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EXECUTIVE STOCK OPTIONS

AN INCENTIVE FOR EARNINGS MANIPULATION USING DISCRETIONARY ACCRUALS

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MY objective is to evaluate whether managers, when executive stock options (ESOs) are part of their compensation, manipulate earnings by using discretionary accruals (DAs). The empirical results of this study provide evidence that executives are not more likely to manipulate earnings when in-the-money exercisable ESOs are a large part of their compensation package. Logistic regression results indicate that an increase in the value of in-the-money exercisable ESOs or value realized on exercise of ESOs does not increase the likelihood of earnings manipulation through the use of DAs.

Introduction

An *executive stock option* plan gives managers the right to buy a specified number of shares for a specified period at a specified price (the *exercise price*).[1] The value of this long-term contract varies with market measures of corporate performance. ESOs, which are usually granted for a maximum of ten years, can be exercised after one to four years, subject to stipulations contained in the compensation contract. These stipulations are based on factors such as the performance of the firm, the time elapsed, and the market price of the company's stock. ESOs cannot be exercised if the stipulations are not met.[2]

ESOs are usually granted at the current market price. When the exercise price for the option is equal to the market price, the option is at-the-money. If the market price exceeds the exercise price, the option is said to be in-the-money. The option is said to be out-of-the-money if the market price is less than the exercise price.

ESOs are granted with the implicit assumption that in the long run, increased ownership in the firm will motivate executives to maximize shareholders' wealth. Over the long term, stock option plans are intended to reduce the potential conflicts of interest between shareholders and executives. Aligning executives' interests with those of the shareholders is one of the most often cited reasons for seeking shareholders' approval for the executive stock option plan.

However, managers can and will act in their own best interests in their response to the economic incentives in compensation contracts (Baiman 1990). My study investigates whether managers manipulate earnings using discretionary accruals when ESOs are part of their compensation.

Earnings can be decomposed into cash flows from operations and total accruals. Total accruals have both discretionary and nondiscretionary components.

Typically, it is assumed in the accounting literature that discretionary accruals are subject to managerial manipulation. This assumption arises from the flexibility accorded under GAAP for recording certain transactions, which gives managers an opportunity to manipulate earnings for private gain.[3]

Since discretionary accruals are not observable, they need to be estimated. Researchers have made extensive use of the Jones model (1991) or its variations to estimate discretionary accruals. The modified Jones model is

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one such variation that segregates accruals into discretionary and nondiscretionary components (Dechow, Sloan, and Sweeney 1995).[4]

Incentives for Earnings Manipulation

Earnings manipulation can have negative consequences for financial statement readers, and impair the statements' usefulness in helping prospective shareholders to make decisions (Warfield et al. 1995).[5] The business community in general concedes that earnings manipulation in financial reporting is pervasive (Bartov 1993). Explicit and implicit contracts (both existing and potential) create incentives for executives to manipulate earnings (Watts and Zimmerman 1990).

Four primary incentives for manipulating earnings are debt covenants (Dhaliwal 1980), weaknesses in corporate governance (Dechow, Sloan, and Sweeney 1996), need for external financing (Dechow, Sloan, and Sweeney 1996), and compensation contracts (Healy 1985).

Several studies show the use of audited financial statements to monitor debt contracts for both public debt and private debt (Smith and Warner 1979; and Leftwich 1983). If a firm is close to violating a debt contract, it is likely to manipulate earnings (Healy and Palepu 1990). Sweeney (1994) shows that managers change accounting procedures in response to tightening debt governance constraints. DeFond and Jiambalvo (1994) report significant working capital accruals in the year of debt covenant violation.

Earnings manipulation also relates to weaknesses in the governance structure. The objective of an internal governance structure is to maintain the credibility of financial statements and provide a barrier to undesirable activities.[6] Indications of weak governance include the absence of an audit committee, low quality of auditors (Dechow, Sloan, and Sweeney 1996), and a CEO who serves as the boards' chair (Jensen 1993).[7] When the CEO serves as chairperson, the board is more likely to be dominated by insiders, which increases the probability of earnings manipulation. This study uses a zero-one dummy variable to control for whether the CEO and the chairperson of the board are the same.

Practitioners have identified the need for external financing as the primary motive to manipulate earnings (Dechow, Sloan, and Sweeney 1996). Opler and Titman (1994) show that firms with high leverage ratios are more likely to issue equity.

