Why do Sovereign Wealth Funds Invest in Asia?*

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Abstract

Purpose – This paper aims to examine the determinants of SWFs' investment in Asian countries and to identify consistent investment patterns of SWFs in specific target firms from Asia, particularly China and South Korea.

Design/methodology – This study extends the Tobin's Q model to examine the relationship between SWF investments in target firms and their returns with other firm-level control variables. We collect consistent data on SWF investments and the matched firm-level data on target firms, which of observation is 1,512 firms (333 in South Korea and 1,179 in China) targeted by 20 SWF sources during 1997–2017. The panel random effect model is used to estimate the extended Tobin's Q model. The robustness of the estimations is tested by the simultaneous equation models and the panel GEE model.

Findings – The evidence shows that sovereign wealth funds are more inclined to invest in the financial sector with a monopoly position and in large firms with higher growth opportunity and superior cash asset ratios in China. In contrast to their investments in China, sovereign wealth funds in South Korea prefer to invest in strategic sectors, such as energy and information technology, and in large firms with high performance and low leverage. Sovereign wealth funds' investments tend to significantly improve the target firm's performance measured by sales growth and returns in both Korea and China.

Originality/value – The existing literature focuses on examining the determination of SWFs investment in the developed countries, such as Europe and the United States. Our paper contributes to the literature in three ways; first, we analyzes case studies of SWF investments in Asian markets, which are less developed and riskier. Second, we examine whether the determination of SWF investment in Asian target firms depends on the different time periods, on types of sources of SWFs, and on acquiring countries. Third, our research uses vast sample data on target firms in longer time periods (1997-2017) than other previous studies on the SWFs for Asian markets.

Keywords: Asian Target Firms, Financial Sector, Sovereign Wealth Funds, Strategic Sector
JEL Classifications: F23, G10

1. Introduction

The investment share of sovereign wealth funds (SWFs) among global financial markets has increased significantly since the global liberalization of capital markets in the late 1990s, attracting the interest of academics and policymakers. According to the Sovereign Wealth Fund Institute (2017), SWFs' total assets have reached US$8.01 trillion, nearly double the amount during the 2008 global financial crisis. Indeed, the SWFs have become major institutional investors in global financial markets. SWF assets are 2.7 times those of hedge

funds and 1.7 times those of private equity funds (TheCity UK, 2017). More than 80% of SWFs is owned and managed by the Middle East and Asia. SWF investments are believed to have a significant impact on the financial markets and economic development of target countries. Total SWF investments were $964.83 billion, of which $69.41 billion was invested in Asia. China among Asia accounts for 7.2% of total investments and is next to the United Kingdom and the United States (Sovereign Wealth Fund Institute, 2017).

Literature on SWF investments analyzed their historical aspects and determinants of their fund sizes (e.g., Johnson, 2007; Kern, 2007; Griffith-Jones et al., 2008). The empirical results found that SWF assets mainly come from excess foreign exchange reserves in Asian countries. Foreign exchange reserves and trade balances affect the size and accumulation of SWFs. Meanwhile, Schonberg (2008) and Aizenman and Glick (2009) showed that an increase in international energy prices is an important factor that affects the size of the SWF assets from commodity exports by the Middle East countries. Aizenman and Glick (2009) also document that the size of SWFs tends to be larger in countries which have good governance but weak democratic institutions.

However, only a few studies focused on SWFs' international investments and their drivers. First, these studies analyzed the determinants of SWF investments in a perspective of the economic and political conditions of target countries. For instance, Megginson et al. (2013), Ciarlone and Miceli (2016), Debarsy et al. (2017), and Amar et al. (2019) show that target countries, which have greater transparency, higher economic development, better investor protection, more developed capital markets, and sharing a similar culture with acquirer countries, attract more SWF investments from abroad. Candelon et al. (2011) found that exchange rate stability is the main determinant when the target country is Europe or the United States. Other studies on the determinants of SWF investments focused on the roles of cultural factors (e.g., Chhaochharia and Laeven, 2009; Boubakri et al., 2011) and bilateral political relations between target and acquirer countries (e.g., Knill et al., 2012). Zhang and Kim (2019) found that the relationship between return, risk and SWF investment depends on the spatial spillover effects of cultural factors.

The impact of SWFs on international financial markets is examined by Kunzel et al. (2011), Sun and Hesse (2011), Fernandes (2011), and Bahgat (2010). They find that SWFs play a positive role in stabilizing international financial markets, whereas Johnson (2007), Kern (2007), Beck and Fidora (2008), and In et al. (2013) show that SWFs increase volatility of target financial markets. Researches focusing on the determinants of SWF investments in target firms instead of target countries are very limited due to availability of the matched firm-level data associated with SWF investments. Boubakri et al. (2011), Bortolotti et al. (2015), Kotter and Lel (2011), and Fernandes (2014) find that SWFs prefer to acquire stakes in large sized target firms that have liquidity constraints, and financially distressed. SWFs also prefer less innovative, and closely located to acquirers. (e.g., Ferreira and Matos, 2008; Bortolotti et al., 2015; Boubakri et al., 2016). Gangi et al. (2019) find that pension funds and SWFs select high-performing firms. Avendano (2010) shows that SWF investments positively affect firm value and profitability, while Bortolotti et al. (2010), Bortolotti et al. (2015), and Aguilera et al. (2016) hold the opposite view.[1] This existing literature generally reveals inconsistent empirical results on the determinants of SWF investments in a target firm-level perspective. This inconsistency may arise from non-transparent and ambiguous governance and management of SWFs.

In general, target countries and target firms invested by SWFs are mostly concentrated in the United States and Europe, even though most SWFs are owned and managed by the

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[1] Kotter and Lel (2011) and Jory et al. (2010) showed that SWF investments do not affect the target firm.

Middle East and Asia. Few studies provided case studies of SWF investments in Asian markets which are less developed and riskier than the developed markets. To fulfill the gaps between the literature and stylized facts of SWFs investment, this study aims to examine the determinants of SWFs' investment in Asian countries and to identify consistent patterns of SWFs in specific target firms from Asia. This study extends the Tobin's Q model to examine the relationship between SWF investments in target firms and their returns with other control variables—firm size, leverage, intangible assets ratio, cash asset ratio, growth, capital control, and sector dummy variables. We collect consistent data on SWF investments and the matched firm-level data from China and Korea. The matched firm-level data have 1,512 firms (333 in Korea and 1,179 in China) targeted by 20 SWF sources during 1997–2017. The panel random effect models are used to estimate the extended Tobin's Q model. The robustness of the estimations is tested by the simultaneous equation models and the panel GEE model.

Our paper contributes to the literature in three ways; first, we analyze case studies of SWF investments in Asian markets, which are less explained in literature. Second, we examine whether the determination of SWF investment in Asian target firms depends on the different time periods, on source types of SWF, and on acquiring countries. Third, our research uses greater sample data of firms and longer periods (1997-2017) than other previous studies on the SWFs. The evidence shows that SWFs are more inclined to invest in China's financial sectors with a monopoly position and in large firms with higher performance. In contrast to the SWFs' investment patterns in China, SWFs in Korea prefer to invest in strategic sectors, such as energy and information technology, and large firms with high performance and low leverage. SWF investments in China and South Korea tend to significantly improve target firms' performance in terms of sale growth and returns.

The remainder of this paper is structured as follows. Section 2 explains the stylized patterns of SWFs in Asia. Section 3 describes the sample data and hypothetical frameworks of SWFs investment. The evidence is presented in Section 4. Section 5 provides the robustness test results for our hypothetical frameworks. Concluding remarks and policy implications are given in the final section.

