Long-term Performance of the Issuance of Employee Stock Options for Firms in Taiwan: Evidence from the Free Cash Flow Theory

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Abstract: This study focuses on the long-term investment performance of employee stock options (ESOs) issued by listed companies in Taiwan for their respective employee compensation packages. The results indicate that the detrimental effect on investment performance of the companies manifest three months after the issuance of the ESOs. In addition, companies that own low free cash flow (FCF) have better long-term performance after issuing ESOs. This result supports the FCF theory of Jensen (1986).

1. Introduction

Employee stock ownership plans are the most common method to incentivize employees and maximize corporate performance (Kruse, 1993; Jones & Kato, 1995; Park & Song, 1995; Blasi, Conte, & Kruse, 1996; Ichniowski, Shaw, & Prennushi, 1997; Cui & Mak, 2002). While most of Taiwan's listed companies have earnings, they appropriate part of the yearly retained earnings to pay stock dividends to employees for employee compensation packages (i.e., employee stock bonus). However, shareholders' earnings per share have a dilution effect due to the stock bonus, thus jeopardizing shareholders' interests. Furthermore, incremental outstanding shares incurred from the stock bonus dilute stockholders' equities, and a result of the selling climax emerges in terms of capricious share prices and detrimental side effects for stockholders. Moreover, for Taiwan's listed

companies, employee stock bonuses are the assignment of companies' earnings (i.e., the stock bonus is gratuitous), and are recognized as expense items at face value, not at market value (but the actual value of the stock bonus is higher than the company's earnings of the year), which differs from international accounting rule, and thus such bonuses are condemned by investors. From the above-mentioned, employee stock bonuses are expected to hurt shareholders' equities and thus result in stock price declines. Thus, Taiwan's Financial Supervisory Committee imposed a cap on the employee stock bonus that companies could offer by mandating that such stock bonuses should be recognized as expense items at fair value and should be reported in the income tax returns of profit-seeking enterprises. Therefore, to retain talented employees, listed companies began to raise employees' pay to retain them and offer employee stock options (ESOs) as a way to boost their performance. As ESOs can inspire employees to work hard to enhance corporate performance in a long-term period, compared with traditional plans, overseas companies have adopted them for several years. In Taiwan, ESOs are often offered through "the issuance of new stocks." This is a practice that differs from share repurchases adopted by other countries to offer stock options that employees can subscribe to. Hence, ESOs are actually alternative SEOs, aimed at employees for equity offerings. Based on these, it is therefore worthy to discuss the effect of the ESO system on a firm's performance. Furthermore, since ESOs are SEOs for employees and most SEO-issuing companies in Taiwan have an excessive free cash flow issue, it is thus possible that the managers of the company may misuse the corporate capital for inefficient investments, which might create subsequent agency problems and endanger corporate performance. Therefore, this research is based on Jensen's (1986) theory of free cash flow (FCF) to study whether the amount of extra cash flow held by corporate managers before ESO issuance will affect the long-term performance of ESO-issuing companies.

Among the existing foreign literature on the long-term performance of ESOs, Hall and Liebman (1998) found that the compensation for CEOs enhanced company performance, suggesting that change in the value of stocks and options owned by the CEO help improve the company's performance. Core and Guay (2001) believed that the compensation plans of ESOs not only motivate employees but also improve corporate value. Sesil, Kroumova, Blasi, and Kruse (2002) suggested that the new economy firms (i.e., pharmaceuticals, software, semi-conductor, and high-technology manufacturing) that issue ESOs always perform better. Ittner, Lambert, and Larcker (2003) proved that new economy firms (i.e., computer, software, Internet, telecommunications, or networking) rely on

ESO compensation plans much more than the companies from traditional sectors; thereby showing improved performance after issuing ESOs.[1] Similarly, Frye (2004) indicated that companies that issue more ESOs deliver greater performance. In summary, the empirical results suggest that a company produces better long-term performance if it adopts ESOs as part of its employee compensation plans.[2] Often Taiwan's listed companies that provide ESOs to employees for subscribing adopt the way of *the issuance of new stocks*, which differs from share repurchases adopted by other countries that offer stock options to employees for subscribing. However, different studies show that share repurchases enhance corporate performance in the long run (Ikenberry, Lakonishok, & Vermaelen, 1995, 2000; Nohel & Tarhan, 1998), while seasoned equity offerings (SEOs) negatively affect corporate performance (Hansen & Crutchley, 1990; Patel, Emery, & Lee, 1993; Lee, 1997; Loughran & Ritter, 1997; McLaughlin, Safieddine, & Vasudevan, 1996, 1998; Cai, 1998; Cai & Loughran, 1998; Shiah-Hou, 2000; Bae, Jeong, Sun, & Tang, 2002; Clarke, Dunbar, & Kahle, 2004; Limpaphayom & Ngamwutikul, 2004; Pastor & Martin, 2004; Wang, Huang, & Chen, 2006). Given that there is a difference between SEOs and share repurchases in the existing literature, the respective performance of the companies that offer ESOs through the issuance of new stocks or share repurchases would also be different. In this light, this paper examines whether the holding systems of ESOs, which issue new stocks, could negatively affect a company's long-term performance. Thus, the first hypothesis of this study is that Taiwan's listed companies that issue ESOs have lower long-term performance.