Healy (1985) and other researchers show that the maximization of bonus payments is a major incentive for earnings manipulation. Healy (1985) and Holthausen, Larcker, and Sloan (1995) suggest that, especially when income nears the threshold limits for bonus payments, managers are motivated to adjust accruals to maximize their compensation. Healy (1985) also predicts that when earnings are above the upper or below the lower bounds, managers tend to select negative or income-decreasing accruals to maximize their future bonus pools. However, Holthausen, Larcker, and Sloan (1995) find no evidence that managers manipulate earnings downwards when earnings are below the lower bound of the bonus plan. Gaver, Gaver, and Austin (1995) also reexamine Healy (1985) and find no evidence that managers manipulate downwards when earnings are below the lower bound of the bonus plan. Since the evidence is inconsistent for the effect of negative DA's, I use only positive DA's.

Description of the Sample and Data

This study uses the 1994 list of Fortune 500 companies, and collects data for the years 1994 to1996 for the companies on the 1994 list.

One of the requirements for firms in this study's sample is that ESOs are a component of executive compensation. I eliminated a total of 180 companies because one or more data items for computing the estimates of the firms' specific parameters were not available. I computed the estimates of firm-specific parameters by using the modified Jones model 1995 for the estimation period between 1982 and 1992 (see Equation below). The sample was further reduced by 42 companies when I found that one or more of the data items for one or more relevant variables were missing on the Compustat tapes for the period 1993 to 1996. This process reduced the sample size to 278 companies.

I also dropped 31 companies because they either did not have an ESO plan or did not report the required

information. A total of 39 companies with an ESO plan did not report the required data for 1994 or 1996. I also eliminated companies without bonus plans or insufficient information on bonus payments.

Finally, I did not include 35 firms with negative discretionary accruals. The final sample consists of 150 firms with a total of 450 observations for three years. Table 1 summarizes the data reduction process and Table 2 provides the descriptive statistics for the final sample of 150 firms.

Table 1: Sample Reduction

	Reduced by	
Original Sample		**500**
Data not found on Compustat for estimating the coefficients for firm-specific parameters (1983-1992)	180	
Data not found on Compustat for estimating the NDAs for the event period (1993-1996)	42	
No ESO plan reported	31	
Companies that did not report 1996 or 1994 data for ESOs	39	
Data not available for bonuses	23	
Companies with negative discretionary accruals	35	
Original sample reduced by	**350**	
Final sample		**150**

Table 2: Summary Descriptive Statistics for the Final Sample of 150 Firms

	Mean	**Min.**	**Max.**	**Median**
Value of exercisable ESOs (in $ millions)	9.000	0.001	173.000	3.700
Value of unexercisable ESOs (in $ millions)	7.000	0.000	147.000	1.800
Value realized (in $ millions)	2.600	0.000	9.800	0.700
Bonus (in $ millions)	2.000	0.002	19.000	1.660
Earnings per share (in $)	2.560	-10.300	10.600	2.300
Total assets (in $ billions)	8.980	0.726	46.408	5.545
Revenue (in $ billions)	9.072	1.375	71.129	5.884
Discretionary accruals (DAs)	0.002	0.000	0.011	0.002R
VESO*	0.001	0.000	0.003	0.001
RVUSO*	0.001	0.000	0.002	0.000
BONUS *	0.000	0.000	0.016	0.000
LEVERAGE*	0.200	0.001	0.725	0.194
SIZE	8.620	6.360	10.650	8.530
VAL_RLZD*	0.000	0.000	0.000	0.000

** Numbers approach zero due to the scaling factor.*

Computation of Discretionary Accruals using the Modified Jones Model 1995

For each firm, total accruals (TAs) are estimated using the Equation 1.1. Non-discretionary accruals (NDAs) are computed for each firm using the modified Jones model 1995 (see Equation 1.2). NDAs are computed for the estimation period (1983–1992) using Equation 1.3. Compustat data for ten years (1983–1992) are used to estimate the coefficients of Equation 1.3. These coefficients are used as the firm-specific parameters for Equation 1.2 to compute NDAs for the period (1993–1996). DAs are computed by subtracting NDAs from TAs using Equation 1.

$$TA = DAs + NDAs \quad (1)$$

where

TA = total accruals computed as per Healy (1985) and Jones (1991)

$$TA_{i,t} = (\Delta CA_{i,t} - \Delta CL_{i,t} - \Delta CASH_{i,t} + \Delta STD_{i,t} - \Delta DEP_{t}) / A_{i,t-1} \quad (1.1)$$

where

$\Delta CA_{i,t}$ = change in current assets (Compustat item 4)

$\Delta CL_{i,t}$ = change in current liabilities (Compustat item 5)

$\Delta CASH_{i,t}$ = change in cash and cash equivalents (Compustat item 1)