2. Sovereign Wealth Funds' Investment Strategy in Asia

SWFs have become a recent major force in global financial markets. Commodity SWFs, mostly located in the Middle East, are a type of SWF that is predominantly funded from oil and gas resource exports. Non-commodity SWFs in Asian countries are funds built from these countries' excess foreign exchange reserves through trade surpluses. SWFs have some major different characteristics from other institutional investors such as private hedge funds or equity funds. The latter ones are owned by a group of public or private shareholders and generally engage in highly leveraged transactions, while SWFs are foreign government entities and use little leverage. SWFs are larger sizes and in general more opaque in their management than private institutional funds. SWFs also differ from the public mutual and pension funds, since the SWFs represent foreign government assets with no specific liabilities to be paid back to shareholders (Kotter and Lel, 2008). SWFs invest in various ways, such as direct investors of FDI, and indirect investors of derivatives, bonds, listed and unlisted equities, real estate, and other financial instruments. SWF investment seeks higher risk and higher returns than those related to government pension and saving funds.

SWFs were critically affected by the 2008 global financial crisis and the 2011 European debt crisis and, since then, increased their investments in Asian countries. Asian financial markets are growing rapidly and are expected to have relatively high returns and high risks. SWF

investments, in particular, have benefitted from the rapid economic growth of Asian economies, such as China and Korea. This section explains the secular trends and strategies of SWF cross-border investments in China and South Korea.

2.1. Stylized Pattern of Sovereign Wealth Funds' Investment in Korea

Table 1 provides the amounts and case numbers of SWF investments in Korea by a category of acquiring country. SWF investments in Korea reach to total $6.90 billion, of which $2.08 billion came from Norway's SWFs, $2.03 billion from Singapore, and $1.29 billion from the United Arab Emirates. Korea's SWF investments in the home country are relatively small amount of $40 million. The most cases of Korean firms invested by SWFs are 195 by Norway, followed by Netherlands and Canada. However, the average amount per a case of SWF investment is relatively modest for the developed countries, compared with these average amounts for Asian or Middle East countries. For instance, the average amounts per a case of SWF investment are $10.6 million for Norway, $11.1 million for Netherlands, and $2.7 million for Canada, although its average amounts get $107 million for Singapore and $144.7 million for UAE. This means that the average amounts per a case of SWF investment by Asian and Middle East countries are 10 times greater than these averages of SWF investment by the developed countries. The SWFs of the developed countries tend to invest in smaller firms than do SWFs of Asian countries. 57.25% out of the total SWF investments in Korea come from commodity funds, while 42.75% from non-commodity funds.

Table 1. SWF Investments in Korea (Unit: million US Dollar)

Panel A: SWF investments in Korea by acquiring country				Panel B: Sectoral distribution of SWF investments in Korea			
Country	Amount	%	case #	Sector	Amount	%	case #
Norway	2082.8	30.2	195	Real Estate	1792.0	26.0	11
Singapore	2033.5	29.5	19	Energy	1327.8	19.2	14
UAE	1294.4	18.8	9	Consumer Discretionary	923.0	13.4	70
Netherlands	779.0	11.3	70	Information Technology	769.0	11.1	42
Azerbaijan	447.0	6.5	1	Industrials	721.5	10.5	62
Saudi Arabia	126.7	1.8	1	Financials	419.2	6.1	52
Canada	95.1	1.4	35	Healthcare	406.7	5.9	20
Korea	39.8	0.6	2	Materials	263.6	3.8	31
United States	2.6	0.0	1	Consumer Staples	165.4	2.4	18
Total	6900.9	100	333	Telecommunications	49.7	0.7	7
				Telecom Services	24.5	0.4	1
				Utilities	20.4	0.3	4
				N/A	18.0	0.3	1
				Total	6900.9	100	333

Panel C: Difference between amounts of SWF investment - Univariate analysis		
SWF from developed countries	SWF from Asia	*t*-statistics
15.547	18.093	-5.967***

**Notes**: 1. Panel C are the natural logarithm of SWF investments.
  2. ***$p<0.001$.
Source: Sovereign Wealth Fund Transaction Database (2017).

Using the *t*-test of mean difference, we test whether there is a difference between the average amounts of the SWF investment by developed and Asian countries. The results are provided in Panel C of Table 1, showing that the mean of SWF investments in Korea is significantly different between developed and Asian acquiring countries.

Panel B of Table 1 presents the sectoral distribution of SWF investments in Korea. The SWF investments in Korea seem to be mainly distributed in strategic sectors, and their investments account for approximately 70% of total investments. According to the Korea company information database, Korea has an average return of 8.30% for strategic sectors, but an average return of 8.07% in other sectors. The difference in sectoral returns on Korea's target firms is provided in Fig. 1.

Fig. 1. Return on Korean Strategic Sectors from 2000 to 2017
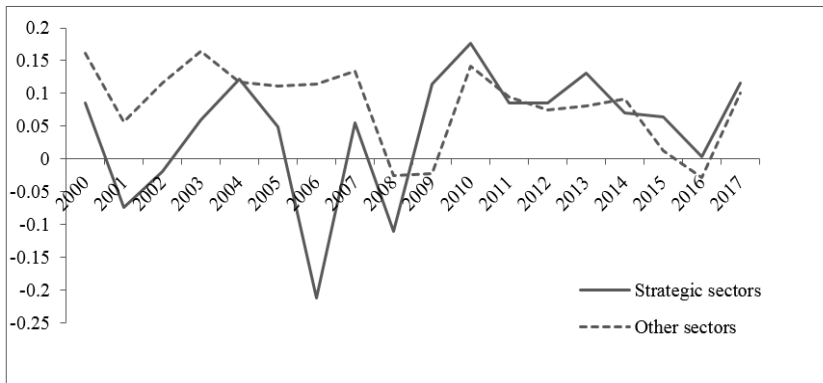
Note: Strategic sectors include energy and information technology sectors.
Source: South Korea company information database.

Returns of strategic sectors seem to be modest and 0.23% higher than these of other sectors in Korea—in sharp contrast to higher returns in the Chinese financial sector with a monopoly position. This finding implies that the SWF investments in Korean strategic sectors likely tend to maximize not current return but, rather, future expected returns of the strategic sectors, considering future technological innovation. The five firms receiving the most investments from SWFs in Korea are Hyundai Oil Bank Co Ltd, Star Tower, Pine Avenue Tower A, Seoul Finance Centre, and Celltrion Inc. (a pharmaceutical company). These investments mainly come from SWFs of Singapore Investment Corporation, the International Petroleum Investment Company, and the State Oil Fund of Azerbaijan. According to the Sovereign Wealth Fund Institute (2017), SWF investments in these five firms were more than $3.4 billion or 48.9% of total investments. Table A in Appendix lists the major target firms of SWF investments in Korea.

2.2. Stylized Pattern of Sovereign Wealth Fund's Investment in China

Table 2 provides secular patterns of SWF investments in China. Global SWFs invested $69.41 billion in China, second only to the United Kingdom and the United States. Singapore's SWF has the largest investments in China, which is $25.86 billion or 37.3% of total investments in China, followed by Qatar, Norway, and Kuwait. In addition, China's SWFs invested $25.65 billion in its own home country, which is 37.0% of total investments.

More than half of the SWF investments in China are from other Asian countries, and mainly come from non-commodity funds. The most cases of Chinese firms invested by SWFs are 609 by China itself, and 281 by Norway, followed by Singapore. However, the average amount per a case of SWF investment is relatively modest for the developed countries, compared with these average amounts for Asian or Middle East countries. For instance, the average amounts per a case of SWF investment are $18.8 million for Norway and $31.3 million for Netherlands, while it is $149.4 million for Singapore, and $2,066 million for Qatar.

Using the t-test of mean difference, we test whether there is a difference between the averages of the SWF investment by the developed vs. Asian countries. The results of t-test are provided in Panel C of Table 2, showing that the mean of SWF investments in China is significantly different between developed and Asian acquiring countries.

