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Outward Foreign Direct Investment and Domestic Output: Evidence from East Asian Economies

(Pelaburan Langsung Asing Keluar dan Output Domestik:Bukti dari Ekonomi Asia Timur)

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ABSTRACT

This study evaluates the impact of outward foreign direct investment (FDI) on domestic output of East Asian economies. It focuses on FDI from eight East Asian economies to Japan, the United States and United Kingdom. The analyses are carried out using annual data at both aggregate and disaggregate level for the 1981-2010 period. The result using aggregate data reveal that there is no evidence to support the idea that outward FDI is growth-enhancing. However, the results based on disaggregate data shows that only outward FDI to the United States are found to benefit East Asian economies. Meanwhile, investments in Japan and the United Kingdom do not appear to have any positive impact. These findings suggest that locational decision for outward FDI is critically important as not all destinations will bring positive benefits for the source countries.

Keywords: Outward foreign direct investment; economic growth; pooled mean group; East Asia

ABSTRAK

Kajian ini menilai impak pelaburan langsung asing (FDI) ke atas keluaran domestik ekonomi Asia Timur. Ia memberi tumpuan kepada FDI dari lapan ekonomi Asia Timur ke Jepun, Amerika Syarikat dan United Kingdom. Analisis dijalankan menggunakan data tahunan pada tahap agregat dan bukan agregat bagi tempoh 1981-2010. Hasil kajian menggunakan data agregat mendedahkan bahawa tidak ada bukti yang menyokong idea bahawa FDI keluar meningkatkan pertumbuhan. Walau bagaimanapun, keputusan berdasarkan data bukan agregat menunjukkan bahawa hanya FDI ke negara Amerika Syarikat didapati memberi manfaat kepada ekonomi Asia Timur. Sementara itu, pelaburan di Jepun dan United Kingdom kelihatan tidak mempunyai kesan positif. Penemuan ini menunjukkan bahawa keputusan pemilihan lokasi untuk FDI keluar adalah sangat penting kerana tidak semua destinasi akan memberi manfaat positif kepada negara sumber.

Katakunci: Pelaburan langsung asing keluar; pertumbuhan ekonomi; pooled mean group; Asia Timur

INTRODUCTION

In the last few decades, global foreign direct investment (FDI) experienced some major changes. During the decade of the 2000s, not only half of global FDI flows to developing and transition countries, one-fourth of the global outward FDI has originated from these countries (UNCTAD 2010). For instance, outflows investments from BRICS[1] rose by 21 per cent in 2016, pushing the group's outward stock over 8 percent of the world total in 2016, up from 5 per cent in 2010 (UNCTAD 2017).

Among the developing economies, East Asian region appears to be an important source of FDI outflows. Outward FDI from this region has been growing steadily and Asian multinational enterprises (MNEs) have grown in size and have made their presence abroad felt (UNCTAD 2006). The share of East Asian economies in global FDI outflows increased from less than 10 percent before 2008 to around 17 percent or $160 billion in 2010. This is driven by increased outflows from China, Hong Kong, Malaysia, Korea, Singapore, and Taiwan. Among the transition economies, China and Hong Kong are the top ten foreign direct investors. Outflows from these two countries in 2010 have reached historic highest level of $76 billion and $68 billion, respectively. In fact, FDI outflow from China has exceeded Japan for the first time in 2010. In addition, China, Malaysia, and Korea are among the top investors in some other regions such as Africa (UNCTAD 2011). One of the reasons for increasing trend of outward FDI from developing countries is encouraging government policies. For instance, the introduction of the Go Global policy in China has significantly improved the dominance of investments by China's MNEs globally.[2]

One of the interesting phenomena observed during the same period is that the East Asian region has a very spectacular growth performance. In 1950, the average real GDP per capita of the East Asian economies was far below the world average as well as below the average of Latin-American economies, but it surpassed the world average by 1978, Latin America's by 1983. In the mid-1980s, they

began to grow faster relative to other regions, becoming the most dynamic region in the world (Hsiao and Hsiao, 2006). East Asian economies are known for their outward orientation policies. This region is open to both trade and capital flows (both inward and outward). Arguably, policy reform towards greater openness for outward FDI may have contributed to the growth performance of these countries.

There are several reasons to believe why outward FDI may have important positive impact on the growth performance.[3] By setting up production and research facilities in countries that have accumulated substantial scientific and technological capabilities, a technology follower can have better access to leading technologies. Therefore, knowledge spillovers via outward FDI may allow local firms to improve their productivity at home, leading to the expansion of the whole economy. However, outward FDI may also have a negative impact on domestic output. Few economists believe that outward FDI may reduce domestic output. They argue that when the multinational companies invest abroad, it causes a reduction in simultaneous investment at home (Desai et al. 2005). In other words, outward investment substitutes foreign investment for domestic investment and therefore may suppress domestic activities, leading to lower output growth, Consequently, it is worth to investigate the impact of outward FDI on the economic performance of East Asian countries. This may shed new lights and help policymaker in the policy formulations.

The objective of this study is to examine the influence of outward FDI on domestic economic performance of selected East Asian Economies. This study fills the existing gap in the literature by evaluating the impact of outward FDI on the domestic output of emerging Asian economies. Most of the studies have tested on the influence of inward FDI on domestic output. Although several recent papers have also tested the impact of outward FDI on growth, they focus mainly on developed countries and find mixed evidence on the usefulness of outward FDI for enhancing output or productivity growth.

The rest of the paper is structured as follows: section II reviews some of the past literature, section III explains the model specification, methodology and data; section IV presents empirical result and section V concludes.

