



## Investment Opportunities, Free Cash Flow and Stock Valuation Effects of Corporate Investments: The Case of Taiwanese Investments in China

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**Abstract.** This paper examines the importance of investment opportunities and free cash flow in assessing the stock market reaction to announcements of cross-border investments in China by Taiwanese firms. Our results support the investment opportunities hypothesis that Taiwanese firms with favorable investment opportunities have significantly positive response to the announcements of their investments in China whereas firms with poor investment opportunities have negative response to such announcements. In contrast, we find no support for the free cash flow hypothesis. Our findings add to the understanding of the determinants of the wealth effect of cross-border investment decisions in the Asia-Pacific region.

**Key words:** cross-border investments, investment opportunities, free cash flow

**JEL Classification:** G14, G31

### I. Introduction

A firm's investment opportunities and free cash flow can be important when assessing the stock market response to the firm's announcements of corporate investment decisions. Recent research shows that the availability or lack of investment opportunities is an important consideration in assessing the wealth effect of corporate investment decisions such as domestic tender offers (Lang, Stulz, and Walkling, 1991), international acquisitions (Doukas, 1995), international joint ventures (Chen, Ho, Lee, and Yeo, 2000), R&D expenditures (Chan, Martin, and Kensinger, 1990; Zantout and Tsetsekos, 1994; and Szewczyk, Tsetsekos, and Zantout, 1996), product strategies (Chen and Ho, 1997) and capital expenditures (Bloise and Shieh, 1997; Chen and Ho, 1997; and Chung, Wright, and Charoenwong, 1998). Specifically, they show that corporate investments by firms with good investment

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opportunities are generally worthwhile while those by firms with poor investment opportunities may be wasteful. In contrast, Jensen's (1986) free cash flow theory, which predicts differential market response to corporate investment announcements depending on the firm's level of free cash flow, has mixed support. The free cash flow theory has power in explaining the variation in bidder returns for domestic tender offers (Lang, Stulz, and Walkling, 1991) and international acquisitions (Doukas, 1995), but lacks power in explaining abnormal returns associated with announcements of international joint ventures (Chen, Ho, Lee, and Yeo, 2000), R&D expenditures (Vogt, 1994; and Szewczyk, Tsetsekos, and Zantout, 1996), product strategies and capital expenditures (Chen and Ho, 1997).

The purpose of this study is to examine the importance of investment opportunities and free cash flow in explaining the cross-sectional differences in stock market reaction to announcements by Taiwanese firms making major capital investments in Mainland China. Since the 1990s, China has become an important economy in the world and attracted substantial investments from many other countries, especially Taiwan. Thus, this study provides useful insights into the determinants of the stock market response to such cross-border investment decisions. This study also provides important international evidence on the role of investment opportunities and free cash flow in assessing the wealth effect of corporate investments in the Asia-Pacific region since existing studies focus mainly on U.S. data.

Our results show that announcements of cross-border investments in China by Taiwanese firms are, on average, associated with positive abnormal returns. These results are similar to those found for U.S. international investments (Morck and Yeung, 1992; and Lang and Ofek, 1995)<sup>1</sup> and Japanese investments in U.S. (Pettway, Sicherman, and Spiess, 1993; and Eun, Kolodny, and Scheraga, 1996). We find support for the investment opportunities hypothesis that Taiwanese firms with favorable investment opportunities have significantly positive response to the announcements of their investments in China whereas firms with poor investment opportunities have negative response to such announcements. Our results hold after controlling for other factors that could affect the abnormal returns. This evidence, together with the results on other types of corporate investment decisions, suggests that the availability or lack of investment opportunities is an important consideration in assessing the wealth effect of different types of corporate investments. In contrast, we find that free cash flow does not explain the wealth effect of Taiwanese investments in China. This finding suggests that Jensen's free cash flow theory may not apply to such investments.

The remainder of the paper is organized as follows. Section II describes the sample selection and methodology. Section III provides the empirical results. The final section concludes.