Table 2. SWF Investments in China (Unit: billions of U.S. Dollars)

Panel A: SWF investments in China by Acquiring country				Panel B: Sectoral distribution of SWF investments in China			
Country	Amount	%	Case#	Sector	Amount	%	Case#
Singapore	25.86	37.3	173	Financials	48.3	69.2	135
China	25.65	37.0	609	Industrials	4.94	7.1	285
Qatar	6.20	8.9	3	Real Estate	4.63	6.7	47
Norway	5.30	7.6	281	Energy	2.29	3.3	79
Kuwait	2.92	4.2	3	Materials	2.02	2.9	154
Netherlands	1.68	2.4	54	Consumer Discretionary	1.59	2.3	135
Canada	0.67	1.0	27	Information Technology	1.55	2.2	108
UAE	0.67	1.0	23	Consumer Staples	1.48	2.1	90
Malaysia	0.45	0.6	3	Healthcare	1.38	2.0	81
Oman	0.01	0.0	3	Utilities	1.08	1.6	48
Total	69.41	100	1179	Infrastructure	0.28	0.4	3
				Media and Entertainment	0.05	0.1	2
				Telecommunications	0.04	0.1	8
				Telecom. Services	0.03	0.0	2
				N/A	0.02	0.0	2
				Total	69.41	100	1179

Panel C: Difference between amounts of SWF investment - Univariate analysis		
SWF from developed countries	**SWF from Asia**	***t*-statistics**
15.637	16.053	-3.235***

Notes: 1. Panel C are the natural logarithm of SWF investments.
2. ***$p<0.001$.
Source: Sovereign Wealth Fund Transaction Database (2017).

China's financial sector is the most favored for SWF investments, and its investment is amount of $48.03 billion or 69.2% of total investments. Most of China's financial institutions are large, state-owned enterprises and, thus, represent a highly monopolized sector protected by the state. The next favored sectors in China are industrials, real estate, and energy.

The China Construction Bank, Agricultural Bank of China, and China Export Credit Insurance Corporation are the top three firms receiving major investment from SWFs. These three firms have $31.19 billion or 45.0% of total investments. Table B in Appendix lists the

target firms of SWF investments in China. The SWFs investments are mainly from Singapore's Temasek Holdings, APG Asset Management, China Investment Corporation, Kuwait Investment Authority, and Qatar Investment Authority. Interestingly, Singapore's SWFs have invested more than other SWFs in Korea and China both. SWFs from Norway and the Netherlands as well as the UAE, Qatar and Kuwait are also major investors in Korea and China. In contrast to Korea, SWF investments in China are mainly concentrated in the financial sectors because of the Chinese government's regulations on foreign ownership (less than 50%). The Chinese banking industry is highly monopolized, giving a higher yield than that of other sectors. China has attracted significant cross-border capital inflows, and saw fast improvements in the financial markets. Fig. 2 shows that the return (11.1%) on equity of China's financial sector is always higher than that (8.9%) of the non-financial sectors.

Fig. 2. Return on Equity of China's Financial Sector from 2000 to 2017
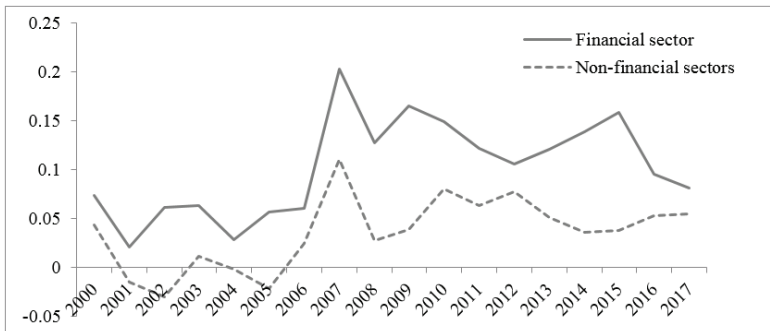
Source: China CSMAR Financial and Economic Databases.

3. Hypothetical Frameworks and Data

3.1. Hypothetical Frameworks

In this paper, we employ a variant of the Tobin's Q model of investment to analyze the determinants of SWFs' investments in Asian target firms. The Q-theory of investment was proposed by Tobin (1969) and Mills et al. (1994). The basic Tobin's average Q model is built up in (1) to examine the relationship between the SWF investments of a specific firm i and its firm value.

$$I_{it} = \beta_0 + \beta_1 Q_{it} + \mu_{it} \qquad (1)$$

where I_{it} represents SWF investments in target firm i in period t and Tobin's Q represents firm's value. β_0, β_1, and μ are the shift parameter, slope, and error term, respectively. We use the existing hypothesis of literature on SWFs to extend the Tobin Q model to consider alternative determinants of SWF investments - firm size, leverage, intangible assets ratio, cash asset ratio, growth, capital control, and sector dummy variables (e.g., Kotter and Lel, 2011; Bortolotti et al., 2015; Boubakri et al., 2016; Megginson et al., 2016; Gangi et al., 2019).

The extended Q model in equation (2) examines the hypothetical frameworks for the determination of SWF investments in Korean and Chinese target firms.

$$I_{it} = \beta_0 + \beta_1 Q_{it} + \beta_2 SE + \beta_3 FS_{it} + \beta_4 LV_{it} + \beta_5 IA_{it} + \beta_6 CA_{it} + \beta_7 PE_{it} + \beta_8 CC_t + \mu \qquad (2)$$

where I_{it} represents SWF investments in target firm i. SE is a sector dummy, which is set to 1 for the financial sector in China and 0 otherwise; in Korea, the sector dummy equals 1 if the target sector is a strategic one - energy, information technology, consumer discretionary, and 0 otherwise. FS, LV, and IA represent firm size, leverage (financial distress), and intangible assets ratio, whereas CA, PE, and CC represent cash asset ratio, firm performance, and capital control, respectively. We use ROA and ROE as two proxies for firm value, Q. The hypothetical frameworks in equation (2) are as follows.

First, a firm size is an important factor in determining international SWF investments in Asia. Larger firms have better financial conditions and more comprehensive management systems and tend to have greater access to resources and opportunities, which can help enhance their productivity. Ferreira and Matos (2008) argue that institutional investors have a strong preference for large firms' stocks. This argument is consistent with the findings of Gompers and Metrick (2001) on the U.S. market and Dahlquist and Robertsson (2001) on the Swedish market. Aggarwal et al. (2005), Bradshaw et al. (2004), Ferreira and Matos (2008), and Lee et al. (2018) also point out that institutional investors attempt to minimize transaction costs and information asymmetry by focusing on large sized firms (e.g., Bortolotti et al., 2010; Fernandes, 2014; Kotter and Lel, 2011; Grira et al., 2018; Gangi et al, 2019).

Second, SWFs aim to diversify their revenue and to seek long-term returns and high growth opportunities. Firms' growth opportunity is a potential driver of SWF investments (e.g., Grira et al., 2018; Gangi et al., 2019).

Third, most institutional investors tend to invest in profitable firms with a historical record of positive returns and low leverage (e.g., Dahlquist and Robertson, 2001; Covrig et al., 2006; Ferreira and Matos, 2008). However, during an economic depression in 2008, they invested in firms that perform poorly and are experiencing financial distress (Fernandes, 2014). During periods of economic prosperity, SWFs tend to invest in profitable firms with strong operating performance and low leverage (Bernstein et al., 2013). Therefore, firm profitability and operating performance are also important factors of SWF investments. Fourth, leverage and cash constraints have a significant impact on SWFs' selection of target firms. Descriptive statistics of firm-level variables are provided in Table 3.

Deviating from the hypothetical framework in (2), we may examine the determination of target firm's performance (PE) as an alternative hypothesis to the determinants of SWFs investment. The SWFs investment would affect the target firm's performance (PE) as its future expected value in Asia. The equation (3) is built up to estimate the determination of the target firms' performance as a function of the SWFs investment and other control variables.

$$PE_i = \beta_0 + \beta_1 I_i + \beta_2 FS_i + \beta_3 LV_i + \beta_4 IA_i + \beta_5 CA_i + \mu_i \qquad (3)$$

where PE is firm performance, measured by one-year sale growth or ROE; the other control variables are the same as previously defined. FS, LV, IA, and CA represent firm size, leverage (financial distress), intangible assets ratio, and cash asset ratio, respectively.

