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Performance and Cash Value of Taiwan Multinational Firms' FDI in ASEAN

Min-Lee Chan[1], Kannika Duangnate[2] and Cho-Min Lin[3]

Abstract

This study uses sample of 3,341 multinational Taiwanese firms during 2000 – 2017 to analyze how the Taiwanese FDI in ASEAN affects firm performances and value of cash holdings. With the OLS regression of full sample, it is found that FDI has significantly positive effects on accounting-based performance (ROA and ROE) while it has no significant effects on market-based performance. Similar results are also concluded by country sample. Results from Quantile regression indicate that FDI has significantly different impacts on performance at high- and low-performance firms when performance is measured by FDI gains; FDI at high-performance firms could create significantly larger gains than that at low-performance firms. FDI in ASEAN, however, has not been evidenced to create firm's cash value.

JEL classification numbers: F21, F23, G32
Keywords: Performance, Cash value, FDI, ASEAN

1. Introduction

In recent years, especially after 2010, the trend of Taiwan's investment in China and the Association of Southeast Asian Nations (hereafter, ASEAN) has undergone a major change. Regional integration in Southeast Asia has matured because of the growing industrial chain in the region and the ASEAN countries actively joining the regional economic and trade organizations (such as TPP). As such, Taiwan foreign investments to Southeast Asia has become a trend after the year of 2010, especially after the year of 2017, when the Taiwan government encouraged "New southbound' policy. Figure 1 shows the Taiwan outward direct investment during 1981 – 2018, with an observation of rapid growth in 2010 and 2017. ASEAN owns ten percent world population and is the second largest factory in the world which make it attractable to foreign investments. As such, how the Taiwan authorities grasp this wave of global economic change to drive exports through investment and to create favorable investment environments to enhance the export competitiveness of Taiwanese enterprises become the urgent issue for current economic policy of Taiwan government.

[1] Finance department, Providence University, Taiwan.
[2] Faculty of Economics, Chiang Mai University, Thailand.
[3] Finance department, Providence University, Taiwan.

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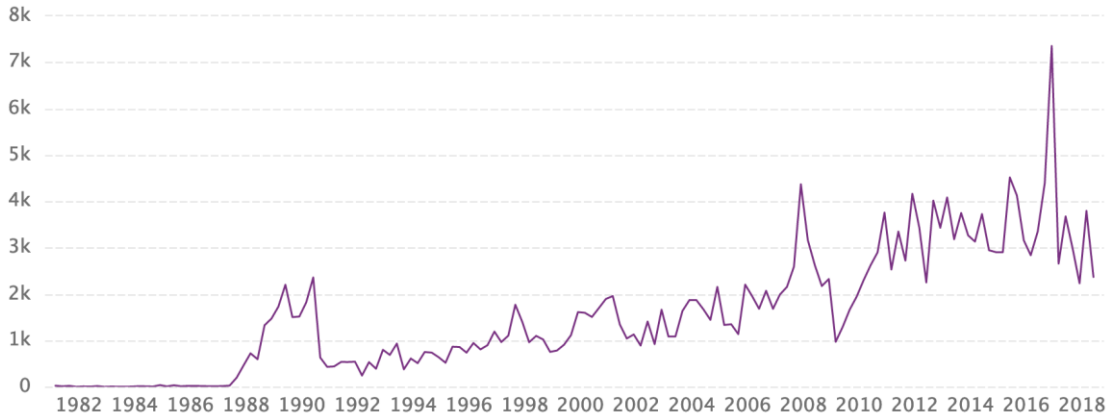

Figure 1: Taiwan outward direct investment (US$ Billion) during 1981 – 2018
(CEIC[4] Data, 2019)

According to the Asian Development Bank's (ADB) forecast, ASEAN, the world's seventh-largest economy with 630 million population and a gross domestic product about 2.4 trillion U.S. dollars, will play the most important role in the economic growth of Asia. ASEAN, which has abundant middle-aged labor force and a vast domestic market, is an attractive investment target for other Asian countries including Taiwan. *Foreign direct investment (*hereafter, FDI) flows in ASEAN has been persistently increasing (Figure 2). Since 1980, Taiwan has successively increased its investment in some countries in the ASEAN and was once the largest foreign investor in the ASEAN. However, this phenomenon was not stayed after the economy of mainland China gradually opened to the world after 1990. The continued development coupled with the relatively low labor wage in China at that time, caused some Taiwanese firms to shift their investments to mainland China, resulting in the reduction of Taiwanese firms' investments in ASEAN. However, with the rise of labor costs and the instability of economic policies in China, investments of Taiwanese firms started to move back to ASEAN for the relatively cheaper labor (production) costs. Consequently, the wind of venture once again turned back to the ASEAN.

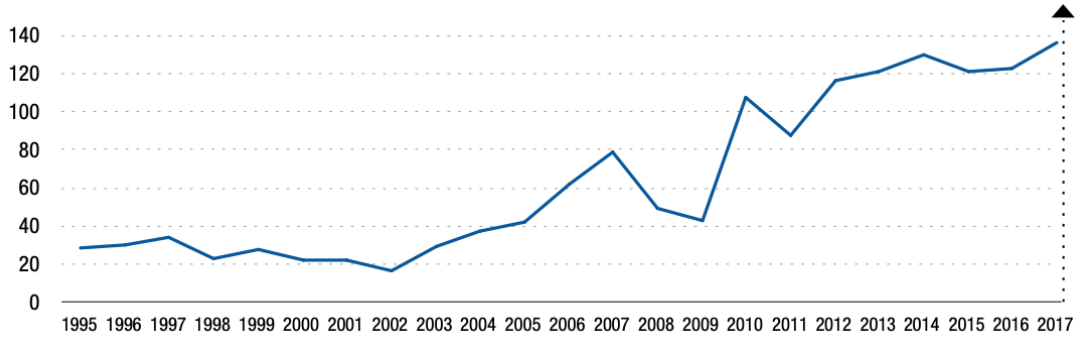

Figure 2: FDI flows in ASEAN (US$ Billion) during 1995 – 2017

(ASEAN Secretariat, 2019)

[4] CEIC is a trusted partner to help navigate the world of macroeconomic data (https://www.ceicdata.com/en).

As shown in Figure 3, the inward FDI to these five countries is a substantial portion of the ASEAN inward FDI. Since 2000, the ASEAN investments by Taiwanese firms are mainly concentrated on five countries from the top five countries including Vietnam, Indonesia, Thailand, Malaysia, and Singapore. Figure 4 also shows that Taiwan FDI in the five countries accounts a large share of Taiwan FDI in ASEAN. According to Taiwan official statistics in 2016, Taiwan is ranked as the third largest source of foreign capital in Thailand, fourth largest in Vietnam and Malaysia, the 15th largest in Indonesia, with a total investments amount of 90.2 billion U.S. dollars in 2016. Furthermore, according to data from the investment office of the Taiwan Ministry of Economic Affairs in 2016, Taiwan investment in Asia accounted for over 70% of Taiwan's global overseas investment, and the investment in Asia mainly focuses on mainland China and the ASEAN, revealing the importance of mainland China and ASEAN to Taiwan's foreign investments.

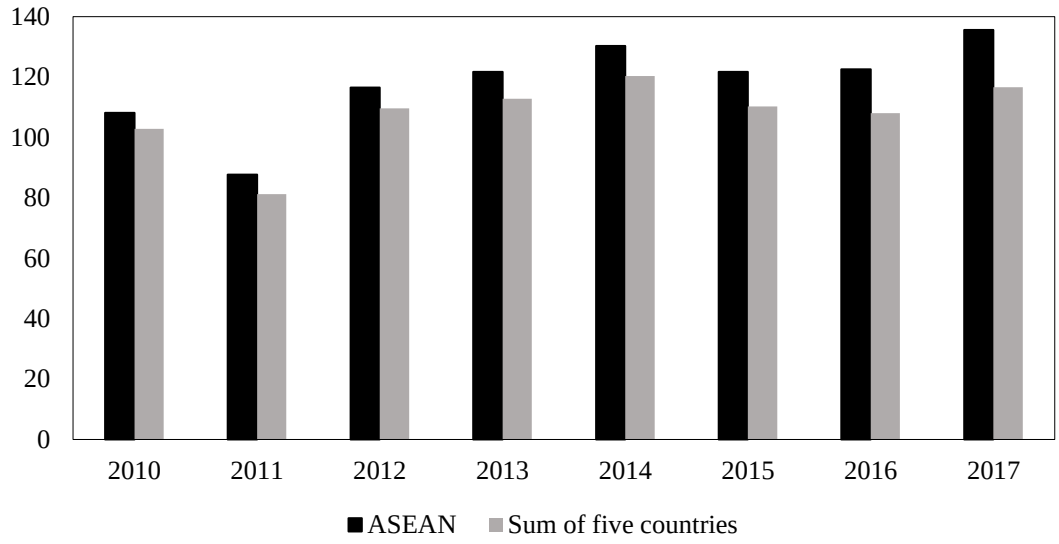

Figure 3: Inward FDI to ASEAN and the five countries, Vietnam, Indonesia, Thailand, Malaysia, and Singapore, ($US billion) during 2010 – 2017