$\Delta STD_{i,,t}$ = change in debt included in current liabilities (Compustat item 34)

$\Delta EP_{i,t}$ = change in depreciation and amortization expense (Compustat item 14)

$A_{i,t-1}$ = total assets (Compustat item 6)

The modified Jones model 1995 for computing NDAs in the event period is as follows:

$$NDAs_{i,t} = a_1(1/A_{i,t-1}) + a_2(\Delta Rev_{i,t} - \Delta Rec_{i,t}) + a_3(PPE) \quad (1.2)$$

$$NDAs_{i,t} = 0.18621\ (1/A_{i,t-1}) + 0.166756\ (\Delta Rev_{i,t} - \Delta\ Rec_{i,t}) - 0.289464(PPE)$$

where

$A_{i,t-1}$ = total assets at t-1

PPE = property, plant, and equipment scaled by $A_{i,t-1}$

$\Delta Rev_{i,t}$ = (Revenue $_{i,t}$ - Revenue $_{i,\ t-1}$) scaled by $A_{i,t-1}$

$DRec_{i,t}$ = (Receivables $_{i,t}$ -Receivables $_{i,t-1}$) scaled by $A_{i,t-1}$

$a_{1,}\ a_{2,}\ a_3$ = firm-specific parameters

Estimates of firm-specific parameters are generated using the following OLS model in the estimation period from 1983 to 1992:

$$NDAs_{i,t} = a_1(1/A_{i,\ t-1}) + a_2(\Delta Rev_{i,}t - \Delta Rec_{i,}t) + a_3(PPE_{i,}\ t) + \varepsilon_{i,}t; \quad (1.3)$$

$$NDAs_{i,t} = 0.18621(1/A_{i,\ t-1}) + 0.166756(\Delta Rev_{i,}t - \Delta Rec_{i,}t) - 0.289464\ (PPE_{i,}\ t) + e_{i,}t\ ;$$

Where

t = 1 to 10 is the estimation period and 1 corresponds to year 1983

Other variables are as defined earlier.

Research Design and Development of Hypotheses

The two hypotheses developed in this section address the issue of earnings manipulation by executives, who use positive DAs when ESOs are part of the executives' compensation packages.

The first hypothesis posits the likelihood of manipulation when substantial dollar value of in-the-money ESOs are exercisable. The second hypothesis concerns the possible effect of exercise of ESOs on earnings manipulation by using prior-period DAs.

Hypothesis 1: Earnings Manipulation and Impact of RVESO

The dollar value of RVESO is likely to increase with passage of time, because the exercisability of options in majority of ESO plans is based on the passage of time and not on a certain market price.[8] Under most plans, the options become exercisable over a period of three to five years. Generally, plans provide that a certain percentage of the options will become exercisable every year (for example, 25% each year).

An executive will exercise options when they are exercisable and in-the-money, and the larger the value is, the greater the benefit to the executive. The executive is, therefore, more likely to manipulate earnings upwards as the value of in-the-money exercisable options increases. We therefore expect to see a direct relation between likelihood of earnings manipulation and value of in-the-money exercisable options. The following hypothesis applies:

Hypothesis 1 (H1): As the value of in-the-money exercisable executive stock options increases, so does the likelihood that management will use positive discretionary accruals to manipulate earnings.

Logit analysis tests the first hypothesis. Since the dollar value of in-the-money exercisable ESOs (RVESO) can change from year to year, even for the same firm, I segregate the impact of RVESO on a yearly basis. H1 is tested by using 150 observations for a given year, and the results are analyzed over three years. The dependent variable in the logistic regression is a dichotomous response variable delineated as a greater likelihood of earnings manipulation [represented by higher than average (for the sample) value of DAs] and a smaller likelihood of earnings.

Equation 2 tests the following null hypothesis:

$H1_0 : \beta_1 = 0$

$H1_a : \beta_1 > 0$

$$DA_{i,t} = \alpha_1 + \beta_1 RVESO_{i,t} + \gamma_1 RVUSO_{i,t} + \gamma_2 BONUS_{i,t} + \gamma_3 LEVERAGE_{i,t} + \gamma_4 CEOCM_{i,t} - \gamma_5 SIZE_{i,t} + \gamma_6 VAL\_RLZD_{i,t} + \varepsilon_{i,t} \quad (2)$$

where

α_2 = intercept term

β_2 = the coefficient for the hypothesized variable

$\gamma_{1...6}$ = the coefficient for each control variable

$DAs_{i,t}$ = 1 if there is a greater likelihood of earnings manipulation (represented by higher than average (for the sample) value of DAs)