3.2. Sample data

Existing studies use a dummy variable for a proxy of SWF investment, which being 1 for SWF investment and 0 otherwise (e.g., Kotter and Lel, 2011; Bortolotti et al., 2015; Boubakri et al., 2016; Gangi et al., 2019). However, we use the amounts of SWF investment in target firm as a dependent variable. A sample data compose of 1,512 firms (333 in Korea and 1,179 in China) targeted by 20 SWFs sources during 1997–2017 to test our hypothetical frameworks

in equations (2) and (3). Our hypotheses are tested in two ways; 1) the firm-specific determinants of SWFs' investments and 2) the impact of SWFs' investments on firms performance. The data on SWF cross-border investments are obtained from the Sovereign Wealth Fund Transaction Database, and the financial data on Chinese and Korean target firms are from the China CSMAR Financial and Economic Databases and the Korea company information database, respectively.

We take the natural logarithm of total assets as a proxy for firm size (*FS*). We adopt total debt divided by total assets as a proxy for a firm's risk of financial distress (leverage, *LV*) and the ratio of cash assets to total assets (*CA*) as a measure of a firm's cash constraints. The ratio of intangible assets to assets (*IA*) is included in our analysis as a proxy for the intensity of know-how and technology of a target firm. We use one-year sales growth (*PE*) and *ROE* to measure a firm's performance.

We use the method from Lane and Milesi-Ferretti (2007) to measure the degree of capital control (*CC*) as a proxy for the openness, which is the ratio of total external assets and liabilities to GDP. The data on total external assets, liabilities and GDP are obtained from the databases of the People's Bank of China and the Bank of Korea. We use a sector dummy variable that equals 1 if the SWFs' target firms are in China's financial sector or in Korean strategic sector. Table 3 presents the descriptive statistics for dependent and explanatory variables used in hypothetical frameworks of (2) and (3).

Table 3. Descriptive Statistics for Financial Variables of Target Firms in China and Korea

Panel A: China

Variable	Obs. Numbers	Mean	Std. Dev.	Minimum	Maximum
Log SWF	1179	15.914	1.629	9.903	23.055
Size *(FS)*	970	23.266	2.046	19.705	30.571
Leverage *(LV)*	970	0.496	0.229	0.013	0.955
Intangible assets ratio *(IA)*	950	0.047	0.064	5.39e-07	0.777
ROA	965	0.041	0.054	−0.627	0.434
ROE	963	0.086	0.106	−1.539	0.956
Cash asset ratio *(CA)*	906	0.195	0.146	0.009	0.819
Sales Growth *(PE)*	885	0.232	1.024	−0.752	23.380
Sector dummy *(SE)*	1179	0.080	0.272	0.000	1.000
Capital control *(CC)*	969	4.066	0.100	3.794	4.239

Panel B: Korea

Variable	Obs. Numbers	Mean	Std. Dev.	Minimum	Maximum
Log SWF	333	15.628	1.272	12.388	19.226
Size *(FS)*	304	21.613	1.857	16.614	26.053
Leverage *(LV)*	304	0.446	0.306	0.021	3.168
Intangible assets ratio *(IA)*	304	0.038	0.076	0.000	0.705
ROA	304	0.046	0.221	−1.515	2.842
ROE	300	0.086	0.345	−1.279	3.153
Cash asset ratio *(CA)*	304	0.054	0.055	0.000	0.304
Sales Growth *(PE)*	299	0.093	0.511	−0.993	4.731
Sector dummy *(SE)*	333	0.393	0.490	0.000	1.000
Capital control *(CC)*	325	1.438	0.052	0.733	1.515

4. Empirical Results

4.1. Determinants of SWF Investments in Asia

This study tests our two hypothetical frameworks of equations (2) and (3) - 1) the firm-specific determinants of SWFs' investments in China and Korea, and 2) the impact of SWFs' investments on firms' performance. The panel random effects model is used to test equations (2) and (3) because the *Hausman* test results indicate that the random effects model is more efficient than the fixed effects model. Table 4 presents the empirical results of the panel random effect model in Asian target firms. The results strongly support our two hypotheses. Note that the target firms' performance (*PE*) in (2) may be endogenously determined. In order to avoid the endogenous problem associated with the target firms' performance in the estimation of (2), we provide the estimation results from the simultaneous equation methods of (2) and (3) in section 5 for the robustness test.

Table 4. Estimation results of the panel random effects model for determinants of SWF Investments in Asia

	China		South Korea		Asia: Full sample	
	(1)	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**
ROA	4.2007***		0.4278**		1.0902**	
	(3.39)		(2.32)		(2.43)	
ROE		2.4934***		0.5119***		0.8781***
		(3.98)		(3.48)		(2.66)
Sector *(SE)*	0.5786*	0.5745*	0.2487***	0.3634***	0.5595***	0.6042***
	(1.85)	(1.85)	(5.97)	(10.77)	(3.11)	(3.44)
Size *(FS)*	0.4123***	0.4067***	0.2117***	0.2507***	0.3727***	0.3850***
	(10.23)	(10.18)	(14.43)	(21.85)	(11.36)	(11.97)
Leverage *(LV)*	−0.5053	−0.8318**	−0.8399***	−1.0281***	−0.6629***	−0.9236***
	(−1.45)	(−2.59)	(−19.13)	(−14.82)	(−2.78)	(−4.19)
Intangible assets ratio *(IA)*	−1.2834	−1.2571	0.0384	−0.0023	−0.5936	−0.9009*
	(−1.59)	(−1.57)	(0.11)	(−0.01)	(−1.06)	(−1.87)
Cash asset ratio *(CA)*	1.0533**	1.0494**	0.3167	0.4747	1.1666***	1.0881***
	(2.20)	(2.22)	(0.68)	(0.91)	(2.91)	(2.73)
Sales Growth *(PE)*	0.0901*	0.0854*	−0.0001	−0.0072	0.0913***	0.0925***
	(1.82)	(1.73)	(−0.00)	(−0.07)	(2.69)	(2.63)
Capital control *(CC)*	−0.6569*	−0.6200*	−4.0263**	−3.0948***	−0.1488**	−0.1310**
	(−1.83)	(−1.92)	(−2.12)	(−3.29)	(−2.55)	(−2.42)
const.	8.7477***	8.8625***	17.0141***	14.8496***	7.7580***	7.5302***
	(3.89)	(3.95)	(6.14)	(10.80)	(11.16)	(11.12)
R^2	0.2130	0.2174	0.1531	0.1615	0.1743	0.1857
obs.	743	744	252	248	995	992

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
2. Observations are the number of samples that successfully matched the dependent and explanatory variables.
3. *$p<0.1$, **$p<0.05$, ***$p<0.001$.

Column 1 of Table 4 shows that the coefficient of a firm's return (*ROA*) is positive and statistically significant at 1% in China. This finding indicates that SWFs tend to invest in Chinese firms with higher return (*ROA)*. Replacing *ROA* with another proxy of *ROE* (in

column 2), SWFs are more interested in selecting highly profitable firms in China at the 1% significance level. This result is consistent with the results of several other studies (e.g., Gangi et al., 2019; Grira et al., 2018; Bortolotti et al., 2015; Boubakri et al., 2016; Fernandes, 2011), but contrasts with the results from Kotter and Lel (2011). Using data of hedge funds, Klein and Zur (2009) show a similar result to our results of first hypothesis.