LITERATURE REVIEW

THEORETICAL FOUNDATION

Some of the earlier theoretical studies describe FDI patterns and directions. Two members of a Japanese school, Kojima (1978) and Ozawa (1992), describe Japanese FDI theories that were initially developed in the 1970s. They combine some micro variables with some macro variables, such as trade policy and industrial policy, to analyze the relationship between FDI, competitiveness and economic development. Ozawa (1992) identifies three primary phases of FDI inflows and outflows. In the first phase of economic growth, the country is underdeveloped and is targeted by foreign companies who want to exploit its potential advantages (especially low labor costs). In this phase, there is no outgoing FDI. In the second phase, new FDI inflows promote domestic markets, and subsequently, result in increasing the standards of living. In this phase, outgoing FDI is motivated by the rising labor costs. Finally, in the third phase, the competitiveness of a country is determined based on innovations. During this phase of economic development, the incoming and outgoing FDI are motivated by market and technological factors.

In the meanwhile, Dunning (1980; 1981; 1988) proposed the "Eclectic paradigm,"[4] classifies international production into five stages. In the first stage, low incoming FDI flows to the country, but foreign companies are beginning to discover the advantages of the country. In this stage, there is no outgoing FDI and no specific advantages owned by the domestic firms. In the second stage, incoming FDI grows and the standards of living are rising. This draws more foreign companies to the country. However, there is still a low outgoing FDI. In the third stage, strong incoming FDI flows to the country, but their nature is changing, due to the rising wages. As such, the outgoing FDI are taking off as domestic companies are getting stronger and developing their competitive advantages. In the fourth stage, there are strong outgoing FDI seeking advantages abroad (low labor costs). Finally, in the fifth stage, investment decisions are based on the strategies of MNEs. Consequently, the flows of outgoing and incoming FDI come into equilibrium.

According to traditional foreign investment theory, although the marginal product of capital (MPK) is different across country borders, both investors and host nations will gain from FDI. This notion may be translated as international trade in savings (Obstfeld 1993). The growing FDI share of global investment has led to a growing debate about the desirability of international imbalances. For instance, there is a debate about the desirability of the current account deficit of some countries (e.g. the U.S.) or the current account surplus of some emerging countries (e.g. China) (Aizenman & Sun 2010). From the flow of funds theory, whether the deficit is "good" or "bad" depends on the effect of the debt on the domestic productivity. In other words, if the benefits from FDI exceed the costs of getting additional real capital, both investors and host nations gain through international trade in savings (Layton & Makin 1993).

EMPIRICAL LITERATURE

Most of the earlier research on FDI primarily focuses on testing the impact of inward FDI on domestic output (see for example Azman-Saini et al 2010 ; Ghazi et al 2017; Nor et al. 2015). Recently, there is a shift in interests

among economists to assess the impact of outward FDI on local economic activity. This is particularly relevant for East Asian countries in recent years, as their MNEs have become more established and ready to take investment abroad. It has been widely known that MNEs operate their business in many different locations concurrently. When MNEs relocate their production facilities abroad, one may argue that the associated outward investments automatically shrink domestic economic growth. Lipsey and Stevens (1992) mention that the interaction between domestic and foreign investment could be explored by looking at both the finance and production side. On the financial side, investments in different locations compete for limited funds. On the production side, foreign investment may either displace the exports of the finished goods or increase the exports of the components. Therefore, when MNEs invest abroad, they may simultaneously reduce their investments at home.

Another argument related to the impact of outward FDI is that when multinational enterprises invest abroad, they finance their investment projects on the world markets and have an opportunity to enter new markets. They enter these markets to access foreign technology, gain more advanced technology, import intermediate goods from foreign affiliates at lower prices, and produce a greater volume of final goods abroad at a lower cost. From this point of view, because outward investors combine home and foreign production, a final output would be generated at a lower cost, rather than the more expensive cost of the final output produced only in the home country. As a result, the whole domestic economy benefits in the long run from outward FDI, due to the increase in the competitiveness of the investing companies and the associated spillovers to the local firms (Desai et al. 2005).

Consequently, the net impact of outward FDI on domestic output is not theoretically clear. In the meanwhile, the empirical work on the domestic growth effects of outward FDI are limited. However; most of them suggest a positive influence of outward FDI. Few studies suggest a negative impact of outward FDI on domestic output. For example, using the U.S. MNEs data, Feldstein (1994) shows that FDI outflows reduce domestic investment on a dollar-for-dollar basis. In addition, Hsu et al. (2011) examine the effects of outward FDI on home-country productivity. They suggest no significant positive or negative effect of outward FDI on productivity. However, Damijan and Decramer (2014) do not confirm this result for firm-level data on the Slovenian manufacturing industry from 1994 to 2002. Instead, they illustrate that firms that invest abroad experience a higher amount of productivity growth. Moreover, using data from 121 developing and transition economies, over the period of 1990–2010, Ali (2013) suggests that FDI outflows negatively influence domestic investments.

On the other hand, van Pottelsberghe and Lichtenberg (2001), Barba-Navaretti and Castellani (2004), and Herzer (2008; 2011; 2012) are among the researchers who report positive influences of outward FDI on domestic outputs. More specifically, Barba-Navaratti and Castellani (2004) examine the effects of outward FDI on domestic economic performance. They use a sample dataset of 1,587 Italian firms for the period of 1993-1998. The panel included data from three types of firms: a) firms that set up their first foreign subsidiary in the period observed, b) MNEs which have at least one foreign subsidiary at the beginning of the period, and c) firms which do not have foreign subsidiaries at the beginning of the period and never invested in the period observed. Barba-Navaratti and Castellani (2004) reveal that foreign investments strengthen rather than deplete home activities. Specifically, they found that investments improve total factor productivity and output but has no significant effects on domestic employment.

