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CAUSALITY ON OUTWARD FOREIGN DIRECT INVESTMENT AND DOMESTIC INVESTMENT IN NEWLY INDUSTRIALIZED ASIAN COUNTRIES

Abstract. *For the past two decades, outward foreign direct investment (OFDI) from newly industrialized countries has substantially increased. Given the role of physical capital accumulation in determining economic growth, it is crucial to evaluate how domestic investment (DI) responds to OFDI. This study empirically examined the effects of OFDI and DI in newly industrialized Asian countries, using data from 1990 to 2011. The results suggested that: (1) a short-run unidirectional causality running from DI to OFDI exists in China, Japan, and South Korea; (2) both long-run and strong unidirectional causalities running from OFDI to DI exist in Singapore and Taiwan; (3) only China exhibits both long-run and strong unidirectional causalities running from DI to OFDI; (4) policies for promoting OFDI may not affect DI in Indonesia, Malaysia, Philippines, and Thailand. Finally, policy implications are provided in the final section of this study.*

Keywords: *Causality; Co-integration; Domestic investment (DI); outward foreign direct investment (OFDI).*

JEL Classification: F21; F41; C22

1. Introduction

In recent decades, advanced countries have remained the leading source of outward foreign direct investment (OFDI), but developing and newly industrialized countries have become increasingly essential sources of OFDI since the 1990s. Numerous multinational enterprises in these newly industrialized countries, particularly those in China, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand are embarking on cross-border investment through FDI. According to the statistics of the *World Investment Report* (2012) of the UNCTAD, the total share of the world OFDI from these countries increased from 3.8% to 19.6% between 1990 and 2011, and peaked in 2010 at 23.8%. Thus, a question that naturally arises is whether these enormous amounts of OFDI affect economic activity in these newly industrialized Asian countries.

Policymakers in these countries should consider how DI is affected by OFDI, because DI is a crucial source of physical capital accumulation, subsequently affecting the economic growth rate. For example, since the economic reforms of the 1980s, China has attracted numerous foreign investments, transforming its low labor-cost advantage into physical capital accumulation that boosted its economic growth in the following decades. High-wage neighboring countries, such as Japan, Singapore, South Korea, and Taiwan, may realize that large labor cost reductions by distributing economic activities to low-wage countries can generate investment competency. If labor costs vary and DI opportunities arise, it can be assumed that the effects of OFDI on DI may differ among these countries.

Recent studies have agreed that the growth rate in East Asia is greater compared with that in other regions. This encouraged us to reexamine the role OFDI plays in East Asia, particularly in these top nine newly industrialized countries. The effects of OFDI on DI may vary among countries, depending on the economy of each nation and the intention of domestic firms to invest abroad. For example, capital outflow as OFDI may shift part of the private domestic savings abroad; thus, the effects of this outflow in countries that possess abundant savings, such as China, Japan, Singapore, South Korea, and Taiwan, may differ substantially from those in countries that exhibit deficient capital such as Indonesia, Malaysia, Philippines, and Thailand.

From a theoretical point of view, Stevens and Lispsey (1992) described two mechanisms explaining how OFDI affected DI. The first mechanism operates through financial markets. Based on the conditions of an imperfect financial market and scarcity of financial resources, OFDI may raise domestic interest rates by transferring funds out of the home country, decreasing the borrowing intentions of domestic firms. Therefore, OFDI may weaken investment in the home country, encouraging domestic firms to internally finance their overseas investments because of high interest rates. An example of this mechanism is the Abenomics (a portmanteau of *Abe* and *economics*) financial policy that Japan adopted in 2012. Facing an almost zero interest rate encouraged Shinzo Abe, the Prime Minister of Japan at the time, to use an aggressive quantitative easing policy to cope with economic recession, thus avoiding the effects of low interest rates on DI. This highly loose monetary policy may eventually lead to currency devaluation, vigorous financial liquidity, and an increased export rate and OFDI.

