

Should I Stay or Should I Go? Taiwan's Foreign Direct Investment (FDI) Inflows and Outflows

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Abstract

This study offers a fresh empirical evidence on the relationship between approved foreign investment (inflows) and approved outward investment in Taiwan. More precisely, it focuses on the Go South policies, which was initiated by the former president, Lee Teng-hui in 1992 that includes negotiating bilateral agreements with Southeast Asian countries to promote investment and other economic cooperation. Since 2012 Taiwan's outflows of foreign investment is observed to be more than its inflows. This study shows that manufacturing is a prominent industry for both Taiwan's foreign investment inflows and outflows. Indeed, Singapore is the top country among the New Southbound Policy (NSP) participated countries with their bilateral investment, then is Malaysia. This study also finds that both Taiwan's approved foreign investment and approved outward investment are positively correlated, and they are interdependent over the period between 1959 and 2017. This study briefly discusses the feasibility of Go South policies, and their implications.

Keywords: *foreign investment, Go South policy, Granger non-causality, Taiwan*

1. Introduction

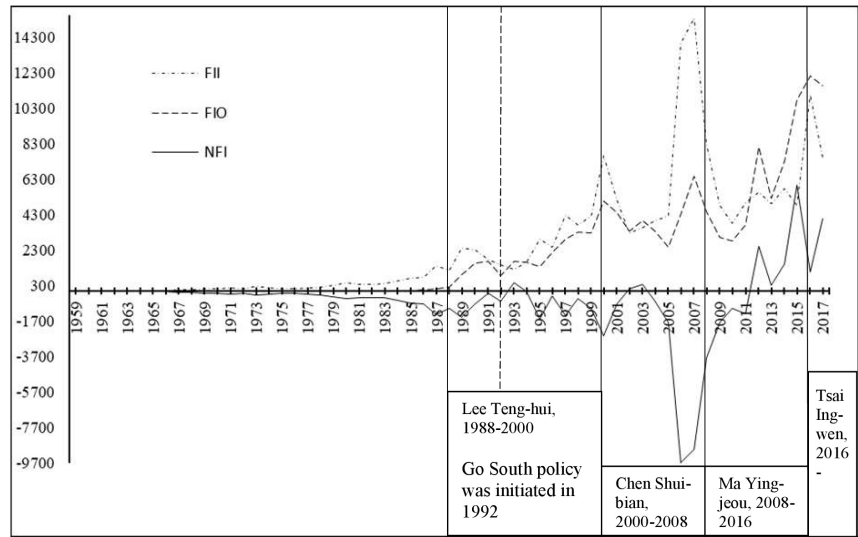
Taiwan, officially the Republic of China (ROC) is a state in East Asia which located off the coast of southwest of Okinawa, Japan and north of the Philippines. Taiwan had been successfully transformed from an underdeveloped and agriculture-based economy into a well-industrialized and mature economy. Taiwan is a world-class leader in technology and had been labelled as one of Four Asian Tigers (Asian Dragons) with Hong Kong SAR, China, Singapore and South Korea. This is contributed by its increasing priority in manufacturing sector and by the active policy of encouraging foreign direct investment (FDI) with tax credits and setting up export-processing zones that had been implemented since the mid-1960s. The Taiwan's FDI was initially concentrated in labour-intensive industries, and in more diversified and sophisticated industries then (see, Chan, 1998: 351-352).

According to a report entitled "Taiwan: A Closer Look at the Southbound Opportunities" published by DBS (Development Bank of Singapore) Group Research on 19 September 2017, from the geographical perspective, there is plenty of room for Taiwan to further diversify its trade and investment portfolios from China to Southeast Asia considering its 18 New Southbound Policy (NSP) participated countries, namely Australia, Bangladesh, Bhutan, Brunei, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Zealand, Pakistan, the Philippines, Singapore, Sri Lanka, Thailand, and Vietnam. In fact, Taiwan is being considered as an attractive destination for FDI because of its economy benefits gained from regional economic dynamism, population with high purchasing power, and prominence of

high-technology. The recently ended global economic crisis (2007-2008), the subsequent Eurozone debt crisis (since the end of 2009) and the slowdown in China (as in 2015) have negative implications on Taiwan's FDI positions. Other fundamental concerns such as speculative activities, rising house prices, excessive bureaucracy and the rigidity of the legislative framework, are all obstacles to bother foreign and domestic investments. Undoubtedly, Taiwan's business environment remains highly attractive as ranked 15th out of 190 countries by World Bank in the "*Doing Business*" 2018 ranking.

FDI either inflows or outflows has been established as one of the flagships under the Go South policy which was initiated by the former president, Lee Teng-hui (1988-2000) in 1992, as well as the 'renewed' versions by other administrations. This study is not intended to discuss various versions of Taiwan's Go South policy as they have been comprehensively discussed by Bing (2017), Hsu (2017), and Glaser *et al.* (2018). Lee Teng-hui had unrolled a Go South policy in 1994 which witnessed a remarkable shift in FDI i.e. FDI flows into Association of Southeast Asian Nations (ASEAN) member countries leapt from USD1.76 billion the previous year to USD4.98 billion, while FDI flows to mainland China were dropped by nearly the same amount that was from USD3.17 billion to a mere USD962 million. The later president, Chen Shui-bian (2000-2008) in his version of Go South policy in 2002 shows Taiwan's FDI to ASEAN grew significantly to USD10.4 billion in 2008, but it had been outmatched by FDI to mainland China which grew at a comparable pace and investment in Southeast Asia fell to USD2.04 billion in 2009 (Marston and Bush, 2018). In 2007, the approved foreign investment (inflows) had reached its peak over the observed period 1959-2017 as illustrated in Figure 1 in a relation to the recent global financial crisis (2007-2008).