In line with this, van Pottelsberghe and Lichtenberg (2001), using data for 13 advanced economies over the period of 1971–1990, investigate the impact of outward technology-sourcing FDI on domestic productivity through foreign R&D spillovers. They find a positive influence of outward FDI on domestic total factor productivity. Moreover, Herzer (2008), using data for 14 industrialized countries over the period of 1971–2005, employs panel cointegration techniques and examines the long-run relationship between outward FDI on domestic output. He finds that outward FDI has a positive long-run effect on domestic economic growth. His result suggests bidirectional causality and illustrates that multinational firms increase their outward investments by raising the domestic input. In this way, an increase in outward FDI is not the only cause of domestic output; it could also be its consequence. Furthermore, Herzer (2011) investigates the influence of outward FDI on the domestic output of developing countries. Using data for 43 countries, over the period of 1981 to 2008, he confirms the positive long run relationship between outward FDI and domestic output. Moreover, using a single-equation and system cointegration technique for the period of 1980 to 2008, Herzer (2012) confirms this positive relationship for Germany. More specifically, Herzer (2012) highlights Germany is one of the leading outward FDI investors in the world. In addition, according to UNCTAD data, German MNEs have grown faster in some years than the U.S. and U.K. MNEs. Herzer (2012) also finds evidence of long run productivity-enhancing, and thus, growth-enhancing effects of outward FDI. However, he indicates that the short-run productivity effects of outward FDI are statistically insignificant. Furthermore, he reports bidirectional Granger causality between outward FDI and domestic output, as well as between outward FDI and total factor productivity.

A number of studies investigate the impact of outward FDI on productivity. Most of these studies found a positive influence of outward FDI on productivity. Van Pottelsberghe and Lichtenberg (2001) investigate

the impact of technology-sourcing outward FDI on domestic productivity through foreign R&D spillovers. Using data for 13 advanced economies over the period of 1971–1990, they find a positive influence of outward FDI on domestic total factor productivity and indicate that only outward FDI into R&D-intensive economies positively affects domestic productivity by conveying technological knowledge from the FDI recipient economy. The Van Pottelsberghe and Lichtenberg (2001) paper also shows that the U.S. is the largest generator towards the productivity of developing countries, while technology spillovers emanating from Japan are weak. They also reveal that FDI senders to the U.S. gain a lot from R&D spillovers; however, the U.S. does not receive significant spillovers from them. That being said, Japan achieves a lot from outside R&D, but the spillovers originating from Japanese outward investors are weak.

In line with the results in van Pottelsberghe and Lichtenberg (2001), Driffield et al. (2009), using U.K. industry data for the period of 1978–1994, find that technology-sourcing and efficiency-seeking outward FDI causes domestic productivity growth. Likewise, Driffield and Chiang (2009) employ industry data for the period of 1995–2005 to investigate the influence of outward FDI from Taiwan to China on productivity. They find positive impact of outward FDI on labor productivity in Taiwan. The results of some studies differ from those previously discussed. Bitzer and Kerekes (2008) analyze industry-level data for 17 OECD countries for the period of 1973-2000 and report a negative influence of outward FDI and foreign R&D capital on domestic productivity. Meanwhile, Braconier et al., (2001) examine manufacturing data in Sweden over the period of 1978–1994. They do not confirm an association between outward FDI by itself, nor do they find a relationship between FDI-related R&D spillovers and domestic productivity. Meanwhile, Li, et al. (2016) examine the influence of Chinese outward FDI on regional innovation performance. They find three contingent factors – absorptive capacity, foreign presence, and the competition intensity of the local market – that moderate the impact of outward FDI on innovation performance and conclude that the outward FDI affect domestic innovation significantly.

Several studies investigate the impact of outward FDI on domestic employment. Brainard and Riker (1997a; 1997b), employing a panel dataset of U.S. MNEs and their affiliates for the period of 1983-1992, suggest that there is an employment substitution between foreign affiliates and their parents, especially for workers at affiliates in alternative low wage locations. Similarly, Konings and Murphy (2001) confirm the employment substitution effects for European firms, especially for firms that operate in the manufacturing sector. They do not find substitution effects for service sectors. Similarly, Federico and Minerva (2008) investigate the influence of Italy's outflow FDI on local employment growth over the time period of 1996-2001 for 12 manufacturing industries and 103 administrative provinces. They suggest that the outward FDI is associated with faster local employment growth. Likewise, Castellani et al. (2008) compare data on 108 Italian manufacturing firms that became multinational (for the first time) during the period of 1998–2004, with a counterfactual group of 2500 national firms that remained national during the same time period. They confirm that the MNEs activities do not decrease home employment in the parent companies. However, they do state that the MNEs, which invest in Central and Eastern European countries, gain some skills by upgrading, as opposed to firms that remained national.

Using the Italian case for the period of 1985–95, Mariotti et al. (2003) find a negative influence of outward FDI on the labor intensity of domestic production in developed countries. At the same time, they find a positive influence on market-seeking investments in developed countries. In line with this, Lee et al. (2015) indicates that the outward FDI of Japanese MNEs increases their domestic employment when it enhances the MNEs competitive advantages, and hence, further expands domestic operations. It reduces domestic employment when it involves a transfer or relocation of domestic operations in foreign countries. Moreover, Lee et al. (2009) analyzes the home effect of outward FDI from six major investors to China. The six investors include the four tigers, as four small and more advanced economies than China, plus Japan and the U.S., as the two large economies. They suggest that outward FDI leads to less "relative income" between the source and host countries. They also find that outward FDI decreases the export to GDP ratio in small countries and indirectly negatively effects growth, because the four tigers are all export-led growth economies. Recently, Liu et al. (2015) investigate the influence of Taiwanese outward FDI on domestic employment. They conclude that Taiwanese outward FDI to high-wage countries has a favorable impact and the outward FDI to low-wage economies has negative impact on domestic employment.