In Frye's study on the long-term performance of ESO-issuing companies through the percentage of employee compensation, Frye (2004) found that companies with higher percentage of employee compensation deliver greater performance.[3] In Taiwan, ESOs essentially come from the issuance of new stocks,

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[1] Murphy (2003) followed the viewpoints of Ittner et al. (2003) and expanded the data period to 1992~2001. He found that senior management and employees in new economy firms receive more ESOs as compensation than their counterparts in the traditional sectors.

[2] Yeo, Chen, Ho, and Lee (1999) found that the overall performance of Singapore's companies in three years after adopting ESOs shows no significant difference from the industry average, a fact which fails to prove that the implementation of ESOs can create long-term effect. Meanwhile, Oyer and Schaefer (2005) believed that employees' motivation can scarcely explain ESO-driven compensation plans. This means that the ESOs issued by companies cannot motivate the employees into working hard to boost their companies' performance, but can instead create sorting and retention effects. Bergman and Jenter (2007) suggested those companies that have employees who are over optimistic towards their companies' share price and extremely favor options over stocks tend to issue ESOs to their employees as part of a compensation package.

[3] Frye (2004) regarded the excess cash flow as a control variable.

which could be deemed as a kind of SEO offered to employees. McLaughlin et al. (1996); Lee (1997); and Wang et al. (2006) all applied Jensen's (1986) FCF theory and observed the long-term performance of SEO-issuing companies from the aspect of FCF. Their empirical results indicate that companies with excess FCF tend to over-invest due to interest conflicts between corporate managers and shareholders, resulting in inefficient investment decisions. Therefore, the agency cost incurred from FCF would jeopardize companies' long-term performance. Thus, FCF is used in this study to explore the impact of the issuance of ESOs on a company's long-term performance, leading us to our second hypothesis – a company that has excess FCF before issuing ESOs for employees' compensation program would have poorer long-term performance. That is, FCF is tested to determine if it could interpret the reasons behind the lackluster performance of an ESO-issuing company.

To verify the two hypotheses mentioned above, this research collected financial statements and share price data of Taiwan's listed ESO-issuing companies from 2001 to 2006 and obtained 93 sample companies that had ever issued ESOs. We firstly tested the sample companies' investment performance three months before and three months after the issuance of ESO. Afterwards, the sample companies were divided into two groups by the median of FCF one year before the approval of ESO issuance, in order to observe the difference in long-term investment performance under different FCF levels. Finally, a regression analysis was carried out after adding some control variables, such as firm size (FS) and growth opportunity (GO), to explore the impact of FCF before ESO issuance on a company's long-term investment performance after ESO issuance.

Empirical results showed that a company would have poorer long-term investment performance after issuing ESOs, thereby supporting the first hypothesis. N ext, a company that has high FCF prior to ESO issuance would also have poor long-term investment performance after issuing ESOs. This means that ESO-issuing companies that reported poorer long-term performance after issuing ESOs were mainly affected by FCF before issuing ESOs. This addresses the seriousness of the agency problem behind ESO-issuing companies, thereby supporting Hypothesis 2. Generally, the results of the research coincide with the FCF theory introduced by Jensen (1986), that is, when a company issues new shares to offer ESOs, it could imply that managers hold a large amount of idle funds to make improperly inefficient investment decisions. The agency cost of this poor decision might cause the deterioration of a company's long-term performance.

This research contains the following sections. The first section addresses data source, variable measurement, and research methodology. The second section presents the analyses of empirical results including ESO-issuing companies' investment performance in the three months prior to and after ESO issuance, the FCF's impact on ESO-issuing companies' long-term investment performance, and the results of the regression analysis. The third section concludes the research.

2. Data and Methodology

2.1 Data

Although Taiwan's ESO-related regulations have been instituted and announced in August 2000, they have not been fully adopted by local companies until 2001. Therefore, this research used Taiwan's ESO-issuing listed companies from 2001 to 2006. The related data of ESOs were collected from Taiwan's Market Observation Post System as well as the financial data found in the Taiwan Economic Journal (TEJ) database. The criteria of samples collection are listed below.

1. Companies with first official approval had indeed issued ESOs, and had offered through "the issuance of new shares" were included in the sample.

2. Companies that obtained the official approval but failed to issue initial ESOs in the first place, that is, the issuance following the second official approval was deemed as the first issuance were included in the sample.

3. Companies that applied for approval to issue ESOs and shares subscription guidelines before going public and issued ESOs to employees after going public were not included in the sample.

4. Companies without complete financial data were excluded from the samples.

In summary, the sample group consisted of companies that were categorized into two categories: (1) those that applied for official approval to issue ESOs for the first time and then issued ESOs afterwards; and (2) those that obtained official approval but failed to issue ESOs in the first place, with the issuance following its second official approval that was then deemed as the first issuance and so on. The initial total sample group reached 177. From these, we excluded those that applied for approval to issue ESOs and shares subscription guidelines before going public, and then issued ESOs after going public. We also excluded those companies

without complete financial data. This elimination process left us with a total sample group consisting of 93 ESO-issuing sample companies.

Table 1.

Distribution of ESO-issuing Companies Classified by Year and Industry

Panel A. Number of ESO-issuing companies classified by year		
Year	Number	Percentage (%)
2001	14	15.05
2002	30	32.26
2003	22	23.66
2004	16	17.20
2005	2	2.15
2006	9	9.68
Total	93	100.00
Panel B. Number of ESO-issuing companies classified by industry		
Industry (Code)	Number	Percentage (%)
Food (02)	1	1.08
Plastic (03)	2	2.15
Electric Machinery (05)	1	1.08
Financial and Insurance (17)	2	2.15
Other (20)	5	5.38
Chemical (21)	1	1.08
Biotechnology and Medical Care (22)	1	1.08
Semiconductor (24)	16	17.20
Computer and Peripheral Equipment (25)	12	12.90
Optoelectronic (26)	14	15.05
Communications and Internet (27)	9	9.68
Electronic Parts/Components (28)	15	16.13
Electronic Products Distribution (29)	5	5.38
Information Service (30)	3	3.23
Other Electronic (31)	6	6.45
Total	93	100.00

Data source: Market Observation Post System.