Figure 1 Taiwan Approved Foreign Investment (FII), Approved Outward Investment (FIO) Excluded China, and Net Foreign Investment (NFI, FIO-FII) (in million USD), 1959-2017



Source: CEIC (Census and Economic Information Center).

In general, Figure 1 shows Taiwan’s approved foreign investment (inflows) which is eventually exceeding the approved outward investment, but an opposite position is observed from 2012 under the later president, Ma Ying-jeou, and present Tsai Ing-wen’s administration. Approved outward investment exceeds approved foreign investment which is in line with the later president Ma Ying-jeou’s diplomatic strategy “viable diplomacy” that focuses more on overseas direct investment and cross-strait relations. This phenomenon can also be partially explained by the lack of natural resources in Taiwan, which is usually a pull factor in attracting FDI, and the structure of capital

inflows to Taiwan have been gradually changing over time. Again, Taiwan's high FDI outflows are contributed by such "globally minded" domestic business firms (Kuo and Kao, 2018). The recent version of Go South policy - New Southbound Policy (NSP) is aimed at diversifying Taiwan's outbound investment away from Mainland China and into Southeast Asia (Glaser *et al.*, 2018) which has been officially announced by President Tsai Ing-wen in her inaugural address on May 20, 2016. It has seen full implementation since January 2017, and her version of Go South policy has different agendas and policy goals comparing to the older versions. As observed in Figure 1, under the Tsai's administration the outflows of Taiwan's foreign investment continue exceeding inflows, and investment inflows dropped largely than of outflows. More interestingly, both foreign investment inflows and outflows are positively correlated, that is an increase in FII (i.e. investment flows into Taiwan) is followed with an increase in FIO (i.e. investment flows out from Taiwan), and vice versa.

Of the available past studies on FDI, Labán and Larraín's (1997) theoretical model predicts that relaxation of controls such as liberalization (globalization) of capital outflows can lead, perhaps paradoxically to increase in inflows. Their study supports this hypothesis for the case of the UK in 1979, New Zealand in 1984, Spain after 1987, and Colombia, Egypt and Mexico in the 1990s, but this is not the case for Chile in the 1990s. Accordingly, when the capital outflow restriction is relaxed, investors would be stuck with the 'wrong' asset for a shorter period of time if it turned out they were to make the 'wrong' decision in the noisy period. Investors will be willing to take a higher risk and invest at home even with a higher probability of a change in the rules of the game. For the same probability of policy continuation, they will be willing to invest at home even with a lower risk-premium, and they will assign a lower value to the 'wait-and-see' option of remaining liquid in

the noisy period. Therefore, a reduction in the period of time that foreign investment is required to stay in the country is likely to increase – not decrease – net capital inflows (Labán and Larraín, 1997: 429). With the data of bilateral gross capital inflows and outflows for a total of 29 countries (with 406 country pairs) over the period 1995-2014, Davis (2015) finds a lot of positive correlations between bilateral capital inflows and outflows including between their aggregate level, which may be driven by the so-called network effects and non-diversification in international banking relationships. Generally, two possible relationships are postulated either positive or negative between inflows and outflows of foreign investment as explained by Davis (2015). If a shock in a country causes aggregate capital inflows into that country decrease [to fall], then for *liquidity reasons* banks may be forced to retrench and decrease capital outflows that is a high positive correlation between aggregate inflows and outflows around the time of a banking crisis (Davis, 2015: 6). On the contrary, if capital inflows and outflows between a pair of countries are highly correlated because of a global risk shock that leads to global retrenchment, then after controlling for a global factor, bilateral inflows and outflows may be negatively correlated. A country-specific factor may also explain to a positive correlation between bilateral inflows and outflows, but after controlling for aggregate capital flows in both countries, bilateral capital flows would be uncorrelated, or perhaps negatively correlated (Davis, 2015: 4). Another study by Davis and Wincoop (2018) updates that the correlation between capital inflows and outflows increase substantially as a result of financial globalization (measured by stock of external assets and liabilities) over time as found from a sample of 127 advanced and developing countries. However, an increase in trade globalization (measured by exports plus imports) reduces the correlation between capital inflows and outflows.

Other bulk of FDI studies looks at the determinants of FDI either inflows or outflows, or both. An early work by Boatwright and Renton (1975) that they apply the neoclassical theory of optimal capital accumulation and examined the determination of the UK inflows and outflows of direct foreign investment over the quarterly data 1961-1972. They concludes that their results are not conclusive, but encouraging. Globerman and Shapiro (2002) examine the effects of governance infrastructure on both FDI inflows and outflows for a broad sample of developed and developing countries for the period 1995-1997. They find that governance infrastructure is an important determinant of both FDI inflows and outflows that investment in governance infrastructure not only attract capital, but also create the conditions under which domestic multinational corporations emerge and invest abroad. Both the inflows and outflows of foreign investment respond positively to good governance.

In fact, there is relatively empty of such topic for examining the relationship between Taiwan's inflows and outflows of foreign investment. Among those related to FDI, for example Tsai (1991) finds that FDI in Taiwan is probably supply-side determined. Other study by Chen (1992) offers different perspective that that Taiwan's direct foreign investment is motivated by different factors under different macroeconomic conditions. The microeconomic factors are varying with firm size that on average, large firms are more inclined to make direct foreign investment than of small firms. However, the driver that determinates both large and small firms to venture abroad is the prior successful export experience. Lin (1995) examines the trade effects of FDI between Taiwan and the four ASEAN member countries, namely Indonesia, Malaysia, the Philippines, and Thailand. The regression estimates show that Taiwan's outward FDI has a positive effect on exports to and imports from the host country, whereas no such effects

are consistently found for inward FDI from the same country. Chan (1998) examines the role of FDI, more specifically to predict Taiwan's economic growth with a multivariate model that includes human capital, fixed investment, exports, and FDI. The study finds a causality from FDI to economic growth. Two transmission channels are outlined by Chan (1998). The first is, FDI could induce technology transfer that results an advance in technology, which in turn promotes economic growth in the host country. Secondly, FDI may induce either fixed investment or exports, which affect economic growth through increased aggregate demand (Chan, 1998: 350). Eventually, the existing studies on Taiwan's FDI have looked at either the determinants of FDI or the effects of FDI on macroeconomic variables such as trade, and economic growth. Indeed, understanding on the relationship between inflows and outflows of investment as the study by Davis and Wincoop (2018) remains vacuum for the case of Taiwan. This study fills this gap.