(ASEAN Statistics Division, 2018)

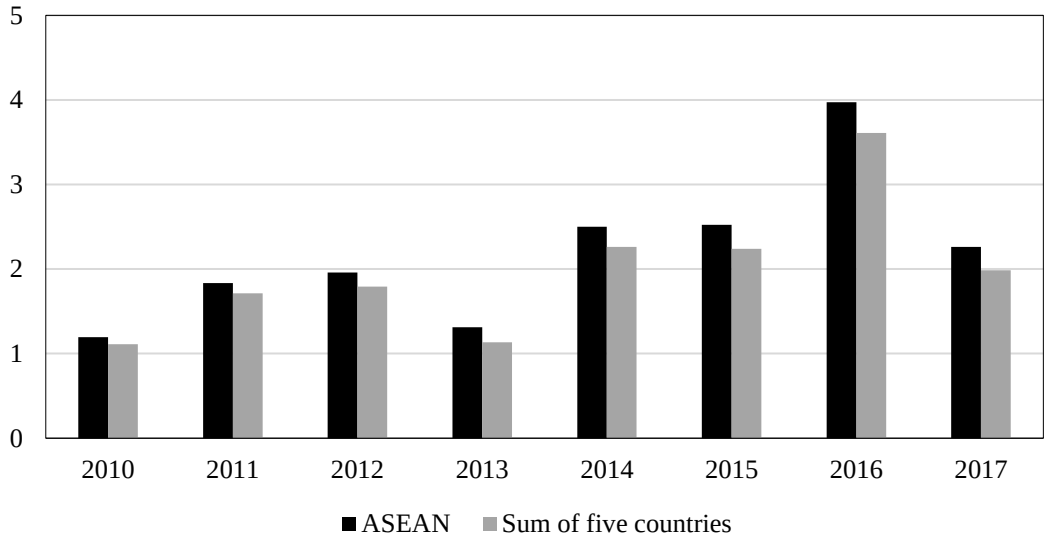

Figure 4: Taiwan FDI flows in ASEAN and the five countries, Vietnam, Indonesia, Thailand, Malaysia, and Singapore, ($US billion) during 2010 – 2017

(ASEAN Statistics Division, 2018)

How do those FDI perform? The literature on the performance of multinational firms has been extensively discussed (refer to Li, 2007). Li (2007) concludes that there are no consistent results of FDI performance. The positive view of FDI is supported by the traditional theory of international investment. This traditional theory develops internalization advantage theory from the point view of trade costs, arguing that firm uses inherent superiority, such as superior production know-how, to avoid imperfection of external markets and to maximize their profits. The benefits of FDI include economies of scale, economies of scope, and the effective leverage of intangible assets and operational flexibility through cross-regional investments (Li, 2007; Kim et al. 1993; Kogut 1985; Kogut and Zander 1993). Internalization advantage theory and Dunning's eclectic theory that cross-border investment will produce positive performance. However, there is also literature arguing that internalization advantage theory has its weaknesses (Li, 2007). Some literature observes the negative relationship between FDI and firm performance (Zaheer 1995; Zaheer and Mosakowski 1997). Those researches argue that FDI exists unfavorable factors, for example, lack of information and cultural awareness of the investing country, exchange rate risks, and different organizational culture, and so on (Zaheer 1995; Zaheer and Mosakowski 1997; Li, 2007).

Because of the inconsistent conclusion in the relationship between FDI and firm performance, this study intends to address the link between firm performance and FDI to ASEAN countries using Taiwanese multinational firms. Besides, cash holding of those multinational firms might be tightened due to outward FDI, whether cash is effectively used by these multinational firms deserves further investigated. This study will also discuss how FDI affects the cash value of Taiwanese firms' investments in ASEAN using the cash value model of Faulkender and Wang (2006).

A growing cash holding in corporate assets has been globally trended. According to Bates, Kahle and Stulz (2009), the average proportion of cash holdings in assets of American firms increased from 10.5% in 1980 to 23.2% in 2006. In emerging markets, the average cash holdings for all listed Taiwanese companies increased from 10.73% in 1991 to 12.34% in 2005. Why do firms hold cash in assets? Amess, Banerji and Lampousis (2015) believe that firms hold cash for two main motives –precautionary purposes and agency problems. Holding cash

can prevent a lack of liquidity for company operations and can reduce the cost of external financing when cash is needed. However, excessive cash holding has an opportunity cost, and one of these costs manifests as agency problems. Excessive cash holdings may motivate managers to abuse cash and spend on poor investment schemes. From above, corporate cash holding is a double-edged sword depending on how managers use cash effectively.

The effective use of cash can generate corporate market value of cash (or cash value). Dittmar and Mahrt-Smith (2007) showed that one dollar of cash can generate up to twice the market value of cash on average when firms use better systems of governance. Firms engaged in foreign investment can convey that the operation of firms may have economies of scale or diversification or just to expand the corporate landscape. As a result, FDI may create the efficient use of cash. This paper accordingly wants to know whether the firm's foreign direct investment will also produce positive cash value. To the authors' knowledge, no literature has discussed the effect of FDI on the cash value, which makes our contribution to the related literature. As mentioned earlier, Taiwan investment in Asia accounted for over 70% of Taiwan's global overseas investment, and the investment in Asia mainly focuses on mainland China and the ASEAN (investment office of the Taiwan Ministry of Economic Affairs in 2016). Accordingly, Taiwanese sampled firms are used to examine the impact of FDI on corporate performance and corporate cash value.

Our empirical results reveal that FDI can explain Taiwanese firm's performance in terms of accounting-based performance better than performance in terms of market-based performance whereas the cash value effect of FDI is not significant.

The remainder of this paper is organized as follows. In addition to the Introduction, the section 2 reviews literature and develops two hypotheses. The section 3 discusses data and variables used in this study and presents our research methodology. The section 4 presents an analysis of empirical results. Finally, conclusions of this study are provided.

2. Literature Review and Hypotheses Development

2.1 Determinants of FDI

A considerable amount of literature explores how firms' corporate governance influence FDI (Lien et al., 2005; Filatotchev et al., 2007; Bhaumik et al., 2010; Buch et al., 2010; Jean et al., 2011; Hu and Cui, 2014). Lien et al. (2005) investigates how governance factors, in a particular of the level of family control, the proportion of domestic and foreign institutional shareholders, and the structure of the Board of Directors, affect the FDI decision. Using data of 228 publicly listed firms in Taiwan, they find that disparate impacts of corporate governance on Taiwanese FDI in China and Taiwanese FDI in the rest of the world. It appears that family control is positively correlated with decisions to invest in China, whereas state and institutional share ownership are positively correlated with FDI in the rest of the world. Their findings, however, reveal inconclusive impacts of the structure of the Board of Director on the FDI decision. Focusing on emerging-market firms, Bhaumik et al. (2010) use Indian firm-level data to study the impact of ownership structure on the decision of undertaking outward FDI. The study finds that family firms and firms with concentrated ownership are less likely to invest abroad, whereas firms with strategic equity holding by foreign investors accelerate outward FDI. Unlike Bhaumik et al. (2010)'s findings, Hu and Cui (2014) find that the levels of domestic institutional investors and foreign corporation ownerships positively influence the outward FDI of emerging economy firms.

In addition to governance, other factors might play an important role in firm's FDI, such as, firm characteristics, location etc. Filatotchev et al. (2007) consider firm-specific, location dummy, and location-specific variables to examine how the ownership structure of the parent company, the affiliate's location within the host economy, and the choice of the mode of entry

affect the decision to engage in FDI. On the equity stake of Taiwanese parent companies in the Chinese affiliates, their study shows the negative impacts of family shareholders and shareholding of domestic financial institutions but the positive impacts of the shareholding of foreign financial institutions and location-specific networks. It, however, appears that the location of the affiliate does have any influence upon the stake taken by the parent company. Furthermore, they investigate if the choice of location is dependent upon the chosen equity stakes by estimating a model of location choice using multinomial logit analysis. They find that location decision is influenced by five groups of variables: regional market size, labor costs, quality of infrastructure, and agglomeration economies.