By contrast, the second mechanism operates through production markets. Firms seeking to invest abroad by transferring production overseas may diminish domestic exports; however, such outflow can be viewed as a complement of DI. Desai et al. (2005) stated that OFDI and DI by U.S. multinational firms are complementary, suggesting that firms use domestic and foreign production to reduce costs and increase returns on domestic production; this increases DI. This is a key mechanism among newly industrialized Asian countries. A prime example is

China, which has received a large amount of FDI from its neighboring countries in recent years, promoting its economic growth. Nearly 70% of the inward FDI in China originates from developing Asian countries. Japan and Taiwan are two of the top three inward FDI sources in China, shifting numerous production facilities to China, and contributing 18.82% and 13.14% to the inward FDI in China, respectively (*World Investment Report*, UNCTAD, 2012). This may diminish the domestic exports of Japan and Taiwan in the short run; however, this effect is inconsequential in the long run because the OFDI may reallocate exports of final products and benefit exports of intermediate products from domestic firms in Japan and Taiwan to foreign affiliates, and therefore promote DI in these countries.

Previous studies have primarily examined how OFDI affects employment, exports, and domestic output (Navaretti and Castellani, 2004), and recently, the available evidence concerning OFDI and DI has been discussed by Feldstein (1995), Agosin and Mayer (2000), and Al-Sadig (2012). However, these studies have not indicated the long-term effects of OFDI on investment as a whole. We analyzed both the short-run and long-run effects of OFDI on DI; to our knowledge this was the first study to examine this topic in newly industrialized Asian countries. To this end, we used a distinct approach to investigate how OFDI affected DI: an autoregressive distributed lag (ARDL) co-integration test and a Granger causality analysis, based on time-series data for nine newly industrialized Asian countries (China, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand). These countries were chosen because they are among the largest OFDI suppliers in East Asia. One of the principal aims of this study was to determine how the effects of OFDI on DI differ, using the Granger causality test to elucidate these differences. The directions of the causal relationship can be classified into four types. The first suggests that OFDI affects DI. By contrast, the second type indicates that DI affects OFDI. The third type expresses that there is a bidirectional relationship between OFDI and DI, and finally, the fourth type is a neutral causal relationship, indicating no relationship between OFDI and DI.

Furthermore, this study differs from previous studies in certain aspects. First, this was the first study to characterize the relationship between OFDI and DI among nine newly industrialized Asian countries, offering insight and policy implications regarding the widely disputed OFDI-growth nexus. Second, we used pure time-series data in our empirical analysis, whereas former studies have used either cross-sectional or panel data (Braunstein and Epstein, 2001), potentially causing problems regarding data comparability and heterogeneity (Atkinson and Brandolini, 2002). Third, we used the Granger causality test and ARDL approach to avoid a low power problem in detecting the co-integrating relationships, whereas previous studies have not tested for this. Failure to reflect the possible two-way causality between the variables may result from a simultaneity problem. Finally, unlike previous studies, we incorporated long-term dynamics in the error correction model (ECM) of the ARDL approach. Neglecting the long-term dynamics in the simple VAR model may generate various estimation biases and deceptive empirical results. The remaining paper is organized as follows. Section 2 describes the estimation procedure including the ADF test, ARDL approach, and Granger causality analysis. Section 3 explains the empirical results. Finally, the concluding remarks and policy implications are presented in Section 4.

2. Methodology and Data

In this empirical study, I is domestic investment, Y stands for gross domestic product (GDP), and $OFDI_i$ represents outward foreign direct investment. Data of domestic investment is measured by gross capital formation, and $OFDI_i$ represents the net FDI outflows. All variables are taken in their natural logarithms prior to conducting the empirical analysis. The annual time series data for China, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand are obtained from World Bank's (*World Development Indicators* (WDI) 2011. Data on $OFDI_i / Y$ are from the UNCTAD FDI data base over the period 1990 to 2011.