Column 1 and 2 in Table 4 also indicates that SWFs are more inclined to invest in the financial sector with a monopoly position in China, as the coefficient of the dummy variable for *Sector (SE)* is positive and statistically significant at traditional significance level. Moreover, the coefficients of *Capital control (CC)* in China are negative and statistically significant at the 10% level. 70% of SWFs in China invested in the financial sector. A higher degree of capital control seems to result in a higher return in financial industry, but less SWF investments. The relationship between return and capital control in the non-financial industry was also negatively significant. This indicates that the relationship between return of non-financial sector and SWFs investment gets significantly negative, as the capital control increases.[2]

In columns 1 and 2, the coefficients of the firm *Size (FS)* are positive and statistically significant at the 1% level, indicating that SWFs are more likely to select large-sized firms in China. This finding is similar to those reported by previous studies on SWFs (e.g., Grira et al., 2018; Gangi et al., 2019; Fernandes, 2011 and 2014; Kotter and Lel, 2011). This result is also consistent with the public pension funds' investment activities (e.g., Smith, 1996; Gompers and Metrick, 2001).

The evidence also shows that SWFs tend to invest in Chinese firms with low leverage(LV), indicating that SWFs are more likely to invest in financially distressed firms. This finding is consistent with that of Fernandes (2011), but different from that of Kotter and Lel (2011) and Gangi et al. (2019). The coefficients of *Sales Growth (PE)* for China are positive and statistically significant, indicating that SWFs select target firms in China with high performance of sale. This result is consistent with Grira et al. (2018) and Gangi et al. (2019). SWFs appear to prefer firms in China with a higher cash asset ratio (CA). This result contrasts with those of Kotter and Lel (2011), explaining that SWFs prefer cash-constrained firms. The SWFs investment seems to be not attracted to knowledge-based firms (IA) in China as the coefficient of IA is statistically insignificant.

Columns 3 and 4 of Table 4 provide the empirical results for Korea, which are quite similar to those results for China. We find that SWFs are strongly attracted by higher profitability firms in Korea. The coefficients for *ROA* and *ROE* are positive and statistically significant at 5% level. Also SWFs are more likely to select large-sized firms in Korea with low leverage. Furthermore, the coefficients of the sector dummy *(SE)* are positive and statistically significant at the 1% level, indicating that SWFs are more inclined to invest in strategic industries in Korea. This result is consistent with Boubakri et al. (2016). However, in sharp contrast to the evidence for China, sales growth, cash asset ratio, and intangible assets ratio are not statistically significant in determining the SWF investment in Korean target firms.

Overall, evidence shows that SWFs are more likely to select large-sized firms with higher return and low leverage in both China and Korea. When SWFs invest in China, they prefer to invest in financial firms with high sales growth and cash asset ratios. In contrast to SWFs' investment pattern in China, SWFs in Korea invest in strategic sectors, such as energy, information technology, and consumer discretionary. However, SWFs investment in Korea does not consider sales growth, cash asset ratios, and intangible assets ratios as important drivers.

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[2] The estimation results are available from authors on request.

4.2. Different Determinants between Time Periods, Types of Sources, and Acquiring Countries

The investment of SWFs has grown rapidly since 2013. We divided total sample period into two sub-sample periods to find out a difference in determinants of the SWF investment between 1997-2012 and 2013-2017. Columns 1 and 2 of Table 5 provide the empirical results in 1997-2012, while Columns 3 and 4 show these results in 2013-2017. Table 5 shows that the SWFs are more likely to select large-sized firms with high profitability and low leverage in both two periods as the coefficients for *ROA (ROE)* and *Size* are positive and statistically significant. But the coefficient for *Leverage* is negative in sign. We also find that the coefficient of *Sector* is positive and statistically significant at the 1% level in the 2013-2017 periods, whereas being insignificant in 1997-2012. The evidence also shows that firms attracting SWF investments have high performance and cash asset ratio, and low intangible assets ratio since 2013, although, in 1997-2012, these factors do not have a significant impact. This indicates that the firm-specific determinants of the SWFs investment turn to be statistically significant since 2013 in Asian target firms. However, this is not the case before 2013.

Table 5. Determinants of SWF Investments in Asia in Different Time Periods

	Asia: 1997-2012		Asia: 2013-2017	
	(1)	**(2)**	**(1)**	**(2)**
ROA	4.3055**		0.9106**	
	(2.42)		(2.37)	
ROE		2.9824***		0.7239**
		(2.96)		(2.39)
Sector *(SE)*	0.2244	0.2473	0.5129***	0.5443***
	(0.48)	(0.52)	(3.48)	(3.71)
Size *(FS)*	0.6133***	0.6025***	0.3144***	0.3290***
	(8.88)	(8.77)	(9.27)	(9.78)
Leverage *(LV)*	−1.1109**	−1.4018***	−0.6245**	−0.8925***
	(−2.06)	(−2.90)	(−2.46)	(−3.74)
Intangible assets ratio *(IA)*	−0.9009	−1.1596	−0.8970*	−1.1422**
	(−0.65)	(−0.83)	(−1.66)	(−2.44)
Cash asset ratio *(CA)*	0.5115	0.4423	1.6330***	1.5926***
	(0.86)	(0.75)	(3.03)	(2.96)
Sales Growth *(PE)*	0.1038	0.0636	0.0858***	0.0876***
	(0.70)	(0.43)	(3.10)	(3.04)
Capital control *(CC)*	−1.1081***	−1.0412***	−0.1194**	−0.1153**
	(−6.66)	(−6.76)	(−2.00)	(−1.99)
const.	6.5180***	6.6120***	8.8914***	8.6624***
	(4.17)	(4.29)	(13.12)	(12.85)
R^2	0.3567	0.3575	0.1527	0.1622
obs.	275	275	720	717

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
  2. *$p<0.1$, **$p<0.05$, ***$p<0.001$.

In the other hand, we test 1) whether or not any difference in the empirical results of our hypothesis exists between the extents of the economic development of SWF acquiring countries (developed vs. Asian countries), and 2) whether any difference exists between the source types (commodity vs. non-commodity) of the SWFs. Although foreign SWFs investing in China are from three developed countries (Canada, Netherlands, and Norway) and six Asian countries (Singapore, Malaysia, the United Arab Emirates, Kuwait, Qatar, and Oman), major SWFs investment comes from Asian countries. The Asian SWFs in China mainly invest in the financial sector, whereas SWFs from developed countries are mainly concentrated in the financials, real estate, and industrials sectors broadly.

The estimation results on the determinants of SWFs investments by developed and Asian countries in China are shown in Table 6. We find a significant difference in SWF investment patterns between developed and Asian acquiring countries. Columns 1 and 2 show that the coefficients for *ROA* and *ROE*, *Size*, and *Leverage* are positive and statistically significant, suggesting that SWFs from the developed countries as acquirers are more likely to select large-sized firms in China with high profitability and leverage. Furthermore, SWFs from developed countries show a strong preference for the Chinese financial sector with a monopoly position (in columns 1 and 2). SWF investments of Asian acquiring countries, however, have not shown a preference for the Chinese financial sector (in columns 3 and 4). Rather, Asian SWFs are more attracted to larger firms with high profitability, cash asset ratios and sales growth, and low leverage.

We also test our hypothesis whether or not the source types of SWFs show different investment patterns. The estimation results of determinants of SWF investments in China and Korea by commodity and non-commodity funds are reported in Table 7. Columns 1 to column 4 in Table 7 show that the coefficients for *ROA*, *ROE* and *Size* are positive and statistically significant. This shows that both commodity and non-commodity SWFs in China are inclined to invest in large-sized firms with high profitability. The intangible assets ratio, cash asset ratio and sales growth are important determinants of SWFs' investments only in the non-commodity funds. Commodity SWFs relatively prefer to invest in the Chinese financial sector. However, commodity SWFs in Korea is more likely to select large-sized firms with high profitability and low leverage as shown in columns 5 to 8. Compared with non-commodity SWFs, the commodity SWFs in Korea are more inclined to invest in strategic industries, such as energy, information technology, and consumer discretionary.