Unlike others mentioned earlier, Jean et al. (2011) employ managerial ethnic ties that drive the FDI decision to study the effect on FDI location choices and firm performance. Jean et al. (2011) reveal that ethnic relations play an important role in enabling FDI location choice but not in improving firm performance.

Considering firms' decisions not only to undertake FDI but also to export, Buch et al. (2010) find positive effects of size and cash flow on both exports and FDI but negative effects of the fixed asset share. Moreover, they suggest that financial constraints affect the choice of FDI and export position; a firm's leverage is more crucial for FDI than for exports.

2.2 FDI and firm's performance

Numerous studies have attempted to specify the relationship between firms' FDI and performance; yet, findings are contradictory (Li, 2007). Diverse measures of FDI and performance and different specifications and data used could be the reasons (Li, 2007; Yang and Driffield, 2012). Despite indecisive results, several studies assert the positive relationship between firms' FDI and performance.

Firm's performance can be measured by various indicators. To study the effects of FDI on firm's performance, operational indicators such as firm growth and total factor productivity (TFP) (Arnold and Hussinger, 2010; Herzer, 2011; Liu et al., 2015) and accounting-based financial indicators including return on asset (ROA), return on sales (ROS) and earning before interests and taxes (EBIT) (Heyder et al., 2011; Garcia-Fuentes, et al., 2013; Yang et al., 2017) are considered.

Using firm level data of German manufacturing sector from 1996 to 2002, Arnold and Hussinger (2010) test the relationship between TFP and patterns of international trade. Comparing three groups of non-exporting firms with no FDI, exporting firms, and multinational firms, they find that exporting firms outperform firms that produce for the domestic market only and firms with foreign subsidiaries are the most productive among the three groups. Similarly, Herzer (2011) observes that outward FDI has, on average, a positive long-run influence on TFP using a panel sample of 33 developing countries over the period from 1980 to 2005.

Among those considering accounting-based financial indicators, Heyder et al. (2011) incorporate EBIT, ROA, and ROS to investigate a relationship between the internationalization and performance. Their findings suggest a positive effect between the internationalization and performance using a panel data of 21 European cooperatives in the dairy and meat sectors. Garcia-Fuentes, et al. (2013), using a sample of U.S. based multinational agribusinesses, also discover a positive effect of FDI on ROA and ROS, conditional on firm size. Yang et al. (2017) consider not only ROA but also the percentage of surviving subsidiaries to explore how the speed of foreign direct investments (FDI) affects firm performance. They compute the speed of foreign direct as the average number of FDI per year using a panel data set of Japanese firms' FDI from 1986 to 1997. Their study suggests that the relationship between the speed of FDI expansions and firm performance is best explained by an inverse U-shape; implying a positive

impact given a range of speed of FDI.

Doukas and Lang (2003) incorporate cumulative abnormal returns and buy-and-hold abnormal returns to examine the contribution of FDI to shareholder value. Using data of U.S. firms that announced new foreign plants over the period 1980–1992, they find that, regardless of the industrial structure, FDI on the core business of the firm is found to increase shareholder value whereas FDI outside the core business is found to degrade the value. Demos et al. (2004) investigate not only whether FDI enhances returns to investors but also which factors establish the excess market value of the firm. Based on information on Greece firms listed on the Athens Stock Exchange, their results show a positive effect of outward FDI on abnormal returns. López-Duarte and García-Canal (2007) exercise similar research questions to Demos et al. (2004); López-Duarte and García-Canal (2007) focus, in particular, on the entry mode and the interaction between the entry mode and the other FDI's features. Four different entry modes considered in their study consist of Greenfield wholly owned subsidiary, Greenfield joint venture, total acquisition, and partial acquisition. Applying data of FDI accomplished during 1990–2003 by listed Spanish companies whose shares were traded on the Madrid Stock Exchange, the study discovers that Greenfield wholly-owned subsidiaries, total acquisitions, and greenfield joint ventures increase firm's market value. Moreover, responses of the stock market to FDI depend on the interaction between the entry mode and the location of the investment, the character of the investor and the international experience of the firm.

Considering M&As as a component of FDI, Chari et al. (2009) apply abnormal announcement returns associated with M&A transactions to estimate the market-capitalized returns to FDI in emerging markets. Regarding M&A transactions that involve publicly listed developed-market acquirer and emerging-market targets during 1986–2006, their results reveal, on average, a statistically significant 1.16% increases in acquirer returns, conditional on the control of emerging-market destinations. Similarly, Gubbi et al. (2010) examine outward FDI by way of acquisitions using the event study of 425 cross-border acquisitions by Indian firms during 2000–2007. They find that abnormal returns to the shareholders of the acquirer are higher when the host country has a higher level of development. Consistent with studies of Chari et al. (2009) and Gubbi et al. (2010), Barbopoulos et al. (2014)'s study confirms that FDI generates gains to the acquirer's shareholders. They apply the event study methodology on 306 FDI announcements by UK firms in seventy-five emerging markets.

While others use abnormal returns, Berry (2006) uses the ratio of its market value to the replacement cost of its tangible assets to test whether shareholder values differ across the investment location choices of firms. Using panel data of 191 U.S. manufacturing firms during 1981–2000, Berry (2006) asserts that investments in advanced and developing countries create market values differently, depending on experiences and capabilities. Berry (2006, p.1137) also claims "unlike prior studies, this study shows that even at these same higher levels of multinational operations, investments in developing countries can provide a firm with increased market valuation". Accordingly, the following hypothesis is established.

Hypothesis 1 *FDI is expected to have positive influence on firm performance.*

2.3 FDI and cash value

Cash holding of those multinational firms might be tightened due to outward FDI, thus, whether market value of holding cashes can be generated by firms with FDI deserves further exploring. This study therefore discusses how FDI affects the cash value of Taiwanese firms' investments in ASEAN. That is, if cash is reserved for FDI, whether this cash holdings create higher value deserves further examining.

Faulkender and Wang (2006) argue that the value (to the equity holder) of one additional dollar

of cash reserves should differ regarding how firms use their cash. They hypothesize that the value of cash is decreasing with the level of the firm's cash holdings, leverage, and financial limitation. Using the sample of US publicly traded firms during 1972 – 2001, their results reveal that the marginal value of the cash would increase with decreasing cash holdings and leverage. The marginal value of cash for firms having more difficulty retrieving capital is higher than that for firms having less limitation. Moreover, stock repurchase appears to have better marginal value of cash than do dividend payment. In line with Faulkender and Wang (2006), Dittmar and Mahrt-Smith (2007) examine how corporate governance impacts cash value. They regress the excess stock return on firm characteristics to analyze how corporate governance influences firm values. They incorporate governance as a binary dummy: one for the lowest tercile of the entrenchment indices and the highest tercile of institutional ownership, and zero for the highest tercile of the entrenchment indices and the lower tercile of block ownership. Dittmar and Mahrt-Smith (2007) hypothesize that the use of cash holdings in poorly and well-governed firms should create cash values differently and their study suggests that improving the use of cash holdings would increase firm values, and governance influences operating- and investment-decisions more than financing decisions related to cash policy. Based on findings on Faulkender and Wang (2006) and Dittmar and Mahrt-Smith (2007), it is hypothesized in this study that if a firm uses cash to engage FDI, its cash value should be increased, resulting in the increase of the firm's excess stock return. The following studies appear to verify the claim.

To validate a positive effect of FDI on cash value, Chen and Chang (2013) investigate the indirect effects of FDI on firms' performance; they test whether the Asian crisis impacted firms' liquidity and value in emerging markets from 1990 – 2006. Chen and Chang (2013) examine the indirect effects of the crisis on firms' cash holding through the channels of growth opportunities, profitability, and investment demand. They observe that, during the Asian financial crisis, firms in the majority of Asian markets held more cash for the sake of more significant growth opportunities and higher investment demands after the crisis. Their finding also indicates that cash could boost firms' value. Chang and Noorbakhsh (2006) demonstrate how FDI affect corporate cash holding. They find that in G-7 countries FDI and cash holdings are substitutes whereas in non-G-7 countries they are complements. Note that Chang and Noorbakhsh (2006) incorporate FDI inflows. Accordingly, the following hypothesis is established.