2.1 Unit root test - Augmented Dickey Fuller (ADF)

The assumptions of the classical time series model require that series $\{ x_t \}$ is stationary and errors have a zero mean and finite variance. Non-stationary variables may result in a spurious regression if the non-stationary properties of the variables are not reflected (Granger and Newbold, 1974). Therefore, unit root test is applied to determine whether variables are stationary individually before conducting causality tests. Numerous macroeconomic time series contain unit roots dominated by stochastic trends as developed by Nelson and Plosser (1982). Unit roots are crucial in examining the stationarity of a time series because a non-stationary regressor can invalidate standard empirical results. The presence of a stochastic trend is determined by testing for the presence of unit roots in time series data. In this study, a unit root test is tested by using Augmented Dickey–Fuller (ADF). The Augmented Dickey–Fuller test (1979) is referred to the *t* statistic of λ_2 coefficient of the following regression:

$$\Delta x_t = \lambda_0 + \lambda_1 t + \lambda_2 x_{t-1} + \sum_{i=1}^{n} \eta_i \Delta x_{t-1} + \mu_t \qquad (1)$$

where Δ is the first difference operator with n lags, μ_t is a stationary random error which adjusts the error of autocorrelation. The null hypothesis is that, x_t is a non-stationary series and rejected when λ_2 is significantly negative ($H_0 : \lambda_2 = 0 ; H_1 : \lambda_2 < 0$). This study uses the Schwarz-Bayesian criteria (SBC) to determine the optimal lag orders for Eq. (1) by selecting the grid of values for the number of lags (n) and obtaining the value of n at which the SBC attains its minimum.

2.2 Autoregressive Distributed Lag (ARDL) co-integration tests

As stated by Desai et at.(2005) and Alper and Erman (2014), we estimate the investment equation

$$(\frac{I}{Y})_t = \beta + \delta(\frac{OFDI}{Y})_t + \mu_t, \tag{2}$$

where $\frac{I}{Y}$ is the domestic investment share of GDP, $\frac{OFDI}{Y}$ represents the outward foreign direct investment share of GDP, and μ_t is the usual error term. We test for the existence of a long-run co-integrating relationship between $OFDI$ and domestic investment by using the bounds test of autoregressive distributed lag (ARDL) approach developed by Pesaran et al. (2001). There are two reasons for applying ARDL approach in this study, first, the ARDL is applicable irrespective of whether the considering variables are $I(0)$ or $I(1)$ or a mixture of both, stationary or non-stationary, and thus avoids the spurious regression or problems inherent in unit root test prior to testing for co-integration. Second, using the ARDL approach avoids a low power in detecting the co-integrating relationship while the sample or data span is inevitably small. Therefore, applying the ARDL approach not only can avoid the possibility of non-stationarity but also may reflect the infusion of requisite capital to support the development process (Blejer and Khan, 1984; Desai et al., 2005; Feldstein and Horioka, 1980; Greene and Villanueva, 1991; Luca and Spatafora, 2012; Ndikumana, 2000; Osikoy, 1994; and Wai and Wong, 1982).

The error correction model (ECM) of the ARDL model is expressed as

$$\Delta(\frac{I}{Y})_t = \beta_1 + \sum_{i=1}^{m1}\theta_{1i}\Delta(\frac{I}{Y})_{t-i} + \sum_{j=0}^{n1}\delta_{1j}\Delta(\frac{OFDI}{Y})_{t-j} + \gamma_1(\frac{I}{Y})_{t-1} + \gamma_2(\frac{OFDI}{Y})_{t-1} + \mu_t, \tag{3}$$

where Δ is the first difference operator. In Eq.(3), the null hypothesis of the co-integrating relationship between $(I/Y)_t$ and $(OFDI/Y)_t$ is detected by testing the *F*-statistic for $H_0 : \gamma_1 = \gamma_2 = 0$ against the alternative $H_1 : \gamma_1 \neq \gamma_2 \neq 0$. Instead of the conventional critical values, Pesaran et al. (2001) proposes a bounds test for two sets of critical variables, the one set assumes that all variables are $I(0)$, and the other set assumes that all variables are $I(1)$. If the tested *F*-statistic value lies below the lower bound critical value, then the null hypothesis of no co-integrating relationship cannot be rejected, and if it exceeds the respective upper bound critical value, the null hypothesis is rejected. If the tested *F*-statistic value falls within the lower and upper critical value bounds, inference is inconclusive. Recently, the set of the bound critical values for the limited data are developed by Narayan (2005).