4.3. Effects of SWF Investments on Firm's Performance

In this section, we test our second hypothetical framework of (3) - the impact of SWF investments on the target firm's performance. Table 8 presents the estimation results of the impact of SWF investments on the Chinese target firm's sales growth. The estimation results are provided for the full sample in column 1 of Table 8, while the test results in columns 2 to 5 is for the impact of SWF investments on target firms' performance by different acquiring countries and different source types of SWFs.

The first column shows that the coefficient on SWF investment *(I)* is positive and statistically significant at the 5% level, indicating that SWF investments significantly improve the sales growth of Chinese target firms. Appendix Table C provides the test results that the Chinese firm's performance measured by *ROE* increases as SWF investments rise. Moreover, the results of SWFs using different acquiring countries and different source types also show that SWF investments have a significant positive impact on the performance of target Chinese firms. The coefficients for the firm-specific control variables such as *Size (FS)*, *Leverage (LV)*, and *Cash asset ratio (CA)*, are statistically significant.

Table 6. Determinants of SWF Investments by Different Acquiring Countries

| | China | | | | Asia: Full Sample | | | |
| | SWFs from developed countries | | SWFs from Asia | | SWFs from developed countries | | SWFs from Asia | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
ROA	14.5359*** (6.07)		2.4427* (1.69)		1.1459** (2.39)		2.4593* (1.70)	
ROE		6.9215*** (6.28)		1.6389** (2.07)		0.9253** (2.57)		1.6652** (2.12)
Sector (SE)	1.6813*** (4.27)	1.6494*** (4.09)	0.0848 (0.18)	0.0714 (0.15)	0.6033*** (4.19)	0.6047*** (4.12)	0.0714 (0.16)	0.0944 (0.21)
Size (FS)	0.3747*** (5.73)	0.3856*** (5.63)	0.4514*** (7.99)	0.4465*** (7.94)	0.3657*** (9.79)	0.3924*** (10.66)	0.4537*** (8.01)	0.4485*** (7.96)
Leverage (LV)	1.3309** (2.20)	−0.3538 (−0.64)	−0.8736** (−2.18)	−1.0290*** (−2.68)	−0.6070** (−2.29)	−1.0019*** (−4.20)	−0.9287** (−2.34)	−1.0722*** (−2.82)
Intangible assets ratio (IA)	−0.6342 (−0.97)	−0.6248 (−0.89)	−1.1413 (−1.14)	−1.1705 (−1.16)	−0.4980 (−1.03)	−0.6151 (−1.29)	−1.0367 (−1.05)	−1.1544 (−1.15)
Cash asset ratio (CA)	0.1383 (0.17)	0.5328 (0.62)	0.9411** (1.99)	0.9134* (1.94)	1.3135** (2.00)	1.2673* (1.94)	0.9298** (2.00)	0.9101** (1.96)
Sales Growth (PE)	0.4142 (1.08)	0.3843 (1.03)	0.0743** (2.39)	0.0698** (2.35)	0.1801 (1.46)	0.2019 (1.62)	0.0762** (2.50)	0.0715** (2.46)
Capital control (CC)	0.9201 (0.94)	1.0057 (1.05)	−1.3199*** (−2.67)	−1.2918*** (−2.61)	−0.2458*** (−3.41)	−0.2634*** (−3.69)	−1.2260*** (−8.80)	−1.1570*** (−7.90)
const.	1.4086 (0.37)	1.6533 (0.45)	11.0099*** (4.72)	11.0651*** (4.73)	7.8929*** (10.51)	7.5150*** (10.17)	10.6014*** (8.45)	10.4890*** (8.31)
R^2	0.4461	0.4305	0.2045	0.2076	0.2149	0.2266	0.2367	0.2282
obs.	219	219	524	525	461	459	535	534

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
2. Although SWFs from Asian countries, such as Singapore and UAE, have significant investments in South Korea, the number of investments is very limited; therefore, the empirical analysis of South Korea is omitted here.
3. *$p<0.1$, **$p<0.05$, ***$p<0.001$.

Table 7. Determinants of SWF Investments by Different Source Types of SWFs

| | China | | | | South Korea | | | | Asia: Full Sample | | | |
| | Commodity | | Non−commodity | | Commodity | | Non−commodity | | Commodity | | Non−commodity | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
ROA	10.3014*** (4.83)		3.3931** (2.12)		0.6207* (1.92)		2.5979 (0.73)		0.9897*** (3.07)		3.1513** (2.22)	
ROE		4.6002*** (5.09)		2.1682** (2.54)		0.5802*** (2.63)		0.6252 (0.94)		0.8472*** (2.59)		1.5542*** (2.69)
Sector (SE)	1.7890*** (5.11)	1.8157*** (4.86)	0.2438 (0.47)	0.2159 (0.41)	0.3700** (2.41)	0.3655** (2.40)	0.1761 (0.52)	0.4962 (1.57)	0.6260*** (4.16)	0.6269*** (4.16)	0.4110 (1.40)	0.4808 (1.63)
Size (FS)	0.4085*** (5.65)	0.4205*** (5.78)	0.3949*** (7.43)	0.3910*** (7.38)	0.3257*** (7.20)	0.3524*** (7.65)	0.1424 (1.26)	0.1901* (1.74)	0.4279*** (11.28)	0.4532*** (12.22)	0.3710*** (7.62)	0.3698*** (7.72)
Leverage (LV)	0.6482 (1.13)	−0.5959 (−1.18)	−0.5771 (−1.31)	−0.8114** (−1.96)	−0.8806*** (−3.45)	−1.2295*** (−4.69)	−1.0887* (−1.74)	−0.8751 (−1.35)	−0.6680** (−2.57)	−1.1103*** (−4.68)	−0.6497* (−1.83)	−0.7916** (−2.33)
Intangible assets ratio (IA)	−0.5241 (−0.63)	−0.4005 (−0.45)	−1.4242* (−1.83)	−1.4395* (−1.85)	0.4391 (0.47)	0.4448 (0.48)	0.9132 (0.33)	−2.4734 (−0.95)	−0.2467 (−0.44)	−0.2645 (−0.47)	−1.1566 (−1.36)	−1.4979** (−2.00)
Cash asset ratio (CA)	0.6215 (0.75)	0.9487 (1.12)	0.8037* (1.65)	0.7899 (1.62)	1.5459 (1.08)	1.6735 (1.20)	−2.0192 (−0.62)	−0.2542 (−0.08)	1.5496** (2.28)	1.4290** (2.06)	0.8342* (1.80)	0.9269** (1.99)
Sales Growth (PE)	0.5116 (1.30)	0.5519 (1.43)	0.0516* (1.78)	0.0476* (1.72)	0.2040 (1.11)	0.2566 (1.39)	−0.0427 (−0.18)	0.1052 (0.76)	0.4616*** (2.67)	0.5050*** (3.03)	0.0711** (2.52)	0.0698*** (2.61)
Capital control (CC)	1.7292 (1.06)	1.7712 (1.21)	−1.7611*** (−3.39)	−1.7197*** (−3.32)	−6.1033 (−1.45)	−6.5014 (−1.56)	−5.697*** (−3.00)	−4.0987*** (−3.21)	−0.3383*** (−4.49)	−0.3404*** (−4.57)	0.0630 (0.77)	0.0833 (1.13)
const.	−2.1368 (−0.60)	−1.9566 (−0.55)	13.9063*** (5.81)	13.9176*** (5.80)	17.5360*** (2.84)	17.6524*** (2.89)	20.7423*** (6.07)	17.2560*** (5.26)	6.8166*** (8.95)	6.4346*** (8.57)	7.0470*** (6.25)	7.0711*** (6.56)
R^2	0.4922	0.4817	0.1816	0.1861	0.2771	0.2904	0.1248	0.1329	0.3207	0.3311	0.1415	0.1579
obs.	208	208	535	536	187	187	107	103	392	392	642	639

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
2. $*p<0.1$, $**p<0.05$, $***p<0.001$.