One important argument in the literature is that outward FDI may reduce investments at home. Braconier and Eckholm (2002) examine this relationship using a dataset of Swedish MNEs in the manufacturing sector for the period of 1970-1998. They do not suggest any strong substitution or complementarity. However, they find a substitution effect in some of the MNEs. Moreover, Herzer and Schrooten (2008) estimate the relationship between outward FDI and domestic investment for two industrial economies: Germany and the U.S. They find long run effects of outward investment for the U.S. and short run effects for Germany. Recently, Ameer et al. (2017) find that outward FDI Granger-cause domestic investment in China. In line with above scholars, Tan et al. (2016) examine the ASEAN-8 countries find that outward FDI have a positive long-run impact on the gross domestic investment.

As highlighted above, the impact of FDI flows from developing countries to developed countries on domestic output has received little attention. FDI usually flows from more developed or capital-rich countries to less developed or capital-scarce countries. In recent years, a new phenomenon has emerged as FDI flows from developing to developed and other developing countries have improved significantly (Bano and Tabbada 2015). Consequently, this study attempts to fill this gap in the literature by focusing on the relationship between domestic output and outward FDI from less developed Asian economies to more developed countries.

METHODOLOGY

MODEL SPECIFICATION

In order to test the impact of outward FDI on domestic output, we use an aggregate production function which can be expressed as follows:

$$Y_{it} = K_{it}^{\alpha_3} H_{it}^{\alpha_2} (A_{it} L_{it})^{(1-\alpha_2-\alpha_3)} \quad (1)$$

where Y, H, L, and K denote the output, human capital, labour and physical capital, respectively. A stands for total factor productivity, which includes various factors that affect the level of productivity (Borensztein et al. 1998). The subscripts are *i* for country and *t* for time. Taking natural logarithms of equation (1) yields the following linear equation:

$$\ln Y_{it} = (1 - \alpha_2 - \alpha_3)A_{it} + (1 - \alpha_2 - \alpha_3)L_{it} + \alpha_2 \ln H_{it} + \alpha_3 \ln K_{it} \quad (2)$$

where's indicate the parameters. Based on the economic growth literature, it is assumed that some variables enhance total factor productivity and, by implication, economic growth. Accordingly, A is assumed to follow the following process:

$$A_{it} = f(OFDI)_{it} \quad (3)$$

where $OFDI_{it}$ is outward FDI which is expected to enhance productivity (Borensztein et al. 1998). Outward FDI affect productivity via diversion of national resources from home to foreign economies which could enrich home activities (Barba-Navaretti & Castellani 2004). Outward FDI to developed countries which invest actively in innovation activities may give Asian countries instant access to new technology available at the world's frontier. Therefore, knowledge spillovers via outward FDI may allow local firms to improve their productivity at home, leading to the expansion of the whole economy.

Let, $y_{it} = \ln Y_{it}$, $h_{it} = \ln H_{it}$, $k_{it} = \ln K_{it}$ and $l_{it} = \ln L_{it}$. The estimated model can be expressed as follows:

$$y_{it} = \alpha + \beta_1 l_{it} + \beta_2 h_{it} + \beta_3 k_{it} + \beta_4 OFDI_{it} + \varepsilon_{it} \quad (4)$$

where β_i is the estimated coefficients.

ESTIMATION STRATEGY

The estimation of model (4) involves two important steps. First, is to evaluate the stationarity properties of the variables involved, then the coefficients for each of the variables are estimated and their statistical significances are tested.

TESTING FOR UNIT ROOT IN PANEL

The first step of the analysis is to evaluate the stationarity properties of the variables to avoid spurious results. For this purpose, this study applies two types of unit root tests proposed by Breitung (2000) and Choi (2001). Breitung (2000) test assumes that there is a common unit root process so that autoregressive coefficient is identical across cross-sections. In other words, this test does not allow heterogeneity. Meanwhile, Choi (2001) employs different alternative strategy by combining the p-values from individual tests to obtain an overall test statistic and this test frequently known as a Fisher-type test. This test is more flexible compared to the former by allowing some sorts of heterogeneity in the series.[5]

POOLED MEAN GROUP (PMG) ESTIMATION

In order to test the impact of outward FDI on output, we can consider a number of alternative methods that differ on the point to which method allow for constraint of heterogeneity across countries. Fully heterogeneity and fully homogeneity are two extremes of the methods. The simple pooled estimator is at one extreme that models the fully homogeneous-coefficient which necessitate that all slope and intercept coefficients be equal across countries. There are some other estimators between the two extremes such as Dynamic Fixed Effects (DFE) estimator where all slope coefficients are to be equal across individuals but different intercepts. The Mean Group (MG) estimator introduced by Pesaran et al. (1995) is at the other extreme that models fully heterogeneous coefficient. Moreover, Pesaran et al. (1999) introduced the Pooled Mean Group (PMG) estimator. In the PMG model, the long-run slope coefficients are identical across individuals but the short-run coefficients and the regression intercept are varied. Following Pesaran et al. (1999), the following equation is based on the unrestricted error correction ARDL (p, q) representation:

$$\Delta Y_{it} = \alpha_i Y_{i,t-1} + \gamma_i OFDI_{i,t-1} + \beta_i X_{i,t-1} + \sum_{j=1}^{p-1} \theta_{ij} \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \pi_{ij} \Delta OFDI_{i,t-j} + \sum_{j=0}^{s-1} \varphi_{ij} \Delta X_{i,t-j} + \mu_i + \epsilon_{it} \quad (5)$$