Note:There were 93 sample companies in the sample, representing Taiwan's ESO-issuing listed companies from 2001 to 2006. Panel A lists the sample distribution of companies that applied for approval to issue ESOs each year. Panel B lists the sector distribution of companies that applied for approval to issue ESOs.

Table 1 shows the statistics of company profiles by year and sector. Panel A lists the sample distribution of companies that applied for approval to issue ESOs each year. The number of applications for approval peaked in 2002 and 2003, reaching 55.92% of the total. The decline in applications could be attributed to the change in the accounting treatment of ESO compensation packages, which was implemented on January 1, 2004. The new rules stipulated that companies have to adopt fair or intrinsic values to calculate the cost of compensation recognized each year. The number of applications for approval accounted for only 29.03% of

the total in 2004, 2005, and 2006. Panel B lists the sector distribution of companies that applied for approval to issue ESOs. The electronic sector accounted for the largest share, 86.02%, of which the largest sub-sector is the semiconductor, followed by electronic parts/components.

2.2 Variable Measurement and Methodology

To effectively measure the respective companies' long-term investment performances, the matching firms of those that did not issue ESOs were identified for comparison using the matching method of Loughran and Ritter (1997). The screening criteria we used are detailed below.

1. Matching firms did not apply for the approval to issue ESOs and share subscription guidelines in the year of implementation. We also considered the one-year period before and after the sample company's application for approval.

2. In the same industry, the asset size of matching firms has to be within 25% to 200% of the sample companies, with the ratio of operating income before depreciation and amortization to total assets closest to that of the sample companies.

3. If there are no matching firms in the industry that have comparative asset size as mentioned, the industry constraint shall be removed and all the listed companies would qualify as matching companies. However, their asset size has to be within 90% to 110% of the sample company's, with the ratio of operating income before depreciation and amortization to total assets closest to that of the sample companies.

Next, monthly returns of the share price of the sample companies during the period when relevant authorities approved the issuance[4] were adopted as indicators of the long-term investment performance of ESO-issuing firms. Meanwhile, in order to measure the difference in investment performance between the sample and matching companies, we deducted the monthly returns of matching firms that had not issued ESOs from the monthly returns of ESO issuing firms. This was done in order to obtain matched-adjusted comparative monthly returns and to provide consistent transverse indicators and investment performance data comparing

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[4] Under the Semi-strong form efficient market hypothesis structure, all related information on ESO issuance and share subscription guidelines completely reflect firm's stock price on the day when the official approval was obtained. Meanwhile, as suggested, all ESOs are completely dispensed at once on approval day, which is the same as the issuance day.

information from three months prior to and after ESO issuance (seven months)[5] of the sample companies. Therefore, a more complete set of performance data could be obtained from ESO-issuing firms. Mean t-tests and the median Wilcoxon Signed-Rank tests were also adopted as the testing methods.

Furthermore, with regard to the measurement of the FCF variable, Jensen (1986) found that the interest conflict between managers and shareholders predisposed managers to retain extra FCF in a company. This tendency led them to make investment decisions characterized by a negative net present value (NPV), which in turn, could reduce the firm's value. Therefore, FCF is very likely to lower long-term performance of ESO-issuing companies. As to the measurement of the FCF variable, this research is based on the definition of McLaughlin et al. (1996, 1998). We divided FCF one year prior to approval by book value of total assets one year prior to the granting of approval to obtain such a gauge. In this study, the FCF was acquired by subtracting corporate income taxes, interest expense on debts, and the dividends payout of common and preferred shares from each company's operating income before depreciation.[6] If such FCFs variable were lower than the sample median, they were defined as low FCF using the dummy variable "1;" otherwise, they were defined as high FCF using the dummy variable "0."

The control variables we used followed Frye's (2004) list, such as firm size and growth opportunities. However, it should be noted that the author failed to specify these variables. In this study, we considered the fact that Taiwan's ESOs are provided via the issuance of new stocks. We likewise considered the main findings in the studies of McLaughlin et al. (1996, 1998) and Loughran and Ritter (1997) stating that a company with smaller firm size are less motivated to promote its reputation and thus have poorer long-term performance after SEO issuance. Therefore, we follow the definition of McLaughlin et al. (1996, 1998) and Loughran and Ritter (1997) to take the natural logarithm from the book value of total assets one year prior to approval as an effective measurement tool. Furthermore, Lee (1997) and McLaughlin et al. (1998) stated that investors tended to be over-optimistic toward the potential growth opportunities of SEO-issuing companies due to the asymmetric information between managerial authorities and shareholders. Thus, a company with more growth opportunities would have

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[5] Although Taiwan's ESO-related regulations have been instituted and announced in August 2000, they have not been fully adopted by local companies until 2001. In order to avoid too much samples to be deleted, this research adopts monthly data that could be the long term under a relative viewpoint to analysis the long-term performance of sample companies.