IF there is a co-integrating relationship between variables, the next step is to estimate the following long-run model and short-run dynamics in Eq.(4) and Eq.(5), respectively.

$$(\frac{I}{Y})_t = \beta_2 + \sum_{i=1}^{m2}\theta_{2i}\Delta(\frac{I}{Y})_{t-i} + \sum_{j=0}^{n2}\delta_{2j}\Delta(\frac{OFDI}{Y})_{t-j} + \mu_{2t}, \quad (4)$$

$$\Delta(\frac{I}{Y})_t = \beta_3 + \sum_{i=1}^{m3}\theta_{3i}\Delta(\frac{I}{Y})_{t-i} + \sum_{j=0}^{n3}\delta_{3j}\Delta(\frac{OFDI}{Y})_{t-j} + \phi ECT_{t-1} + \mu_{3t}, \quad (5)$$

where ϕ is a statistically significant coefficient of error correction term (ECT) with a negative sign and shows how fast variables converge to the equilibrium.

2.3 Causality tests

The ARDL approach reveals the long-run co-integration information, but it does not indicate causal relationship between variables. Thus, the two-step procedure of Engle and Granger (1987) causality test is conducted by examining the causal relationship between the share of domestic investment and outward FDI. To investigate the short-run and long-run Granger causality relationship, we estimate Eq.(4) to obtain the estimated residuals and then employ the following error correction model:

$$\Delta(\frac{I}{Y})_t = \beta_4 + \sum_{i=1}^{m4}\theta_{4j}\Delta(\frac{I}{Y})_{t-i} + \sum_{j=0}^{n4}\delta_{4i}\Delta(\frac{OFDI}{Y})_{t-j} + \phi_1 ECT_{t-1} + \mu_{4t}, \quad (6)$$

$$\Delta(\frac{OFDI}{Y})_t = \beta_5 + \sum_{i=0}^{m5}\theta_{5j}\Delta(\frac{I}{Y})_{t-i} + \sum_{j=1}^{n5}\delta_{5i}\Delta(\frac{OFDI}{Y})_{t-j} + \phi_2 ECT_{t-1} + \mu_{5t}, \quad (7)$$

Both residual terms μ_{4t} and μ_{5t} are independently and normally distribution with zero mean and constant variance, and the SBC is used to select the optimal lag structure for ARDL specification. If rejects the null hypothesis, it implies that $(OFDI/Y)$ does Granger cause (I/Y), and (I/Y) does Granger cause $(OFDI/Y)$, respectively. Granger causal relationship can be conducted in three ways by using Eq.(6) and Eq.(7):

(i) Short-run Granger causality is conducted by testing $H_0: \delta_{4i} = 0$ and $H_0: \theta_{5j} = 0$ for all i and j, respectively.

(ii) Long-run Granger causality is conducted by testing $H_0: \phi_1 = 0$ and $H_0: \phi_2 = 0$, and notes that the coefficient (ϕ) of ECT measures how fast the deviations from the long-run equilibrium are shrunk following changes of each variable.

(iii) Strong Granger causality is detected by testing $H_0: \delta_{4i} = \phi_1 = 0$ and $H_0: \theta_{5j} = \phi_2 = 0$ for all i and j, respectively.

3. Empirical Results

3.1 Results of Unit root tests

The ADF unit root test was the first step to confirm the stationarity and the degree of integration of each variable. If the order of integration of any of the variables was larger than one, then the critical bounds suggested by Pesaran et al. (2001) were not valid because they are only computed on the basis that variables are $I(0)$ or $I(1)$. The ADF test results are presented in Table 1 for the level term and the first difference of each of the variables. Table 1 shows that the OFDI variable for Philippines and the DI variables for Indonesia and Philippines were not stationary regarding both level terms and first differences. This result suggests that we should drop Indonesia and Philippines for OFDI and DI nexus from the ARDL bounds testing approach of co-integration and causality analysis because of the different integration orders. However, the ARDL bounds approach could be used for the remaining countries.