where μ_i represents the fixed effects, α_i is a coefficient on the lagged dependent variable, γ_i is the coefficient on main explanatory variable which is outward FDI, β_i is the $k \times 1$ vector of coefficients, θ_{ij} 's are scalar coefficients on lagged first-differences of dependent variables, and π_{ij} and φ_{ij} are coefficients on first-difference of explanatory variables and their lagged

values. The model assumes that the disturbances ϵ_{it} in the ARDL model is independently distributed across i and across t with zero mean and variance $\sigma_i^2 > 0$. Furthermore, assuming that coefficients on first-difference of explanatory variables are less than zero and therefore, there exists a long-run relationship between dependent and explanatory variables defined by:

$$Y_{it} = \omega_1 X_{it} + \omega_2 OFDI_{it} + \vartheta_{it} \quad (6)$$

where ω_1 and ω_2 are long-run coefficients, and $\vartheta_{it}\eta_{it}$ is stationary with possibly non-zero means (including fixed effects). Since Equation (6) can be rewritten as:

$$\Delta Y_{it} = \phi_i \varepsilon_{i,t-1} + \sum_{j=1}^{p-1} \theta_{ij} \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij} \Delta OFDI_{i,t-j} + \sum_{j=0}^{s-1} \varphi_{ij} \Delta X_{i,t-j} + \mu_i + u_{it} \quad (7)$$

where $\varepsilon_{i,t-1}$ is the error correction term given by (12), hence coefficients on first-difference of explanatory variables are the error correction coefficients measuring the speed of adjustment towards the long-run equilibrium.

The PMG estimator allows the intercepts, short-run coefficients and short-run adjustment to be dependent on country characteristics meaning differ across groups, but the long-run coefficients are homogeneous across countries/individuals. However, the MG allows for heterogeneity of all the coefficients and gives the estimates of short-run and long run coefficients. The MG approach comprises of estimating regressions for all countries separately and computing averages of the countries/individual-specific coefficients. The comparison of PMG and MG is like a trade-off between consistency and efficiency. If the long-run coefficients are identical across individual/countries, then the PMG estimates will be consistent and efficient, while the MG estimates will only be consistent. If, the long-run coefficients are not identical across countries, then the PMG estimates will be inconsistent, while the MG will provide a consistent estimate of the mean of long-run coefficients across countries. The long-run slope homogeneity hypothesis can be examined using the Hausman test (Hausman 1978). Under this hypothesis, PMG estimators are consistent and more efficient than Mean Group (MG) estimators, which impose no constraint on the regression (Pesaran et al. 1999).

SOURCES OF DATA

This study includes a panel of eight East Asian economies namely; Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand using annual data for the 1981-2010 period.

Our key variable outward FDI is measured as follows:

$$OFDI_{it} = OFDI_{it,J} + OFDI_{it,US} + OFDI_{it,UK} \quad (8)$$

where $OFDI_{it,J}$ is outward FDI from country i to Japan. Similarly, $OFDI_{it,US}$ symbolizes the OFDI from country i to United States, and $OFDI_{it,UK}$ the OFDI from country i to United Kingdom. Accordingly, the $OFDI_{it,}$ is the summation of outward FDI from country i, which is one on the eight East Asian economies, to three more advanced countries including Japan, United States, and United Kingdom. The choice of these three countries is due to this study aims to focus on the outward FDI to advanced countries. Accordingly these three advanced countries are selected because they are the most important FDI recipients from East Asian countries. The outward FDI to other advanced economies is not considerable (UNCTAD 2015). It is worth to mention that these countries are among the world's biggest R&D spenders (WDI 2015) and other countries which lag behind in R&D activities may benefit from investment in countries which are located at the technology frontier (van Pottelsberghe & Lichtenberg 2001).

The dependent variable is measured by real GDP at constant 2005 national prices (in mil. 2005US$) obtained from the Penn World table database. Data for outward FDI, which is measured by outward FDI flows by partner country, is obtained from the OECD database. Data for the control variables which includes domestic investment (measured by capital stock at constant 2005 national prices (in mil. 2005US$)), Labour (measured by number of persons engaged (in millions)), and human capital (measured index of human capital per person, based on years of schooling (Barro & Lee 2012) and returns to education (Psacharopoulos 1994) are obtained from the Penn World Table database.

RESULTS AND DISCUSSIONS

Table 1 reports the results of the panel unit root tests. Two tests are used namely Breitung (2000) and Fisher's type (Choi 2001). The tests are implemented for both model with- and without-trend for $p \leq 3$. The null hypothesis for both tests is that the variable contains unit root. The results of the Breitung test show that in most cases the null hypothesis cannot be rejected at level except for the variable of outward FDI in the model without trend. However, it is stationary after first difference in model with trend or it is I(1). Moreover, there is a minor exception for labor when the null cannot be rejected after first difference for $P = 3$. Meanwhile, the results of Fisher's type test reveal that there is less concrete evidence to support that variables are $I(0)$. The Fisher's type results are mixed of both $I(1)$ and $I(0)$. The variable of domestic output is $I(1)$ for $p = 2$ and 3 but it is $I(0)$ just in the case of $p = 1$. Similarly, in most cases of the other variables the null hypothesis cannot be rejected at level for all different lags (Ps). Overall, the unit root test results indicate that the series are generally non-stationary at level. We thus proceed with PMG analysis, which relies on the non-stationary heterogeneous panels, assuming that the series are non-stationary.