[6] Lehn and Poulsen (1989) also mentioned the same definitions.

poorer long-term performance after issuing SEOs. Therefore, this research adopted Tobin's q of Lee (1997) and McLaughlin et al. (1996) as the proxy of growth opportunities. This can be calculated by summing up the market value of the equity and the book value of total debts one year ahead of approval, and dividing the book value of total assets one year ahead of approval. Tobin's q exceeding 1 implies that ESO-issuing companies have greater chances to grow, and vice versa.

Table 2.

Sample Characteristics for ESO-issuing Companies

	Mean	Std. Dev.	First Quartile	Median	Third Quartile	Max.	Min.
Ratio of Free Cash Flow to Book Value of Assets (%) (FCF)	6.63	17.72	0.42	4.29	8.06	165.13	-8.17
Firm Size (Ln) (FS)	15.91	1.24	15.01	15.58	16.65	19.44	13.64
Growth Opportunities (GO)	1.52	0.70	1.13	1.36	1.68	3.94	0.61

Note: The table shows the descriptive statistics of the regression variables of the 93 ESO-issuing listed companies from 2001 to 2006 (its abbreviation is below the variable). This includes the mean, standard deviation, first quartile, median, third quartile, maximum, and minimum of the following three regression variables, the ratio of FCF to book value of assets (FCF), the firm size of the issuing company (FS), and the growth opportunities of the issuing company (GO). The ratio of FCF to the book value of total assets is FCF one year prior to approval, and then divided by the book value of the total assets one year prior to approval. The proxy for firm size refers to the natural logarithm from the book value of total assets one year prior to approval. On the other hand, the proxy for growth opportunities refers to the sum of the market value of equity and book value of total debts one year ahead of approval, and then divided by the book value of total assets one year ahead of approval.

Table 2 provides descriptive statistics of the sample's characteristics. The median (mean) of the ratio of FCF to total assets is 4.29% (6.63%), suggesting that the ratio of FCF to total assets is over 4% in majority of the sample companies. The average asset size is 15.91. The median (mean) of GOs is 1.36 (1.52), indicating that most of the sample are high-growth firms.

According to the above data and variable definitions, the investment performance three months prior to and after ESO issuance in the sample companies was firstly tested, and then the median of FCF one year prior to approval was used as a cut-off line to divide sample firms into two groups: high FCF and low FCF. This was carried out in order to examine the changes in the long-term returns of stock price. Finally, control variables (such as FS and GO) were added to implement the regression analysis. Thus, the impact of FCF on the long-term

returns of share price of ESO-issuing companies, along with a more comprehensive empirical analysis was determined.

3. Empirical Results

This paper tests ESO-issuing sample companies to observe the change in their overall long-term investment performance. Next, it focuses on the FCF theory introduced by Jensen (1986) and further explored whether the FCF variable could be used to explain the long-term investment performance of the sample firms.

Table 3 presents data on the investment performance and changes in actual performance of ESO-issuing companies. Panel A shows that the percentage of positive values three months prior to and the first month after ESO issuance in sample companies is somewhere between 34%~41%. Although it is not high, this percentage presents significantly negative returns on share price. In contrast, the percentage of positive values in the third month after ESO issuance is 53.76%, indicating a significantly positive performance of the share price. Meanwhile, Panel B shows that after adjusting matching companies that did not issue ESOs, the ESO-issuing companies did not see significant improvement in their investment performance. In Panel C, we can see that the investment performance had significantly negative returns, except the period between one month prior to and three months after issuance of ESOs. This phenomenon could be explained through the data found in Panel A, which shows that significantly positive returns appeared in the third month after the issuance. When the accumulated absolute returns between one month prior to and three months after issuance was calculated, positive returns in the third month partly offset the accumulated negative returns between one month prior to and two months after issuance. This created insignificantly negative investment performance between one month prior to and three months after issuance. After adjusting matching firms, in Panel D, we can see that the returns of the share price of issuing firms was only significantly negative between one month prior to and three months after the issuance, after which it turned insignificantly negative in other periods. This suggested that, compared with non-ESO-issuing companies, ESO-issuing companies delivered significantly worse investment performance three months after ESO issuance.[7]

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[7] As to the empirical evidences of the changes in investment performance, this research verifies the robustness from buy-and-hold returns, showing the results in Appendix 1. The empirical results were pretty much in line with the testing results of accumulated returns in Panel C and D of Table 3.

Table 3.

Investment Performance of ESO-issuing Companies

Panel A. Investment performance							
Month	-3	-2	-1	0	+1	+2	+3
Median	-0.0544*	-0.0428**	-0.0478**	-0.0064	-0.0430**	-0.0091	0.0247*
	(-1.9243)	(-2.1472)	(-2.0930)	(-0.9094)	(-2.8258)	(-0.7243)	(1.8911)
Mean	-0.0256*	-0.0333*	-0.0226	-0.0149	-0.0396**	-0.0033	0.0368**
	(-1.6637)	(-1.7755)	(-1.4908)	(-0.9322)	(-2.5381)	(-0.2436)	(2.1159)
% Positive	38.71%	40.86%	38.71%	43.01%	34.41%	46.24%	53.76%
Std. Dev.	0.1486	0.1810	0.1460	0.1546	0.1503	0.1322	0.1678
N	93	93	93	93	93	93	93