## II. Sample selection and methodology

The results of this paper are based on a sample of Taiwanese listed firms that have announced investment in China during the period from 1991 to 1995. The announcements are collected from the Excellent Business Database, which provides news-service abstracts from major Taiwanese journals and magazines.<sup>2</sup> We then review the articles in the publications that refer to those announcements. When a repeat announcement is found in a different publication,

Table 1. Sample distribution of announcements of investments in China by Taiwanese firms

Industry	Year					Total
	1991	1992	1993	1994	1995	
Cement	0	0	0	1	2	3
Food	1	8	4	2	5	20
Plastic	0	0	0	2	1	3
Textile	2	3	5	3	2	15
Electronical	0	0	1	2	2	5
Wire and cable	0	0	2	2	2	6
Chemicals	0	0	2	1	3	6
Glass	0	2	2	1	0	5
Paper	0	1	0	0	1	2
Steel	0	0	2	0	0	2
Rubber	1	1	0	1	0	3
Automobile	0	0	0	0	2	2
Electronics	0	2	4	0	1	7
Construction	0	0	0	0	1	1
Transportation	0	0	0	2	1	3
Retailing	0	0	0	1	0	1
Others	0	1	4	2	4	11
Total number of announcements in each year	4	18	26	20	27	95
Percent of total sample (%)	4.2	18.9	27.4	21.1	28.4	100

*Notes:* This table summarizes the distribution, by year and by industry, of announcements of investments in China by Taiwanese firms from 1991 to 1995. There are 95 announcements by 71 different Taiwanese firms. The industry classification obtained from the Taiwan Economic Journal Data Bank is based on that used by the Taiwan Stock Exchange. The announcements are collected from the Excellent Business Database, which provides news-service abstracts from major Taiwanese journals and magazines.

the announcement that has the earliest date is chosen because this is the earliest date when the information about the investments in China by Taiwanese firms is publicly available. Our definition of announcement date (day 0) is the date of the publication in which the company's initial announcement appears.

We include initial announcements if sufficient data on the firms are available from the Taiwan Economic Journal (TEJ) Data Bank, which includes stock price, financial statements and ownership information for Taiwanese listed firms. Our final sample comprises 95 announcements by 71 different Taiwanese firms.<sup>3</sup> Table 1 reports the distribution of our sample by time profile and industry classification.<sup>4</sup> Most of the investments in China by Taiwanese firms occurred in 1993 and 1995. The investments mainly came from the two industries: food and textile.

Table 2 shows the sample characteristics for the explanatory variables used in this study. Data are obtained from TEJ. To empirically distinguish the effects of investment opportunities, a proxy for the profitability of new investment is needed. Tobin's  $q$ , defined as the ratio of the market value of a firm to the replacement costs of its assets, is per-

Table 2. Sample characteristics

Variables	<i>N</i>	Mean	Median	Standard Deviation
Pseudo <i>q</i>	95	1.28	1.23	0.35
Cash flow (%)	95	5.67	6.43	5.31
Firm size				
(Taiwan millions)	95	15,245	8,055	20,461
(U.S. millions)		579	306	777
Dollar investment				
(Taiwan millions)	82	381	200	656
(U.S. millions)		14	8	25
Dollar investment/TA (%)	82	6.20	3.75	7.63
Managerial ownership (%)	91	25.73	21.97	14.86
Debt ratio (%)	95	37.56	36.94	13.71
Dividend yield (%)	95	0.92	0	1.85

*Notes:* The sample consists of 95 announcements of investments in China by Taiwanese firms from 1991 to 1995. Data are obtained from the Taiwan Economic Journal Data Bank and the articles in the journals and magazines that refer to those announcements. Pseudo *q* is estimated as the average ratio of the market value of the firm's assets to the book value of the firm's assets for the three fiscal years before the announcement, where the market value of assets is estimated as the book value of assets minus the book value of common equity plus the market value of common equity. The cash flow variable is defined as operating income before depreciation minus interest expense, taxes, preferred dividends, and common dividends, all divided by total assets, for the year preceding the announcement. Firm size is the announcing firm's market value of assets for the year preceding the announcement. Dollar investment/TA is the amount of investment made by the announcing firm divided by its book value of total assets for the year preceding the announcement. Managerial ownership is the stock ownership by officers and directors for the year preceding the announcement. Debt ratio is 1 minus the ratio of the book value of equity to the book value of total assets for the year preceding the announcement. Dividend yield is the announcing firm's dividend to price per share for the year preceding the announcement. The numbers of observations for dollar investment, dollar investment/TA, and managerial ownership are smaller because of data availability.