TABLE 1. Unit root tests

		Breitung						Fisher's type					
		P=1		P=2		P=3		P=1		P=2		P=3	
Intercept		Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference
	Domestic Output	4.07 (1.00)	–3.11*** (0.00)	3.54 (0.99)	–1.44* (0.07)	1.28 (0.89)	–1.66** (0.04)	–1.79** (0.03)	–5.95*** (0.00)	–0.46 (0.32)	–3.94*** (0.00)	0.11 (0.54)	–4.18*** (0.00)
	Outward FDI	–2.98*** (0.00)	–8.48*** (0.00)	–2.98*** (0.00)	56.48*** (0.00)	–3.07*** (0.00)	–5.03*** (0.00)	–6.02*** (0.00)	–13.63*** (0.00)	–3.80*** (0.000)	–10.19*** (0.00)	–2.18** (0.01)	–8.53*** (0.00)
	Domestic investment	–0.42 (0.33)	–2.81*** (0.00)	0.06 (0.52)	–2.57*** (0.01)	–1.28 (0.09)*	–2.27*** (0.01)	–2.97*** (0.00)	–2.52*** (0.00)	0.54 (0.70)	–0.70 (0.26)	0.64 (0.74)	0.12 (0.45)
	Human Capital	0.16 (0.56)	–2.91*** (0.00)	0.31 (0.62)	–2.84*** (0.00)	0.00 (0.50)	–1.35* (0.08)	0.46 (0.32)	–1.55* (0.06)	0.04 (0.51)	–2.05** (0.02)	0.40 (0.65)	–1.86** (0.03)
	Labor	5.04 (1.00)	–4.67*** (0.00)	3.55 (0.99)	–3.68*** (0.00)	2.30 (0.98)	–0.91 (0.17)	3.20 (0.14)	–6.40*** (0.00)	–2.62 (0.99)	–4.32*** (0.00)	2.89 (0.99)	–4.6–*** (0.00)
Intercept + trend													
	Domestic Output	0.55 (0.71)	–3.27*** (0.00)	0.56 (0.71)	–2.68*** (0.00)	0.27 (0.61)	–2.49*** (0.00)	–1.89** (0.02)	–4.94*** (0.00)	–0.74 (0.22)	–2.27*** (0.01)	–0.20 (0.41)	–2.88*** (0.00)
	Outward FDI	2.26 (0.98)	–1.61** (0.05)	2.12 (0.98)	–7.48*** (0.00)	1.80 (0.96)	–6.51*** (0.00)	–5.20*** (0.00)	–11.79*** (0.00)	–2.89*** (0.00)	–8.21*** (0.00)	–1.08 (0.13)	–6.69*** (0.00)
	Domestic investment	0.14 (0.55)	–2.51*** (0.00)	0.34 (0.63)	–1.32* (0.09)	0.06 (0.53)	–1.61** (0.05)	–0.48 (0.31)	–2.99*** (0.00)	2.71 (0.99)	–1.41* (0.07)	1.52 (0.99)	–0.92 (0.19)
	Human Capital	–0.73 (0.23)	–2.53*** (0.00)	–0.73 (0.23)	–2.03** (0.02)	–0.50 (0.30)	–2.08*** (0.01)	0.56 (0.28)	–0.34 (0.36)	–0.45 (0.67)	–1.62** (0.05)	0.63 (0.73)	–1.63** (0.05)
	Labor	–0.04 (0.48)	–4.28*** (0.00)	–0.00 (0.49)	–3.42*** (0.00)	–0.70 (0.24)	–0.89 (0.18)	–0.20 (0.41)	–4.93*** (0.00)	–2.55*** (0.00)	–2.47*** (0.00)	–3.77*** (0.00)	–2.40*** (0.00)

Notes: Null hypothesis for both tests is that the series contain unit root. Numbers in parentheses are p-value. *, **, *** represent statistically significance at 10%, 5% and 1% respectively**.** In Fisher's type test, three of the methods differ in whether they use the inverse χ 2, inverse-normal, or inverse-logit transformation of p-values and the fourth is a modification of the inverse χ 2 transformation that is suitable for when N tends to infinity. The inverse-normal and inverse-logit transformations can be used whether N is finite or infinite. Choi's (2001) simulation results suggest that the inverse normal Z statistic offers the best trade-off between size and power, and he recommends using it in applications. In this table the inverse-normal transformation is reported.

AGGREGATED ANALYSIS OF OUTWARD FDI TO THE US, THE UK, AND JAPAN

The impact of outward FDI on the domestic output is assessed using PMG estimator[6]. This study considers a common ARDL (1, 1, 1, 1, 1) specification for all countries. For comparison purposes, the result from MG estimator is also presented. Table 2 reports results using both MG and PMG estimators using aggregated data on FDI flows to U.S. Japan and U.K. The table presents estimates of the long-run coefficients, the error-correction term and Hausman test statistics. The results indicate that the joint Hausman test statistic fails to reject the null hypothesis and this reveals that the data do not reject the restriction of common long-run coefficients. Moreover, the Hausman test also indicates that the pooling restrictions cannot be rejected; meaning that the difference between the two models of MG and PMG is rejected by the Hausman test and PMG is more efficient.

As shown in the Table 2, the coefficient on outward FDI is insignificant in both long-run and short-run. This suggests that investments made by East Asian economies in industrial countries do not have any positive impact on domestic output growth. However the coefficient of outward FDI is not significant in the short-run estimation. This finding does not support the growing view that countries which lag behind in R&D activities may benefit from investment in countries which are located at the technology frontier (van Pottelsberghe & Lichtenberg 2001). However, this finding is consistent with Lee et al. (2009) and Wong (2013) who also find that outward FDI has not effect on domestic output growth. The coefficients for other variables are found to be are positive and significant, except for human capital in the short run. These finding are consistent not only with theoretical prediction but also most of the empirical literature.