Panel B. Matched-adjusted investment performance							
Month	-3	-2	-1	0	+1	+2	+3
Median	-0.0112	0.0105	-0.0088	-0.0041	-0.0205	0.0127	-0.0122
	(-1.3564)	(0.5613)	(-0.7931)	(-1.1016)	(-1.1476)	(0.4732)	(-1.0767)
Mean	-0.0155	-0.0003	-0.0062	-0.0152	-0.0123	0.0025	-0.0189
	(-1.2371)	(-0.0163)	(-0.4435)	(-1.2293)	(-0.8054)	(0.1878)	(-1.3035)
% Positive	47.31%	52.69%	44.09%	47.31%	41.94%	53.76%	45.16%
Std. Dev.	0.1209	0.1558	0.1353	0.1193	0.1476	0.1294	0.1399
N	93	93	93	93	93	93	93

Panel C. Change in investment performance[8]						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	-0.0768***	-0.1014***	-0.0987***	-0.0416	-0.0675**	-0.0417**
	(-2.7204)	(-2.8699)	(-2.6074)	(-1.5441)	(-2.5563)	(-2.3965)
Mean	-0.0559**	-0.0771**	-0.0804**	-0.0436	-0.0545**	-0.0429**
	(-2.1299)	(-2.5678)	(-2.4481)	(-1.1327)	(-2.2934)	(-2.1024)
% Positive	33.33%	32.26%	34.41%	45.16%	36.56%	36.56%
Std. Dev.	0.2531	0.2895	0.3168	0.3712	0.2292	0.1968
N	93	93	93	93	93	93

Panel D. Change in matched-adjusted investment performance						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	-0.0043	-0.0467	-0.0769	-0.0916*	-0.0249	-0.0068
	(-0.4330)	(-1.6054)	(-1.2721)	(-1.8123)	(-1.5288)	(-0.5613)
Mean	-0.0065	-0.0338	-0.0312	-0.0502*	-0.0275	-0.0098
	(-0.3540)	(-1.4232)	(-1.1261)	(-1.6683)	(-1.3587)	(-0.4722)
% Positive	48.39%	40.86%	39.78%	36.56%	45.16%	48.39%
Std. Dev.	0.1768	0.2288	0.2676	0.2899	0.1955	0.2003
N	93	93	93	93	93	93

Note:

a. Table 3 shows the 93 ESO-issuing listed firms' investment performance from 2001 to 2006 in Taiwan. Panel A represents the investment performance of ESO-issuing firms. Panel B shows the matched-adjusted investment performance of ESO-issuing firms. Panel C shows the change in investment performance of the ESO-issuing firms, and Panel D shows the change in matched-adjusted investment performance of the ESO-issuing firms.

b. The Wilcoxon Signed-Rank test was used to obtain the median, and t-test was used to obtain the mean, both of which adopted two-tailed tests. The data in parentheses represent the statistic.

c. *, **, *** represent significance levels of 0.1, 0.05, and 0.01, respectively.

Overall, Table 3 shows that a company's investment performance does not perform better after issuing ESOs. Compared with non-ESO-issuing firms, ESO-issuing firms deliver significantly poorer long-term investment performance

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[8] The change in investment performance is represented by sum of absolute returns of each sample firm in each relative issuing month.

three months after issuance, supporting Hypothesis 1. The empirical result is different from previous literature on the improvement of long-term performance of ESO-issuing companies (Hall & Liebman, 1998; Core & Guay, 2001; Sesil *et al*., 2002; Ittner *et al*., 2003; Frye, 2004), partly because Taiwan's ESOs are mainly dealt with through the issuance of new stocks, which could be deemed as a kind of SEO offered to employees. This is different from share repurchase adopted overseas, which allows employees to subscribe to stock options. And the past literature investigating the long-term performance of SEO-issuing companies, for example, Hansen and Crutchley (1990), Patel *et al*. (1993), Lee (1997), Loughran and Ritter (1997), McLaughlin *et al*. (1996, 1998), Cai (1998), Cai and Loughran (1998), Shiah-Hou (2000), Bae *et al*. (2002), Clarke *et al*. (2004), Limpaphayom and Ngamwutikul (2004), Pastor and Martin (2004), and Wang *et al.* (2006), etc., mostly supports that the long-term performance of the companies is negative after SEOs, thus consisting with the result of this research.

From the data presented, the poor long-term investment performance of companies that issued ESOs implies that the aforementioned companies are inefficient. As Taiwan's ESOs are mainly dealt with through the issuance of new stocks, this could be considered as a type of SEO offered to employees. Since McLaughlin *et al*. (1996), Lee (1997) and Wang *et al*. (2006) have blamed the deterioration of long-term performance of companies making SEOs on the excessive free cash flow in the hands of company managers, the study tries to use the free cash flow hypothesis of Jensen (1986) to analyze whether the long-term performance of ESO-issuing companies is affected by the amount of excessive cash flow in the hands of company managers before ESOs.

To verify the results, we used the median of FCF one year before approval as the cut-off line to separate the sample companies into two groups: high FCFs and low FCFs. Table 4 shows the change and the difference in the matched-adjusted investment performance of companies with high and low FCFs. Panel A contains the sample companies with high FCFs. The empirical results prove that the investment returns of share price is significantly negative between two months prior to and one month prior to issuance, between one month prior to and after issuance, between one month prior to and two months after issuance, and between one month prior to and three months after issuance. These values show a positive value percentage between 30% and 43%, indicating that an ESO-issuing company with relatively higher FCFs would deliver poorer investment performance. In addition, the share price is reflected one month ahead of time.

Table 4.

