The Impact of FDI on Economic Growth through Financial Sector Development, Trade Openness, and Human Capital in ASEAN-5

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ABSTRACT

The objective of this paper is to examine foreign direct investment (FDI) impact on ASEAN-5 economic growth through its interaction with domestic absorption capacity, such as financial sector development, trade openness, and human capital. These three factors are exercised simultaneously in this paper with a purpose to show which factor being the most important precondition for FDI to have a positive impact on the economic growth. A panel dataset for ASEAN-5 member countries over 1980 – 2012 is employed and estimated by using Generalized Method of Moments approach. This paper empirically found that the interaction between FDI and domestic absorption capacity has a positive impact on the economic growth. The results also provide evidence that interaction of FDI with trade openness is more important than its interaction with human capital and financial sector development. Given these results, the role of FDI in integrating a country to regional or global supply chain should be prioritized and counted as a consideration in formulating incentive policy to FDI. Overall, assessment of this paper indicates region-specific evidences while previous findings mostly focused on bigger scope.

Keywords: FDI, Financial Development, Trade Openness, Human Capital, Economic Growth

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1. Background

Foreign direct investment (FDI) is one of the sources of economic growth. Besides providing additional funds, FDI becomes more useful as it brings new technology and knowledge for the indigenous firms. That is why FDI could induce higher productivity in the recipient country (Das, 2010). In sum, the impact of FDI on economic growth will increase when *spillover* effect takes place. However, this spillover effect does not automatically exist, yet need to be created (Musonera, 2005). Thus, it is important to elaborate not only FDI role on economic growth but also preconditions of host country that are needed for the spillover effect.

This paper will assess above topics on ASEAN countries, especially on the five founding members: Indonesia, Malaysia, Philippines, Singapore, and Thailand, the ASEAN-5. From 2004 to 2011, ASEAN-5 has been dominating around 80 – 90% of total FDI inflow in ASEAN. Moreover, FDI has increased rapidly with CAGR at 23.8% during this period (ASEAN Secretariat, 2012).

In contrary with the above trends, manufacturing sector share of GDP in ASEAN-5 has declined in recent years. The manufacturing to GDP ratio in Indonesia fell from 29.05% to 23.93% during 2001 to 2012. In the same period, Malaysia's ratio also fell from 29.34% to 24.23%. In Singapore the share of manufacturing sector to GDP dropped from 23.77% to 20.70% and in Philippines it also dropped from 24.66% to only 20.55%. Meanwhile Thailand was the only country which recorded improvement in this period to 33.97% from 33.42%. Nevertheless, the small improvement is still

counted as an anomaly in regard to the huge FDI inflows mentioned above. Moreover in line with these declining trends, worse degradation is even occurred for manufacturing sector to export ratio in the same period. (World Bank, 2013)

On the other hand, raw material contribution in ASEAN-5 export signs an improvement in the recent years, except for Singapore. The contribution of metal and ore products in Indonesian export increased from 5.5% in 2001 to 6.34% in 2012. The shares in Philippines also gained to 5.09% in 2012 from only 1.87% in 2001. There is also a slight incline in Thailand and Malaysia, 0.28% and 1.31% respectively. In parallel, inclining trend is also emerged for agriculture sector share on export ratio in the same period. (World Bank, 2013)

The above data indicates that FDI role on ASEAN-5 economy through technological and productivity development has not been optimally realized. Moreover, above trend might be harmful for ASEAN-5 economy as explained by *Dutch Disease* hypothesis. The booming natural resources sector might give an adverse effect on non-booming sector (manufacturing sector) (Javaid, 2011). This study suspects that the laxity of a country pre-condition such as human capital, financial sector development, and trade openness are the cause of above trend. (Borensztein et al, 1998; Bhagwati,1978; Balasubramanyan et al, 1996; Hermes & Lensink, 2003).

2. Theoretical Framework

The paper exercises the model from Romer (1996) to claim the impact of human capital on economic growth and from Borensztein et. al (1998) to portray the impact of interaction between FDI and human capital on economic growth. To describe FDI and trade openness interaction effect, the paper uses Bhagwati (1978) and Balasubramanyan (1996) hypothesis. Last but not least, this paper applies Hermes & Lensink (2003) model to figure FDI and financial sector development effect on economic growth.