haps the most commonly used measure of growth opportunities (Denis, 1994). The deviation of market value from replacement value will depend on the profitability of both the firm's assets in place and its expected investment opportunities. With scale-expanding investments and decreasing marginal returns on capital, if new investment opportunities are expected to be profitable then the firm's assets in place must also be profitable and Tobin's *q* will be high (Lang and Litzenberger, 1989). On the other hand, if the profitability of the firm's assets in place is low, its investment opportunities will also be expected to earn a low rate of return and Tobin's *q* will be low. Therefore, Tobin's *q* will be positively correlated with the profitability of new investment. Note that there is no necessary connection between the *q* ratio and the marginal profitability of new investment opportunities. However, it seems reasonable to follow Barclay and Litzenberger (1988) and Lang and Litzenberger (1989) and assume that, on average, a measure of a firm's average profitability of investment is positively correlated with the marginal profitability of new investment.

Because of data availability, we estimate *q* as the ratio of the market value of the firm's assets to the book value of the firm's assets, where the market value of assets equals the book

value of assets minus the book value of common equity plus the market value of common equity. This simple measure of  $q$  for investment opportunities (the “pseudo  $q$ ”) has been widely used in previous studies (e.g., Denis, 1994; Perfect and Wiles, 1994; Barclay and Smith, 1995a and 1995b; Agrawal and Knoeber, 1996; Kang and Stulz, 1996; Chen and Ho, 1997; and Holderness, Kroszner, and Sheehan, 1999). Our pseudo  $q$  variable is the average pseudo  $q$  for the three fiscal years prior to the announcement.<sup>5</sup> The mean (median)  $q$  of our sample firms is 1.28 (1.23).

Following Lehn and Poulsen (1989), Lang, Stulz, and Walkling (1991), Howe, He, and Kao (1992), Doukas (1995), and Szewczyk, Tsetsekos, and Zantout (1996), we define cash flow ratio as operating income before depreciation minus interest expense, taxes, preferred dividends, and common dividends for the fiscal year preceding the announcement, divided by the book value of total assets. The mean (median) cash flow ratio of our sample firms is 5.67% (6.43%).

The control variables used in this study are firm size, the size of investment, managerial ownership, debt ratio, and dividend yield. Firm size is the announcing firm’s market value of assets for the year preceding the announcement. The size of investment (dollar investment/TA) is the amount of investment made by the announcing firm divided by its book value of total assets for the year preceding the announcement.<sup>6</sup> Managerial ownership is the stock ownership by officers and directors for the year preceding the announcement. Debt ratio is one minus the ratio of the book value of equity to the book value of total assets for the year preceding the announcement. Dividend yield is the announcing firm’s dividend to price per share for the year preceding the announcement. The summary characteristics for these variables are shown in Table 2. The numbers of observations for dollar investment, dollar investment/TA, and managerial ownership are smaller because of data availability.

We employ standard event-study methods to examine stock price responses to announcements of cross-border investments in China by Taiwanese firms. Data are obtained from TEJ. The abnormal return is calculated as the difference between the actual return and an expected return generated by the market model. Market model parameters are estimated over a period from 200 to 60 days before the initial announcements. The value-weighted Taiwan Stock Exchange All-Share Index is used to measure market return.

### III. Empirical results

Table 3 reports the cumulative abnormal stock returns for our sample firms. The average two-day announcement-period (days  $-1$  to  $0$ ) abnormal return is 0.51%, statistically significant at the 5% level.<sup>7</sup> The announcement date (day 0) accounts for most of the gain. The median announcement-period abnormal return is also positive although it is not statistically significant. No significant abnormal returns are observed preceding and following the announcement period. Thus, announcements of cross-border investments in China by Taiwanese firms are associated with positive abnormal returns, similar to those found for U.S. international investments (Morck and Yeung, 1992; and Lang and Ofek, 1995) and Japanese investments in U.S. (Pettway, Sicherman, and Spiess, 1993; and Eun, Kolodny, and Scheraga, 1996).