Table 8. Impact of SWF Investments on Chinese Firms' Sale Growth

	Full sample	SWFs from developed countries	SWFs from Asia	Commodity SWFs	Non−commodity SWFs
SWF (I)	0.0618**	0.0324***	0.0667*	0.0423***	0.0594*
	(2.11)	(3.36)	(1.76)	(3.52)	(1.76)
Size (FS)	−0.0699**	−0.0212**	−0.0820*	−0.0330***	−0.0731*
	(−2.12)	(−2.01)	(−1.85)	(−2.71)	(−1.87)
Leverage (LV)	0.3410**	0.1103	0.4141*	0.1725*	0.3808*
	(2.13)	(1.23)	(1.82)	(1.75)	(1.71)
Intangible assets ratio (IA)	−0.3172	−0.0935	−0.5819	−0.1852	−0.3826
	(−0.94)	(−1.01)	(−0.83)	(−0.97)	(−0.75)
Cash asset ratio (CA)	−0.1769	0.2012*	−0.3215	0.2262*	−0.3119
	(−0.43)	(1.77)	(−0.54)	(1.76)	(−0.54)
const.	0.7527	0.0576	0.9722	0.1299	0.8990
	(1.57)	(0.28)	(1.42)	(0.56)	(1.44)
R^2	0.0109	0.0671	0.0100	0.0846	0.0659
obs.	744	219	525	208	536

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
      2. *$p<0.1$, **$p<0.05$, ***$p<0.001$.

Table 9 presents the estimation results on the impact of SWF investments on Korean firms' sales growth. The first column in Table 9 reports the estimation results of the full sample, and the second and third columns present the results of SWFs from different source types of SWFs (commodity vs. non-commodity). Column 1 shows that SWF investments have a significant positive impact on target firms' sales growth. Korean firms' performance improves after receiving SWF investments. Column 2 of Table 9 further provides robust evidence that Korean firm performance increases after SWF investments, which is the similar to empirical results for Chinese cases. Robust empirical results using *ROE* as a proxy for Korean firm performance are reported in Appendix Table D.

Table 9. Impact of SWF Investments on Korean Firms' Sale Growth

	Full sample	Commodity	Non−commodity
SWF (I)	0.0316***	0.0148***	0.0151***
	(3.41)	(2.69)	(8.47)
Size (FS)	−0.0158***	−0.0173***	−0.0134***
	(−6.59)	(−4.76)	(−11.05)
Leverage (LV)	−0.1054***	−0.1090**	−0.0288
	(−6.36)	(−2.50)	(−1.58)
Intangible assets ratio (IA)	0.0226	−0.0044	0.0857**
	(0.58)	(−0.09)	(2.32)
Cash asset ratio (CA)	−1.0432***	−0.1563	−0.0100
	(−7.65)	(−0.88)	(−0.15)
const.	0.0427	0.2518**	0.1829***
	(0.42)	(2.59)	(4.64)
R^2	0.0185	0.0895	0.0285
obs.	248	186	106

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
      2. *$p<0.1$, **$p<0.05$, ***$p<0.001$.

Overall, the evidence shows that SWF investments in both China and Korea have a positive impact on target firms' performance as measured by both sales growth and *ROE*. Firm performance improves after receiving SWF investment in Asia, while being also affected by firm size, leverage, and cash asset ratio.

5. Robustness Tests of Simultaneous Equation Methods and The GEE

The dependent variables of equation (3) may be the explanatory variables of equation (2), and vice versa. In order to avoid the endogenous problems with the estimations of (2) and (3), we adopt the simultaneous equation methods to test the robustness of the previous estimation results from the panel random effects model. Table 10 and 11 present the robustness test results of the simultaneous equation methods. In Table 10, these test results are in line with the previous results of the panel analysis, confirming that firms attracting SWF investments are large-sized and have higher performance, cash asset ratio and better sales growth. Moreover, SWFs are more inclined to invest in the financial sector with a monopoly position in China, while they invest in strategic sectors in Korea. Table 11 also confirms that SWFs have a positive effect on target firm performance in China and Korea both.

Table 10. Robustness Test of Determinants of SWF Investments in Asia

	China	South Korea	Asia: 1997-2012	Asia: 2013-2017
ROA	4.2863***	0.6018**	0.8136	0.9135**
	(3.52)	(2.10)	(0.25)	(2.44)
Sector *(SE)*	0.6918**	0.2694*	0.1904	0.5364***
	(2.31)	(1.93)	(0.36)	(3.40)
Size *(FS)*	0.4114***	0.2359***	0.6196***	0.3106***
	(10.60)	(5.05)	(7.41)	(9.27)
Leverage *(LV)*	−0.4370	−0.8599***	−2.3835**	−0.5925**
	(−1.29)	(−2.75)	(−2.36)	(−2.54)
Intangible assets ratio *(IA)*	−1.2723	0.5158	−1.4625	−0.8910
	(−1.61)	(0.51)	(−0.73)	(−1.30)
Cash asset ratio *(CA)*	1.0277**	0.7521	−0.7544	1.6265***
	(2.19)	(0.56)	(−0.66)	(2.96)
Sales Growth *(PE)*	0.0841*	−0.0114	2.2711**	0.0818*
	(1.69)	(−0.08)	(1.96)	(1.73)
Capital control *(CC)*	−0.6366	−4.9454**	−0.9122***	−0.1132**
	(−1.25)	(−2.37)	(−3.30)	(−1.99)
const.	8.6481***	17.8259**	6.1616***	8.9343***
	(3.83)	(5.38)	(3.11)	(12.96)
R^2	0.2133	0.1573	0.1570	0.1533
obs.	743	252	274	720

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.

2. *$p<0.1$, **$p<0.05$, ***$p<0.001$.

Table 11. Robustness Test of Impact of SWF Investments on Target Firms' Sale Performance

	China	South Korea	Asia: 1997-2012	Asia: 2013-2017
SWF (I)	0.0314***	0.0012**	0.0249***	0.0339***
	(6.93)	(1.69)	(9.72)	(11.90)
Size *(FS)*	0.0018***	0.0069***	0.0010*	0.0024***
	(2.79)	(2.68)	(1.80)	(4.31)
Leverage *(LV)*	−0.0088	−0.0316***	−0.0041	−0.0198***
	(−1.51)	(−2.96)	(−1.06)	(−5.07)
Intangible assets ratio *(IA)*	0.0140	−0.0980*	0.0256**	−0.0174
	(1.18)	(−1.85)	(2.17)	(−1.41)
Cash asset ratio *(CA)*	0.0108*	0.0233	0.0031	−0.0093
	(1.65)	(0.65)	(0.71)	(−1.24)
const.	−0.3053***	−0.0588	−0.1836***	−0.3867***
	(−23.37)	(−1.04)	(−17.81)	(−31.51)
R^2	0.8715	0.1021	0.9348	0.8396
obs.	744	248	275	717

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
2. $*p<0.1$, $**p<0.05$, $***p<0.001$.

Alternatively, we use the panel GEE method with autocorrelation errors to test robustness of the estimation results of the panel random effects model. This additional robustness test results are also similar to the previous estimation results; the empirical results are robust and reliable regardless of the estimation methods. We abstract from reporting the additional robustness test results of the panel GEE method for abbreviation of text.

6. Conclusion

SWFs have become important participants in the global financial market, and their investments and assets have become larger than those of other institutional investors, such as hedge funds and private equity funds. SWFs are mainly operated by the Middle East and Asia. Given the rapid growth of emerging countries and the relative increase in expected returns, SWFs increased their investments particularly in China and South Korea. However, in the existing literature, the target countries and target firms of SWFs are mainly focusing on developed countries. Few studies analyzed the case studies of SWF investments in Asian markets. Using vast sample data of SWF investments in a longer time period, we analyze the determinants of SWFs' investment in Asian countries. The evidence finds consistent SWF investment patterns in specific target firms from China and South Korea.