2.1 Human Capital and FDI Interaction

Human capital of the recipient country is an prominent factor to enhance the contribution of FDI to economic growth (Borensztein et. al, 1998). Stock of human capital reflects the ability to absorb new knowledge or technology brought by the FDI. There are two main hypotheses from Borensztein et. al. Firstly, Borensztein et. al assume that there are two types of capital goods, domestic goods with *n* variants and foreign goods with *n** variants. In aggregate level, total of *n* and *n** is *N*, in comparison with total variants product in the world is *N**. If the capital varieties increase, adaptation of technology is needed which requires fixed setup cost ***F***. The larger amount of *n*/N* (number of FDI to the total number of firms), the lower fixed setup cost. On the other side, the bigger *N/N** the fixed setup cost is bigger. Second, FDI which represented by *n*/N* is associated with the stock of human capital, ***H***. The higher stock of human capital effect of FDI is also higher. Below is the expression for the rate of economic growth by Borensztein et. al:

$$g \quad - \quad ^{-} \quad 1 - \quad \overline{} F \ \frac{*}{}, - * \quad - \qquad (2.1)$$

2.2 Trade Openness and FDI Interaction

Another precondition that also affects the impact of FDI on economic growth is trade openness. First of all, liberal trade regime is an important investment climate that may encourage FDI inflow larger. On the other hand, the restricted trade regime will create an inefficient investment allocation, leading to the decreasing inflow of FDI. Secondly, the conducive investment climate will pursue export orientation FDI inflow as they are probably integrated to the international trade activity. Having higher integration in the international market will encourage FDI to provide their best and latest technology. Eventually, FDI will push domestic resources to meet their demand and spillover will occurs. (Bhagwati, 1978)

Thirdly, the trade restriction regime may disturb import activities and the knowledge as well. Moreover, the trade restriction – through integration, redundancy, and allocation effect - may decrease the growth rates. Trade restriction is seen as a distortion and disruption for the investment climate. (Rivera-Batiz & Romer, 1991)

Fourthly, FDI on economic growth has a stronger impact for a country having *export promoting* (EP) orientation rather than it having *import substituting* (IS) orientation. IS gives distortion to the market and tends to limit the scope of the market only in domestic scale. In contrast, EP gives no distortion which will induce higher competition and in doing so, encourage investment in human capital and research to increase the competitiveness. (Balasubramanyam et. Al, 1996)

2.3 Financial Sector Development and FDI Interaction

Last but not least, financial sector development is also an important precondition to increase the impact of FDI on economic growth. According to Hermes & Lensink (2003), the rate of economic growth is depends on the rate of technological growth. Next, if *A* is the level of technology, then it is a function of financial sector development *A = f(F)*, where *dA/dF > 0*. Second, FDI (which in Borensztein et. al reflects the idea of imitation cost) is associated with the financial sector development. Thus, the higher financial sector development, effect of FDI is also higher. Below is the expression for the rate of economic growth by Hermes & Lensink:

$$g \quad - \quad \frac{\quad}{\mathrm{FD}} \quad F \quad - \tag{2.2}$$

3. Empirical Study

The empirical literature on FDI contribution for many countries still provides ambiguous results. As summarized by Musonera (2005), researchers who found positive spillover are Blomstorm in Mexico, Caves in Australia, Globerman in Canada, Romeo in USA, and Liu in China. While, researchers who found negative spillover are Aitken & Harrison in Venezuela, Kathuria in India, and Konings in Bulgaria.

Mixed result can also be found on FDI and human capital interaction empirical literature. Borensztein et al (1998) found that only 46 out of the 69 countries that have sufficient stock of human capital in order to increase the impact of FDI. Tu & Tan (2013) on their research in ASEAN found only three out of 10 countries that have sufficient human capital. Salsabila (2013) discovers that FDI contribution in Indonesia is varies for each province as the threshold for each province is different. On the other hand, Chee & Nair (2010) found a negative effect on economic growth from the interaction between FDI and human capital.

Varied result can also still be found on FDI and financial sector development interaction empirical literature. Hermes & Lensink (2003) found a positive effect on economic growth from the interaction of FDI and financial sector in 37 countries. Choong et. al (2004) discover positive effect only in several countries, three developed countries (Japan, UK, and USA) and some East Asia countries (Indonesia, South Korea, Malaysia, Philippines, Singapore, and Thailand). Chee & Nair found similar result on their research to 44 Asia and Oceania countries. In contrast, Apergis et. al (2006) and He (2012) found that FDI might cause credit aversion for domestic firms.

More uniform result can be found on FDI and trade openness interaction empirical literature. Makki & Somwaru (2004) found positive effect from FDI and trade openness interaction in 66 developing countries. Pham (2012) found that liberalization of trade improves spillover effect in Vietnam, whether for horizontal or vertical spillover. Lesher & Miroudot (2008) also found similar result for firms' productivity in OECD countries.

The mixed result provides a space to re-conduct research on these variables. The lack of empirical study that simultaneously uses those three interaction variables is also one of the motivations of this study. Lastly, the assessment of this paper indicates region-specific evidences in which previous empirical study mostly focused on bigger scope. As Chee & Nair said, region specific evidences might enhance the quality of policy recommendation.