Hypothesis 2 *FDI is expected to create a positive cash value.*

3. Variable definitions[5] and Research methodology

Panel regression and Quantile regression are applied to examine FDI performance and FDI's cash value by sample of the publicly listed Taiwanese FDI[6] firms with 3,341 sample observations during 2013 to 2017. In line with Faulkender and Wang (2006) and Dittmar and Mahrt-Smith (2007), cash value model is constructed in equation (1). Financial data is collected from Taiwan Economic Journal (TEJ) and FDI information is collected from Market Observation Post system in TWSE (Taiwan Stock Exchange) (http://mops.twse.com.tw).

$$\begin{aligned} r_{i,t} - M_t = {} & \beta_0 + \beta_1 \Delta C_{i,t} + \beta_2 \Delta E_{i,t} + \beta_3 \Delta NA_{i,t} + \beta_4 \Delta RD_{i,t} + \beta_5 \Delta I_{i,t} + \beta_6 \Delta D_{i,t} + \beta_7 C_{i,t-1} \\ & + \beta_8 LEV_{i,t} + \beta_9 NF_{i,t} + \beta_{10} FDI_{i,t} + \beta_{11} \Delta C_{i,t} \times C_{i,t-1} + \beta_{12} \Delta C_{it} \times LEV_{it} \\ & + \beta_{13} \Delta C_{i,t} \times FDI_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

[5] Variable definitions are provided in the appendix.

[6] The study focuses on Taiwanese firms' outward FDI to Thailand, Malaysia, Singapore, Vietnam and Indonesia, Philippine.

Variable definitions are listed in Appendix.

According to Faulkender and Wang (2006) and Dittmar and Mahrt-Smith (2007), firm values are measured by excess stock returns defined as difference between the FDI firm's stock returns(r_{it}) and market returns (M_t); market return is measured by returns of Taiwan stock market index. Other proxies for firm values including accounting performance of return on assets (ROA), return on equity (ROE), and Tobin Q are also considered in this study. The major hypothesis is to test whether outward FDI has a positive impact on Taiwanese firms' performance (expected positive coefficient of β_{10}) for Hypothesis 1and firms' value through hoarding cashes (expected positive coefficient of β_{13}) for Hypothesis 2. Moreover, the different impacts across host countries are discussed. The sample countries are distributed as shown in Table 1.

Table 1: FDI country distribution

Country	Freq.	Percent
Thailand	559	16.73
Malaysia	663	19.84
Philippine	205	6.14
Vietnam	643	19.25
Singapore	940	28.14
Indonesia	331	9.9
Total	3,341	100

4. Discussion of Empirical Results

4.1 Summary statistics

As shown in Table 2, the average excess return (*r-M*) in research sample is 7.837% with large deviation among sample, and the average FDI is USD 1.607 billion with FDI gain (*fdigain*) of USD 63.331million on average. The cash holdings take 28.3% to total assets (*C*) on average in multinational Taiwanese firms which is much higher than the average ratio of cash holding in global, Henk Von Eije (2012) evidenced average cash holdings of 26 countries from 2001 to 2009 to be 12.7%. Other descriptive statistics could refer to Table 2. The correlation matrix across each variable could refer to Appendix 2.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
r-M	7.837	41.866	-54.579	206.012
ROA	3.786	8.587	-36.550	24.660
ROE	6.254	14.963	-61.040	44.990
Tobin Q	1.172	1.273	0.020	38.070
⊿C	-0.003	0.116	-0.457	0.366
FDI	1,607,478	5,130,515	-80,090	40,000,000
fdigain	63,331	295,642	-494,130	2,211,625
⊿E	0.012	0.114	-0.358	0.565
⊿NA	0.082	0.362	-0.944	1.974
⊿RD	0.001	0.009	-0.041	0.036
⊿I	0.000	0.005	-0.030	0.020
⊿D	0.003	0.024	-0.053	0.092
C	0.283	0.313	0.007	2.146
LEV	0.455	0.262	0.036	1.000
NF	0.037	0.132	-0.296	0.618
Please refer to Appendix 1 for variable definitions.				

4.2 Empirical results

This study mainly focuses on examining the impact of FDI on firm performance (Hypothesis 1) and cash values (Hypothesis 2). The empirical results are presented in two sections –full sample results and country results.

4.2.1 Full sample results

Full sample results are shown in Table 3 to Table 6 which include both OLS and Quantile analysis across different percentile groups as comparisons, namely, Q90, Q75, Q25 and Q10. As shown in Table 3, OLS model in FDI with significantly negative coefficient under 10% significance level tells that the higher outward FDI at these Taiwanese firms will generate negative stock returns on average. Due to higher factor productivity of these FDI firms, it is hypothesized the positive sign of FDI on Stock performance as expected by Herzer (2011). However, results reveal negative relationship between them; it might be due to the higher risk-taking from FDI perceived by investors resulting in negative stock performance by higher FDI. Looking at other sample percentile groups in Table 3, no significant results are supported. Even though insignificant effect of FDI on stock performance is evidenced, the accounting-based financial indicators, ROA and ROE are further examined, and results are shown in Table 4 and Table 5.

The findings in Table 4 and Table 5 show significantly positive effects of FDI on ROA and on ROE regardless of OLS full sample or any percentile subsamples. Hypothesis 1 is significantly confirmed by ROA and ROE, consistent with Heyder et al. (2011), Garcia-Fuentes, et al. (2013) and Yang et al. (2017). Whether this positive result also holds when considering Tobin Q as a measure of firm value, it is further tested, and results are shown in Table 6. Interestedly, it is

found significantly different results in subsamples of Q75 and Q25, i.e. negative influence of FDI at Q75 sample and positive influence of FDI at Q25 sample. This implies that more FDI generates negative values at higher firm value sample, such as 75^{th} percentile groups (Q75) while it creates positive values at lower firm value sample, such as, 25^{th} percentile groups (Q25). When firm FDI gain is measured as dependent variable, Table 7 indicates that FDI has positive effect on FDI gains at relatively high FDI gain subsample, not at the relatively low FDI gain subsample while it creates negative effect at low 10 percentile groups. This infers that Hypothesis 1 is supported, especially on the accounting-base performance measures.

Table 3: Performance measure with *r-M* (full FDI sample)

r-M	Q90	Q75	OLS	Q25	Q10
intercept	84.271	36.231	23.988	-9.104	-21.884
	0.000***	0.000***	0.000***	0.000***	0.000***
△C	142.779	150.362	104.446	27.494	5.084
	0.001***	0.000***	0.000***	0.186	0.783
FDI	-5.81E-09	2.54E-08	-1.21E-07	-1.76E-08	4.90E-08
	0.962	0.673	0.098*	0.695	0.348
△E	78.142	65.314	65.360	42.389	39.724
	0.000***	0.000***	0.000***	0.000***	0.000***
△NA	15.445	19.727	22.218	15.547	13.300
	0.000***	0.000***	0.000***	0.000***	0.000***
△RD	396.963	263.765	276.160	215.858	216.758
	0.024**	0.001***	0.000***	0.000***	0.001***
△I	-1,041.381	-1,020.643	-718.790	-271.752	-218.818
	0.000***	0.000***	0.000***	0.005***	0.029**
△D	777.292	479.124	549.718	322.425	325.433
	0.000***	0.000***	0.000***	0.000***	0.000***
C_{t-1}	-10.148	-5.842	-5.418	-5.473	-7.042
	0.001***	0.021**	0.000***	0.005***	0.000***
LEV	-91.809	-48.662	-49.257	-14.318	-5.857
	0.000***	0.000***	0.000***	0.000***	0.006***
NF	44.329	5.344	15.708	-4.307	-12.986
	0.000***	0.380	0.001***	0.248	0.007***
$\triangle C*C_{t-1}$	-74.866	-60.258	-30.092	0.000	28.424
	0.206	0.027**	0.074*	1.000	0.154
△C*LEV	-223.067	-215.747	-174.786	-50.460	-11.770
	0.000***	0.000***	0.000***	0.093*	0.650
△C*FDI	2.39E-08	-1.04E-07	-9.20E-07	-9.44E-07	-1.95E-06
	0.985	0.877	0.361	0.154	0.006***
R^2	0.251	0.184	0.303	0.137	0.137

Note: Q90, Q75, Q25 and Q10 are the sample with *r-M* in 90th percentile, 75th percentile, 25th percentile and 10th percentile. Other variable definitions could refer to Appendix 1. Statistical significance of each coefficient is determined by p-value with *, **, and *** for the 10%, 5% and 1% levels of significance.