Adjusted Investment Performance of ESO-issuing Companies with High and Low FCFs

Panel A. Change in investment performance of high FCF samples						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	-0.0498*	-0.0634**	-0.1127*	-0.1466*	-0.0249	-0.0156
	(-1.7302)	(-2.2381)	(-1.8572)	(-1.9207)	(-1.6032)	(-0.8889)
Mean	-0.0442*	-0.0774**	-0.0792**	-0.0804*	-0.0446	-0.0231
	(-1.7585)	(-2.4663)	(-2.1608)	(-1.9771)	(-1.5444)	(-0.7764)
% Positive	42.55%	34.04%	29.79%	31.91%	40.43%	44.68%
Std. Dev.	0.1723	0.2150	0.2512	0.2787	0.1978	0.2041
N	47	47	47	47	47	47
Panel B. Change in investment performance of low FCF samples						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	0.0240	-0.0258	-0.0004	-0.0680	-0.0100	0.0139
	(1.1526)	(-0.0983)	(-0.1857)	(-0.5463)	(-0.6446)	(0.1256)
Mean	0.0320	0.0108	0.0177	-0.0193	-0.0102	0.0038
	(1.2429)	(0.3099)	(0.4329)	(-0.4344)	(-0.3556)	(0.1301)
% Positive	54.35%	47.83%	50.00%	41.30%	50.00%	52.17%
Std. Dev.	0.1748	0.2360	0.2776	0.3008	0.1937	0.1977
N	46	46	46	46	46	46
Panel C. Difference of change in investment performance between high and low FCF samples						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	-0.0432**	-0.0702	-0.0853	-0.0758	-0.0264	-0.0633
	(-2.0325)	(-1.4946)	(-1.6406)	(1.1603)	(-0.8414)	(-0.7723)
Mean	-0.0755**	-0.0879*	-0.0965*	-0.0615	-0.0346	-0.0268
	(2.1179)	(1.8833)	(1.7657)	(1.0166)	(0.8471)	(0.6456)
% Positive	46.81%	46.81%	42.55%	44.68%	40.43%	42.55%
Std. Dev.	0.2561	0.3560	0.3869	0.4190	0.2995	0.2666
N	47	47	47	47	47	47

Note:
a. Table 4 shows the 93 listed companies in Taiwan's stock market that issued ESOs from 2001 to 2006. These were divided into two groups by the median of FCF one year prior to approval. Companies with FCFs over the median comprised the high FCF sample group, and those with FCFs under the median comprised the low FCF group. Panel A represents the change in investment performance of sample companies with high FCFs in each period, and Panel B contains the change in investment performance of sample companies with low FCFs in each period. Panel C shows the difference of the change in investment performance of sample companies with high and low FCFs during each period. Only the changes in adjusted investment performance of ESO-issuing companies in each year have been listed to shorten the length of this research.
b. The Wilcoxon Signed-Rank test was used to obtain the median, and t-test was used to obtain the mean, both of which adopted two-tailed tests. The data in parentheses represent the statistic.
c. *, **, *** represent significance levels of 0.1, 0.05, and 0.01, respectively.

Panel B presents data on the sample companies with low FCFs. The empirical results show that there is no sufficient evidence to suggest that a sample company with relatively low FCFs would deliver poorer investment performance. Panel C shows the differential comparison between high and low FCF samples. The test to obtain the median values generated significantly negative returns between two

months prior to, and one month prior to issuance. On the other hand, the test to obtain the mean values generated significantly negative returns between two months prior to and one month prior to issuance, between one month prior to and after issuance, and between one month prior to and two months after issuance. This indicates that a company that has high FCF before issuing its ESOs actually turns in poorer share price performances[9]. Given that Table 3 contains sample companies with high and low FCFs, between which the difference of the change in investment performance could produce the offset effect, the results in Table 3 and Table 4 could be considered to have diverged.

Table 5.

Regression Analysis of Investment Performance of ESO-issuing Companies

	Change in investment performance of ESO-issuing companies from month$_{-i}$ to month$_{+i}$			
	-1~+1		-1~+2	
Model	1	2	1	2
Intercept	-0.1791	0.3104	-0.1748	0.1261
	(-4.4869)	(0.7156)	(-3.9006)	(0.2576)
FCF	0.1862***	0.1301**	0.1725***	0.1266*
	(3.3154)	(1.9952)	(2.7362)	(1.7207)
FS		-0.0217		-0.0101
		(-0.8696)		(-0.3607)
GO		-0.0767*		-0.0766
		(-1.7488)		(-1.5488)
N	93	93	93	93

Note: Table 5 lists the factors affecting the long-term investment performance of the 93 listed companies that issued ESOs from 2001 to 2006. The equation used is presented as:

$R_i = \beta_0 + \beta_1 FCF_i + \beta_2 FS_i + \beta_3 GO_i + \varepsilon_i$

In the equation above, i represents the i-th issuing company, and the dependent variable represents the matched-adjusted accumulated returns between one month prior to issuance and one month after issuance and the matched-adjusted accumulated returns between one month prior to issuance and two months after issuance. These independent variables are described as follows. If FCFs were lower than the sample median, they were defined as low FCF with a dummy variable "1"; otherwise, they would be defined as high FCF with a dummy variable "0." In addition, FS takes the natural logarithm from the book value of total assets one year prior to approval, while GO is the sum of the market value of equity and book value of total debts one year ahead of approval, which is divided by the book value of total assets one year ahead of approval. ε_i shows the i-th issuing firm's residual term. The data in parentheses represent the t statistic. Finally, *, ** and *** represent significance levels of 0.1, 0.05 and 0.01, respectively.

