Market Valuation of Employee and Director Bonuses for Profitable High-Tech Firms: The Case of Taiwan

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ABSTRACT

This study examines whether investors incorporate the effect of employee and director bonuses into firm market valuation for a sample of 191 profitable high-tech firms during 2001-2007 in Taiwan.

We use the Ohlson (1995) equity valuation model, and compare difference dilution ratio model's explanation power. We find a negative correlation between the value of CSBs and Tobin's Q but no significant, it may be the trade-off between dilutive effects and incentive efforts. The results suggest that investors appear to value these firms' CSBs as an expense but as an intangible asset on the firm's equity value.

Keywords: *employee bonuses; equity valuation; equity dilution; earning dilution.*

INTRODUCTION

Taiwan, as an emerging market, has a strong standing in the global electronics industry. Employee cash and stock bonuses (CSBs)[1] have been a unique incentive system to high-tech industry[2] in Taiwan . One reason for the prevalence of employee bonuses is their favorable accounting treatment. Under Taiwan Generally Accepted Accounting Principles (Taiwan's GAAP), employee bonuses and director compensation are regarded as distribution of earnings, meaning that employees do not have to pay any cost, and companies do not have to recognize expenses for the bonus shares issued to employees, in other words, it does not at all affect the bottom line. In January 2007, the Ministry of Economic Affairs issued a Letter required companies to recognize CSBs as expenses changing this value to earnings. The high-tech industries met with strong opposition the recognition of expenses for bonus shares to employees because it greatly reduces annual earnings and causes a de-rating of firm valuations in the capital markets.

This study examines whether investors incorporate the effect of CSBs into firm market valuation.

Employee Stock Options (ESOs), an international system similar to bonus shares for employees, is recognized as expenses at fair value during the tenures of employees. Therefore, when Taiwanese companies would like to be listed in the US, they must follow US GAAP requirements regarding ESOs by expensing a number of shares, as expected issued to employees. There have been strange occasions that companies report earnings based on Taiwan's GAAP, but are still able to distribute dividends and bonuses even though they are in the deficit, as based on US GAAP.

Riding the tidal wave of liberalization and globalization, local accounting and valuation professions were just about to get ready to embrace global convergence at the dawn of the new millennium. In 2008, Taiwan's GAAP began to follow International Financial Reporting Standards (IFRS) by recognizing bonuses to employees as expenses, rather than earnings distributions, the practice of the past. This is a major change in the accounting system in Taiwan. When the world is moving toward IFRS, it is important to examine the impact of different accounting treatments on equity valuation.

Compensating employees with bonus shares rather than cash can be attractive to firm, since bonus shares provide long-term incentives and might reduce agency problem. Therefore, CSBs value affects share prices in two opposing ways: it dilutes the value of the firm's outstanding shares (the 'dilution effect'), and yet provides incentives to

[1] For Taiwanese firms, employee compensation generally contains three components: a basic salary, a year-end bonus, and employees' bonus (cash/or stock bonus), director compensation only cash.
[2] An average 76% firms grant employee large amounts of CSBs.

employees to increase the firm's stock price (the 'incentive effect'). Aboody (1996) shows that there is a negative correlation between the value of ESOs schemes and firm share prices, this suggests that the dilutive effects of ESOs schemes are greater than the incentive effects. However, Bell et al. (2002) indicates that the markets do not devaluate the companies who recognize more expenses associated with ESOs schemes. As soon as the employee bonus shares in Taiwan are recognized as expenses, there is currently a dispute on whether or not the value of CSBs really affects equity valuation. Accordingly, we expect a negative (positive) correlation between CSBs and firms' equity market value if the dilution is larger (smaller) than the expected impact on future performance.

To examine this issue, whether investors incorporate the effect of a firm's outstanding CSBs into equity market valuation. This study is conducted by estimating the CSBs for each firm. Subsequently, we test the association between CSBs and firm's equity market value through a cross-sectional regression by applying Ohlson (1995) equity valuation model. The sample consists of 191 high-tech firms listed on the Taiwan Stock Exchange during 2001-2007. Firm in Taiwan are required by law to pay an annual bonus (cash and/or stock) equal to a percentage of net income. The empirical results show a negative correlation between the value of CSBs and firm's equity market value.