Table 4: Performance measure with *ROA* (full sample)

ROA	Q90	Q75	OLS	Q25	Q10
intercept	16.892	13.369	8.480	5.956	0.176
	0.000***	0.000***	0.000***	0.000***	0.833
△C	20.258	21.503	24.606	15.321	24.260
	0.000***	0.000***	0.000***	0.000***	0.000***
FDI	4.56E-08	5.39E-08	9.70E-08	9.51E-08	1.53E-07
	0.006***	0.000***	0.000***	0.000***	0.000***
△E	10.366	9.300	12.741	11.137	9.095
	0.000***	0.000***	0.000***	0.000***	0.000***
△NA	2.190	2.502	5.822	4.205	5.326
	0.000***	0.000***	0.000***	0.000***	0.000***
△RD	33.459	57.233	89.186	72.873	115.558
	0.01***	0.000***	0.000***	0.000***	0.000***
△I	21.187	11.405	-32.722	10.378	-68.713
	0.094*	0.137	0.088*	0.798	0.098*
△D	31.175	27.652	27.535	23.127	31.364
	0.000***	0.000***	0.000***	0.000***	0.000***
C_{t-1}	0.173	-0.234	-1.934	-2.037	-4.318
	0.732	0.428	0.000***	0.000***	0.001***
LEV	-20.165	-16.528	-11.744	-9.919	-5.726
	0.000***	0.000***	0.000***	0.000***	0.000***
NF	0.872	-0.646	-7.058	-4.210	-8.391
	0.270	0.099*	0.000***	0.000***	0.000***
$△C*C_{t-1}$	0.178	-2.465	3.707	14.939	31.468
	0.916	0.115	0.321	0.045**	0.006***
△C*LEV	-25.364	-29.071	-33.226	-21.815	-34.122
	0.000***	0.000***	0.000***	0.000***	0.001***
△C*FDI	9.97E-08	1.18E-07	2.83E-07	-1.45E-07	2.38E-07
	0.516	0.199	0.252	0.545	0.542
R^2	0.377	0.308	0.288	0.135	0.165

Note: Q90, Q75, Q25 and Q10 are the sample with r-M in 90th percentile, 75th percentile, 25th percentile and 10th percentile. Other variable definitions could refer to Appendix. Statistical significance of each coefficient is determined by p-value with *, **, and *** for the 10%, 5% and 1% levels of significance.

Table 5: Performance measure with *ROE* (full sample)

ROE	Q90	Q75	OLS	Q25	Q10
intercept	24.268	19.906	13.011	8.820	2.441
	0.000***	0.000***	0.000***	0.000***	0.067*
△C	36.741	41.261	39.591	25.012	32.710
	0.000***	0.000***	0.000***	0.000***	0.006***
FDI	9.25E-08	9.74E-08	1.87E-07	2.01E-07	3.07E-07
	0.036**	0.001***	0.000***	0.000***	0.000***
△E	31.449	24.819	25.689	27.296	18.744
	0.000***	0.000***	0.000***	0.000***	0.000***
△NA	5.507	7.153	10.766	8.869	12.239
	0.000***	0.000***	0.000***	0.000***	0.000***
△RD	130.584	125.599	189.741	153.257	223.106
	0.000***	0.000***	0.000***	0.000***	0.000***
△I	-37.676	46.219	-73.008	19.905	-166.564
	0.460	0.023**	0.078*	0.725	0.059*
△D	100.256	50.016	60.272	34.138	49.431
	0.000***	0.000***	0.000***	0.000***	0.000***
C_{t-1}	0.508	-0.672	-2.424	-2.924	-5.713
	0.239	0.490	0.000***	0.000***	0.001***
LEV	-21.408	-20.592	-18.395	-16.508	-19.398
	0.000***	0.000***	0.000***	0.000***	0.000***
NF	-6.532	-6.178	-13.113	-10.228	-19.956
	0.000***	0.000***	0.000***	0.000***	0.000***
$\triangle C*C_{t-1}$	-3.457	-8.102	4.733	19.172	62.005
	0.139	0.121	0.440	0.103	0.002***
△C*LEV	-36.509	-45.156	-44.650	-31.645	-43.365
	0.000***	0.000***	0.000***	0.001***	0.003***
△C*FDI	2.74E-07	2.13E-07	2.45E-07	-3.78E-07	-1.35E-07
	0.247	0.507	0.598	0.319	0.855
R^2	0.273	0.206	0.303	0.143	0.188

Note: Q90, Q75, Q25 and Q10 are the sample with r-M in 90th percentile, 75th percentile, 25th percentile and 10th percentile. Other variable definitions could refer to Appendix. Statistical significance of each coefficient is determined by p-value with *, **, and *** for the 10%, 5% and 1% levels of significance.

Table 6: Performance measure with *Tobin Q* (full sample)

Q	Q90	Q75	OLS	Q25	Q10
intercept	2.975	2.089	2.073	1.283	1.047
	0.000***	0.000***	0.000***	0.000***	0.000***
△C	1.031	0.872	0.685	0.155	0.181
	0.229	0.042**	0.012**	0.195	0.241
FDI	-1.16E-09	-8.52E-10	1.22E-09	2.55E-09	3.51E-10
	0.300	0.079*	0.153	0.002***	0.629
△E	0.117	0.295	0.293	0.194	0.183
	0.016**	0.000***	0.000***	0.001***	0.002***
△NA	0.047	0.029	0.126	-0.002	-0.012
	0.015**	0.095*	0.000***	0.837	0.208
△RD	-3.998	3.070	2.715	3.043	2.399
	0.052*	0.000***	0.006***	0.000***	0.000***
△I	-0.440	2.597	3.588	1.735	3.597
	0.494	0.001***	0.002***	0.055*	0.002***
△D	0.217	0.064	0.154	0.012	-0.388
	0.626	0.835	0.615	0.952	0.145
C_{t-1}	0.279	0.182	0.181	0.034	0.035
	0.001***	0.003***	0.000***	0.394	0.217
LEV	-3.103	-2.160	-2.518	-1.280	-1.029
	0.000***	0.000***	0.000***	0.000***	0.000***
NF	0.430	0.579	0.623	0.465	0.374
	0.000***	0.000***	0.000***	0.000***	0.000***
△C*C_{t-1}	0.793	0.185	0.704	0.355	0.192
	0.019**	0.574	0.002***	0.026**	0.259
△C*LEV	-1.316	-1.285	-1.486	-0.460	-0.340
	0.193	0.015**	0.000***	0.014**	0.059*
△C*FDI	-2.44E-09	-1.86E-09	1.60E-09	-6.08E-09	2.63E-09
	0.874	0.800	0.829	0.179	0.606
R^2	0.387	0.341	0.477	0.241	0.263

Note: Q90, Q75, Q25 and Q10 are the sample with r-M in 90th percentile, 75th percentile, 25th percentile and 10th percentile. Other variable definition could refer to Appendix. Statistical significance of each coefficient is determined by p-value with *, **, and *** for the 10%, 5% and 1% levels of significance.

Regarding the cash value created by FDI in terms of the interaction terms between change of cash holdings △C and FDI, results are shown from Table 3 to Table 6. All results indicate no significant cash value from FDI regardless of any measure of performance and any sample except for excess stock return at Q10 sample (Table 3). The negative significance of Q10 sample implies that investors give a lower evaluation of the cash for FDI at firms with lower

stock return. This infers that there is no significant evidences supporting Hypothesis 2. Despite that, cash management across different host countries are further analyzed, that is, the cash value of FDI to different Southeast Asia countries are considered. Results by country sample are shown in next section.