From the aforementioned context, we could find that an ESO-issuing company with high FCF would record poorer long-term investment performance. That is, as the company already has excess FCF but still issued new shares to dispense ESOs, the extra fund raised through ESO issuance is very likely to be invested in negative

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[9] Appendix 2 shows the change and the difference in the matched-adjusted investment performance between companies with high and low free cash flow from the aspect of buy-and-hold returns, which is generally in line with the results in Table 4.

NPV projects, resulting in the deterioration of the company's long-term investment performance. Thus, the second hypothesis in this research is reinforced. This means FCF before the issuance can be used to predict the long-term investment performance of ESO-issuing companies.

Meanwhile, Table 5 lists the results of the regression analysis of the impact from FCF on the long-term investment performance of the ESO-issuing sample companies after factoring in the control variables such as FS and GO into the analysis. The empirical study shows that FCF is significantly positive between one month prior to and after issuance and between one month prior to and two months after issuance. This suggests that sample companies with high FCFs could suffer from significantly deteriorating long-term investment performance after issuing ESOs, a result which is in line with the FCF theory brought up by Jensen (1986). That is, when a company owns excess FCF, its managers tend to over-invest and misuse its funds in negative NPV projects, thus decreasing the quality of the company's performance.

As to the control variables, FS does not show significance whether in the period between one month prior to and after issuance or between one month prior to and two months after issuance. However, GO is significantly negative between one month prior to and after issuance, indicating that managers of ESO-issuing companies facing more GOs would tend to make poorer long-term investments due to asymmetric information.[10]

The most important conclusion from the overall results is that FCF could be used to explain the long-term share price performance of companies after issuing ESOs. When factoring in the control variables into the analysis, the results are still fully supported. This suggests that the long-term investment performance of ESO-issuing companies would depend on whether or not they possess excess FCF.

4. Conclusions

In this study, we selected Taiwan's listed companies that issued ESOs between 2001 and 2006 as the samples, with the aim of exploring the long-term investment performance of companies that issued ESOs as part of their respective

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[10] Appendix 3 represents the results of the regression analysis of the impact from FCF on the long-term investment performance of sample companies from the aspect of buy-and-hold returns. The result shows that after implementing control variables into the analysis, FCF turns insignificantly positive, suggesting that if ESO-issuing companies own more FCF, the deterioration of their long-term investment would be insignificant.

employee compensation packages. From the empirical results, we found that the detrimental effect on the long-term investment performance of ESO-issuing firms manifested three months after ESO issuance. Moreover, the existence of FCF before the issuance can interpret the long-term investment performance of a company that issued such ESOs. This means that for companies that issued ESOs as part their compensation packages, the amount of FCF before ESO issuance has a reverse relationship with the companies' long-term investment performance. The empirical result supports Jensen's (1986) FCF theory, in other words, if Taiwan's companies owned more FCF before issuing ESOs for employee compensation packages, they would tend to over-invest by allocating disproportionate funds to negative NPV projects, thus jeopardizing their long-term investment performance. From practical viewpoint, this study implicitly says that there might be a serious agency problem between managerial authorities and shareholders in companies that have high FCF and issue ESOs as part of their employee compensation plans. The results could serve as an important reference for companies that plan to issue ESOs as part of their compensation packages and could help ESO-issuing companies predict whether or not the expected purposes could be reached. Furthermore, the policy implication behind this research is that ESO-issuing companies should adopt alternatively financing method through share repurchases, not substituting through the issuance of new stocks, to enhance corporate performance.

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Appendix 1.

Investment Performance of ESO-issuing Companies – Buy-and-Hold Returns

Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Panel A. Change in investment performance						
Median	-0.0828***	-0.1126***	-0.1137***	-0.0809**	-0.0672***	-0.0434***
	(-2.7971)	(-2.9733)	(-2.9082)	(-1.9963)	(-2.6898)	(-2.6093)
Mean	-0.0502*	-0.0676**	-0.0719**	-0.0358	-0.0509**	-0.0434**
	(-1.8821)	(-2.2536)	(2.2258)	(-0.9028)	(-2.1485)	(-2.1585)
% Positive	31.18%	32.26%	31.18%	39.78%	35.48%	34.41%
Std. Dev.	0.2573	0.2894	0.3113	0.3821	0.2286	0.1941
N	93	93	93	93	93	93
Panel B. Change in matched-adjusted investment performance						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	-0.0037	-0.0393	-0.0752	-0.0745*	-0.0254	-0.0051
	(-0.3640)	(-1.6016)	(-1.3257)	(-1.9120)	(-1.4368)	(-0.6284)
Mean	-0.0015	-0.0277	-0.0290	-0.0509*	-0.0266	-0.0155
	(-0.0815)	(-1.1764)	(-1.0447)	(-1.6529)	(-1.3087)	(-0.7338)
% Positive	49.46%	41.94%	37.63%	35.48%	46.24%	48.39%
Std. Dev.	0.1811	0.2270	0.2679	0.2973	0.1957	0.2036
N	93	93	93	93	93	93

Note:

a. Appendix 1 shows the 93 ESO-issuing listed firms' investment performance from 2001 to 2006 in Taiwan from the aspect of buy-and-hold returns. Panel A shows the change in investment performance of ESO issuing companies in the holding period and Panel B shows the change in matched-adjusted investment performance of the ESO-issuing firms in the holding period.

b. The Wilcoxon Signed-Rank test was used to obtain the median, and t-test was used to obtain the mean, both of which adopted two-tailed tests. The data in parentheses represent the statistic.

c. *, **, *** represent significance levels of 0.1, 0.05, and 0.01, respectively.