= 0 if there is a smaller likelihood of earnings manipulation (represented by lower than average value of (for the sample) DAs)

$RVESO_{i,t}$ = total value of exercisable ESOs in-the-money for the top five executives (as disclosed in the proxy statement) scaled by total assets at $t_{i,t-1}$

$RVUSO_{i,t}$ = total value of unexercisable ESOs in-the-money for the top five executives (as disclosed in the proxy statement) scaled by total assets at $t_{i,t-1}$

$BONUS_{i,t}$ = total value of annual bonus payments to the top five executives (as disclosed in the compensation summary table of proxy statement) scaled by total assets (Compustat item no. 6) at $t_{i,t-1}$

$LEVERAGE_{i,t}$ = long-term debt (Compustat item no. 9) divided by total assets (Compustat item no. 6)

$CEOCM_{i,t}$ = dummy variable coded as 1 if CEO also chairs the board of directors; otherwise coded as 0

$SIZE_{i,t}$ = natural logarithm of total assets (Compustat item no. 6)

$VAL\_RLZD_{i,t}$ = value realized on exercise of ESOs scaled by total assets (Compustat item no. 6) at $t_{i,t-1}$

$e_{i,t}$ = error term

Hypothesis 2: Earnings Manipulation and Impact of Value Realized

When ESOs are part of an executive's compensation, the executive is likely to have some expectations of returns from those ESOs. To realize those unobservable expectations, the executive may manipulate earnings upwards before exercising the options. Once the perceived expectations have been achieved, the manager is more likely to exercise the options. Because the earnings manipulation is likely to precede the actual exercise, the impact of prior-period manipulation through DAs may be positively related with the value realized on exercise of ESOs in the current period. The following hypothesis applies:

Hypothesis 2: As the value realized from the exercise of executive stock options increases, so does the likelihood that management used prior-period positive discretionary accruals to manipulate earnings.

Logit analysis tests the second hypothesis. Since the VAL_RLZD can change from one year to another, even for the same firm, I choose to segregate the impact of value realized on a yearly basis. H2 is also tested by using 150 observations for a given year, the results are analyzed over three years. The dependent variable in the logistic regression is a dichotomous response variable categorized as a greater likelihood of earnings manipulation [represented by higher than average value of DAs (for the sample) for the year t-1] and a smaller likelihood of earnings manipulation [represented by lower than average value of DAs (for the sample) for the year t-1]. Equation 3 tests the following null hypothesis:

$H2_0 : \beta_2 = 0$

$H2_a : \beta_2 > 0$

$$DA_{i,t-1} = \alpha_2 + \beta_2\, VAL\_RLZD + \gamma_7 RVESO_{i,t} + \gamma 8 RVUSO_{i,t} + \gamma 9\, BONUS_{i,t} + \gamma_{10}\, LEVERAGE_{i,t} + \gamma_{11}\, CEOCM_{i,t} - \gamma_{12} SIZE_{i,t} + \varepsilon_{i,t} \quad (3)$$

where

α_2 = intercept term

β_2 = the coefficient for each hypothesized variable

$\gamma_{7...12}$ = the coefficient for the control variable

$DAs_{i,t-1}$ = 1 if there is a greater likelihood of earnings manipulation (represented by higher than average (for the sample) value of DAs)

= 0 if there is a smaller likelihood of earnings manipulation (represented by lower than average value of (for the sample) DAs)

All other variables are as defined in equation 2.

Table 3: provides the sources of data used for variables in the study.

The value of in-the-money exercisable options (RVESO) and value realized (VAL_RLZD) are hypothesized variables for testing the two hypotheses. The value of in-the-money unexercisable executive stock options (RVUSO) is used as an exploratory indicator of future accumulated compensation that could motivate managers' behavior. The earnings-based bonus compensation (BONUS) is used as a control variable for the bonus hypothesis. A leverage (LEVERAGE) ratio is used to control for external financing and debt-covenant violation. Size (SIZE) is used to segregate the impact of income smoothing due to size only. CEOCM, a categorical variable representing whether or not CEO is also the chairman of the board, controls for corporate governance.