Table 3. Cumulative abnormal returns

Event Days	Mean Abnormal Return (%)	<i>t</i> -statistic	Median Abnormal Return (%)	<i>p</i> -value for the Wilcoxon <i>z</i> -statistic
[-30, -2]	-0.04	-0.05	-0.74	0.80
[-20, -2]	0.33	0.39	-0.23	0.92
[-10, -2]	0.43	0.92	-0.14	0.65
-2	0.10	0.68	0.04	0.64
-1	0.17	0.95	-0.08	0.79
0	0.34	2.08**	0.04	0.28
[-1, 0]	0.51	2.50**	0.02	0.33
1	0.03	0.20	-0.05	0.83
2	0.12	0.70	-0.05	0.85
[1, 10]	0.11	0.20	-0.57	0.87
[1, 20]	-1.05	-1.37	-0.90	0.22
[1, 30]	-1.26	-1.21	-0.95	0.34

Notes: The sample consists of 95 announcements of investments in China by Taiwanese firms from 1991 to 1995. Cumulative abnormal returns are estimated using the standard market model procedure with parameters estimated for the period 200 days to 60 days before the announcement. Day 0 in event time is the date of the publication in which the company's initial announcement appears. "\*\*\*\*" represents a 5% significance level.

In Panel A, Table 4, we examine the importance of investment opportunities in explaining the announcement effect of cross-border investments in China by Taiwanese firms. The sample firms are divided according to whether the announcing firms have a pseudo  $q$  greater or less than one. High  $q$  firms are those with pseudo  $q$  above one while low  $q$  firms are those with pseudo  $q$  below one. This classification follows that of Lang, Stulz, and Walkling (1991), Howe, He, and Kao (1992), Doukas (1995), and Szewczyk, Tsetsekos, and Zantout (1996). High  $q$  firms are those with good investment opportunities whereas low  $q$  firms are those with poor investment opportunities. Our results show that high- $q$  firms have statistically significantly positive average (median) two-day announcement-period abnormal return of 0.69% (0.10%). In contrast, the average and median abnormal returns for the low- $q$  firms are negative although they are not statistically significant. The mean difference between the abnormal returns for high- and low- $q$  firms is statistically significant. This result is robust to possible deviations from nonnormality, since it also holds for the nonparametric Kruskal-Wallis test statistic. Our findings are consistent with the investment opportunities hypothesis: Cross-border investments in China by Taiwanese firms with good growth opportunities are worthwhile while those by firms with poor growth opportunities are not.

In Panel A, Table 4, we also investigate the importance of free cash flow in explaining the announcement effect. Jensen (1986) argues that managers endowed with free cash flow will invest in wasteful investments rather than pay it out to shareholders. Cross-border investments may be one such use of this free cash flow. The potential agency costs of cross-border investments are therefore higher for high-free-cash-flow firms. On the other hand, cross-border investments by low-free-cash-flow firms increase the chance the firm will seek new external financing. New external financing provides monitoring, and the firm's willingness to undergo such monitoring may be a favorable signal (Szewczyk, Tsetsekos,

Table 4. Mean and median two-day announcement period abnormal returns for subsamples stratified according to pseudo  $q$  and cash flow

Panel A: Analysis of subsamples based on pseudo  $q$  and cash flow

	Pseudo $q$	Cash Flow
High	Mean abnormal return = 0.69% Median abnormal return = 0.10% (2.91***, 0.09, 78)	Mean abnormal return = 0.59% Median abnormal return = 0.07% (1.93*, 0.39, 47)
Low	Mean abnormal return = -0.35% Median abnormal return = -0.44% (-1.55, 0.16, 17)	Mean abnormal return = 0.43% Median abnormal return = -0.16% (1.57, 0.52, 48)
Mean difference	1.04% (3.19)*** [0.07]	0.16% (0.40) [0.80]

Panel B: Analysis of subsamples based on pseudo  $q$  and cash flow simultaneously

	High $q$	Low $q$	Mean Difference
High cash flow	Mean abnormal return = 0.89% Median abnormal return = 0.14% (2.41**, 0.07, 37)	Mean abnormal return = -0.53% Median abnormal return = -0.62% (-2.47**, 0.05, 10)	1.42% (3.32)*** [0.05]
Low cash flow	Mean abnormal return = 0.51% Median abnormal return = -0.21% (1.67*, 0.46, 41)	Mean abnormal return = -0.09% Median abnormal return = 0.02% (-0.20, 0.81, 7)	0.60% (1.10) [0.61]
Mean difference	0.38% (0.79) [0.40]	-0.44% (-0.86) [0.56]	