The remainder of this paper is organized as follows: Section 2 is literature review; Section 3 explains the research design together with sample selection criteria and descriptive; Section 4 presents empirical results; Section 5 concludes the paper.

BACKGROUND AND LITERATURE REVIEW

Many companies in the U.S. have Employee Stock Option Plans (ESOPs). According to APB No.25, companies were required to calculate the value of ESOs based on the intrinsic value method (by subtracting market value with subscription value). Under such rules, there was no intrinsic value because the subscription price equaled to the market price of the issue date. Companies were not required to recognize any compensation expenses, as ESOs were treated as valueless financial products, which resulted in a lack of reliability of financial reporting, and allowed an opportunity for senior executives to gain personal profits. At the same time, shareholders were not able to understand what is going on. Due to heavy criticism, the FASB issued the Exposure Draft, as based on the fair value method, at the beginning of 1993. It stipulated that a debit should be made as "prepaid compensation expenses", based on the fair value on the exercise date of options, and a corresponding credit should be made as "capital reserve – ESOs". The amortization of the prepaid expenses from the issue date to the exercise date was recognized as related compensation expenses.

The fair value method created huge compensation expenses, which in turn, had effect on the bottom line. Meanwhile, the dilutive effects of increases in the number of outstanding shares led to a reduction of EPS, and all financial ratios related to assets and equity. For example, both ROA and ROE dropped as a result, and thus, this draft was opposed as never before. Therefore, the FASB issued SFAS No.123 on October 1995, which "encouraged" companies to use the fair value method instead of "requiring" them to do so. It also allowed companies to continue to use the intrinsic value method to evaluate compensation expenses by following APB No.25. However, if companies choose to continue to observe APB No.25, they were required to disclose both the pro-forma net income and EPS under the fair value method. SFAS No.123 is adopted by most companies in the U.S., and thus, is the fundamental principle to treat ESOs as operating expenses, which is the accounting procedure that Taiwanese companies must follow in the future, as the cost of bonus employee shares. Such a cost shall be recognized as expenses.

International studies on ESOs compare different evaluation methods of compensation expenses, and the market views on such expenses. Aboody (1996) used modified option pricing model, 478 companies sample, whose number of outstanding ESOs options exceeded 5% of the total number of outstanding ordinary shares from 1980 ~1990, and found that there was negative correlation between the value of outstanding ESOs and firm share prices; Huson and Scott et al. (2001) research by observing 63,656 sampled companies in Compustat from 1970 to 1995, the result supported ESOs had dilutive effects on ERC (earnings reactive coefficient); Aboody et al. (ABK 2004) study found that investors regarded the ESOs expenses under SFAS No.123 as firm expenses, and negative market evaluations by samples consisting of S&P 500, S&P 400, and S&P 600 from 1996-1998; Bell et al. (BLMY 2002) used the valuation models of Ohlson (1995, 1999) and FO (1999) to examine 85 computer software companies with profit potentials. They compared

the accounting treatments under APB No.25, SFAS No.123, and the Exposure Draft of share-based compensation schemes in order to understand how investors evaluate companies under the three different recognition methods. Their empirical study found the opposite from Aboody; markets do not value companies less just because companies recognize more ESOs expenses. The results are identical under all accounting treatments. Meanwhile, if companies adopt the Exposure Draft method, they can enhance market evaluation, in other words, investors believe that ESOs expenses have positive incentive effects because they create "intangible assets" for companies. The different conclusion from Aboody (1996, 2001) is probably due to the selection of samples[3]. Aboody (2004) examined knowledge-based and profitable companies with instrumental variables and still found a negative correlation[4].