DISAGGREGATED ANALYSIS OF OUTWARD FDI TO THE US, THE UK, AND JAPAN

As mentioned before, the result reported in the previous table is based on aggregated data for three FDI recipient countries namely Japan, United States, and United Kingdom. Basically, the result reveals that outward FDI from eight East Asian economies to developed economies have no significant impact on domestic output. However, this result may be influenced by the use of aggregated data as researches suggest that R&D followers are more likely to benefit from the U.S than any other countries. van Pottelsberghe and Lichtenberg (2001) and Coe, et al. (1997) indicate that the US is the leading contributor to the productivity of developing economies while technology spillovers deriving from Japan are weak. Therefore, the next logical step is to employ the disaggregated data and estimate the impact of investment made to each of the developed countries. This allows us to test whether the United States, United Kingdom or Japan is the most important source of R&D spillovers for East Asian economies.

The results of this analysis are reported in Tables 3, 4, and 5 for the United States, United Kingdom and Japan, respectively. The results indicate that the joint Hausman test statistic fails to reject the null hypothesis and this reveals that the data do not reject the restriction of common long-run coefficients. Moreover, the Hausman test also indicates that the pooling restrictions cannot be rejected; meaning that the difference between the two models is rejected by the Hausman test and PMG is more efficient.

The upshot of this analysis is that only outward FDI to the United States are found to be significant for the East Asian economies. Investments into Japan and the United Kingdom appear not to be important for the region. Additionally, all other control variables

TABLE 2. Outward FDI and Domestic Output (Aggregated Data)

	PMG			MG		
	Coef.	S.e.	p-value	Coef.	S.e.	p-value
Long-Run						
Outward FDI	–0.02	0.03	0.49	0.75	0.76	0.32
Domestic investment	0.68	0.02	0.00	0.28	0.30	0.35
Human Capital	1.10	0.32	0.00	2.35	1.87	0.21
Labor	0.43	0.17	0.01	0.67	0.24	0.01
Short-Run						
Error-correction Adjustment	–0.23	0.12	0.05	–0.67	0.11	0.00
Outward FDI	–0.01	0.13	0.91	–0.12	0.09	0.20
Domestic investment	0.65	0.17	0.00	1.08	0.24	0.00
Human Capital	1.34	1.52	0.38	–0.32	1.85	0.86
Labor	0.45	0.24	0.06	0.11	0.13	0.39
Dummy1998	–0.04	0.01	0.00	–0.03	0.01	0.00
Constant	0.15	0.04	0.00	–0.68	1.59	0.67
Joint Hausman Test for long-run Homogeneity (χ^2)	2.24		0.69			

Notes: S.e. denotes standard error.

TABLE 3. Outward FDI to the US

	PMG			MG		
	Coef.	S.e.	p-value	Coef.	S.e.	p-value
Long-run						
Outward FDI	0.08	0.03	0.01	–0.06	0.12	0.59
Domestic investment	0.67	0.02	0.00	0.38	0.20	0.06
Human Capital	1.32	0.24	0.00	1.95	1.21	0.11
Labor	0.31	0.13	0.01	0.65	0.26	0.01
Short-run						
Error-correction Adjustment	–0.27	0.16	0.08	–0.67	0.13	0.00
Outward FDI	0.00	0.00	0.19	0.00	0.00	0.78
Domestic investment	0.68	0.18	0.00	1.08	0.25	0.00
Human Capital	1.38	1.37	0.31	0.96	1.56	0.54
Labor	0.42	0.24	0.08	0.11	0.16	0.51
Dummy 1998	–0.03	0.01	0.00	–0.03	0.01	0.00
Constant	0.06	0.01	0.00	0.65	0.53	0.22
Joint Hausman Test for long-run Homogeneity (χ^2)	1.41		0.84			

Notes: S.e. denotes standard error.

TABLE 4. Outward FDI to the UK

	PMG			MG		
	Coef.	S.e.	p-value	Coef.	S.e	p-value
Long-Run						
Outward FDI	0.01	0.04	0.86	0.50	0.69	0.47
Domestic investment	0.70	0.02	0.00	0.23	0.34	0.50
Human Capital	0.84	0.34	0.01	2.49	1.86	0.18
Labor	0.53	0.18	0.00	0.73	0.25	0.00
Short-Run						
Error-correction Adjustment	–0.21	0.12	0.08	–0.64	0.10	0.00
Outward FDI	0.00	0.01	0.98	0.01	0.01	0.49
Domestic investment	0.64	0.17	0.00	1.07	0.25	0.00
Human Capital	1.38	1.49	0.35	–0.15	1.96	0.94
Labor	0.46	0.24	0.06	0.13	0.15	0.40
Dummy 1998	–0.03	0.01	0.00	–0.03	0.01	0.00
Constant	0.08	0.02	0.00	–0.04	1.32	0.97
Joint Hausman Test for long-run Homogeneity (χ^2)	1.65		0.80			

Notes: S.e. denotes standard error.

are statistically significant at the 5% level and with correct sign. The error correction term indicate that any disequilibrium is corrected by 27% per year. This finding is consistent with van Pottelsberghe and Lichtenberg (2001) who find that the United States is the strongest generator to the productivity of developing economies. Meanwhile, they show that Japan has weakly transferred the technology spillovers to developing economies. In the other words, the FDI senders to the United States gain a lot from its R&D spillovers, whereas the R&D spillovers conveyed by Japan are weak. They also find that outward FDI is a better channel than inward FDI in achievement to leading sources of technology.

It worth to mention that the United States is among the world's biggest spenders in R&D. Moreover, economic cooperation in the forms of free trades agreement (FTA) or an economic partnership (EP) such as Regional Comprehensive Economic Partnership (RCEP)[7] and Trans-Pacific Partnership (TPP)[8] improves the absorptive capacity of these countries via improvement of trade relations. Several East Asian economies have been in cooperation through the agreements such as FTAs or EFs with industrial countries, like the United States, United Kingdom, and Japan. However, the results derived from this study suggest that only economic cooperation with the United States that has actually benefited East Asian economies.