Table1. ADF unit roots test results

Country	Outward FDI		Domestic Investment	
	Level Term	First differences	Level Term	First differences
China	-1.140(0)	-3.562(0)	-1.371(0)	-4.867(0)
Indonesia	-0.103(1)	-4.271(0)	-0.031(0)	-2.160(0)*
Japan	-1.294(0)	-4.172(0)	-1.510(0)	-4.563(0)
Malaysia	-1.481(0)	-4.674(0)	-1.164(0)	-3.997(0)
Philippines	-0.529(0)	-0.337(0)*	-2.272(2)	-2.271(0)*
Singapore	-1.535(0)	-7.182(0)	-1.743(1)	-9.435(0)
South Korea	-1.637(0)	-3.782(0)	-1.131(0)	-6.927(0)
Taiwan	-2.851(0)	-6.440(0)	-2.172(1)	-3.498(0)
Thailand	-0.334(0)	-3.192(0)	-2.434(2)	-2.965(0)

Note: (a) All the regressions include an intercept and a linear trend in the levels and include an intercept in the first differences. (b) Numbers in parentheses are the optimal lag orders and selected based on Schwarz Bayesian Criterion (SBC). (c) Numbers of lags are in parentheses of 95% simulated critical values for observations calculated by stochastic simulations.

3.2 Results of ARDL co-integration tests

According to the optimal lag for the ARDL model, selected by SBC (Pesaran and Shin, 1999), the ARDL model used here indicated no evidence of serial correlation or heteroskedasticity (Table 2). The bound *F*-statistic for the co-integration test indicated a long-run relationship between (I/Y) and $(OFDI/Y)$ at a 1% significance level for China and Taiwan, 5% significance level for South Korea, and 10% significance level for Japan and Singapore. By contrast, the results of the ARDL bounds test revealed that no long-run or equilibrium relationship between (I/Y) and $(OFDI/Y)$ in Malaysia and Thailand. Thus, neither the Co-integration nor the causal relationships within the dynamic VEC model could be estimated for Malaysia or Thailand.

Table 2: ARDL cointegration tests

Countries	F^a	LM^c	HET^d
China	17.36***	0.40(0.54)	3.36(0.06)
Japan	3.92*	0.60(0.42)	0.04(0.82)
Malaysia	0.02	0.26(0.73)	0.03(0.91)
Singapore	3.86*	0.58(0.43)	0.71(0.42)
South Korea	4.96**	2.78(0.12)	0.64(0.45)
Taiwan	12.16***	0.34(0.57)	2.45(0.12)
Thailand	1.65	2.64(0.10)	0.43(0.52)

Asymptotic critical values [b]

1%		5%		10%	
$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
6.027	6.76	4.09	4.663	3.303	3.797

Note: (a) F is the ARDL cointegration test. (b) Asymptotic critical value bounds are obtained from Narayan (2005, Appendix: Case II). (c) LM is the Lagrange multiplier test for serial correlation with a x^2 distribution with only one degree of freedom. (d) HET is the test for heteroskedasticity with a x^2 distribution with only one degree of freedom.

In addition, because the sample period used in this paper includes the global financial crisis period, it is likely the data series may exist one or multiple structural breaks. For this purposes, we use time-plots to depict the time series of DI in Figure 1 and OFDI in Figure 2 respectively. During the global financial crisis period specifically in the year of 2008, we find that there is no significant structural breaks of DI (Figure 1) and OFDI (Figure 2) in most of these newly industrialized Asian countries, but only significant structural breaks of OFDI in Philippines (Figure 2).

Figure 1: Plot of the trends of domestic investment (DI)

