employees who are willing to accept non-cash based compensation, and subsequently these option grants lead to

cash preservation for the firm. The results for the base models show that younger and smaller firms, firms maintaining higher levels of cash holdings, and firms with lower dividends are using relatively more options in their compensation practices. On the other hand, firms with lower levels of debt and robust financial performance are less likely to be financially constrained, but they also use option-based compensation extensively. This is supporting evidence for the sorting explanation of option grants. Sorting may be more important factor in option-granting decisions, and subsequent direct financial savings may be simply a positive side-effect of these grants rather than one of the primary reasons for them.

Additional tests on the Equations 4 and 5 models are performed as robustness checks of the result presented above. Due to truncation of the options data on the ExecuComp database and imperfections of the total option grants reconstruction methodology of Oyer, Schaefer (2005), there is a possibility that relatively small option grants might be misclassified. To avoid this misclassification problem, the base models are re-evaluated on reduced samples, where observations on the non-executive option grants representing 10%, 20% or 30% or less of the total options granted are removed. Robustness tests are also performed on the sub-samples over various time periods to verify that results are not driven by the sample selection. For this purpose, the base sample is divided into five 3-year periods and into three 5-year periods. Results for all tests remain consistent with the base sample tests: higher levels of the BBSO grants are associated with lower levels of debt, higher levels of cash holdings, capital expenditures and free cash flows. Similarly to the base models, NEOs are higher for the younger and smaller companies as measured by the SA Index or individual variables for size and age. To preserve space, results of all robustness tests are not reported.

Interesting results come from the multivariate tests on the sub-samples of firms sorted into quarters by age and size. Table IV shows results for the two firm groups from the first and fourth quarters for the following combinations: small-young and large-old firms. A firm is classified as small if it is in the lowest quarter of the base sample sorted by the level of total assets, and all firms in the top size quarter are classified as large. Firms are classified as young or old if they are sorted into the lowest or highest quarters of the sample sorted by firm age.

Some of the results support the financing hypothesis of option grants, but there seems to be much stronger supporting evidence for the sorting explanation of option granting practices. According to the results in Table IV it appears that both the younger, smaller firms and the older, larger firms in the test sample actively use firm-wide options. In the case of the former group, this may indicate an internal financing motive in option grants. The latter group of firms may be self-selecting into options as a means of sorting into optimistic employees. Support of the sorting hypothesis comes from the test results for the Large-Old firms sub-sample: positive performance, as measured by the FCF, and dividends are positively related to the magnitude of the option grants. Firms, performing well financially and paying dividends are not likely to be financially

constrained. Therefore, offering options on a company-wide basis at these firms may be primarily driven by the sorting motive to attract more optimistic and skilled employees. Further evidence for sorting is found in the sub-sample of the smaller, younger firms: levels of debt are negatively related to NEOs and the coefficient estimate for the debt variable is about thirty times greater than the respective estimate for more mature firms in the sample. As the costs of financial distress are lower for lower levels of debt, employees of less leveraged firms should be more optimistic about their firm's prospects and more willing to accept non-cash forms of pay. Optimistic employees accept even more of the option-based pay if the firm has steady financial performance: the FCF and the option grants are positively related across both sub-samples.

VI. Conclusion

We investigate whether financing motives may be among the factors in option grants to non-executive employees. Results of the study largely support the sorting hypothesis: firm-wide option grants indicate that firms compensate optimistic employees with options. Moreover, the financing benefits effect seems to be a positive side effect of sorting. Two models utilize a panel of the individual variables and the SA Index as proxies for the financial constraints. We confirm findings in prior compensation literature: option-granting firms with good future prospects, and possibly with current financing constraints, capitalize on the optimism of their employees and choose to offer options as a part of compensation package to non-executives. The financing motive for broad-based option grants may be economically significant for some firms, but it does not seem to be a primary factor in the implementation decision in general. Financial benefits from BBSO grants are likely to be a positive side-effect of sorting.