The objective of study is to explore the relationship between approved foreign investment (inflows, FII), and approved outward investment (outflows, FIO) for a case study of Taiwan. It also focuses on the periods of various versions of Go South policy. This study serves as an extension of Liew and Tang's (2019) study which looks at the feasibility of Go South policies from the perspective of international trade by examining the existence of long-run relation between the flows of exports and imports of Taiwan with 9 ASEAN member countries, namely Indonesia, Cambodia, Laos, Myanmar, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. They find that Go South policies as favourable one for the most ASEAN member countries, except for Lao PDR, Myanmar, and the Philippines. There are two fresh dimensions to be covered by this study. Firstly, this study describes the inflows and outflows of Taiwan's foreign investment by different industries, and by the NSP participated countries. Secondly, this study

empirically investigates the relationship between these variables. This study offers a fresh empirical evidence that Taiwan's investment inflows and outflows are positively correlated (associated), and they are interdependent over the sample periods between 1959 and 2017. This finding is in line with the past studies those for other countries' evidence, and adds to the empirical literature given no such study has been found for the case of Taiwan.

Perhaps, study for FII and FIO relationship is important for Taiwan in line with its Go South policies. Duplicating the intuition by Davis and Wincoop (2018: 83), higher expected return in Taiwan should lead both domestic and foreign investors to shift their investments to Taiwan, leading to larger Taiwan capital inflows and lower outflows. Other factor is the change in the relative riskiness of Taiwan's assets that an increase in global risk or risk-aversion will then lead to a general retrenchment towards domestic assets, lowering both inflows and outflows. They add that capital flows have a portfolio growth component (associated with saving) that positive correlation reflects saving is positively correlated across countries, and a portfolio reallocation component (due to changes in expected returns and risk) in which, a negative correlation reflects that domestic and foreign agents face the same portfolio problem shifting their portfolios in the same direction.

The structure of this study is organized as follows. The next section gives a brief descriptive insight on Taiwan approved foreign investment and approved outward investment associating with various versions of Go South policy, by industrial sectors and NSP participated countries. Section 3 offers an empirical evidence of positive relationship between Taiwan's FDI inflows and outflows by applying the relevant econometric tests viz. correlation analysis, Ordinary Least Squares (OLS) estimates, and pairwise Granger non-causality tests. Section 4 concludes this study with policy discussion.

2. A Preview of Taiwan's Foreign Investment Inflows and Outflows

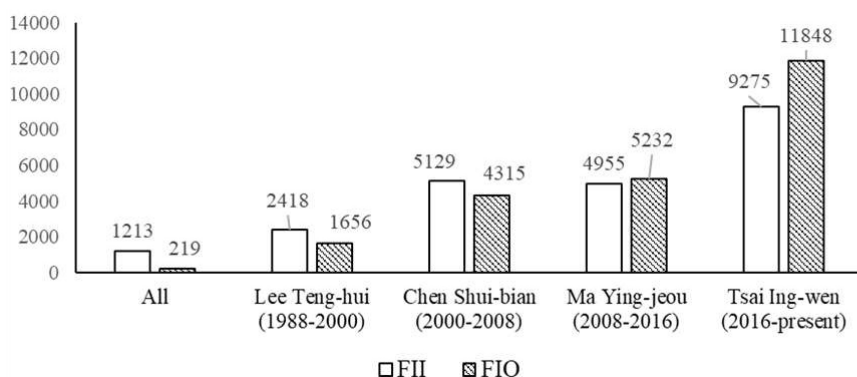
This section offers a descriptive preview on Taiwan's approved foreign investment (FII), and approved outward investment (FIO) over the period 1959-2017 covering the four different administrations from the former president, Lee Teng-hui (1988-2000), Chen Shui-bian (2000-2008), Ma Ying-jeou (2008-2016), and to present president, Tsai Ing-wen (2016- recent). The underlying data are obtained from CEIC (Census and Economic Information Center) database, which is assisted by an anonymous colleague from the Faculty of Economics and Business, Universiti Malaysia Sarawak (UNIMAS). Besides the aggregate FII and FIO data, this section also considers the data by industry, as well as by the NSP participated countries. By and large, these descriptive statistics may be interpreted with caution because of a relatively large missing data either empty or zero values are reported. The summary statistics are computed based on their respective administrates, for example only two observations that is two years of 2016-2017 for current president, Tsai Ing-wen. Therefore, this section is preliminary in depicting a general picture about Taiwan's investment inflows and outflows over the new and old versions of Go South policy, respectively.

Table 1 reports the summary statistics of FII and FIO. It is interesting to look at the standard deviation statistic which captures the 'risk' (i.e. volatility) that to be bear by domestic (outflows) and foreign (inflows) investors. The FII is found to be in the highest 'risk' during the Chen Shui-bian's administration, while the least under Lee Teng-hui; but Ma Ying-jeou's administration has created the highest 'risk' investment environment for FIO, and Tsai Ing-wen's administration is the least.