Notes: Two-day  $(-1, 0)$  announcement period abnormal returns are estimated using the standard market model procedure with parameters estimated for the period 200 days to 60 days before the announcement. Pseudo  $q$  is estimated as the average ratio of the market value of the firm's assets to the book value of the firm's assets for the three fiscal years before the announcement, where the market value of assets is estimated as the book value of assets minus the book value of common equity plus the market value of common equity. High- $q$  (low- $q$ ) firms are firms with pseudo  $q$  above (below) 1. Cash flow is defined as operating income before depreciation minus interest expense, taxes, preferred dividends, and common dividends, all divided by total assets, for the year preceding the announcement. High-cash-flow (low-cash-flow) firms are firms with cash flow above (below) the median for the whole sample. For each cell, we report the mean abnormal return, the median abnormal return, and, in parentheses, the  $t$ -statistic, the  $p$ -value for the Wilcoxon  $z$ -statistic and the number of observations. For the comparison of means, we report mean difference, the  $t$ -statistic in parentheses assuming unequal variances and the  $p$ -value for the nonparametric Kruskal-Wallis statistic in square brackets. The results are similar with the assumption of equal variances. "\*\*\*\*", "\*\*\*", and "\*\*" represent 1%, 5%, and 10% significance levels, respectively.

and Zantout, 1996). Therefore, the free cash flow theory predicts that the market response to a cross-border investment announcement would be inversely related to the firm's level of free cash flow. Panel A, Table 4, shows the comparison of abnormal returns based on the cash flow ratio. High-cash-flow (low-cash-flow) firms have the cash flow ratio above (below) the median for the whole sample. This classification follows that of Lang, Stulz, and



Walkling (1991), Howe, He, and Kao (1992), Doukas (1995), and Szewczyk, Tsetsekos, and Zantout (1996). We find no significant difference in abnormal returns between high- and low-cash-flow firms.

We also present a  $2 \times 2$  table in Panel B, Table 4, for our sample firms stratified according to pseudo  $q$  and cash flow simultaneously. Free cash flow agency costs may depend on the firm's investment opportunities since firms with less (more) growth opportunities are more (less) likely to have free cash flow (Szewczyk, Tsetsekos, and Zantout, 1996). Therefore, the free cash flow hypothesis predicts that low- $q$ /high-cash-flow (high- $q$ /low-cash-flow) firms have the highest (lowest) potential agency costs associated with corporate investments, and hence, should have the lowest and negative (highest and positive) announcement-period abnormal returns. Our results show that the subsample of low- $q$ /high-cash-flow firms has a significantly negative average (median) abnormal return of  $-0.53\%$  ( $-0.62\%$ ), the lowest among the four subsamples. However, the subsample of high- $q$ /high-cash-flow firms has the highest and positive average and median abnormal returns. Further, there is no statistically significant difference in average abnormal returns between low- $q$ /high-cash-flow and low- $q$ /low-cash-flow firms, and between high- $q$ /high-cash-flow and high- $q$ /low-cash-flow firms. These results do not support the free cash flow hypothesis.

Results in Panel B, Table 4, provide some support for the investment opportunities hypothesis. For each of the subsamples of high-cash-flow and low-cash-flow firms, high  $q$  firms have generally higher average abnormal returns than do low  $q$  firms, although the difference is statistically significant only for the high-cash-flow firms.

Table 5 presents cross-sectional regression analyses of the announcement-period abnormal returns for our sample. The  $t$ -values are computed with heteroskedasticity-consistent standard errors (White, 1980). Following Lang, Stulz, and Walkling (1991) and Doukas (1995), we use a dummy that takes a value of one for firms with a pseudo  $q$  that exceeds one and zero otherwise.<sup>8</sup>

The significance of investment opportunities and free cash flow are tested separately in models 1 and 2, respectively, and jointly in model 3. We find that the investment opportunities hypothesis is supported but the free cash flow hypothesis is not. The coefficient for the pseudo  $q$  dummy variable is positive and statistically significant while that for the cash flow variable is not. The results are consistent with those of Table 4.