Key findings of the study can be summarized as follows:

- separation of the sorting and financing mechanisms is not a trivial task and considering these hypotheses jointly is likely an appropriate approach for future research;
- results indicate that sorting is an important factor in BBSO grants, while internal financing can be simply a positive side-effect of option grants and not a primary factor in managerial decisions to grant options on a firm-wide basis;
- the SA Index, Cash, Total Debt and FCF appear to be the most robust proxy variables for the financial constraints and may be used for the purposes of future research. The Size variable, defined as the scaled level of total assets, and Dividends, are not reliable proxies in empirical modeling of the financial constraints;
- comparing the SA Index and its component variables, Age and Total assets, index variable is a preferable measure to be used for future research. While the Age variable is highly consistent across all tests and model specifications, the Size variable proves to be less reliable. SA Index measures the combined effect of Age and Size and it produces consistent results across all tests in this study.

Table I. Variables List and Descriptions

Variable Name	Variable Description	Identificator	Database
NEO	See Methodology Section		
$PCTTOTOPT_i$	Percent of option grant to a top executive i (i = 1 to 5; i = 1 for CEO) relative to the total grants made by a company during fiscal year.	PCTTOTOPT	ExecuComp
$BLKSHVAL_i$	Value of the grant to a top executive i (i = 1 to 5; i = 1 for CEO) using Black-Scholes methodology, in thousands of dollars	BLKSHVAL	ExecuComp
SA	"Size-age" index (see Methodology section)		
Age	# of years with non-missing stock price		Compustat
TA	Total assets, book value	Item 6	Compustat
Size	Natural logarithm of TA		Compustat
Total Debt	Long- plus short-term debt, book value	Items 9, 34	Compustat
Sales	Total sales	Item 12	Compustat
Cash	Cash and marketable securities	Item 1	Compustat
Dividends	Dividends Common/Ordinary	Item 21	Compustat
FCF	Net CF from operations minus capital expenditures	Items 308, 128	Compustat
CAPX	Capital expenditures	Item 128	Compustat

Table II. Sample characteristics

	All Firms	Low NEO Firms	High NEO Firms	Difference	p-value
Obs.	14,271	7,133	7,138		
NEO	54.73	2.0584	107.3647	-105.3063	(<0.0001) ***
SA	-3.9802	-4.2874	-3.6732	-0.6142	(<0.0001) ***
Age	2.9786	3.271	2.6865	0.5845	(<0.0001) ***
Size	7.3702	7.7913	6.949	0.8423	(<0.0001) ***
Cash	0.4212	0.09	0.7521	-0.6621	(<0.0001) ***
CAPX	0.0938	0.0662	0.1213	-0.0551	(<0.0001) ***
Total Debt	0.5806	0.4751	0.6861	-0.211	(0.0998) *
FCF	-0.075	0.039	-0.189	0.2281	(<0.0001) ***
Dividends	0.0328	0.0213	0.0443	-0.023	(-0.4148)

Notes to Table II: Means of variables are sized by Sales, except for SA, Size and Age variables. SA is a calculated index, Size is a natural logarithm of Total Assets, Age is a natural logarithm of the firm age measured in years. Tests of differences for means are based on two sample t-statistics. Last column reports corresponding p-values and "***" indicates significance at 0.01 level; "**" significance at 0.05 level; and "*" significance at 0.10 level.