Table 1 Summary Statistics for the Approved Foreign Investment (FII) and Approved Outward Investment (FIO), in million USD

	Mean (p.a.)		Median (p.a.)		Maximum		Minimum		Standard Deviation	
	FII	FIO	FII	FIO	FII	FIO	FII	FIO	FII	FIO
All (1959-2017)	2,635	2,108	1,213	219	15,361	12,123	0	0	3,407	3,022
1959-1987	253	13	142	4	1,419	103	1	0	307	23
Lee Teng-hui (1988-2000)	2,862	2,045	2,418	1,656	7,608	5,077	1,183	219	1,780	1,294
Chen Shui-bian (2000-2008)	7,259	4,210	5,129	4,315	15,361	6,470	3,272	2,447	4,554	1,147
Ma Ying-jeou (2008-2016)	5,989	6,387	4,955	5,232	11,037	12,123	3,812	2,823	2,251	3,392
Tsai Ing-wen (2016-2017)	9,275	11,848	9,275	11,848	11,037	12,123	7,513	11,573	2,492	389

Notes: These statistics are overlapped in order to include the transition period between the presidents, for example, Lee Teng-hui 1988-2000, and Chen Shui-bian data for 2000 are included. The reported values are in nominal terms.

Figure 2 Average (Median) p.a. of Approved Foreign Investment (FII) and Approved Outward Investment (FIO) (in million USD) by Different Administrations

Source: CEIC (Census and Economic Information Center).

Figure 2 illustrates their average (median) per annum (p.a.) of FII and FIO excluded China (in nominal USD million) over the four administrations for the available periods between 1959 and 2017 as from Table 1. Outliers and skewed data have a smaller effect on median than of to mean and mode. It generally exhibits an upward trend of their average FII and FIO over the four administrations, except for Ma Ying-jeou that a slightly drops in FII. The overall average FII (USD1,213 million) largely exceeds FIO (USD219 million). It may reflect a positive correlation between the inflows and outflows of Taiwan's foreign investment. The highest average FII and FIO are USD9,275 million, and USD11,848 million, respectively occurred during the current Tsai's administration. The lowest average FII and FIO are observed during the administrate of Lee Teng-hui which are USD2,418 million and USD1,656 million, respectively. Over the four administrations, this phenomenon (i.e. FII > FIO) is only occurred during the administrative of Lee Teng-hui, and Chen Shui-bian, while FIO is slightly higher than FII under Ma Ying-jeou, and even higher under the Tsai Ing-wen.

Table 2 reports the average (median per month) FII and FIO of 12 of 20 industries in Taiwan. The data are mostly available monthly between 2006m1 and 2018m11 that 8 industries and the LeeTeng-hui's administration (1988-2000) are excluded. The statistics show that manufacturing is the most dominant industry with its largest average FII and FIO over the period 2006-2018 regardless of the different administrations. An average FII of USD280.98 million is fourfold larger than of FIO during Chen Shui-bian, but FIO exceeds FII for Ma Ying-jeou (slightly), and Tsai Ing-wen. This industry is generally reflected by the technology-intensive areas, and to encourage domestic technological spillovers. Meanwhile, FII is the only investment for construction; accommodation & eating-drinking places; real estate (except for Tsai Ing-wen); support services (except for Chen Shui-bian); arts,

Table 2 Average (median, per month) of Approved Foreign Investment (FII) and Approved Outward Investment (FIO) by Industry (in million USD)

Industry:		Manufacturing (Mfg):		<i>Food</i>		<i>Textiles mills</i>		<i>Printing & reproduction of recorded media</i>	
President	Period	FII	FIO	FII	FIO	FII	FIO	FII	FIO
Chen Shui-bian	May 2000-May 2008	280.98	68.18	0.08	0	0.18	0.40	0	0
Ma Ying-jeou	May 2008-May 2016	99.36	106.67	1.28	0	0	0	0.01	0
Tsai Ing-wen	May 2016-Nov 2018	106.98	180.43	0.69	0.19	0.02	6.53	0.03	0
		<i>Chemical material</i>		<i>Chemical products</i>		<i>Medical goods</i>		<i>Plastic products</i>	
President:	Period	FII	FIO	FII	FIO	FII	FIO	FII	FIO
Chen Shui-bian	May 2000-May 2008	3.13	0.04	0.88	0	0	0.09	1.41	0
Ma Ying-jeou	May 2008-May 2016	1.84	0.17	1.27	0	0.85	0	1.52	0
Tsai Ing-wen	May 2016-Nov 2018	1.33	0.67	0.57	0	0.16	0.73	0.48	1.00
		<i>Non-metallic mineral products</i>		<i>Basic metal</i>		<i>Fabricated metal products</i>		<i>Electronic parts & components</i>	
		FII	FIO	FII	FIO	FII	FIO	FII	FIO
Chen Shui-bian	May 2000-May 2008	0.50	0	0.38	0	4.98	1.00	132.04	11.29
Ma Ying-jeou	May 2008-May 2016	0.10	0	0.04	0	3.34	0.42	22.03	15.19
Tsai Ing-wen	May 2016-Nov 2018	0.13	0	0.00	1.35	1.54	2.00	25.61	30.60
		<i>Computers, electronic & optical products</i>		<i>Electrical equipment</i>		<i>Machinery & equipment</i>		<i>Motor vehicles & parts</i>	
		FII	FIO	FII	FIO	FII	FIO	FII	FIO
Chen Shui-bian	May 2000-May 2008	16.18	4.35	2.11	1.54	2.15	0.84	0.10	0
Ma Ying-jeou	May 2008-May 2016	3.02	3.14	3.30	1.00	3.69	0.33	0.11	0
Tsai Ing-wen	May 2016-Nov 2018	5.14	1.93	2.65	0.36	3.58	1.85	1.52	0.60

Table 2 (Continued)