Table 7: Performance measure with FDI gain (full sample)

FDI gain	Q90	Q75	OLS	Q25	Q10
intercept	32,110.670	6,455.290	55,447.200	-1,004.329	-5,851.451
	0.000***	0.000***	0.000***	0.048**	0.101
△C	55,534.960	8,982.093	359,729.700	3,110.606	58,686.160
	0.275	0.171	0.003***	0.590	0.085*
FDI	0.105	0.056	0.034	0.000	-0.012
	0.000***	0.000***	0.000***	0.249	0.000***
△E	7,426.667	2,683.721	-10,972.430	-1,091.674	-6,165.152
	0.357	0.107	0.644	0.787	0.723
△NA	3,775.862	1,085.806	38,926.710	762.155	19,265.340
	0.054*	0.038**	0.000***	0.267	0.002***
△RD	196,857.000	43,221.160	1,140,482.000	38,370.430	132,213.300
	0.088*	0.028**	0.000***	0.085*	0.348
△I	-38,125.250	-15,118.000	360,509.000	150,557.400	590,352.900
	0.732	0.613	0.529	0.007***	0.301
△D	57,708.280	16,487.840	-398,453.100	15,912.310	-16,037.550
	0.236	0.167	0.023**	0.091*	0.798
C_{t-1}	1438.318	-550.983	-4562.484	-387.533	677.088
	0.799	0.221	0.491	0.382	0.368
LEV	-38,793.780	-9,406.523	-127,426.900	-3,723.478	-45,527.300
	0.000***	0.000***	0.000***	0.013**	0.000***
NF	-5,009.937	-101.607	-38,360.100	-2,463.218	-53,405.890
	0.444	0.945	0.124	0.282	0.007***
$\triangle C*C_{t-1}$	1,2209.870	951.888	-224,710.700	-2,759.325	-1,070.862
	0.772	0.858	0.272	0.624	0.972
△C*LEV	-66,532.530	-10,972.610	-422,366.100	1,958.065	-78,317.160
	0.209	0.212	0.003***	0.839	0.149
△C*FDI	0.021	-0.003	-0.011	0.000	0.013
	0.828	0.880	0.670	0.900	0.393
R^2	0.574	0.381	0.374	0.001	0.035

Note: Q90, Q75, Q25 and Q10 are the sample with r-M in 90th percentile, 75th percentile, 25th percentile and 10th percentile. Other variable definitions could refer to Appendix. Statistical significance of each coefficient is determined by p-value with *, **, and *** for the 10%, 5% and 1% levels of significance.

4.2.2 Results by country

In this section, Taiwanese firm's FDI to six countries in ASEAN (Thailand, Malaysia, Philippines, Vietnam, Singapore, and Indonesia) that accounts for most FDI of Taiwanese firms in Southeast countries are examined. Results are shown in Table 8. From Table 8, it appears that FDI has inconsistently impact on firm's performances, depending upon the host countries. Looking at the market performance measured by excess stock returns (r-M), FDI has generally negative influence on market returns, especially in Philippine, Vietnam and Indonesia. In consideration of accounting performance measured by ROA, results show that FDI has significantly positive effect on firms' performance in Malaysia, Philippine and Vietnam. Regarding to Tobin Q, FDI has significantly positive influence on firm value in Thailand and Malaysia while it has negative effect on firm value in Indonesia. Above results indicate that FDI, as expected, does positively contribute to Taiwanese multinational firm's accounting performance rather than to market performance with negative effects. The negative influence of FDI on stock market performance may come from investor's concern about firm's risk-taking of outward investments, especially in less developed countries, such as, Philippine, Vietnam and Indonesia.

As to the cash value of FDI measured by the interaction of $\triangle C$ and FDI , the results generally doesn't provide strong evidence to support Hypothesis 2, that FDI could positively create value of cash holding. However, it reveals that Taiwanese firm's FDI to Malaysia will result in consistently and significantly negative cash value regardless of performance measure in excess market returns, ROA or firm value (Tobin Q). When performance is measured by ROA, FDI creates negative cash value in Philippine and Indonesia. In general, certain empirical results tell that more foreign investments with cash cannot create better firm's performance, and even hurts firm's performance. This result implies Taiwanese firms need to concern the effective use of cash reserves for FDI to Southeast countries, and empirical results can provide reference for Taiwanese companies or government authorities when formulating South-Oriented Investment policies.

Considering that FDI's effects may differ at various levels of firm performance, this study also attempts to take a further Quantile analysis by different percentile groups of performance, namely, 90^{th} percentile (Q90), 75^{th} percentile (Q75), 25^{th} percentile (Q25) and 10^{th} percentile (Q10). Empirical results are shown in Table 9 (for performance measured by FDI gains) and in Table 10 (for performance measured by ROA)[7]. As shown in both tables, Quantile regression analysis to each country is applied to test whether FDI could create firm performances and cash values or not, moreover, the equality of FDI coefficients between two groups as comparisons, Q75 vs Q25 and Q90 vs. Q10 is also statistically tested. As shown in Table 9, FDI has consistently positive impacts on firm performance regardless of any six countries, and also create positive cash values in Thailand and Indonesia. The former results again support Hypothesis 1 that FDI could generate positive effects on multinational firms. However, whether FDI creates cash values still could not reach consistent conclusions across countries. Regarding to the high- and low-performance sample firm comparison, Table 9 indicates that FDI effects on FDI gains presents consistently and statistically different at Q75 and Q25 under 5% significance level for all six countries, and, similar results exist by comparing Q90 and Q10 groups except for Philippine. Higher gains from FDI can be created by higher performance sample firms than by lower performance sample firms. However, this result is not verified by performance measured by accounting performance ROA (shown in Table 10). All pairwise

[7] Other measures of performance are also tried, results are omitted due to space limitation.

hypotheses tests of FDI coefficients on ROA across Q75 vs Q25 and Q90 vs. Q10 turn out no significances with *p*-values greater than 5%, meaning that FDI has no significantly different impacts on performance at high-ROA and low-ROA firms.

5. Conclusion

The growing international trade and increasing level of firm cash holdings motivate this research to investigate how outward FDI creates firm performance and value of cash holdings. Prior research provides inconsistent conclusion in the relationship between FDI and firm performance, and, so far, value of cash holding for those FDI firms has never been discussed yet. This study accordingly addresses the link between firm performance and FDI to ASEAN countries using Taiwanese multinational firms during 2000 to 2017. Quantile regression analysis is also adopted to examine the issue by comparing different percentile performance groups. In full sample, FDI has significantly positive effect on accounting performance (ROA and ROE) regardless of full sample or any percentile sample (Q90, Q75, Q25 and Q10), which results are consistent with Heyder et al. (2011), Garcia-Fuentes, et al. (2013) and Yang et al. (2017). Country sample results also indicate that FDI, as expected, does positively contribute to Taiwanese multinational firm's accounting performance. As such, the hypothesis 1 is generally confirmed. However, when performance is measured by stock market performance, it turns out with negative effects. The negative influence of FDI on stock market performance may come from investor's concern about firm's risk-taking of outward investments, especially in less developed countries, such as, Philippine, Vietnam and Indonesia. Regarding value of cash holdings of those multinational FDI firms, no consistent results have been evidenced that FDI will positively affect the performance through cash holdings as expected in Hypothesis 2. Few results even present negative cash value from FDI, such as, in Malaysia.

Finding from this study could provide useful information to multinational firms on how to efficiently use internal cash to create better performances and higher cash values when investing in ASEAN countries, and also provide an important reference to government policy makers in formulating outward FDI policy.

Table 8: Performance measure of r-M, ROA, Tobin Q (country sample)

r-M	Thailand	Malaysia	Philippines	Vietnam	Singapore	Indonesia
△C	130.357	289.226	451.021	82.084	14.630	0.477
	0.043**	0.001***	0.000***	0.195	0.748	0.994
FDI	-9.25E-07	1.07E-07	-5.82E-06	-1.89E-06	3.31E-08	-7.22E-06
	0.158	0.805	0.044**	0.000***	0.811	0.000***
$\triangle C*C_{t-1}$	-65.567	-261.208	-559.140	-41.767	-4.624	144.996
	0.447	0.002***	0.005***	0.610	0.811	0.000***
△C*LEV	-215.043	-368.342	-527.134	-168.581	-87.852	-83.551
	0.021**	0.001***	0.000***	0.06*	0.182	0.348
△C*FDI	-8.36E-06	-6.94E-06	4.20E-05	3.35E-06	1.02E-06	2.97E-05
	0.623	0.009***	0.540	0.562	0.509	0.546
R^2	0.291	0.341	0.411	0.365	0.397	0.257
ROA	**Thailand**	**Malaysia**	**Philippines**	**Vietnam**	**Singapore**	**Indonesia**
△C	34.020	42.578	34.847	44.421	19.848	49.559
	0.005***	0.003***	0.118	0.000***	0.001***	0.000***
FDI	1.16E-07	1.17E-07	2.23E-06	3.29E-07	-3.57E-09	-4.68E-07
	0.278	0.000***	0.000***	0.001***	0.895	0.285
$\triangle C*C_{t-1}$	22.491	6.136	60.755	12.035	-4.452	4.903
	0.143	0.610	0.125	0.471	0.294	0.525
△C*LEV	-54.363	-59.151	-55.094	-62.178	-21.493	-62.114
	0.001***	0.002***	0.077*	0.000***	0.014**	0.001***
△C*FDI	1.41E-06	-5.29E-07	-1.84E-05	-5.86E-07	6.52E-07	-2.66E-05
	0.553	0.025**	0.051*	0.853	0.105	0.004***
R^2	0.515	0.342	0.681	0.498	0.344	0.497
Tobin Q	**Thailand**	**Malaysia**	**Philippines**	**Vietnam**	**Singapore**	**Indonesia**
△C	-1.176	-1.050	1.010	1.475	0.803	0.433
	0.178	0.201	0.653	0.086*	0.109	0.626
FDI	1.23E-08	1.31E-08	3.91E-08	2.18E-08	-1.23E-09	-4.15E-08
	0.063*	0.000***	0.242	0.106	0.390	0.089*
$\triangle C*C_{t-1}$	3.745	1.476	-1.634	-1.146	-0.399	-1.392
	0.006***	0.015**	0.678	0.206	0.175	0.174
△C*LEV	0.738	1.256	-1.556	-2.042	-1.333	-0.935
	0.546	0.258	0.540	0.114	0.055*	0.459
△C*FDI	9.02E-08	-4.05E-08	4.86E-08	7.80E-09	1.93E-10	-1.65E-07
	0.497	0.016**	0.953	0.943	0.985	0.839
R^2	0.523	0.545	0.612	0.461	0.486	0.591