RESEARCH DESIGN AND SAMPLE

1. The Relation Between Equity Market Value and CSBs

Ohlson(1995)shows that market value of equity equals book value of equity plus the present value of expected future abnormal earnings, expressed as follows:

$$P_t = BVE_t + \alpha_t (ROE_t - R_{E\,t})$$

Let P_t : market value of equity during period t

BVE_t : book value of equity during period t

α_t : assessed risk coefficient during period t

ROE_t : return of equity during period t

$R_{E\,t}$: cost of equity during period t

Under the concept of fully loaded earnings, all items that affect changes of shareholders' equity. The model can be simplified as follows:

$$P_t = BVE_t + NI_t$$

Both ends of the equation are divided with the book value of equity[5], then the function of market value Q can be derived.

$$\frac{P_t}{BVE_t} = 1 + \frac{NI_t}{BVE_t},$$

$$Q_t = \alpha_0 + \alpha_1 ROE_t$$

To investigate whether investors incorporate the effect of a firm's outstanding CSBs into equity market valuation. Equation (1), Tobin's Q, defined as market value of equity divided by book value of equity, is used as the dependent variable to assess the model's explanatory power.

$$Q_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \alpha_2 CSB_{i,t} + \varepsilon_{i,t} \qquad (1)$$

$Q_{i,t}$: equity market value of firm i during period t

$ROE_{i,t}$: return of equity of firm i during period t

CSB_{it} : cash and stock bonus shares to employees of firm i during period t

[3] Aboody samples contained a wider range of companies, profitable or not, and this approach is different from sampling knowledge-based and profitable companies. It is possible that in a knowledge-based economy, ESOs is treated as an intangible asset, but not in other industries. See Bell et al.,(2002),p.973.

[4] Aboody (2004) comments that the sample of Bell (2002) is neither extensive nor representative. See Aboody et al., (2004),p.263-265.

[5] Book value will be a better approximate of replacement cost if more items of assets and liabilities are to be measured in fair value instead of historical cost.

It is expected that α_1 is significantly positive, and if investors regard bonus shares to employees as firm expenses, then coefficient α_2, should be negative.

2. CSBs Effect and Dilution Ratio Measurement

First, we conducted by estimating the CSBs for each firm. Subsequently, we examine the association between CSBs and equity market value through a cross-sectional price-level regression. The practice of the past, dilution ratio was adopted to explain the CSBs effect to equity market value. For example, shareholders' equity dilution ratio (see Model A) and profit dilution ratio (see Model B) based on face value (De_{FV} ; Dp_{FV}) or on market value (De_{MV} ; Dp_{MV}). The shortcoming in the former, that based- fair value approach, the higher the market price the more underestimate dilutive effects on shareholders' equity; then in the latter, that based- market value approach, market value simultaneously are used to calculate dependent variable and explanatory variables, it will create quantitative errors. In order to mitigate the spurious relations that can result from using contemporaneous data. This paper forward suggest adopting number of bonus shares ratio (see Model C) without consideration shares' prices. To investigate this issue, we will separately compare and assess these models's explanatory power.

Model A : Shareholders' Equity Dilution Ratio (De);

MA-1: based on face value De_{FV} ; MA-2: based on market value De_{MV}

$$De_{FV} = \frac{BN * F + C}{E} \quad ; \quad De_{MV} = \frac{BN * M + C}{E}$$

where

BN: number of bonus shares

F: face value

C: bonus cash

E: shareholders' equity

M: market value (ex-right prices)

Model B: Profit Dilution Ratio (Dp);

MB-1:based on face value Dp_{FV} ; MB-2: based on market value Dp_{MV}

$$Dp_{FV} = \frac{BN * F + C}{P} \quad ; \quad Dp_{MV} = \frac{BN * M + C}{P}$$

where

P: after-tax profit

Model C: number of bonus shares Ratio (Dn)

$$Dn = \frac{BN}{TN} + \frac{C}{E}$$

where

TN: Total Number of outstanding shares

3. Samples & Descriptive Statistics

Employee cash and stock bonuses, director compensation and ex-right adjusted share prices are retrieved from Taiwan Economic Journal (TEJ) data base for the year 2001 to 2007. Sample firms consist of all Taiwan Stock Exchange listed electronics companies. These companies all reported pre-tax earnings, and have a system in place to issue bonus shares to employees, resulting in a sample of 191 firms or 1022 observations over the 7-year sample period.

April 30 share prices are used to measure market value because it is the official deadline for filing annual report with the SFB (Securities and Futures Bureau). Stock prices are adjusted for stock and cash dividend distributions.