Models 4 and 5 regress abnormal returns against the pseudo  $q$  dummy variable, cash flow, and several other potential factors.<sup>9</sup> In model 4, we control for firm size, size of investment, and managerial ownership. If, as many researchers suggest (e.g., see Hertz and Smith, 1993; and Kang and Stulz, 1996), information asymmetry is likely to be more severe for small firms, we expect stock market reaction to be negatively related to firm size *ceteris paribus*. As suggested by Lummer and McConnell (1990), the magnitude of market reaction may be also related to the size of investment. When a firm enters into an investment, a fraction of the firm's total resources are devoted to the project. Since the common stock of the firm reflects the value of all of the firm's undertakings, the magnitude of the value created by the investment may be affected by the size of funds invested in the project. We measure size of investment as dollar investment relative to book value of total assets of the firm. Finally, managerial ownership is included to control for ownership structure effects (Jensen and Meckling, 1976). Firms with tightly-held shareholdings may have lesser



Table 5. Cross-sectional regression analyses of two-day announcement period abnormal returns

Variable	Model				
	1	2	3	4	5
Intercept	-0.0035 (-1.60)	0.0039 (1.59)	-0.0052 (-1.72)*	0.0607 (1.73)*	0.0567 (1.73)*
Pseudo $q$ dummy	0.0104 (3.24)***		0.0107 (3.25)***	0.0078 (2.08)**	0.0079 (2.21)**
Cash flow		0.0209 (0.71)	0.0270 (0.90)	0.0261 (0.65)	0.0161 (0.42)
Log of firm size				-0.0038 (-1.84)*	-0.0031 (-1.50)
Dollar investment/TA				0.0177 (0.81)	0.0099 (0.42)
Managerial ownership				-0.0002 (-1.25)	-0.0002 (-1.25)
Debt ratio					-0.0211 (-1.13)
Dividend yield					0.0059 (0.07)
Adjusted $R^2$	0.031	-0.008	0.025	0.032	0.022
$F$ -statistic	3.97**	0.29	2.23	1.51	1.24
Number of observations	95	95	95	78	78

Notes: Two-day  $(-1, 0)$  announcement period abnormal returns are estimated using the standard market model procedure with parameters estimated for the period 200 days to 60 days before the announcement. Pseudo  $q$  is estimated as the average ratio of the market value of the firm's assets to the book value of the firm's assets for the three fiscal years before the announcement, where the market value of assets is estimated as the book value of assets minus the book value of common equity plus the market value of common equity. High- $q$  (low- $q$ ) firms are firms with pseudo  $q$  above (below) 1. Pseudo  $q$  dummy has a value of one if the firm has high  $q$  and zero otherwise. The cash flow variable is defined as operating income before depreciation minus interest expense, taxes, preferred dividends, and common dividends, all divided by total assets, for the year preceding the announcement. Firm size is the announcing firm's market value of assets for the year preceding the announcement. Dollar investment/TA is the amount of investment by the announcing firm divided by its book value of total assets for the year preceding the announcement. Managerial ownership is the stock ownership by officers and directors for the year preceding the announcement. Debt ratio is 1 minus the ratio of the book value of equity to the book value of total assets for the year preceding the announcement. Dividend yield is the announcing firm's dividend to price per share for the year preceding the announcement. The  $t$ -values in parentheses are computed with heteroskedasticity-consistent standard errors (White, 1980). The numbers of observations in Models 4 and 5 are smaller because of missing data on some of the control variables. "\*\*\*\*", "\*\*\*", and "\*\*" represent 1%, 5%, and 10% significance levels, respectively.

agency problems of free cash flow. The results show that after controlling for these factors, the investment opportunities hypothesis still holds while there is no support for the free cash flow hypothesis. The only significant control variable is the firm size variable. The smaller the firm, the more favorable is the market response.

In model 5, we also control for the firm's debt ratio and dividend yield. They are included as alternative measures of free cash flow (Jensen, 1986) and investment opportunities

(Smith and Watts, 1992), respectively. The results are similar to those in model 4 except that firm size loses its significance in model 5.<sup>10</sup>

#### IV. Conclusion

This paper examines the importance of investment opportunities and free cash flow in explaining the stock valuation effects of cross-border investments in China by Taiwanese firms. We demonstrate that Taiwanese firms with favorable investment opportunities have significantly positive response to the announcements of their investments in China whereas firms with poor investment opportunities have negative response to such announcements. Our results support the investment opportunities hypothesis and hold even after controlling for other potential explanatory factors. In contrast, we find that free cash flow does not explain the wealth effect of Taiwanese investments in China. This evidence suggests that Jensen's free cash flow theory may not apply to such investments. Our findings add to the understanding of the determinants of the stock market response to cross-border investment decisions in the Asia-Pacific region.