Appendix 2.

Adjusted Investment Performance of ESO-issuing Companies with High and Low FCFs – Buy-and-Hold Returns

Panel A. Change in investment performance of high FCF samples						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	-0.0337	-0.0477**	-0.0923*	-0.1049**	-0.0254	-0.0229
	(-1.4339)	(-1.9630)	(-1.8889)	(2.1323)	(-1.5291)	(-0.8201)
Mean	-0.0371	-0.0634**	-0.0646*	-0.0808**	-0.0402	-0.0230
	(-1.5485)	(-2.1762)	(-1.9208)	(-2.1598)	(-1.4584)	(-0.7752)
% Positive	48.94%	36.17%	27.66%	31.91%	42.55%	44.68%
Std. Dev.	0.1640	0.1997	0.2304	0.2565	0.1888	0.2036
N	47	47	47	47	47	47
Panel B. Change in investment performance of low FCF samples						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	0.0055	-0.0220	-0.0066	-0.0577	-0.0171	0.0076
	(0.9614)	(0.3496)	(-0.1129)	(-0.5572)	(-0.5790)	(0.0437)
Mean	0.0348	0.0088	0.0073	-0.0205	-0.0127	-0.0078
	(1.2268)	(0.2395)	(0.1647)	(-0.4156)	(-0.4217)	(-0.2570)
% Positive	50.00%	47.83%	47.83%	39.13%	50.00%	52.17%
Std. Dev.	0.1922	0.2488	0.2997	0.3340	0.2036	0.2055
N	46	46	46	46	46	46
Panel C. Difference of change in investment performance between high and low FCF samples						
Period	-2~-1	-1~+1	-1~+2	-1~+3	0~+1	+1~+2
Median	-0.0081*	-0.0435	-0.0830	-0.0401	-0.0135	-0.0383
	(-1.7328)	(-1.1603)	(-1.3524)	(0.9567)	(0.8068)	(-0.5648)
Mean	-0.0737*	-0.0668	-0.0663	-0.0540	-0.0216	-0.0124
	(1.9396)	(1.5446)	(1.2974)	(0.9783)	(0.6756)	(0.3592)
% Positive	47.83%	47.83%	43.48%	45.65%	45.65%	45.65%
Std. Dev.	0.2629	0.3503	0.3948	0.4308	0.2989	0.2748
N	47	47	47	47	47	47

Note:

a. Appendix 2 shows the 93 listed companies in Taiwan's stock market that issued ESOs from 2001 to 2006. These were divided into two groups by the median of FCF one year prior to approval. Companies with FCFs over the median comprised the high FCF sample group, and those with FCFs under the median comprised the low FCF group. Panel A represents the change in investment performance of sample companies with high FCFs in each period from the aspect of buy-and-hold returns, and Panel B contains the change in investment performance of sample companies with low FCFs in each period from the aspect of buy-and-hold returns. Panel C shows the difference of the change in investment performance of sample companies with high and low FCFs during each period from the aspect of buy-and-hold returns. Only the changes in adjusted investment performance of ESO-issuing companies in each year have been listed to shorten the length of this research.

b. The Wilcoxon Signed-Rank test was used to obtain the median, and t-test was used to obtain the mean, both of which adopted two-tailed tests. The data in parentheses represent the statistic.

c. *, **, *** represent significance levels of 0.1, 0.05, and 0.01, respectively.

Appendix 3.

Regression Analysis of Investment Performance of ESO-issuing Companies – Buy-and-Hold Returns

	Change in investment performance of ESO-issuing companies			
	from $month_{-i}$ to $month_{+j}$			
	-1~+1		-1~+2	
Model	1	2	1	2
Intercept	-0.0912	0.7823	-0.0936	0.6301
	(-2.7488)	(2.2096)	(-2.4016)	(1.4903)
FCF	0.1121**	0.0434	0.1242**	0.0630
	(2.4029)	(0.8147)	(2.2660)	(0.9914)
FS		-0.0473**		-0.0381
		(-2.3289)		(-1.5675)
GO		-0.0561		-0.0574
		(-1.5678)		(-1.3421)
N	93	93	93	93

Note: Appendix 3 lists the factors affecting the long-term investment performance of the 93 listed companies that issued ESOs from 2001 to 2006 by the aspect of buy-and-hold returns. The equation used is presented as:

$R_i = \beta_0 + \beta_1 FCF_i + \beta_2 FS_i + \beta_3 GO_i + \varepsilon_i$

In the equation above, i represents the i-th issuing company, and the dependent variable represents the matched-adjusted buy-and-hold returns between one month prior to issuance and one month after issuance and the matched-adjusted buy-and-hold returns between one month prior to issuance and two months after issuance. These independent variables are described as follows. If FCFs were lower than the sample median, they were defined as low FCF with a dummy variable "1"; otherwise, they would be defined as high FCF with a dummy variable "0." In addition, FS takes the natural logarithm from the book value of total assets one year prior to approval, while GO is the sum of the market value of equity and book value of total debts one year ahead of approval, which is divided by the book value of total assets one year ahead of approval. ε_i shows the i-th issuing firm's residual term. The data in parentheses represent the t statistic. Finally, *, ** and *** represent significance levels of 0.1, 0.05 and 0.01, respectively.