Our paper contributes to the literature in three ways; first, we analyzes case studies of SWF investments in Asian markets, which are less developed, less deep, and riskier. Second, we examine whether the determination of SWF investment in Asian target firms depends on the different time periods, on types of sources of SWFs, and on different acquiring countries. Third, our research has use of vast sample data of target firms and longer time periods (1997-2017) than other previous studies on the SWFs.

Singapore's SWF is the most important investor in China and Korea, whereas Norway and the Netherlands, the UAE, Qatar, and Kuwait are also major investors in the two Asian countries. Our empirical results show that SWFs prefer to invest in the financial sector with a monopoly position and in large-sized firms in China with higher performance, growth, and

cash asset ratios, and lower leverage. In contrast to SWF investment patterns in China, SWFs in Korea are more inclined to invest in strategic sectors, such as energy, information technology, and consumer discretionary, and in large-sized firms with high performance and low leverage. China's financial sector has a high yield due to its strong monopoly position, while Korea's strategic industry is predicted to have future expected high returns because of its high technological monopoly. These different investment patterns help policymakers to better understand the motivations and strategies of SWF investments in Asia.

It is interesting to note that the determinants of SWF investments depend on different time periods, acquiring countries and source types of SWFs. The above mentioned empirical results get strongly supported in a period of 2013-2017, when SWFS investment has significantly increased in Asian markets after 2013. However, these results get less significant in 1997-2012. The SWFs from the developed countries as acquirers are more likely to prefer large-sized firms in China with high profitability and leverage, and show a strong preference for the financial sector with a monopoly position in China. However, SWF investments of the Asian acquiring countries are more attracted to larger firms with high profitability, cash asset ratios and sales growth, and low leverage. The different source types of SWFs also show different investment patterns; commodity SWFs relatively prefer to invest in the Chinese financial sector, while investing in strategic industries in Korea.

This finding suggests that, when promoting and attracting SWFs to invest in Asian markets, differentiated investment policies should be implemented according to the origins of SWFs in different regions and source types. With the advent of recent rapid flows of international capital, attracting international SWF investments into Asian markets can help solve the capital accumulation gap, reduce the cost of capital re-allocation, and smooth the impact of short-term capital flows on Asian domestic financial markets.

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Appendices

Table A. Target Firms that receive major SWF Investments in South Korea (Unit: millions of U.S. Dollars)*

Target firm	Target sector	N. of Investment	Transaction amount	SWFs
Hyundai Oilbank Co Ltd	Energy	3	1294	UAE IPIC
Star Tower, Seoul, South Korea	Real Estate	1	900	Singapore GIC
Pine Avenue Tower A, Seoul	Real Estate	1	447	Azerbaijan SOFAZ
Seoul Finance Centre, Seoul, South Korea	Real Estate	1	400	Singapore GIC
Celltrion Inc	Healthcare	4	335	Singapore Temasek, Norway GPFG, Netherlands APG
Seoul Semiconductor Co Ltd	IT	2	228	Singapore Temasek, Norway GPFG
SK Hynix Inc	IT	2	177	Canada CPPIB, Norway GPFG
Hyundai Mipo Dockyard Co Ltd	Industrials	3	156	Saudi Arabia SAMA, Norway GPFG, Netherlands APG
Hyundai Motor Co	Consumer Discretionary	2	153	Norway GPFG, Netherlands APG
Hyundai Mobis Co Ltd	Consumer Discretionary	2	116	Norway GPFG, Netherlands APG
LG Electronics Inc	Consumer Discretionary	3	110	Norway GPFG, Netherlands APG
Samsung Electronics Co Ltd	IT	2	98	Canada CPPIB, Norway GPFG
Daewoo Shipbuilding & Marine Engineering Co Ltd	Industrials	1	94	Netherlands APG

Source: Sovereign Wealth Fund Transaction Database, 2017.
* The percentage of total SWFs investment for these target firms is about 65%

Table B. Target Firms that receive major SWF Investments in China (Unit: billions of U.S. Dollars)*

Target firm	Target sector	N. of Investment	Transaction amount	SWFs
China Construction Bank Corp	Financials	7	14.50	CIC, Temasek, APG
Agricultural Bank of China Ltd	Financials	8	10.41	Temasek, KIA, QIA, NSSF, CPPIB, APG, Norway GPFG, CIC
China Export and Credit Insurance Corporation	Financials	2	6.28	CIC
Industrial and Commercial Bank of China Ltd	Financials	5	4.23	Temasek, KIA, APG, CIC
CITIC Pacific Limited	Financials	4	3.10	NSSF, SAFE, QIA, Temasek
China Pacific Insurance Group Co Ltd	Financials	8	1.76	GIC, Norway GPFG, ADIA, Temasek, APG
China Development Bank	Financials	1	1.50	NSSF
ProLogis-China Operations	Real Estate	1	1.30	GIC
Cinda Asset Management	Financials	5	1.22	Norway GPFG, NSSF, CPPIB
China Petroleum & Chemical Corp	Energy	4	0.95	GIC, Norway GPFG, APG

Source: Sovereign Wealth Fund Transaction Database, 2017.
*The percentage of total SWFs investment for these target firms is about 45%

Table C. Impact of SWF Investments on Chinese Target Firm's *ROE*

	Full sample	SWFs from developed countries	SWFs from Asia	Commodity	Non-commodity
SWF (I)	0.0071***	0.0232***	0.0056**	0.0158***	0.0072***
	(3.42)	(7.71)	(2.20)	(4.14)	(2.87)
Size *(FS)*	0.0072**	−0.0007	0.0025	0.0069	0.0018
	(2.34)	(−0.13)	(0.68)	(1.14)	(0.54)
Leverage *(LV)*	−0.0355	−0.0377	−0.0194	−0.0568	−0.0185
	(−1.34)	(−0.91)	(−0.63)	(−1.24)	(−0.74)
Intangible assets ratio *(IA)*	0.0728	−0.0143	0.1282	−0.0346	0.1136*
	(1.41)	(−0.40)	(1.37)	(−0.72)	(1.71)
Cash asset ratio *(CA)*	0.0955**	0.1516***	0.0631	0.1560***	0.0640*
	(2.52)	(3.16)	(1.48)	(3.14)	(1.84)
Sales Growth *(PE)*	0.0045**	0.0637***	0.0040***	0.0634***	0.0039
	(2.47)	(3.29)	(2.60)	(3.20)	(1.49)
const.	−0.1944***	−0.2562***	−0.0760	−0.3080***	−0.0844
	(−3.19)	(−2.58)	(−1.05)	(−2.71)	(−1.19)
R^2	0.0572	0.2861	0.0328	0.2675	0.0842
obs.	744	219	525	208	536

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
2. $*p<0.1$, $**p<0.05$, $***p<0.001$.

Table D. Impact of SWF Investments on Korean Target Firm's *ROE*

	Full sample	Commodity	Non-commodity
SWF (I)	0.0178***	0.0662**	0.0092***
	(4.21)	(2.59)	(10.04)
Size *(FS)*	−0.0407***	−0.0714***	−0.0068***
	(−2.80)	(−3.98)	(−3.28)
Leverage *(LV)*	0.1789***	0.4913**	−0.1708
	(3.00)	(2.59)	(−0.26)
Intangible assets ratio *(IA)*	0.5184*	0.0305	0.5027***
	(1.77)	(0.14)	(8.65)
Cash asset ratio *(CA)*	−0.1448	0.5146	0.0467
	(−0.71)	(0.75)	(1.07)
Sales Growth *(PE)*	−0.0095	−0.1847	−0.0006
	(−0.96)	(−1.43)	(−0.07)
const.	0.6025*	0.3714	0.1035***
	(1.89)	(0.84)	(2.71)
R^2	0.1053	0.2244	0.1188
obs.	248	187	103

Notes: 1. T-statistics are reported in the parenthesis and adjusted for robust standard errors.
　　　 2. *$p<0.1$, **$p<0.05$, ***$p<0.001$.