Table 3: Hypothesized Signs for Coefficients and Data Sources for Variables

	Sign	Data Source
Value of exercisable ESOs in the proxy (RVESO)	+	Proxy statement
Value of unexercisable ESOs in the proxy (RVUSO)	?	Proxy statement
Annual bonus payment to top five executives as reported in the proxy statement (BONUS)	+	Proxy statement
Long-term debt / total assets (LEVERAGE)	+	Compustat Database
Dummy variable to check whether CEO and chairman of the board are the same (CEOCM)	+	Proxy statement
Natural logarithm of total assets at year t (SIZE)	–	Compustat database
Value realized for the top five executives as reported in the proxy scaled by total assets at year t-1 (VAL_RLZD)	+	Proxy statement
Discretionary accruals (DAs) - dependent variable		Computed (Equation 1)

Results for Hypothesis 1: Impact of RVESO

To test the prediction in H1, I estimate a logit regression model for years 1994 through 1996 and present the results in Tables 4 through 6.

There are 150 observations (cases) for each year. The coefficient (b_1) for the hypothesized variable (RVESO) for all three years is not significantly different from zero. This implies that the likelihood of manipulation is not affected by an increase in the value of RVESO.

Coefficients for CEOCM, BONUS, and the exploratory variable RVUSO are also not significant for all three years (1994 through 1996). Note that the coefficient for VAL_RLZD is significant and positive for 1994. It implies that an increase in VAL_RLZD is associated with an increase in the likelihood that managers may use income-increasing accruals.

For the year 1994, results (see Table 4) show that coefficients for LEVERAGE and VAL_RLZD are significant. I compute fitted values for LEVERAGE for its median value of 0.19 and maximum value of

Table 4: Logistic Regression Results for 1994 - Likelihood of Management's Use of Positive Discretionary Accruals to Manipulate Earnings

$$DA_{i,t} = \alpha_1 + \beta_1 RVESO_{i,t} + \gamma_1 RVUSO_{i,t} + \gamma_2 BONUS_{i,t} + \gamma_3 LEVERAGE_{i,t} + \gamma_4 CEOCM_{i,t} - \gamma_5 SIZE_{i,t} + \gamma_6 VAL\_RLZD_{i,t} + \varepsilon_{i,t}$$

	Beta	Significance	Exp. (β or γ)
CONSTANT(α_1)	-3.8220	0.1415	–
RVESO(β_1)	-0.0006	0.6138	0.9999
RVUSO(γ_1)	-0.0003	0.1126	0.9997
BONUS(γ_2)	-0.0009	0.1233	0.9991
LEVERAGE(γ_3)	3.8102	0.0200*	45.1595
CEOCM(γ_4)	-0.2398	0.2371	0.7868
SIZE(γ_5)	0.4321	0.1163	1.5391
VAL_RLZD(γ_6)	0.0002	0.0544*	1.0002
Chi-square test of model's fit = 39.18	Degrees of freedom = 7		Significance = 0.00

** Test statistically significant at 5% level*

0.75.[9] The likelihood of manipulating income increases from about 4% for the median value to 51% for maximum value of LEVERAGE. This result indicates that proximity to debt-covenant violation levels increases the likelihood of earnings management, confirming the findings of Dhaliwal (1980) and Dechow, Sloan, and Sweeney (1996).

The fitted values of VAL_RLZD at different levels are not significantly different from each other, indicating that the likelihood of manipulation does not increase in any economically significant manner with an increase in VAL_RLZD.

SIZE is positive and significant for 1995 (see Table 5). Fitted values for SIZE are computed at two levels - the minimum value of 6.36 and the median value of 8.53. The probability of earnings manipulation increases from 15% for the minimum value to 49% for the median value, implying that as the SIZE increases, so does the probability of earnings manipulation through DAs.[10] Coefficients for all other variables are not significantly different from zero.

Table 5: Logistic Regression Results for 1995 - Likelihood of Management's Use of Positive Discretionary Accruals to Manipulate Earnings

$$DA_{i,t} = \alpha_1 + \beta_1 RVESO_{i,t} + \gamma_1 RVUSO_{i,t} + \gamma_2 BONUS_{i,t} + \gamma_3 LEVERAGE_{i,t} + \gamma_4 CEOCM_{i,t} - \gamma_5 SIZE_{i,t} + \gamma_6 VAL\_RLZD_{i,t} + \varepsilon_{i,t}$$

	Beta	**Significance**	**Exp. (β or γ)**
CONSTANT(α_1)	-6.7236	0.0026	–
RVESO(β_1)	-0.0009	0.3560	0.9999
RVUSO(γ_1)	0.0001	0.6876	1.0000
BONUS(γ_2)	-0.0002	0.5236	0.9998
LEVERAGE(γ_3)	1.3408	0.3477	3.8223
CEOCM(γ_4)	0.0533	0.7770	0.9481
SIZE(γ_5)	0.7387	0.0024*	2.0932
VAL_RLZD(γ_6)	0.0002	0.2425	1.0002
Chi-square test of model's fit = 20.21	Degrees of freedom = 7		Significance = 0.005