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#### Notes

1. In contrast, Doukas and Travlos (1988) and Waheed and Mathur (1995) find that announcements of U.S. foreign investments are, on average, associated with insignificantly positive and significantly negative abnormal returns, respectively.
2. We appreciate Shao-Chi Chang for his kindly providing these announcements.
3. We have also checked whether the announcements in our final sample are "contaminated" by other contemporaneously announced information. We find that they do not have contemporaneous announcements.
4. The industry classification obtained from TEJ is based on that used by the Taiwan Stock Exchange.
5. This follows the approach used in Lang, Stulz, and Walkling (1991), Szewczyk, Tsetsekos, and Zantout (1996), and Chen and Ho (1997). A three-year average gives a better estimate of a firm's true  $q$  (Lang, Stulz, and Walkling, 1989).
6. Data on the amount of investment are collected from the articles in the publications that refer to those investments.
7. We have also conducted significance tests in Table 3 using the Z-statistic, as described in Dodd and Warner (1983). Similar results are obtained.
8. The motivation is that a sufficient condition for the availability of good investment opportunities is a  $q$  that exceeds one. Furthermore, the relationship between abnormal returns and  $q$  may be nonlinear. Lang, Stulz, and

Walkling (1989) and Chung, Wright, and Charoenwong (1998) provide similar reasons for their preference for the dichotomous variable for investment opportunities.

9. The numbers of observations in models 4 and 5 are smaller because of missing data on some of the control variables.
10. We have also included the following variables in model 5: (1) industry dummies; (2) ownership squared (to allow for possible nonlinear relationship); and (3) cash flow if the firm has low  $q$  and 0 otherwise (to test another prediction of the free cash flow hypothesis that the abnormal return of low- $q$  firms in comparison with high- $q$  firms decreases with the cash flow of low- $q$  firms (Lang, Stulz, and Walkling, 1991)). The conclusions in this paper remain unchanged.

## References

- Agrawal, A. and C. R. Knoeber, "Firm Performance and Mechanisms to Control Agency Problems between Managers and Shareholders." *Journal of Financial and Quantitative Analysis* 31, 377–397, (1996).
- Barclay, M. J. and R. H. Litzenger, "Announcement Effects of New Equity Issues and the Use of Intraday Price Data." *Journal of Financial Economics* 21, 71–99, (1988).
- Barclay, M. J. and C. W. Smith, Jr., "The Maturity Structure of Corporate Debt." *Journal of Finance* 50, 609–631, (1995a).
- Barclay, M. J. and C. W. Smith, Jr., "The Priority Structure of Corporate Liabilities." *Journal of Finance* 50, 899–917, (1995b).
- Blose, L. E. and J. C. P. Shieh, "Tobin's  $q$ -Ratio and Market Reaction to Capital Investment Announcements." *Financial Review* 32, 449–476, (1997).
- Chan, S. H., J. Martin and J. Kensinger, "Corporate Research and Development Expenditures and Share Value." *Journal of Financial Economics* 26, 255–276, (1990).
- Chen, S. S. and K. W. Ho, "Market Response to Product-Strategy and Capital-Expenditure Announcements in Singapore: Investment Opportunities and Free Cash Flow." *Financial Management* 26, 82–88, (1997).
- Chen, S. S., K. W. Ho, C. F. Lee and G. Yeo, "Investment Opportunities, Free Cash Flow and Market Reaction to International Joint Ventures." *Journal of Banking and Finance* 11, 1747–1765, (2000).
- Chung, K. H., P. Wright and C. Charoenwong, "Investment Opportunities and Market Reaction to Capital Expenditure Decisions." *Journal of Banking and Finance* 22, 41–60, (1998).
- Denis, D. J., "Investment Opportunities and the Market Reaction to Equity Offerings." *Journal of Financial and Quantitative Analysis* 29, 159–177, (1994).
- Dodd, P. and J. Warner, "On Corporate Governance: A Study of Proxy Contests." *Journal of Financial Economics* 11, 401–438, (1983).
- Doukas, J., "Overinvestment, Tobin's  $q$  and Gains from Foreign Acquisitions." *Journal of Banking and Finance* 19, 1285–1303, (1995).
- Doukas, J. and N. G. Travlos, "The Effect of Corporate Multinationalism on Shareholders' Wealth: Evidence from International Acquisitions." *Journal of Finance* 43, 1161–1175, (1988).
- Eun, C. S., R. Kolodny and C. Scheraga, "Cross-Border Acquisitions and Shareholder Wealth: Tests of the Synergy and Internalization Hypotheses." *Journal of Banking and Finance* 20, 1559–1582, (1996).
- Hertzel, M. and R. L. Smith, "Market Discounts and Shareholder Gains for Placing Equity Privately." *Journal of Finance* 48, 459–485, (1993).
- Holderness, C. G., R. S. Kroszner and D. P. Sheehan, "Were the Good Old Days That Good? Changes in Managerial Stock Ownership Since the Great Depression." *Journal of Finance* 54, 435–469, (1999).
- Howe, K. M., J. He and G. W. Kao, "One-Time Cash Flow Announcements and Free Cash-Flow Theory: Share Repurchases and Special Dividends." *Journal of Finance* 47, 1963–1975, (1992).
- Jensen, M. C., "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review* 76, 323–329, (1986).
- Jensen, M. C. and W. H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics* 3, 305–360, (1976).