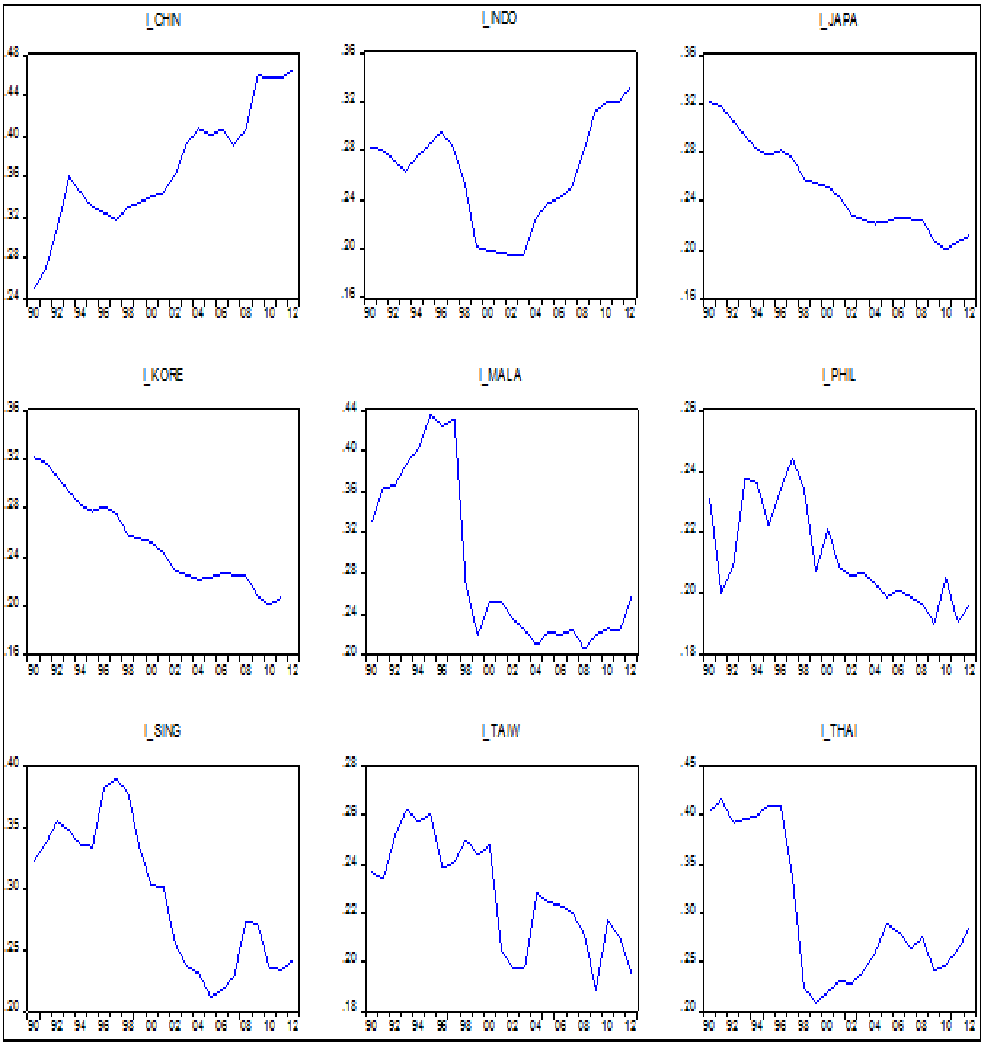
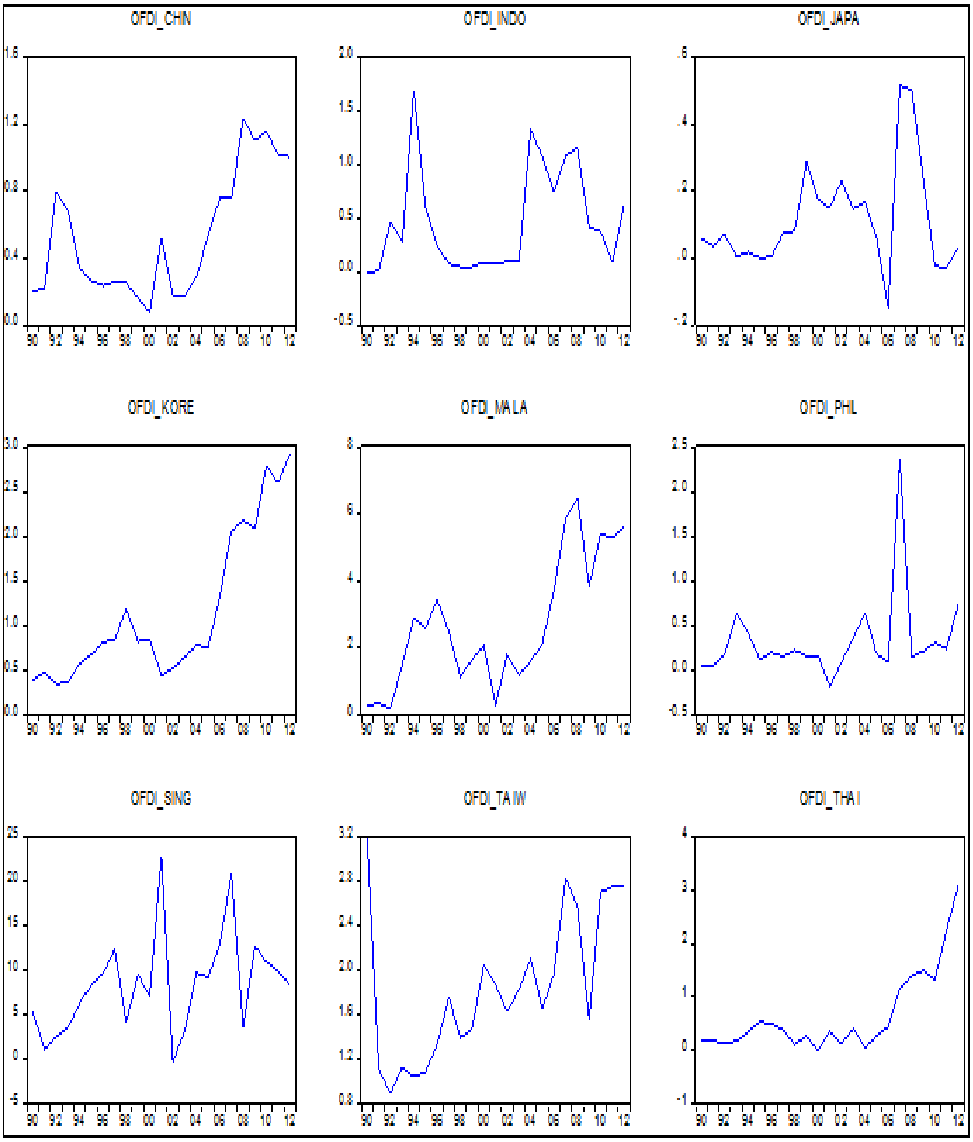