** Test statistically significant at 5% level*

Table 6: Logistic Regression Results for 1996 - Likelihood of Management's Use of Positive Discretionary Accruals to Manipulate Earnings

$$DA_{i,t} = \alpha_1 + \beta_1 RVESO_{i,t} + \gamma_1 RVUSO_{i,t} + \gamma_2 BONUS_{i,t} + \gamma_3 LEVERAGE_{i,t} + \gamma_4 CEOCM_{i,t} - \gamma_5 SIZE_{i,t} + \gamma_6 VAL\_RLZD_{i,t} + \varepsilon_{i,t}$$

	Beta	**Significance**	**Exp. (β or γ)**
CONSTANT(α_1)	-6.4011	0.0090	–
RVESO(β_1)	-0.0001	0.2220	0.9999
RVUSO(γ_1)	0.0000	0.7844	1.0000
BONUS(γ_2)	0.0004	0.4353	1.0004
LEVERAGE(γ_3)	3.0599	0.0419*	21.3253
CEOCM(γ_4)	-0.3315	0.0946	0.7178
SIZE(γ_5)	0.6423	0.0117*	1.9008
VAL_RLZD(γ_6)	-0.0004	0.1616	0.9996
Chi-square test of model's fit = 25.242	Degrees of freedom = 7		Significance = 0.00

** Test statistically significant at 5% level*

Table 6 presents the results for 1996. Coefficients for LEVERAGE and SIZE are the only two control variables that are significantly different from zero. Computation of fitted value for LEVERAGE shows that the likelihood of manipulation increased from under 1% at the mean value of 0.2 to 2% for the maximum value at 0.75.

I compute fitted values for SIZE at the minimum value of 6.365 and median value of 8.530. The likelihood of using income-increasing accruals due to SIZE increases from 9% to 29%. This change indicates that the likelihood of earnings manipulation increases as SIZE increase.

The model is significant, with a chi-square value of 24.87. The change in the fitted value of LEVERAGE implies that the likelihood of earnings manipulation increases as LEVERAGE increases.

One of the explanations for the non-significant relationship between RVESO and earnings management could be that despite the incentive provided by ESOs and the flexibility provided by GAAP, executives are not free to report any numbers they please. There are certain constraints on managerial actions, such as the presence of external auditors and institutional ownership.

Although all auditors must meet the minimum standards set by the AICPA, it is possible that the greater resources of large audit firms enable them to provide higher quality audits. Large audit firms have more resources available for personnel training and development, which increases the likelihood of higher quality audits.

Because of their relatively large holdings, institutional investors have significant economic incentives to monitor any opportunistic behavior by managers (Agrawal and Mandelker 1990). These institutions can hire sophisticated financial analysts who are more likely to notice unusual accruals or other accounting choices used to manage reported earnings (Black,1990).

Results for Hypothesis 2: Impact of Value Realized

Hypothesis 2: As the value realized from the exercise of executive stock options increases, so does the likelihood that management will use prior-period positive discretionary accruals to manipulate earnings.

To test H2, I estimate a logistic regression model for years 1994 through 1996, using 150 observations (or cases) for each year. The results are presented in Tables 7 through 9.

Table 7: Logistic Regression Results for 1994 - Likelihood of Management's Use of Prior-Period Positive Discretionary Accruals to Manipulate Earnings

$$DA_{i,t} = \alpha_2 + \beta_2 VAL\_RLZD_{i,t} + \gamma_7 RVESO_{i,t} + \gamma_8 RVUSO_{i,t} + \gamma_9 BONUS_{i,t} + \gamma_{10} LEVERAGE_{i,t} + \gamma_{11} CEOCM_{i,t} - \gamma_{12} SIZE_{i,t} + \varepsilon_{i,t}$$

	Beta	Significance	Exp. (β or γ)
CONSTANT(α_2)	-3.1743	0.2073	–
VAL_RLZD(β_2)	-0.0008	0.1492	0.9992
RVESO(γ_7)	-0.00001	0.9054	1.0000
RVUSO(γ_8)	-0.0002	0.3338	0.9998
BONUS(γ_9)	-0.0005	0.2833	0.9995
LEVERAGE(γ_{10})	4.3671	0.0074*	78.8128
CEOCM(γ_{11})	-0.2886	0.1544	0.7493
SIZE(γ_{12})	0.3181	0.2310	1.3745
Chi-square test of model's fit = 36.012	Degrees of freedom = 7		Significance = 0.00

** Test statistically significant at 5% level*

The coefficient (b_2) for the hypothesized variable VAL_RLZD is significant only for 1995. Coefficients for RVESO, RVUSO, BONUS, and CHM_CEO are not significantly different from zero for the years 1994 through 1996. The chi-square value indicates that the overall model is significant for all three years.