- Kang, J. K. and R. M. Stulz, "How Different Is Japanese Corporate Finance? An Investigation of the Information Content of New Security Issues." *Review of Financial Studies* 9, 109–139, (1996).
- Lang, L. H. P. and R. H. Litzenger, "Dividend Announcements: Cash Flow Signalling vs. Free Cash Flow Hypothesis?" *Journal of Financial Economics* 24, 181–192, (1989).
- Lang, L. H. P. and E. Ofek, "Why Do Firms Invest in Eastern Europe?" *European Financial Management* 1, 147–171, (1995).
- Lang, L. H. P., R. M. Stulz and R. A. Walkling, "Managerial Performance, Tobin's  $Q$ , and the Gains from Successful Tender Offers." *Journal of Financial Economics* 24, 137–154, (1989).
- Lang, L. H. P., R. M. Stulz and R. A. Walkling, "A Test of the Free Cash Flow Hypothesis: The Case of Bidder Returns." *Journal of Financial Economics* 29, 315–335, (1991).
- Lehn, K. and A. Poulsen, "Free Cash Flow and Stockholder Gains in Going Private Transactions." *Journal of Finance* 44, 771–787, (1989).
- Lummer, S. L. and J. J. McConnell, "Stock Valuation Effects of International Joint Ventures," in S. G. Rhee and R. P. Chang (Eds), *Pacific-Basin Capital Markets Research*, New York: Elsevier Science Publishers, 531–546, 1990.
- Morck, R. and B. Yeung, "Internalization: An Event Study Test." *Journal of International Economics* 33, 41–56, (1992).
- Perfect, S. B. and K. W. Wiles, "Alternative Constructions of Tobin's  $q$ : An Empirical Comparison." *Journal of Empirical Finance* 1, 313–341, (1994).
- Pettway, R. H., N. W. Sicherman and D. K. Spiess, "Japanese Foreign Direct Investment: Wealth Effects from Purchases and Sales of U.S. Assets." *Financial Management* 22, 82–95, (1993).
- Smith, C. W., Jr. and R. L. Watts, "The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies." *Journal of Financial Economics* 32, 263–292, (1992).
- Szewczyk, S. H., G. P. Tsetsekos and Z. Zantout, "The Valuation of Corporate R&D Expenditures: Evidence from Investment Opportunities and Free Cash Flow." *Financial Management* 25, 105–110, (1996).
- Vogt, S., "The Cash Flow/Investment Relationship: Evidence from U.S. Manufacturing Firms." *Financial Management* 23, 3–20, (1994).
- Waheed, A. and I. Mathur, "Wealth Effects of Foreign Expansion by U.S. Banks." *Journal of Banking and Finance* 19, 823–842, (1995).
- White, H., "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." *Econometrica* 48, 817–838, (1980).
- Zantout, Z. and G. Tsetsekos, "The Wealth Effects of Announcements of R&D Expenditure Increases." *Journal of Financial Research* 17, 205–216, (1994).