President:	Period	<i>Other transport equipment</i>		<i>Not elsewhere classified</i>		Construction		Wholesale & retail trade	
		FII	FIO	FII	FIO	FII	FIO	FII	FIO
Chen Shui-bian	May 2000-May 2008	0.01	0.19	0	0	4.60	0	46.12	13.09
Ma Ying-jeou	May 2008-May 2016	0.30	0	2.36	0	1.08	0	46.83	17.71
Tsai Ing-wen	May 2016-Nov 2018	0.10	0	3.89	1.80	1.25	0	69.34	32.43
		Transportation & storage		Accommodation & eating-drinking places		Information & communication		Finance & insurance	
		FII	FIO	FII	FIO	FII	FIO	FII	FIO
Chen Shui-bian	May 2000-May 2008	1.14	0	0.10	0	8.47	1.44	184.3	135.33
Ma Ying-jeou	May 2008-May 2016	0.57	0.06	1.75	0	5.43	2.18	88.10	82.95
Tsai Ing-wen	May 2016-Nov 2018	1.41	0.98	3.87	0	14.32	4.73	65.49	153.84
		Real estate		Professional, science & technical services		Support services		Arts, entertainment & recreation	
		FII	FIO	FII	FIO	FII	FIO	FII	FIO
Chen Shui-bian	May 2000-May 2008	3.21	0.00	10.01	0.27	0.36	0.25	0	0
Ma Ying-jeou	May 2008-May 2016	20.49	0.00	8.19	1.41	1.00	0	0.03	0
Tsai Ing-wen	May 2016-Nov 2018	25.63	0.78	26.45	2.38	0.81	0	0.43	0
		Other services							
		FII	FIO						
Chen Shui-bian	May 2000-May 2008	0.15	0						
Ma Ying-jeou	May 2008-May 2016	1.72	0						
Tsai Ing-wen	May 2016-Nov 2018	0.17	0						

Notes: “-” means no data available (reported). The reported values are in nominal terms. The industries those with either zero or “-” (i.e. data are unavailable), and those with only one value for both FII and FIO are excluded here are Agri, forestry, fishery & animal husbandry; Mining & quarrying; Electricity & gas supply; Water supply & remediation services; Public admin, defense & compulsory social security; Educational services; Health care &

social work services; and Miscellaneous. The sub-industries of Manufacturing those excluded are Beverages; Tobacco; Wearing apparel & clothing accessories; Leather, fur & related products; Wood & bamboo products; Pulp, paper & paper products; Petroleum & coal products; Rubber products; Furniture; and Repair & install of industrial machinery & equipment.

entertainment & recreation; and other services. One observed feature is that FII is greater than FIO over different administrations, in which FII in wholesale & retail trade is double than of FIO, other industries are transportation & storage; information & communication; professional, science & technical services; and finance & insurance, except for Tsai Ing-wen's administration.

Of the 17 sub-industries of manufacturing, electronic parts & components is the most important sub-industry which contributes the highest value of both FII and FIO, on average. The average FII is found to be larger than FIO for chemical material; electrical equipment; machinery & equipment; fabricated metal product (except for Tsai Ing-wen); electronic parts & components (except for, Tsai Ing-wen); and computers, electronic & optical products (except for Ma Ying-jeou). An opposite is observed that FIO is greater than FII for textiles mills; and medical good, except for Ma Ying-jeou's administration. Some sub-industries of manufacturing have only FII, namely food; printing & reproduction of recorded media; chemical products; plastic product (except for, Tsai Ing-wen); motor vehicles & parts (except for Tsai Ing-wen); non-metallic mineral product; basic metal; and other transport equipment (except for Chen Shui-bian).

The last preview is about average (median) FII and FIO for 7 out of 18 NSP participated countries due to their data availability as presented in Table 3. It is observed that the largest Taiwan's bilateral investment (FII and FIO) country is Singapore with FII exceeds FIO. It is followed

by Malaysia. On the contrary, Indonesia, the Philippines and Thailand have received more investment from Taiwan (i.e. FIO is greater than FII, on average) in their bilateral investment over the four administrations. Also, it is interesting to note that Australia is only with Taiwan's FII, while Vietnam is only with Taiwan's FIO. The latter (Vietnam) is sevenfold with an average of USD33.54 million and USD30.05 million during Ma Ying-jeou and Tsai Ing-wen's administrations, respectively comparing to previous administrations. Nevertheless, no data are available to support either unilateral or bilateral investment between Taiwan and its 11 NSP countries, namely Bangladesh, Bhutan, Brunei, Cambodia, India, Laos, Myanmar, Nepal, New Zealand, Pakistan, and Sri Lanka. It may be the case that their investments are 'too small' (inactive) to be reported.

Table 3 Average (median, per month) of Approved Foreign Investment (FII) and Approved Outward Investment (FIO) by 18 NSP Countries (in million USD)

By country:		Australia		Indonesia		Malaysia		The Philippines	
President	Sample Period	FII	FIO	FII	FIO	FII	FIO	FII	FIO
Lee Teng-hui	Jan 1988-May 2000	0	-	0	1.26	0.11	1.14	0.10	0.50
Chen Shui-bian	May 2000-May 2008	0.12	-	0	0	3.01	0.82	0	0
Ma Ying-jeou	May 2008-May 2016	0.33	-	0.08	0.11	3.61	0.86	0.02	0
Tsai Ing-wen	May 2016-Nov 2018	1.42	-	0.05	4.46	1.69	1.35	0.05	0.45
		Singapore		Thailand		Vietnam			
		FII	FIO	FII	FIO	FII	FIO		
Lee Teng-hui	Jan 1988-May 2000	6.00	2.59	0	2.96	-	2.62		
Chen Shui-bian	May 2000-May 2008	9.06	2.20	0.02	0.61	-	3.93		
Ma Ying-jeou	May 2008-May 2016	7.28	4.89	0.02	1.06	-	33.54		
Tsai Ing-wen	May 2016-Nov 2018	8.19	2.85	0.10	4.89	-	30.05		

Notes: The reported values are in nominal terms. The data are mostly available monthly between 1989m1 and 2018m11. The median is calculated from the respective monthly data. The countries those with either zero or “-” (i.e. data are unavailable) for both FII and FIO are excluded here, namely Bangladesh,

Bhutan, Brunei, Cambodia, India, Laos, Myanmar, Nepal, New Zealand, Pakistan, Sri Lanka.