In 1994, LEVERAGE significantly affects the likelihood of earnings manipulation (see Table 7). Coefficients for all other control variables are not significant.

For 1995 (see Table 8), the coefficient for the hypothesized variable (VAL_RLZD) is positive and significant at less than 5%. However, a comparison of the fitted values at minimum and maximum level of VAL_RLZD indicates that there is no economically significant increase in the likelihood of manipulation when VAL_RLZD increases. For 1995 (see Table 8), the coefficient for SIZE is also positive and significant at less than 5% level of significance. Coefficients for all other control variables are not significant.

Table 8: Logistic Regression Results for 1995 - Likelihood of Management's Use of Prior-Period Positive Discretionary Accruals to Manipulate Earnings

$$DA_{i,t} = \alpha_2 + \beta_2 VAL\_RLZD_{i,t} + \gamma_7 RVESO_{i,t} + \gamma_8 RVUSO_{i,t} + \gamma_9 BONUS_{i,t} + \gamma_{10} LEVERAGE_{i,t} + \gamma_{11} CEOCM_{i,t} - \gamma_{12} SIZE_{i,t} + \varepsilon_{i,t}$$

	Beta	Significance	Exp. (β or γ)
CONSTANT(α_2)	-4.6091	0.0679	–
VAL_RLZD(β_2)	0.0002	0.0482*	1.0002
RVESO(γ_7)	-0.0002	0.1741	0.9998
RVUSO(γ_8)	-0.00009	0.3205	1.0000
BONUS(γ_9)	-0.0008	0.1573	0.9992
LEVERAGE(γ_{10})	1.4633	0.3257	4.3202
CEOCM(γ_{11})	-0.1944	0.3108	0.8233
SIZE(γ_{12})	0.5292	0.0466*	1.6975
Chi-square test of model's fit = 25.927	Degrees of freedom = 7		Significance = 0.00

** Test statistically significant at 5% level*

Table 9: Logistic Regression Results for 1996 - Likelihood of Management's Use of Prior-Period Positive Discretionary Accruals to Manipulate Earnings

$$DA_{i,t} = \alpha_2 + \beta_2 VAL\_RLZD_{i,t} + \gamma_7 RVESO_{i,t} + \gamma_8 RVUSO_{i,t} + \gamma_9 BONUS_{i,t} + \gamma_{10} LEVERAGE_{i,t} + \gamma_{11} CEOCM_{i,t} - \gamma_{12} SIZE_{i,t} + \varepsilon_{i,t}$$

	Beta	Significance	Exp. (β or γ)
CONSTANT(α_2)	-8.2562	0.0006	–
VAL_RLZD(β_2)	-0.0001	0.5996	0.9999
RVESO(γ_7)	-0.00002	0.7243	1.0000
RVUSO(γ_8)	-0.00006	0.6228	1.0000
BONUS(γ_9)	0.0040	0.4840	1.0004
LEVERAGE(γ_{10})	2.5720	0.1302	13.0915
CEOCM(γ_{11})	0.0021	0.9913	1.0021
SIZE(γ_{12})	0.8711	0.0005*	2.3895
Chi-square test of model's fit = 21.748	Degrees of freedom = 7		Significance = 0.002

** Test statistically significant at 5% level*

The coefficient of VAL_RLZD is not significant for 1996. SIZE is the only significant variable in 1996 (see Table 9). Although companies used in the sample are part of the Fortune 500 list, they still vary significantly in size in terms of assets and organization structure. Also, the large size and decentralized operations of some of these companies might facilitate earnings management. Thus, overall results provide no evidence for earnings manipulation by using DAs when ESOs are part of an executive's compensation package.

Limitations of the Study

This study does not consider the tax implications of ESOs, although available tax incentives affect the choice of an ESO plan. The reasons for not considering tax effects are twofold: (1) the Tax Reform Act 86 (TRA 86) reduced the tax incentive associated with ESOs moreover, (2) the tax effect has been previously analyzed by several authors. Haugen and Senbet (1981), Hagerty, Ofer, and Siegal (1990), and Lambert, Larcker, and Verrechia (1991) all analyze the tax effects of incentive stock option plans.

The study also does not control for the presence of an efficient labor market. Also, since this study targets only large companies, its results might not apply to smaller companies.