Table 1 provides descriptive statistics of all variables . The mean (medium) of market values (Q), and ROEs of the sampled companies, are 1.51, 14.66%, (1.25, 13.83%), respectively. The statistical calculates shareholders' equity dilution ratio based on face value derives an average of 1.32% (1.16), as based on market value reports an average of 3.52% (2.31%), 2.67 times which of the face value approach. The profits dilution ratio based on face value, reports an average of 9.51% (9.15%). If calculated with market value, the average was 22.45% (18.43%), 2.36 times which of the face value approach. The number of bonus shares ratio was 1.85% (1.60%). The dilutive effect was far greater when the calculation was based on market value, rather than face value, especially in 2006 when the stock market peaked.

Table 2 provides the correlation matrix of dependent variables and all independent variables. These have a stronger association with the Q ratio, with the exception of De_{FV} .

EMPIRICAL TEST AND RESULTS

To examines whether investors incorporate the effect of employee and director bonuses into firm market valuation, we conduct cross-sectional regression for each year in the sample period . Results are shown in Table3, Table 4 and Table 5.

Table 3 the adjusted R^2 in Panel A and Panel B shows that shareholders' equity dilution ratio based on face value and /market value has significant explanatory power for equity market value for all year. The coefficient of De_{FV} is negative in four of the seven years for equity market value but is nonsignificant for all years. However, the coefficient of De_{MV} is significant positive correlation for equity market value for all years, but we discredit the results with spurious relations.

The adjusted R^2 in Panel A and Panel B of Table 4 shows that profits dilution ratio based on face value and /market value has significant explanatory power for equity market value for all year. The coefficient of Dp_{FV} is negative in three of the seven years for equity market value but is nonsignificant for all years but whole sample is significant. The coefficient of Dp_{MV} is significant positive correlation for equity market value, but we discredit the results as the same with spurious relations.

Comparative results of number of bonus shares ratio Dn are presented in Table 5. The adjusted R^2 shows that bonus shares ratio has significant explanatory power for equity market value for all year. The coefficient of Dn is negative in five of the seven years for equity market value but is nonsignificant for all years.

CONCLUSIONS

In 2008, Taiwan's GAAP began to follow IFRS by recognizing bonuses employees as expenses, rather than earnings distributions. The purpose of our study is to examine the association between CSBs and equity market value and also conducts tests on different dilution ratios market investor's views on bonuses to employees.

We analyze a sample of 191 profitable high-tech firms granted CSBs to employee during the period 2001-2007 in Taiwan. We propose five different Panel regressions, if adopt equity/profits dilution ratio to calculate CSBs based on market value approach, the result shows that investors regards CSBs as intangible asset, a positive on firm value, but we suspect the result with spurious relations. We propose a modified bonus shares ratio approach without considerate stock price, the result as the same based on face value approach, a negative on firm value, investors regards CSBs as an expense, estimating the cost of CSBs into equity market valuation. Although the result is nonsignificant, it may be the trade-off between dilutive effects and incentive efforts.

The paper's sample selection concentrates on electron industry. It is possible that this paper's results cannot be applied on non-electron industry. Future research will focus on the determinants of bonus shares to employees for long-term performance, short-term tax benefits or other.

Table 1. Descriptive Statistics of Samples in Different Models of Dilution Ratio by Year[a]