Table 9: Performance measured by FDI gain with Quantile (country sample)

FDI gain	Q90	Q75	OLS	Q25	Q10
Thailand					
△C	-60,754.470	-6,369.405	273,048.800	-7,777.830	-36,353.040
	0.629	0.905	0.046**	0.810	0.676
FDI	0.113	0.068	0.034	0.001	0.000
	0.000***	0.000***	0.000***	0.757	0.997
△C*C_{t-1}	-71,995.470	-33,505.770	-318,922.800	10,746.350	17,464.630
	0.644	0.643	0.032**	0.791	0.891
△C*LEV	88,095.790	-14,516.980	-413,359.900	-12,377.020	28,880.380
	0.623	0.882	0.066*	0.836	0.857
△C*FDI	0.297	0.167	0.208	0.015	-0.006
	0.09*	0.304	0.023**	0.719	0.962
R^2	0.5756	0.3496	0.3537	0.0087	0.025
$H_{0:}$ FDI_{Q25} = FDI_{Q75} vs. $H_{1:}$ FDI_{Q25} ≠ FDI_{Q75} P-VALUE = 0.0000***					
H_0: FDI_{Q10} = FDI_{Q90} vs. H_1: FDI_{Q10} ≠ FDI_{Q90} P-VALUE = 0.0000***					
Malaysia					
△C	-11,951.060	-1,533.087	473,853.500	10,113.480	222,090.900
	0.934	0.974	0.022**	0.761	0.043**
FDI	0.107	0.080	0.051	0.000	-0.006
	0.000***	0.000***	0.000***	0.989	0.699
△C*C_{t-1}	30,614.450	3,923.513	-194,340.400	12,083.340	-85,472.870
	0.884	0.953	0.162	0.575	0.126
△C*LEV	169,899.900	23,946.850	-468,941.100	10,467.330	-314,203.800
	0.454	0.799	0.141	0.870	0.113
△C*FDI	-0.241	-0.120	-0.153	-0.057	-0.025
	0.001***	0.217	0.094*	0.193	0.741
R^2	0.701	0.405	0.484	0.024	0.108
$H_{0:}$ FDI_{Q25} = FDI_{Q75} vs. $H_{1:}$ FDI_{Q25} ≠ FDI_{Q75} P-VALUE = 0.0000***					
H_0: FDI_{Q10} = FDI_{Q90} vs. H_1: FDI_{Q10} ≠ DI_{Q90} P-VALUE = 0.0000***					
Philippines					
△C	-184,213.300	-148,305.800	224,238.800	20,493.380	53,012.380
	0.197	0.056*	0.441	0.869	0.866
FDI	0.036	0.026	0.016	0.002	0.008
	0.000***	0.031**	0.011**	0.733	0.706
△C*Ct-1	371,129.200	231,724.300	-420,719.100	-165,027.500	-421,509.700
	0.094*	0.087*	0.369	0.470	0.444

△C*LEV	242,489.800	156,937.200	-322,932.600	-50,729.560	-124,130.000
	0.236	0.072*	0.386	0.728	0.792
△C*FDI	-0.179	-0.023	-0.120	-0.230	-0.203
	0.341	0.874	0.448	0.209	0.532
R^2	0.422	0.124	0.203	0.059	0.202
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.0282 **					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.2026					
Vietnam					
△C	-18,818.270	24,741.580	680,718.400	65,150.000	246,337.200
	0.892	0.810	0.008***	0.431	0.275
FDI	0.209	0.091	0.067	0.005	0.000
	0.000***	0.000***	0.000***	0.385	0.993
$\triangle C*C_{t-1}$	93,441.190	23,420.640	-516,028.100	-65,663.810	79,109.180
	0.675	0.861	0.143	0.591	0.742
△C*LEV	41,291.040	-54,118.140	-863,604.000	-68,689.350	-360,844.600
	0.809	0.706	0.017**	0.531	0.262
△C*FDI	0.044	-0.002	0.003	0.036	0.104
	0.863	0.994	0.946	0.655	0.648
R^2	0.570	0.370	0.393	0.017	0.051
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.0000***					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.0000***					
Singapore					
△C	389,585.500	48,190.830	818,069.700	20,115.350	64,769.520
	0.092*	0.798	0.006***	0.401	0.682
FDI	0.087	0.055	0.032	0.000	-0.012
	0.000***	0.000***	0.000***	0.990	0.000***
△C*Ct-1	-791,138.900	-126,876.200	-957,683.600	-28,630.730	-132,012.000
	0.294	0.787	0.068*	0.397	0.408
△C*LEV	-326,192.100	-35,444.550	-834,865.800	-25,642.510	4,957.647
	0.120	0.816	0.03**	0.566	0.986
△C*FDI	-0.004	-0.004	0.014	0.010	0.022
	0.976	0.945	0.717	0.728	0.230
R^2	0.560	0.382	0.361	0.003	0.136
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.0000***					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.0000***					

Indonesia					
△C	19,584.760	79,274.300	20,884.190	32,578.350	-30,969.380
	0.813	0.161	0.782	0.626	0.740
FDI	0.137	0.074	0.038	0.003	-0.048
	0.000***	0.002***	0.007***	0.779	0.103
$\triangle C*C_{t-1}$	-13,335.110	-119,638.500	40,182.250	16,967.430	73,624.170
	0.914	0.137	0.621	0.801	0.590
△C*LEV	-55,844.360	-131,210.600	-214,412.300	-111,076.800	-38,942.890
	0.685	0.180	0.145	0.330	0.809
△C*FDI	0.392	0.402	0.325	0.093	0.227
	0.026**	0.003***	0.093*	0.640	0.265
R^2	0.533	0.274	0.390	0.041	0.133
$H_{0:}\ FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}\ FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.0055***					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.0000***					
Note: Statistical significance of each coefficient is determined by p-value with *, **, and *** for the 10%, 5% and 1% levels of significance.					

Table 10: Performance measured by ROA with Quantile (country sample)

ROA	Q90	Q75	OLS	Q25	Q10
Thailand					
△C	100.669	24.478	56.274	72.779	65.445
	0.015**	0.476	0.006***	0.013**	0.137
FDI	2.86E-07	9.42E-08	1.55E-07	1.85E-07	-3.31E-07
	0.434	0.746	0.529	0.660	0.651
$\triangle C*C_{t-1}$	-46.918	59.885	48.358	55.499	128.177
	0.393	0.200	0.07*	0.398	0.1*
△C*LEV	-116.247	-30.771	-81.739	-125.061	-122.480
	0.034**	0.493	0.004***	0.003***	0.031**
△C*FDI	-5.25E-06	-3.98E-06	2.90E-06	1.03E-05	6.47E-06
	0.454	0.575	0.585	0.178	0.693
R2	0.328	0.266	0.524	0.302	0.377
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.8477					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.4161					
Malaysia					
△C	9.546	33.897	79.415	67.583	151.428
	0.797	0.362	0.001***	0.077*	0.000***
FDI	5.68E-07	6.21E-07	4.45E-07	2.87E-07	3.93E-07
	0.000***	0.000***	0.000***	0.105	0.146
$\triangle C*C_{t-1}$	39.241	12.472	2.603	10.277	-24.5***
	0.121	0.676	0.895	0.789	0.708
△C*LEV	-17.666	-52.357	-105.729	-96.532	-214.516
	0.719	0.250	0.001***	0.05**	0.000***
△C*FDI	-2.86E-06	-2.90E-06	-1.94E-06	-4.71E-07	-1.63E-06
	0.03**	0.006***	0.003***	0.734	0.565
R^2	0.309	0.2482	0.3442	0.1657	0.2312
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.1031					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.5138					
Philippines					
△C	131.116	83.618	14.669	-121.622	-85.593
	0.103	0.157	0.718	0.038**	0.140
FDI	3.14E-06	4.45E-06	2.48E-06	2.44E-06	2.82E-06
	0.237	0.071*	0.012**	0.129	0.026**
△C*Ct-1	-61.6***	50.332	195.049	499.551	385.609
	0.612	0.668	0.01***	0.000***	0.000***
△C*LEV	-157.339	-113.507	-34.440	127.903	91.675