I compute DAs using the modified Jones model 1995. Although the model is accepted in accounting research, nevertheless, the accuracy of measurement of DAs will depend on how accurately the model can segregate discretionary accruals from total accruals.

Summary

The empirical results of this study provide evidence that executives are not more likely to manipulate earnings when ESOs are part of their compensation package. Logistic regression results indicate that increasing the value of RVESO does not increase the likelihood of earnings manipulation through the use of DAs.

The overall results do not provide support for the two hypotheses. An explanation could be that managers have some flexibility to manipulate earnings, but they cannot arbitrarily report any number they wish. The restraints on managers' actions include, but are not limited to, the presence of audit committee, vigilance by external auditors, the existence of an efficient labor market, and large financial institutions that hold a sizable percentage of equity.

Also, there could be a fear of exposure and subsequent penalty by the stock market if the manipulative practices are discovered (Dechow, Sloan, and Sweeney 1996).

Notes

1 ESOs are like call options. However, they are not traded publicly, and differ from publicly traded options in many ways. Characteristics of ESOs that make them different from standard traded options: nontransferability, time to maturity, vesting period, performance criteria, forfeiture clauses, dilution effects, and the repricing of options.

2 An example from Citicorp explains one such stipulation. In 1995, John S. Reed, the CEO of Citicorp, granted 300 of his top managers performance-based stock options when the market value of a Citicorp share was at $63. The options were to become exercisable when the company's daily average stock price reached $100 for 20 out of 30 consecutive days ("As Options Windfall Nears, Citicorp's Brass Hold Breath, Analysts Raise Eyebrows", *Wall Street Journal*, November 20, 1996). On average, these stock options were valued at $323,000 per executive (based on the closing price for November 19, 1996) and were designed to align the interests of senior management more closely with those of the stockholders, as per the company's spokesperson.

3 Managers can choose, within the purview of GAAP, from a set of manipulation methods comprising real decisions and pure accounting decisions. Real decisions include operating, financing, and investment decisions (Jiambalvo, 1996). Real decisions involve an actual delay in, or acceleration of, expense or revenue recognition. Delaying or accelerating advertising costs or research and development expenditures are examples of operating decision that has an impact on cash flows. Managers can also use pure accounting decisions to manipulate or influence earnings. For example, they can choose between accounting methods such as straight line or accelerated depreciation. Pure accounting decisions comprise most of the DAs.

4 The modified version of Jones model (1991) was first considered by Dechow, Sloan, and Sweeney (1995).

5 Examples of earnings manipulation include reports that inflate earnings to avoid a debt-covenant violation, and underreporting of earnings to negotiate a favorable management buyout.

6 It is not clear that all manipulations are undesirable. For example, DAs that avoid debt covenant violation could be in the shareholders' best interest. Income smoothing may also be desirable in some cases. For example, when shareholders are conservative and want to obtain a fixed return on their investments.

7 The quality of auditors plays a role in establishing the credibility of financial statements. Palmrose (1988) links higher quality to the Big Six (then Big Eight) audit firms, showing empirically that the Big Six are sued less frequently than are other audit firms. Most Fortune 500 companies use one of the Big Six as their auditors, and therefore the quality of the audit is not a major issue for this study. Companies selected for this study are primarily large firms, and most are listed on the New York Stock Exchange (NYSE). One of the listing requirements for the NYSE is that the listed company must have an audit committee. Thus, the companies selected are likely to have audit committees.

8 Only 20 major US companies implemented plans that grant directors stock or stock options, or both, when certain performance goals are met."The Board's Turn," Wall Street Journal, April 9, 1998, R6.

9 The fitted logistic response function and fitted values (pi) are expressed as 1/ [1 + exp(-bX)] and 1/ [1 + exp (- bXi)], where b denotes the vector of the maximum likelihood estimates (Neter et al. 1996). For illustration, to compute point estimates for LEVERAGE in Table 9, I use the following logistic response function: (pi) = 1/ [1+ exp (3.8220 + 0.0006 RVESOi,t + 0.0003 RVUSO i,t + 0.0009 BONUS i,t - 3.8102 LEVERAGE i,t + 0.2398 CEOCM i,t - 0.4312SIZE i,t - 0.0002 VAL_RLZD i,t). To find the probability estimate for the maximum value of LEVERAGE, it is substituted in the function, holding others predictor variables constant. Thus, the fitted value gives the probability that the firms would manipulate earnings for a given value of LEVERAGE.

10 The likelihood of earnings manipulation increases to 84% for the maximum value of 10.65 for SIZE.

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