Dilution Model	2001	2002	2003	2004	2005	2006	2007	whole sample
	1.17	1.21	1.24	1.33	1.32	1.41	1.42	1.32
De_{FV} [b]	1.06	1.06	1.10	1.13	1.18	1.22	1.24	1.16
	0.73	0.80	0.83	0.89	0.89	0.94	0.89	0.87
	4.04	4.14	3.01	3.29	3.10	4.35	2.97	3.52
De_{MV}	2.57	2.87	2.01	2.15	2.22	3.23	2.03	2.31
	4.57	4.60	2.90	3.52	3.12	4.37	2.83	3.73
	9.23	9.65	9.82	9.07	9.80	9.86	9.12	9.51
Dp_{FV}	8.93	9.00	9.42	8.53	9.81	9.88	9.56	9.15
	3.81	5.36	8.31	7.03	4.63	4.46	3.65	5.43
	23.23	27.74	21.13	20.07	19.82	24.31	21.99	22.45
Dp_{MV}	17.32	23.71	17.69	18.06	16.16	19.68	17.28	18.43
	19.37	23.45	14.89	12.13	16.62	18.01	16.26	17.38
	1.71	1.77	1.77	1.78	1.80	1.93	2.02	1.85
Dn	1.51	1.52	1.48	1.55	1.61	1.78	1.77	1.60
	1.13	1.21	1.17	1.20	1.22	1.28	1.28	1.23
	1.50	0.91	1.28	1.15	1.60	1.97	1.78	1.51
Q	1.30	0.83	1.12	1.04	1.38	1.71	1.43	1.25
	0.78	0.40	0.60	0.55	0.85	1.04	1.05	0.89
	13.15	13.74	13.73	15.62	14.00	15.29	15.73	14.66
ROE	10.91	12.69	13.38	15.27	13.46	14.17	14.80	13.83
	7.25	8.44	7.60	7.84	7.70	9.06	7.99	8.10
sample	92[c]	118	120	151	166	184	191	1022

[a] Numbers in each cell are mean, median and standard deviation. Numbers everything is shown as percentages, with the exception of Q.

[b] Variable definitions are as follows: De_{FV} : Shareholders' Equity Dilution Ratio Based on Face Value; De_{MV} :Shareholders' Equity Dilution Ratio Based on Market Value (ex-right prices); Dp_{FV} : Profits Dilution Ratio Based on Face Value; Dp_{MV} : Profits Dilution Ratio Based on Market Value (ex-right prices); Dn : Number of bonus shares Ratio; Q=Tobin's Q ratio, mean equity market value; ROE: Return of Equity.

[c] Number of firms with complete data available.

Table 2. Pearson Correlation Matrix of Dependent and Different Dilution Ratio Variables

Variables	ROE	De_{FV}	De_{MV}	Dp_{FV}	Dp_{MV}	Dn
Q	0.52**[1]	0.41**	0.50**	-0.03	0.32**	0.40**
ROE	1.00	0.75**	0.70**	-0.16**	0.27**	0.74**

[1] Two-tailed test:**significance at 1% level;*significance at 5% level.

Table 3. Summary Statistics from Regression of Tobin's Q Ratio and Shareholders' Equity Dilution Ratio Based on Face Value and /Market Value by Year[a]

Panel A: $Q_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \alpha_2 De_{FV\,i,t} + \varepsilon_{i,t}$

Year	α_0	α_1	α_2	Adj.R²	F
2001	1.07***(6.48)	2.80(1.65)	4.81(0.29)	0.07	4.28***
2002	0.63***(9.66)	2.85***(4.74)	-8.96(-1.41)	0.21	16.82***
2003	0.75***(7.44)	3.86***(4.14)	-0.39(-0.05)	0.22	18.06***
2004	0.41***(5.60)	5.49***(8.44)	-9.02(-1.58)	0.46	63.57***
2005	0.68***(6.11)	7.59***(6.83)	-10.77(-1.12)	0.35	45.98***
2006	0.91***(7.36)	5.52***(5.26)	15.80(1.57)	0.35	50.38***
2007	0.49***(3.70)	7.69***(7.08)	6.12(0.63)	0.39	60.64***
Whole Sample	0.66***(13.38)	5.29***(11.80)	5.22(1.25)	0.27	189.25***

Panel B: $Q_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \alpha_2 De_{MV\,i,t} + \varepsilon_{i,t}$

Year	α_0	α_1	α_2	Adj.R²	F
2001	1.14***(6.95)	1.45(1.01)	4.06*(1.77)	0.10	5.95***
2002	0.67***(10.10)	0.83(1.27)	3.14**(2.63)	0.25	19.95***
2003	0.81***(8.12)	1.92**(2.11)	6.81***(2.86)	0.27	23.42***

2004	0.52***(6.71)	3.01***(4.73)	4.94***(3.49)	0.49	72.43***
2005	0.87***(8.66)	1.51(1.62)	16.58***(7.20)	0.51	85.24***
2006	0.97***(8.33)	4.34***(5.13)	7.89***(4.50)	0.41	64.01***
2007	0.70***(5.67)	3.51***(3.48)	17.76***(6.23)	0.49	92.22***
Whole Sample	0.75***(15.19)	3.65***(9.12)	6.41***(7.36)	0.31	225.29***

[a] Number in parentheses are t-statistics(F-statistics for adjusted R²). Two-tailed test: ***significance at 1% level, ** significance at 5% level and *significance at 10% level.