4. Data and Methodology

The study uses panel data which are sourced from the publication of World Bank, ASEAN Secretariat, and also statistic institution of each country as well as are based on the period of 1980 to 2012. Base model of this study was adapted and modified from Chee & Nair model (2010). The econometric model for this empirical analysis is:

$$PDBK_{it} \quad FDI_{it} \quad FinDe_{it} \quad PEN_{it} \quad _{it} \quad FDI_{it} \quad FinDe_{it} \quad FDI_{it} \quad PEN_{it} \quad FDI_{it} \quad _{it} \quad P_{it} \quad _{it} \tag{3.1}$$

where,

PDBK = GDP per capita

FDI = FDI to GDP ratio

FinDev = Financial sector development proxy to GDP ratio (Private Credit/PDB)

OPEN = Trade openness proxy to GDP ratio (Export + Import)/PDB)

H = Human capital stock proxy (Tertiary school enrolment rate)

P = Other variables that affect economic growth (Control variable)

i denotes country, *t* denotes year

Derivation of equation 3.1 is:

$$\frac{\text{it}}{i} \quad FinDe_{it} \quad PEN_{it} \quad _{it} \tag{3.2}$$

Where, reflects the direct effect of FDI on economic growth. While, , , dan reflects the impact of FDI on economic growth that depend on the level of financial sector development, trade openness, and human capital, respectively.

4.1 Empirical Methodology

This study uses dynamic panel data *Generalized Method of Moments* (GMM) as static panel data is unable to satisfy BLUE assumption. Two initial methods that employed in this study are *fixed effect* (FE) and *random effect* (RE). Afterwards, Hausman test is utilized to determine which estimator (FE or RE) is more appropriate to the data (Gujarati, 2003). The model might exhibit some misspecification problems, namely heteroskedasticity, auto correlation, and multicollinearity. Thus, standard error adjustment will be employed to correct heteroskedasticity. Moreover, multicollinearity problem is expected to arise due to the usage of interaction variable in the model. Regarding to this problem, we modify the data of related variable by using standardization formula: (Z): _____. Lastly,

additional lagged independent variable is prepared to overcome auto correlation problem. Nevertheless, the lagged independent variable in the static panel data will generate inconsistent estimator as the variable is correlated with the error. Therefore, dynamic panel data GMM is applied as the solution for this problem. GMM was also chosen by considering its ability to overcome bias problem that arise in other dynamic panel data approaches.

4.2 Data

The dependent variable in this paper is economic growth. Real GDP per capita (base year 2005) is used for the proxy of this variable. The objective independent variables in this study are real FDI inflow to GDP ratio (FDI), credits to private sector to GDP ratio for financial sector development (CREDIT), sum of export and import to GDP ratio for trade openness (OPEN), tertiary enrolment ratio for the proxy of human capital (HUMAN). The control independent variables are real gross

capital formulation to GDP ratio (K), government expenditure to GDP ratio (GOVEX), and population growth (N).

The empirical model also insert three interaction variables (SPILL1, SPILL2, SPILL3) which measure by multiplying FDI with CREDIT, OPEN, and HUMAN. The variable is constructed as indices with base value at 100. This technique is adopted from Chee & Nair in the purpose of making the interpretation more meaningful.

5. Empirical Results

According to the Hausman test, FE creates more appropriate estimator than RE does. Nevertheless, Wooldridge test indicates the presence of auto correlation. Hence, the model is estimated by using dynamic panel data GMM. Standard error adjustment is performed to address the result of Sargan test that rejects the validity of overidentifying restriction. (See Appendix)

The equation obtained from GMM estimation is:

$$_{it} \quad 0.818 * \quad 1PDBK_{it} - 0.276 * \quad 2PDBK_{it} \quad 0.302 * \quad 3PDBK_{it} \quad 0.010 * FDI_{it} - 0.017 * FinDe_{\ it} \quad 0.003 \quad PEN_{it} - 0.012 * \quad _{it} - 0.006 \quad FDI_{it} \quad FinDe_{\ it} \quad 0.007 * FDI_{it} \quad PEN_{it} - 0.001 \quad FDI_{it} \quad _{it} \quad 0.117 * Ka \quad ital_{it} - 0.009 * N_{it} \quad 0.033\, G \quad E_{it} \quad _{it} \qquad (4.1)$$

Derivation of equation 4.1:

$$\frac{\text{it}}{i} \quad 0.010 * - 0.006 \quad FinDe_{\ it} \quad 0.007 * \quad PEN_{it} - 0.001 \quad _{it} \qquad (4.2)$$

Equation 4.2 shows that the impact of FDI on economic growth is positive and mounting by its interaction with trade openness variable. On the other hand, the interaction variable, *FDI x FinDev* and *FDI x H* yields negative impact but statistically insignificant.