3. Empirical illustration

This section offers an empirical evidence that Taiwan's inflows and outflows of foreign investment are positively associated over the sample periods between 1959 and 2017 that covers 59 annual observations. Two measures are being considered here, the first pair of foreign investment variables is in real terms, namely real approved foreign investment (RFII) and real approved outward investment, excluded China (RFIO), in New Taiwan dollar (TWD) millions. The raw data of both variables (in nominal USD millions) are obtained from CEIC (Census and Economic Information Center) database. Taiwan's Consumer Price Indices, CPI (2016=100) is employed as price deflator. Exchange rate and CPI data are obtained from DGBAS (National Statistics of the Directorate-General of Budget, Accounting and Statistics, at <http://statdb.dgbas.gov.tw/pxweb/dialog/statfile1L.asp>). The second pair of variables is labelled as FIIGDP and FIOGDP those are Taiwan's approved foreign investment, and approved outward investment as ratio of Taiwan's Gross Domestic Product (GDP), respectively. Taiwan's GDP data are in USD millions at current prices. It is feasible for robustness check that they have been adjusted for the size of Taiwan economy (output).

The underlying variables are visualized in Figure 3. Both measures of approved outward investment (RFIO and FIOGDP) show a take-off in the year of 1988 when Lee Teng-hui (1988-2000) was the president, in which it is established by his Go South policy initiated in 1992. For the inflows of foreign investment, RFII exhibits a gradually increasing trend, while FIIGDP remains volatile around its constant mean with

Figure 3 Time Series Plots of RFII, RFIO, FIIGDP and FIOGDP

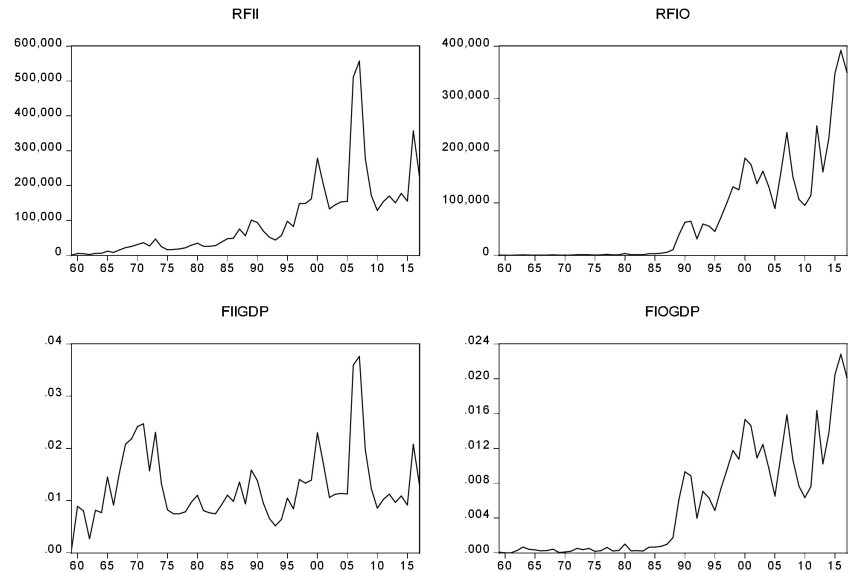
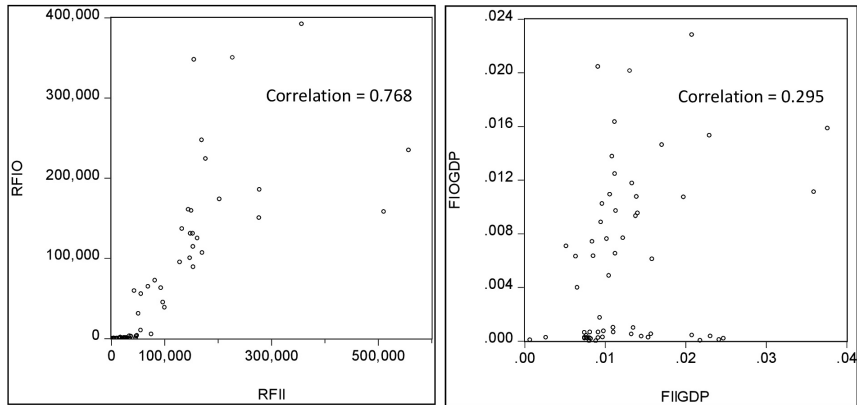


Figure 4 Scatter Plots of RFII-RFIO and FIIGDP-FIOGDP



extraordinary inflows between 2006 and 2007. As explained by the data that FIIGDP volatile because of it inherently volatile, and not the volatility of Taiwan's GDP.

Figure 4 informs the correlation patterns between Taiwan's approved foreign investment and outward investment. The left panel shows a relatively strong positive correlation coefficient of 0.77 between real approved foreign investment and outward investment. Similar observation is shown when both variables are measured as ratio of GDP, but its correlation coefficient is eventually lower, 0.30 after taking the economic size of Taiwan into account. From the policy perspective, however, data in real terms (RFII-RFIO) are preferable to ratio (FIIGDP-FIOGDP) on how much FDI actually are inflows and outflows.