Figure 2: Plot of the trends of outward foreign direct investment (OFDI)



3.3 Results of causality tests

The existence of an ARDL co-integration relationship between (I/Y) and $(OFDI/Y)$ for China, Japan, Singapore, South Korea, and Taiwan suggested that a Granger causality should be evident in at least one direction. The causality test results for China, Japan, Singapore, South Korea, and Taiwan (Table 3) were as follows:

(i) China, Japan, and South Korea exhibited a short-run unidirectional Granger causality running from (I/Y) to $(OFDI/Y)$.

(ii) Furthermore, Singapore and Taiwan exhibited both long-run and strong unidirectional Granger causalities running from $(OFDI/Y)$ to (I/Y).

(iii) Finally, only China exhibited both long-run and strong unidirectional Granger causalities running from (I/Y) to $(OFDI/Y)$.

Table 3: Granger causality test results

Null Hypotheses	China	Japan	Singapore	South Korea	Taiwan
F-statistics for short-run Granger causality					
$\Delta(OFDI/Y) \Rightarrow \Delta(I/Y)$	1.673	0.327	1.527	0.584	0.021
$(H_0: \theta_{4j} = 0)$	(0.212)	(0.458)	(0.236)	(0.439)	(0.876)
$\Delta(I/Y) \Rightarrow \Delta(OFDI/Y)$	12.221	3.294	0.934	3.264	0.322
$(H_0: \delta_{5j} = 0)$	(0.003) ***	(0.076) **	(0.378)	(0.054) **	(0.675)
F-statistics for long-run Granger causality					
$\Delta ECT \Rightarrow \Delta(I/Y)$	0.052	2.349	12.164	2.852	5.822
$(H_0: \phi_1 = 0)$	(0.894)	(0.531)	(0.002) ***	(0.504)	(0.012)
$\Delta ECT \Rightarrow \Delta(OFDI/Y)$	21.383	2.218	0.0281	2.337	0.562
$(H_0: \phi_2 = 0)$	(0.000) ***	(0.139)	(0.873)	(0.221)	(0.531)
F-statistics for strong Granger causality					
$\Delta(OFDI/Y), \Delta ECT \Rightarrow \Delta(I/Y)$	1.173	0.891	8.547	0.699	3.397
$(H_0: \theta_{4j} = \phi_1 = 0)$	(0.562)	(0.451)	(0.005) ***	(0.472)	(0.047)
$\Delta(I/Y), \Delta ECT \Rightarrow \Delta(OFDI/Y)$	16.208	1.943	1.623	1.788	1.278
$(H_0: \delta_{5j} = \phi_2 = 0)$	(0.001) ***	(0.256)	(0.331)	(0.398)	(0.445)