Table III. Multivariate Tests of Factors in Option Grants to the Non-Executives

	Model 1	Model 2	Model 3	Model 4
	Models without FE		Models with Time and Industry FE	
Intercept	15.21	7.51	17.71	2.13
	(0.3245) ***	(0.2623) ***	(1.4768)***	(0.9548)**
SA Index	2.65	-	7.8	-
	(0.0765) ***		(0.6450)***	
SA Index ^{2}	-	-	0.77	-
			(0.0797)***	
Size	-	-0.17	-	-0.03
		(0.0383) ***		-0.0311
Age	-	-0.11	-	-0.12
		(0.0038) ***		-0.403
Age ^{2}	-	-	-	-0.22
				(0.0725)***
Cash	6.35	7.19	18.97	19.21
	(0.1780) ***	(0.1859) ***	(0.0213)***	(0.0214)***
CAPX	13.88	13.85	12.85	12.65
	(0.4974) ***	(0.5024) ***	(0.1957)***	(0.1958)***
Total Debt	-1.05	-0.84	-0.02	-0.12
	(0.0589) ***	(0.0623) ***	(0.0109)**	(0.0109)***
FCF	7.73	7.94	4.25	3.99
	(0.4189) ***	(0.4351) ***	(0.0340)***	(0.0339)***
Dividends	-13.52	-12.87	-8.27	-7.14
	(1.5883) ***	(1.5934) ***	(0.0390)***	(0.0389)***
	Obs. = 14,271	Obs. = 14,271	Obs. = 14,271	Obs. = 14,271
	R^2 = 0.0547	R^2 = 0.0533	R^2 = 0.0764	R^2 = 0.0764

Notes to Table III: MM estimation of the robust regression of the non-executive option grants on the SA index or size, age individual variables with proxy variables for financial constraints. SA is the calculated index variable (see Section 3.3); Size is the natural logarithm of Total Assets; Age is a natural logarithm of the firm's age measured in years. All other variables are sized by the level of sales.

The top numbers are the MM robust regression estimates of the parameters and the numbers below in parentheses are the corresponding standard errors. Statistical significance of the parameter estimates is denoted with *** for the 0.01 level, ** for the 0.05 level and * for the 0.10 level. Results in the Models 3 and 4 columns are based on the fixed effects model tests. Fixed effects for the 15 years of the test sample length and 65 unique first two-digits of the SIC codes are added into the base models. Age^2 and SA Index^2 terms are added to Models 3, 4 to control for non-linear relationship between Age and NEO. Parameter estimates and corresponding standard errors for the variables of interest are reported in the Model 3 and Model 4 columns.

Table IV. Multivariate Tests of the NEO Grants Across Sub-Samples of Firms Grouped on the Size-Age Dimension

	Young-Small Firms	Young-Small Firms	Large-Old Firms	Large-Old Firms
Intercept	76.9	51.69	-0.96	-7.03
	(11.1377) ***	(7.8391) ***	-1.2904	(2.3204) ***
SA Index	19.91	-	-0.5495	-
	(3.7152) ***		(0.2547) **	
Size	-	-4.56	-	0.1
		(1.3465) ***		(0.0587) *
Age	-	-4.93	-	2.03
		(2.4821) **		(0.6011) ***
Cash	52.11	52.3	2.19	2.05
	(0.9183) ***	(0.9144) ***	(0.2538) ***	(0.2507) ***
CAPX	32.09	30.43	1.93	2.15
	(6.1124) ***	(5.9922) ***	(0.7934) **	(0.7974) ***
Total Debt	-14.31	-16.4	-0.55	-0.64
	(2.0339) ***	(1.8094) ***	(0.0913) ***	(0.0929) ***
FCF	20.22	15.92	3.1	3.12
	(2.7992) ***	(1.8161) ***	(0.6262) ***	(0.6258) ***
Dividends	-132.88	-148.91	9.35	9.75
	(29.4282) ***	(29.2384) ***	(1.7870) ***	(1.7763) ***
	Obs = 1,548	Obs = 1,548	Obs = 1,866	Obs = 1,866
	R^2 = 0.1928	R^2 = 0.1930	R^2 = 0.0262	R^2 = 0.0288

Notes to Table IV: MM estimation of the robust regression of the non-executive option grants on SA index or size, age individual variables with proxy variables for financial constraints. SA is the calculated index variable (see Section 3.3); Size is the natural logarithm of Total Assets; Age is a natural logarithm of the firm's age measured in years. All other variables are sized by the level of sales. The top numbers are the MM robust regression estimates of the parameters and the numbers below in parentheses are the corresponding standard errors. Statistical significance of the parameter estimates is denoted with *** for the 0.01 level, ** for the 0.05 level and * for the 0.10 level.

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