The focus of this section is to investigate the relationship (association) between inflows and outflows of foreign investment in Taiwan by estimating a set of simple linear (time series) regression equations. They are:

$$\begin{aligned} \text{RFII}_t &= a + b\text{RFIO}_t + e_t, \\ \text{RFIO}_t &= a' + b'\text{RFII}_t + e'_t, \\ \text{FIIGDP}_t &= a + b\text{FIOGDP}_t + e_t, \text{ and} \\ \text{FIOGDP}_t &= a' + b'\text{FIIGDP}_t + e'_t \end{aligned}$$

However, it is to note that these estimated equations by OLS estimator may have suffered from the so-called *spurious* regression problem that is nonsense regression if they involve non-stationary or $I(1)$ variables (see, Engle and Granger, 1987). It generally reflects in a case that some statistically significant coefficients and comes with a very high R^2 . A “*rule of thumb*” to describe such *spurious* regression is, a high adjusted R^2 with a low Durbin-Watson statistic. Therefore, it is necessary to ascertain that the underlying time series variables are

stationary, or $I(0)$ variables before estimating the OLS regression model(s). Table 4 is about the results of Phillips-Perron unit-root test (Phillips and Perron, 1988). It shows that the four variables are stationary in levels, or $I(0)$ variables, in which the null hypothesis of a unit root can be rejected at 5 per cent level of significant, except for RFIO. RFIO is suggested to be non-stationary, $I(1)$ at 1 per cent level of significant. For such a case, this variable is assumed to be stationary, $I(0)$ given its ‘weak’ rejection of the null hypothesis of a unit root at first-differenced variable (i.e. $\Delta\text{RFIO}_t = \text{RFIO}_t - \text{RFIO}_{t-1}$), that is at 10 per cent significance level. This assumption is to avoid information loss due to first-differencing transformation. By the same token, since both approved foreign investment and outward investment are stationary, or $I(0)$, therefore no cointegration (i.e. no long-run relation) can be delivered. Such the finding is also supported by the results reported from Engle and Granger (1987) tests as in Table 5. The null hypothesis of “the underlying [time series] variables are not cointegrated” can be rejected (at least, at 10 per cent level of significant) that is a cointegration does exist, only for the case when RFII and FIIGDP are being served as dependent variable, but it is not true for RFIO and FIOGDP. Therefore, no cointegration can be concluded.

The estimated OLS equations are tabulated in Table 6. All of the independent variables are statistically significant at least, at 5 per cent level, and they have a positive sign as expected. It supports the early intuition of a positive association (i.e. correlation as illustrated in Figure 4) between Taiwan’s foreign investment inflows and outflows, regardless of their unit of measurement either in real term or in ratio of GDP. These estimates are *reasonable* as the respective equations have their [adjusted] R^2 which is lower than Durbin-Watson statistic, except for RFIO equation with R^2 (0.58) slightly higher than Durbin-Watson statistic (0.46), but it is still acceptable with such small variation.

Table 4 Phillips and Perron (PP) Root Tests (Phillips and Perron, 1988)

Variable:	Levels	First-differenced	$I(d)$
$RFII_t$	-3.689** [6]	-	$I(0)$
$RFIO_t$	-2.239 [1]	-8.097*** [6]	$I(1)$
$FIIGDP_t$	-3.962** [2]	-	$I(0)$
$FIOGDP_t$	-3.286* [1]	-	$I(0)$

Notes: The unit root equation is with constant and linear trend for data at levels, while only constant is included for the first-differenced data. Value in [.] is bandwidth using Bartlett kernel. ***, **, and * indicate significant at the level of 1 per cent, 5 per cent, and per cent, respectively based on their computed p -value.

Table 5 Engle and Granger (1987) Cointegration Tests

Dependent variable:	tau-statistic	p -value	z-statistic	p -value
RFII	-3.398587	< 0.10	-20.77928	< 0.05
RFIO	-1.855630	> 0.10	-10.24574	> 0.10
FIIGDP	-3.825133	< 0.05	-22.65457	< 0.05
FIOGDP	-0.652519	> 0.10	-2.121002	> 0.10

Note: The results are based on a maximum of 3 lags.

Table 6 Estimates of Ordinary Least Squares Regression Equations

	Dependent variable:			
	$RFII_t$	$RFIO_t$	$FIIGDP_t$	$FIOGDP_t$
$RFIO_t$	0.896*** (0.099)	-	-	-
$RFII_t$	-	0.658*** (0.073)	-	-
$FIOGDP_t$	-	-	0.323** (0.139)	-
$FIIGDP_t$	-	-	-	0.269** (0.115)
Constant	34804.43*** (12035.81)	6874.855 (11005.53)	0.011*** (0.001)	0.002 (0.002)
Adj. R^2	0.582	0.582	0.071	0.071
Durbin-Watson	0.726	0.459	0.741	0.162
F-stats	81.898 [0.000]	81.898 [0.000]	5.431 [0.023]	5.431 [0.023]

Notes: value in (.) is standard error, while [.] is p -value. ***, and ** indicate significant at the level of 1 per cent, and 5 per cent, respectively based on their computed p -value.

Lastly, this section applies the so-called [pairwise] Granger non-causality tests (see, Granger, 1969) because of its intuition behind that “*all the cause occurs before effect*”. More technically, X is said to Granger-cause Y , if Y can be better predicted using the histories of both X and Y than it can by using the history of Y alone (Granger, 1969). This test helps to identify the possible causality patterns between Taiwan’s approved foreign investment and outward investment. In brief, a bivariate VAR (Vector Autoregression) framework, let say X and Y can be expressed as the following OLS linear regression equations with a requirement that the underlying variables are stationarity, $I(0)$:

$$Y_t = a_0 + a_1 Y_{t-1} + \dots + a_p Y_{t-p} + b_1 X_{t-1} + \dots + b_p X_{t-p} + v_t, \text{ and} \\ X_t = c_0 + c_1 X_{t-1} + \dots + c_p X_{t-p} + d_1 Y_{t-1} + \dots + d_p Y_{t-p} + v_t'$$

For the Y equation, for instance, the null hypothesis is labelled as $H_0: b_1 = b_2 = \dots = b_p = 0$ (i.e. X does not Granger-cause Y), against the alternative hypothesis that $H_A: b_1 \neq b_2 \neq \dots \neq b_p \neq 0$ (i.e. X does Granger-cause Y).