Note: (a) $(OFDI/Y)$ is the outward FDI share of GDP, (I/Y) is the domestic investment share of GDP, Δ is the first difference operator. (b) ***, **, and * represent the 1%, 5%, and 10% significance level, respectively (c) The number inside the parenthesis is the *P*-value for *F*-statistics. (d) The numbers of optimal lags are selected based on SBC and calculated as one for Japan and Taiwan, and two for China, Singapore, and South Korea.

4. Conclusions and Policy Implications

We investigated the causal relationship between DI and OFDI for nine newly industrialized Asian countries: China, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand. We used the ADF test to confirm the stationarity and integration orders of the variables, and subsequently applied the two-step procedure of Engle and Granger model. The primary conclusion that emerged was that the causal relationship between DI and OFDI is not uniform among countries. The results of this study prove that China, Japan, and South Korea exhibit a short-run unidirectional causality running from DI to OFDI. By contrast, there is a long-run and strong unidirectional causality running from OFDI to DI in Singapore and Taiwan, and from DI to OFDI in China. However, any causality between DI and OFDI in Indonesia, Malaysia, Philippines, and Thailand is not detected.

The empirical results of this study should provide policymakers with information regarding the relationship between OFDI and DI, which can be used to formulate investment policies in these nine newly industrialized Asian countries. First, in the short run, there is causality from DI to OFDI in China, Japan, and South Korea. This indicates that an impact of DI may affect OFDI among these countries. To avoid adversely affecting OFDI, efforts must be made to encourage government and industry to overcome DI constraints. For instance, China, Japan, and South Korea could enhance the competitiveness, productivity, and investment openness policy of their domestic industries. In addition, policies aiming to improve the sociopolitical stability, government efficiency, and physical infrastructure (transportation, electricity, and telecommunications) also benefit the DI environment. An enhanced DI environment increases the attractiveness of the domestic economy more attractive to foreign and domestic investors, increasing the opportunities of domestic firms to participate in international markets because they become increasingly competitive. Furthermore, policy recommendations are worth proposing in response to the strong unidirectional causality running from DI to OFDI in China. China is one of the fastest growing economies in the world, and has attracted substantial FDI in the previous two decades; however, vigilance is required if OFDI plateaus in the future, because China may encounter capital shortages in high-risk areas or new industries in which DI is limited, and demand for exports may substantially decline, directly or indirectly affecting trade with other countries. Therefore, given the evidence of strong unidirectional causality and the Chinese DI exerts a much greater contribution to growth than does the OFDI, Chinese authorities could promote their domestic investment environment to attract OFDI when designing and executing investment strategies.

Finally, evidence shows that both long-run and strong unidirectional causality runs from OFDI to DI in Singapore and Taiwan. To prevent the consequences of the OFDI impact on DI, Singapore and Taiwan could keep maintaining their monetary rules, advantages of financial incentives, and openness to foreign investment as a feasible policy. These openness policies are critical factors for investors operating in multiple foreign markets (e.g., banks, insurance companies, and e-businesses) because these businesses evaluate the availability of financial resources and the advantages of tax regimes when deciding to invest in a country. In addition, Taiwan exhibits a rather high degree of dependence on foreign trade; thus, to motivate the OFDI, Taiwan could promote policies for loosening investment restrictions, establish foreign investment promotion agencies, enhance the trade-related aspects of intellectual property, and eliminate tariffs and other trade barriers. Moreover, subsequent evidence of strong unidirectional causality may reveal that effective openness trade policies for promoting OFDI may not only benefit DI, but also boost the economic growth of these countries.

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