	0.149	0.194	0.524	0.083*	0.207
△C*FDI	1.42E-06	-5.30E-05	-2.20E-05	-4.50E-05	-5.10E-05
	0.978	0.214	0.281	0.180	0.116
R^2	0.4988	0.3272	0.5939	0.3873	0.5846
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.4440					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.9066					
Vietnam					
△C	8.581	31.999	59.593	39.157	55.093
	0.776	0.175	0.001***	0.083*	0.156
FDI	1.14E-06	2.44E-07	5.84E-07	4.79E-07	6.44E-07
	0.003***	0.619	0.001***	0.021**	0.016**
$△C*C_{t-1}$	11.800	0.837	25.649	22.828	106.584
	0.815	0.982	0.443	0.684	0.211
△C*LEV	4.398	-27.717	-74.466	-53.846	-85.398
	0.903	0.353	0.002***	0.095*	0.13
△C*FDI	3.82E-06	4.40E-06	2.83E-06	3.71E-06	4.86E-06
	0.57	0.255	0.186	0.421	0.501
R^2	0.390	0.305	0.454	0.220	0.280
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.646					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.2522					
Singapore					
△C	41.064	37.299	34.324	33.539	37.966
	0.007***	0.003***	0.006***	0.059*	0.315
FDI	-1.67E-07	-3.44E-08	-2.57E-08	5.66E-08	-3.80E-08
	0.000***	0.345	0.631	0.517	0.828
$△C*C_{t-1}$	2.029	-1.968	-9.874	-8.185	4.508
	0.874	0.828	0.214	0.689	0.882
△C*LEV	-49.250	-48.394	-31.524	-29.492	-39.337
	0.018**	0.011**	0.087*	0.238	0.450
△C*FDI	-7.61E-07	-3.88E-07	1.04E-06	3.91E-07	2.11E-06
	0.150	0.399	0.186	0.722	0.015**
R^2	0.262	0.191	0.364	0.201	0.252
$H_{0:}$ $FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}$ $FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.3331					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.4987					
Indonesia					
△C	-22.902	55.604	79.655	62.984	104.424
	0.643	0.024**	0.001***	0.093*	0.012**

FDI	5.24E-07	-4.74E-07	-7.35E-07	8.73E-07	1.05E-06
	0.596	0.414	0.269	0.563	0.533
△C*Ct-1	-18.905	-12.882	1.615	-17.115	45.994
	0.507	0.427	0.907	0.656	0.367
△C*LEV	3.737	-71.700	-87.703	-76.197	-105.814
	0.956	0.055*	0.045**	0.149	0.083*
△C*FDI	5.77E-05	-1.30E-05	-6.80E-05	-4.90E-05	-1.40E-04
	0.168	0.385	0.001***	0.245	0.005***
R^2	0.442	0.349	0.487	0.247	0.372
$H_{0:}\ FDI_{Q25} = FDI_{Q75}$ vs. $H_{1:}\ FDI_{Q25} \neq FDI_{Q75}$ P-VALUE = 0.3754					
H_0: $FDI_{Q10} = FDI_{Q90}$ vs. H_1: $FDI_{Q10} \neq FDI_{Q90}$ P-VALUE = 0.7861					
Note: Statistical significance of each coefficient is determined by p-value with *, **, and *** for the 10%, 5% and 1% levels of significance.					

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Appendix 1: Variable definitions

Variable name	Definition
Dependent variable	
r-M	Rate of stock return(r) = ln(closing price at end period)- ln(closing price at initial period) Market return(M) = ln(market index at end period)- ln(market index at initial period)
ROA	Firm's return on assets = Net income after taxes and interest divided by total assets
ROE	Firm's return on equity = Net income after taxes and interest divided by total equity
FDIgain	Investment gain of FDI at year t, measured in thousands of US dollar
Tobin Q	Market value to book value of equity
Hypothesized variables	
$\triangle C$	Change of cash holdings from t-1 to t, measured by cashes and cash equivalents divided by market value of equity at t-1
FDI	Foreign direct investments= FDI amounts measured in thousands of US dollar
$\triangle C*FDI$	Interaction terms of $\triangle C$ and FDI
Control variables	
C_{t-1}	Cash holdings at t-1
$\triangle E$	Change of Net income before taxes and interests divided by market value of equity at t-1
$\triangle NA$	Change of net assets (total assets minus cashes) divided by market value of equity at t-1
$\triangle RD$	Change of expenses at research and developments divided by market value of equity at t-1
$\triangle I$	Change of Interest expenses divided by market value of equity at t-1
$\triangle D$	Change of cash dividends divided by market value of equity at t-1
NF	Net financing of new equities and new debts= (Net New Equity Issues + Net New Debt Issues) divided by market value of equity at t-1
LEV	Total Debt divided by Total assets
$\triangle C*C_{t-1}$	Interaction term between $\triangle C$ and C_{t-1}
$\triangle C*FDI$	Interaction term between $\triangle C$ and FDI
$\triangle C*LEV$	Interaction term between $\triangle C$ and LEV

Appendix 2: Pearson Correlation matrix

	r-M	***ROA***	***ROE***	***Tobin Q***	***⊿C***	***FDI***	***fdigain***	***⊿E***	***⊿NA***	***⊿RD***
r-M	1.000									
ROA	0.274	1.000								
	0.000									
ROE	0.285	0.952	1.000							
	0.000	0.000								
Tobin Q	0.279	0.021	0.032	1.000						
	0.000	0.087	0.008							
⊿C	0.103	0.218	0.230	0.040	1.000					
	0.000	0.000	0.000	0.002						
FDI	-0.012	0.063	0.073	-0.043	-0.002	1.000				
	0.367	0.000	0.000	0.000	0.875					
fdigain	0.032	0.145	0.146	0.032	0.023	0.604	1.000			
	0.012	0.000	0.000	0.009	0.077	0.000				
⊿E	0.346	0.284	0.317	0.024	0.162	0.017	0.003	1.000		
	0.000	0.000	0.000	0.064	0.000	0.180	0.788			
⊿NA	0.168	0.199	0.228	-0.091	0.024	0.047	0.049	0.129	1.000	
	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.000		
⊿RD	0.089	0.173	0.187	0.045	0.099	0.035	0.059	0.003	0.121	1.000
	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.823	0.000	

Appendix 2: Pearson Correlation matrix (continued)

	r-M	***ROA***	***ROE***	***Tobin Q***	***ΔC***	***FDI***	***fdigain***	***ΔE***	***ΔNA***	***ΔRD***	***ΔI***	***ΔD***	***Ct-1***	***LEV***	***NF***
ΔI	-0.075	-0.003	0.007	-0.017	0.118	0.019	0.019	-0.070	0.305	0.046	1.000				
	0.000	0.802	0.564	0.177	0.000	0.135	0.142	0.000	0.000	0.000					
ΔD	0.434	0.251	0.275	0.053	0.164	0.037	0.012	0.433	0.143	0.045	-0.010	1.000			
	0.000	0.000	0.000	0.000	0.000	0.004	0.347	0.000	0.000	0.000	0.455				
Ct-1	0.004	-0.075	-0.059	0.322	-0.196	-0.028	0.011	-0.066	-0.047	-0.027	-0.034	-0.072	1.000		
	0.787	0.000	0.000	0.000	0.000	0.028	0.407	0.000	0.000	0.042	0.011	0.000			
LEV	-0.200	-0.161	-0.110	-0.334	-0.028	0.035	-0.021	0.032	0.266	-0.019	0.099	-0.035	-0.260	1.000	
	0.000	0.000	0.000	0.000	0.026	0.003	0.079	0.012	0.000	0.143	0.000	0.006	0.000		
NF	0.057	-0.095	-0.096	0.008	0.076	-0.035	-0.030	0.033	0.209	-0.003	0.135	0.004	-0.072	0.152	1.000
	0.000	0.000	0.000	0.550	0.000	0.006	0.018	0.009	0.000	0.798	0.000	0.738	0.000	0.000	

Note: The second number at each correlation coefficient is the p-value. Please refer to appendix 1 for each variable definition.