Table 7 reports the results of Granger non-causality tests for both pairs of RFII-RFIO and FIIGDP-FIOGDP, respectively as based on a lag length of 1, 2, and 3 year(s). The empirical results suggest a bi-directional causality between Taiwan’s real approved foreign investment (RFII) and real approved outward investment (RFIO) given 2 and 3 lags since the null hypothesis can be rejected at least at 10 per cent level. It informs that both inflows and outflows of Taiwan’s investment are considerably interdependent. However, if both variables are scaled by GDP, the results turn into a weaker position that is only one-way causality with 2 lags from approved foreign investment (FIIGDP) to approved outward investment (FIOGDP).

Table 7 Pairwise Granger (1969) Non-Causality Tests (*F*-statistics)

Lags:	1	2	3
Null Hypothesis:			
RFIO \neq RFII	2.667 [0.108]	2.521 [0.090]*	2.584 [0.064]*
RFII \neq RFIO	0.108 [0.744]	3.519 [0.037]**	3.308 [0.028]**
FIOGDP \neq FIIIGDP	0.012 [0.914]	0.066 [0.937]	0.858 [0.469]
FIIIGDP \neq FIOGDP	0.556 [0.459]	3.431 [0.040]**	2.158 [0.105]

Notes: \neq stands for “does not Granger-cause”. A value in [.] is *p*-value. ** and * indicate significant at the level of 5 per cent, and 10 per cent, respectively based on their computed *p*-value.

4. Conclusions and Policy Discussions

This study examines the nature of Taiwan's approved foreign investment (FII) and approved outward investment (FIO) by covering both the new and older versions of Go South policy since 1992 from the former president Lee Teng-hui to the present Tsai Ing-wen. The key findings of this study are that, there is an increasing trend on average for both FII and FIO, except for Ma Ying-jeou's administration (2008-2016) in which a slightly decline occurred in FII. In the late Ma's (since 2012) and Tsai Ing-wen's administrations, Taiwan's outflows of foreign direct investment is noticeably more than its inflows, that is more domestic capitals are flowing out abroad which reflects a lower the national savings from the portfolio perspective. It seems to be unfavourable to Taiwan. Secondly, Taiwan's manufacturing industry is ranked the top among the 20 industries of both FII and FIO. Third, Singapore is being considered as the most active among Taiwan's NSP countries for bilateral investment (FII exceeds FIO), while other country is Malaysia. Lastly, and more fundamentally, a positive correlation (association) occurs between FII and FIO for the period 1959-2017.

Meanwhile, a bi-directional causality is found between Taiwan's FII and FIO, which reflects that both inflows and outflows of foreign investment in Taiwan are interdependent.

Do the Go South policy (older versions) and NSP make their success story in reducing the dependency of China, in particularly in term of foreign direct investment? It has been observed that older versions of Go South policy as well as current NSP do alter the foreign investors and the Taiwanese entrepreneurs about their investment decisions – their mindset. This study mirrors that Go South policy (including NSP) is necessary, but insufficient to say a success story without looking at other aspects more comprehensively which are out of the scope of this study. Indeed, it is ‘too big’ China to be replaced by the active NSP countries by considering that China has accounted for 44.4 per cent of Taiwan's outward FDI flows in 2017, for instance (see, Kuo and Kao, 2018). And, only two NSP countries, namely Singapore and Malaysia are the most active in term of their bilateral foreign investment, while the remaining countries play either a limited role or inactive to Taiwan's inward and outward foreign investment flows.

What are the key factors to determine Taiwan's inward and outward direct investments since the 1992's Go South policy? It is an essential question that to be answered in this study. There are two conventional factors determining the behaviour of investors in Taiwan, namely the expected return in Taiwan and the relative riskiness of Taiwan assets, as pointed out by Davis and Wincoop (2018). However, this study believes that “China factor” is the most fundamental determinant to Taiwan's inflows and outflows of foreign investment, such that Taiwan's policy analysts have identified China as the main obstacle to further progress of the NSP countries in term of trade, investment, educational exchange, and tourism via its “China factor” impinging effect on Taiwan's engagement policies under the NSP. Such “China factor” has

consistently undermined Taipei's efforts to strike bilateral investment and free trade agreements (FTAs) with regional partners (Kuo and Kao, 2018).

For policy implications, NSP is being considered as a long-standing policy which requires further *revision and extension*, especially to promote more active participation from the NSP countries in their bilateral investments to the potential (major) industries. Indeed, Taiwan's investment and trade with the NSP participated countries do not seem to grow rapidly. A way out is to enlarge the number of existing 18 NSP participated countries. Taiwan should strengthen its 'connectedness' with the *North (Northeast) Asia* such as Japan, Mongolia, North Korea and South Korea, and with other *South* countries that are inactive, such as Bangladesh, Bhutan, Brunei, Cambodia, India, Laos, Myanmar, Nepal, New Zealand, Pakistan, and Sri Lanka, by revising and strengthening its existing diplomacy policies, in a sense that – *to talk more and do more*. Also, as highlighted by Glaser *et al.* (2018), a clear economic benchmark should be established for the NSP that is rooted in commercial results for Taiwan's businesses including sales, exports, outward and inward investment, employment, and value-added created. Undoubtedly, Taiwan needs foreign investment as well as domestic entrepreneurs for growth. Taiwan is in a situation of battling brain drain that results outside 'resources' especially, foreign investments are being important to boost the economy. It may be hard to realize such the role as foreign investors still face some barriers in setting up their investment in Taiwan, among them are language barrier, high transaction costs, difficulty in obtaining loan from Taiwan's conventional banking system; negative prospect in the island's longer-term economic outlook, the domestic companies investing abroad are pessimistic about their business ideas in Taiwan, and lastly the issues related to protection of intellectual property rights (Susilo, 2018).

Indeed, further study is required from a multidisciplinary perspective for evaluating and revising the NSP for making Taiwan the new economy miracle.

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Notes

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