Table 4. Summary Statistics from Regression of Tobin's Q Ratio and Profits Dilution Ratio Based on Face Value and /Market Value by Year[a]

Panel A: $Q_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \alpha_2 Dp_{FV\,i,t} + \varepsilon_{i,t}$

Year	α_0	α_1	α_2	Adj.R²	F
2001	1.05***(3.87)	3.19***(2.89)	0.24(0.11)	0.07	4.24***
2002	0.51***(5.17)	2.33***(5.75)	0.81(1.26)	0.21	16.57***
2003	0.75***(6.08)	3.83***(5.92)	-0.01(-0.03)	0.22	18.06***
2004	0.37***(3.99)	4.77***(11.11)	0.44(0.92)	0.45	62.06***
2005	0.67***(3.96)	6.61***(9.40)	-0.01(0.01)	0.35	45.00***
2006	0.67***(3.25)	7.03***(10.02)	2.30(1.61)	0.35	50.48***
2007	0.33(1.63)	8.23***(11.06)	1.71(1.05)	0.39	61.22***
Whole Sample	0.57***(8.16)	5.81***(19.52)	0.91**(2.06)	0.27	191.08***

Panel B : $Q_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \alpha_2 Dp_{MV\,i,t} + \varepsilon_{i,t}$

Year	α_0	α_1	α_2	Adj.R²	F
2001	1.03***(5.71)	3.06***(2.79)	0.29(0.71)	0.07	4.51***
2002	0.50***(7.56)	1.89***(5.02)	0.55***(4.07)	0.30	26.07***
2003	0.63***(6.10)	3.14***(4.77)	1.00***(2.98)	0.28	23.87***
2004	0.32***(4.16)	3.95***(8.64)	1.09***(3.68)	0.49	73.69***
2005	0.50***(4.53)	5.75***(8.45)	1.47***(4.67)	0.43	61.94***
2006	0.67***(5.21)	5.94***(8.90)	1.64***(4.87)	0.42	66.71***
2007	0.36**(2.65)	7.24***(9.40)	1.32***(3.47)	0.42	70.23***
Whole Sample	0.53***(10.24)	5.13***(17.18)	1.01***(7.21)	0.30	223.78***

[a] Number in parentheses are t-statistics(F-statistics for adjusted R²). Two-tailed test: ***significance at 1% level, ** significance at 5% level and *significance at 10% level.

Table 5. Summary Statistics from Regression of Tobin's Q Ratio and Number of Bonus Shares Ratio by Year[a]

Panel A: $Q_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \alpha_2 Dn_{i,t} + \varepsilon_{i,t}$

Year	α_0	α_1	α_2	Adj.R²	F
2001	1.07***(6.46)	2.88*(1.93)	2.68(0.28)	0.07	4.27***
2002	0.62***(9.57)	2.65***(4.45)	-4.11(-0.99)	0.21	16.18***
2003	0.75***(7.44)	3.94***(4.32)	-0.97(-0.16)	0.22	18.08***
2004	0.41***(5.58)	4.99***(7.64)	-2.41(-0.57)	0.45	61.59***
2005	0.67***(6.03)	6.62***(6.14)	-0.07(-0.01)	0.35	45.00***
2006	0.92***(7.40)	5.95***(5.68)	7.59(1.02)	0.35	49.29***
2007	0.50***(3.77)	8.26***(7.71)	-0.68(-0.10)	0.38	60.33***
Whole Sample	0.66***(13.39)	5.40***(12.34)	2.82(0.98)	0.27	188.83***

[a] Number in parentheses are t-statistics(F-statistics for adjusted R²). Two-tailed test: ***significance at 1% level, ** significance at 5% level and *significance at 10% level.

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