The results obtained from interaction term FDI and financial sector development is inconsistent with the theoretical framework employed in this paper. The negative impacts suggest that FDI may provide *crowd out* and adverse effect in ASEAN-5 as it may cause differences in the access to credit. In the presences of FDI, the financial sector institutions tend to give credit to international companies rather than to domestic companies. (Apergis, Katrakilidis, & Tabakis, 2006; He, 2012)

These results coincided with a negative and statistically significant impact of financial sector development. These results are similar with Chee & Nair founding. One of the possible reasons for the negative impact is *financial fragility* problem. Vulnerable and unstable financial sector tends to result inefficient investment. In turn, the inefficient investment will burden the economic growth. (Bernanke dan Gertler, 1990)

In addition, the result of FDI and human capital interaction is also inconsistent with Borensztein et. al hypothesis. The negative impact means that the impact of FDI to growth declines when human capital increases. The lack of synergy between domestic research and development (R&D) with foreign R&D is one of the possible reasons to explain this result. Hence, it may causes redundancy and so adaptation cost will increases. (Chee & Nair, 2010) As this result arises together with the negative and statistically significant impact of human capital, *brain drain* problem is also one of the possible reasons of negative *FDI x H* impact. (Merlevede et.al, 2013)

On the other hand, the impact of the interaction variable FDI and trade openness is positive and statistically significant. Meanwhile, the individual impact of trade openness is also found to be positive yet statistically insignificant. These results are consistent with the Bhagwati, Balasubramanyan, and Rivera-Batiz & Romer hypothesis described above. These results are also consistent with the findings of previous research such as Makki & Somwaru, Lesher & Miroudot, dan Pham.

For the control variables, all estimation results are consistent with the pre-estimation expectation. The impact of gross capital formulation is found to be positive and statistically significant. The coefficient value of government expenditure is also found to be positive but statistically insignificant. Meanwhile, the negative and statistically significant impact is found from population growth. Positive impact of gross capital formulation and government expenditure means that both variables have positive contribution to increase the economic growth. On the other hand, the negative impact of the population growth means that higher population growth will give bigger burden to the economic growth.

6. Conclusion

This study has examined the impact of FDI on economic growth through its interaction with trade openness, financial sector development, and human capital in ASEAN-5. The study finds that FDI has a positive impact on ASEAN-5 economic growth. Moreover, there is a positive impact from interaction between FDI and trade openness on ASEAN-5 economic growth. In contrast, there are negative impacts from interaction between FDI and financial sector development and also between FDI and human capital on ASEAN-5 economic growth. This result coincided with the individual financial sector and human capital variable that also has a negative impact. The result of this empirical study shows that the most important complementary effect to the growth in ASEAN-5 comes from interaction between FDI and trade openness.

Based on the results, this paper suggests ASEAN-5 countries to keep implementing trade liberalization and issuing more export promotion policies. In addition, FDI having strong orientation to integrate a country to its international value chain should be prioritized and counted as a consideration in formulating incentive policies, such as tax exemptions and/or reduction of share ownership restrictions. On the other hand, ASEAN-5 also needs to make a policy to encourage the human capital and financial sector development. Therefore they might generate positive interaction effect with FDI.

APPENDIX

Table A. Estimated Results of Panel Data

Variable	FE	FE-AR(1)	GMM
PDBK			
L1.	0.8538131*	0.374054*	0.8077133*
L2.	-	-	-0.2764935*
L3.	-	-	0.301809*
FDI	0.0090863*	0.005965***	0.0100512*
Credit	-0.0158431*	-0.01413*	-0.0170504*
Open	0.0022997	0.001896	0.0027863
Human	-0.0059092	0.012168	-0.012083*
Kapital	0.0977581*	0.163708*	0.1173735*
Govex	0.0254489	0.154026*	0.0330174
N	-0.0109933*	-0.00848*	-0.0097525*
Spill1	-0.004444	0.004289	-0.0059886
Spill2	0.0052641	0.001851	0.0070002**
Spill3	-0.0009602	0.004965	-0.0009073

R-squared	0.9923	0.7771	-
Hausman Test	0.0001	-	-
Modified Wald (HSK)	0.2708	-	-
Wooldridge (Autocorrelation)	0.0016	-	-
Modified Bhargava et. al DW	-	1.5123144	-
Sargan Test	-	-	*omitted*
AR(2)	-	-	0,6807
Observations	160	155	145

Nb: *, **, *** denotes significance at 1%, 5%, and 10% respectively.

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