TABLE 5. Outward FDI to Japan

	PMG			MG		
	Coef.	S.e.	p-value	Coef.	S.e	p-value
Long-Run						
Outward FDI	–0.01	0.01	0.42	0.02	0.01	0.04
Domestic investment	0.70	0.02	0.00	0.55	0.16	0.00
Human Capital	0.85	0.33	0.01	1.14	0.80	0.16
Labor	0.55	0.18	0.00	0.55	0.27	0.04
Short-Run						
Error-correction Adjustment	–0.21	0.12	0.07	–0.61	0.10	0.00
Outward FDI	0.01	0.00	0.13	0.00	0.00	0.86
Domestic investment	0.68	0.18	0.00	1.04	0.23	0.00
Human Capital	1.36	1.57	0.39	1.21	1.80	0.50
Labor	0.42	0.25	0.09	0.14	0.14	0.29
Dummy 1998	–0.04	0.01	0.00	–0.03	0.01	0.00
Constant	0.08	0.01	0.00	0.43	0.31	0.17
Joint Hausman Test for long-run Homogeneity (χ^2)	3.46		0.48			

Notes: S.e. denotes standard error.

CONCLUSIONS

In recent years, the East Asian region appears to be an important source of FDI outflows among developing economies. There are two opposing views on this issue. One group believes that FDI outflows, especially into industrial countries, may have an important positive impact on domestic growth performance. They argue that by setting up production and research facilities in countries that have accumulated substantial scientific and technological capabilities, a technology follower can have better access to leading technologies available at the frontier. Therefore, knowledge spillovers via outward FDI may allow local firms to improve their productivity at home, leading to the expansion of the entire economy. Another group argues that outward investment substitutes foreign investment for domestic investment, and therefore, may suppress domestic activities, leading to lower output growth. Consequently, it is worth investigating the impact of outward FDI. Several recent studies have also tested the impact of outward FDI on growth. They focus primarily on developed countries. This study tries to fill the existing gap in the literature by evaluating the impact of outward FDI on the domestic output of emerging Asian economies.

The impact of outward FDI from the East Asian economies to the U.S., the U.K., and Japan are examined using both aggregated and disaggregated data. Using the aggregated outflow data, the results illustrate that the outward FDI has no positive impact on the performance of the East Asian economies. Further analysis using disaggregated outflow data shows that only investments into the U.S. appear to benefit the East Asian economies. However, investments into Japan and the U.K do not have any positive economic impacts on the domestic output of the East Asian economies. This finding is consistent with van Pottelsberghe and Lichtenberg (2001) who find that the U.S is the main source of knowledge spillovers. It is also consistent with Dunning's (1994) paradigm where companies prefer to invest abroad in order to take advantage of their own technology base.

The results show that only investments into the U.S. appear to benefit the East Asian economies. However, this study couldn't find that investments into Japan and the U.K. have any positive economic impacts on the domestic output of the East Asian economies. It is worth mentioning that, over the preceding years the East Asian economies have joined several agreements (e.g. free trade agreements (FTAs) and economic partnerships (EPs)) with industrial countries to improve the absorptive capacity of their economies through the improvement of trade relationships and economic partnerships. Accordingly, policy makers should consider the United States as the main destination for FDI. Both tax and non-tax incentives should be given to local firms to invest in the United States and regulation that limit free flows of productive capitals should be minimized. By setting up production and research facilities in the U.S. that has accumulated substantial scientific and technological capabilities, East Asian countries can have better access to leading technologies.

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NOTES

1 The group comprises of Brazil, the Russian Federation, India, China and South Africa.

2 Paul and Benito (2018) provide an extensive review on the directions of outward foreign direct investment from emerging economies, especially investments from China.

3 Knoerich (2017) reviews various channels through which outward FDI may have important impacts on the performance of domestic economy.

4 The main difference between Ozawa (1992) and Dunning's paradigm is that the former focuses on dynamic paradigm which traces out the intertemporal sequence of interactions between FDI (first inward and, later, outward) and structural transformation while the Dunning's paradigm is static.

5 We also evaluate the unit root properties by using cross sectional augmented IPS (CIPS) test proposed by Pesaran (2007). We find that the result is consistent with Choi (2001) and Breitung (2000). The results are available upon request.

6 Initially, the cointegration property of the series was evaluated using Pedroni (1999) and Westerlund (2007) tests. The tests reveal that the variables are not cointegrated. Therefore, using Fully Modified OLS or Panel Dynamic SUR is not a possible option

7 Regional Comprehensive Economic Partnership (RCEP) is a proposed free trade agreement (FTA) between the ten member states of the Association of Southeast Asian Nations (ASEAN) (Brunei, Burma (Myanmar), Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, Vietnam) and the six states with which ASEAN has existing FTAs (Australia, China, India, Japan, South Korea and New Zealand). RCEP negotiations were formally launched in November 2012 at the ASEAN Summit in Cambodia.

8 The Trans-Pacific Partnership (TPP) is a proposed trade agreement between several Pacific Rim countries concerning a variety of matters of economic policy. Among other things, the TPP seeks to lower trade barriers such as tariffs, establish a common framework for intellectual property, enforce standards for labor law and environmental law, and establish an investor-state dispute settlement mechanism. TPP is an expansion of the Trans-Pacific Strategic Economic Partnership Agreement (TPSEP or P4) which was signed by Brunei, Chile, Singapore, and New Zealand in 2006. Beginning in 2008, additional countries joined for a broader agreement: Australia, Canada, Japan, Malaysia, Mexico, Peru, the United States, and Vietnam, bringing the total number of participating countries to twelve. The US. President Donald Trump signed a presidential memorandum to withdraw the United States' signature from the agreement. On April 13, 2018, he said the United States may rejoin the TPP.

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