The impact of foreign direct investment and trade on economic growth—Taking China, Korea, Malaysia, Philippines & Thailand for example

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Abstract: In this study the authors make efforts to survey the impact of foreign direct investment and trade on the economic growth of five East Asian countries, China, Korea, Malaysia, Philippines and Thailand. Using an augmented production function (APF) growth model, the authors apply panel data Method and data span is from1980 to 2006. The required data are extracted from *World Development Indicator 2008*. The result shows that a co-integration relationship between growth and its determinants in the APF model is supported. Firstly, the study shows that with the increasing the inflow of foreign direct investment, positive impact on growth in Thailand, Korea and China is proved. However, this impact is negative in Philippine and Malaysia. Also the impact of trade on economic growth has the same result with FDI impact in sign. Further, the impact of labor force on growth is not significant in these countries and the effect of gross fixed capital on growth is positive and has a very high impact on selected countries.

Key words: trade; foreign direct investment (FDI); growth

1. Introduction

The relationship among FDI, trade and growth is one of the most important issues in international economics. Policymakers in a large number of countries are engaged in creating all kinds of incentives to attract FDI, because it is assumed to positively affect economic development. Also, they make efforts to expand their trade capacities with foreign countries to stimulate their growths. Explosion of growth in FDI and trade over the 1990's, especially in the developing countries, has inspired a stream of literature focusing on the impact of FDI and trade on the growth.

The main stimulus of economic growth and development is investment and the most important source of the preparation of this investment for various countries is national saving, while most of the developing countries encounter with the shortage of investment because of some fundamental economic difficulties, such as low national income, inflation, unemployment and the deficiency of different economic parts. For this reason, these countries make constant endeavor to utilize foreign borrowing for retaliating this shortage. But, after awhile they face with difficulties for repaying them. Why? For this reason that these investments have been used in deficient

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sections which are not profitable and they are not able to repay their debts. This problem causes the increase of foreign debts that has bad and mortal effect on the economic of those countries. For these causes, these countries are encouraged to use foreign investment particularly foreign direct investment (FDI). The need for attracting FDI causes them to compare with each other. In this competition, the mentioned countries increasingly relate with the developed countries that are the origin of the prior technology and management. Because of the most significance of this subject, a great number of researchers have a lot of studies about the effect of FDI on different economic sections. Under this background, it is imperative that the impact of FDI and trade on economic growth needs to be assessed for each country. The main objective of this study is to survey the impact of FDI and trade in East Asia countries such as China, Korea, Malaysia, Philippines and Thailand.

2. Literature review

In theory, there are several potential ways in which FDI can promote economic growth. For example Solow type standard neoclassical growth model suggests that FDI increases the capital stock and thus growth in the host country by financing capital formation (Brems, H., 1970).

FDI by transferring knowledge in the host country will increase the existing stock of knowledge through labor training, transferring of skills, and the transfer of new managerial and organizational practice. Also it can promote the use of advanced technology by capital accumulation in host countries. Accordingly, FDI related to technological spillovers offsets the effects of diminishing returns to capital and keeps the economy on a long-run growth path. Therefore, FDI from way of capital accumulation and knowledge spillover may play an important role for economic growth (De Mello, L., 1999; De Mello, L., 1997).

Also, FDI may allow a country to develop in technology and knowledge that are not readily available to domestic investors, and in this way increase productivity growth through the economy (De Gregorio, Jose, 2003).

Blomstrom, et al (1994) said that FDI has a positive effect on economic growth, but there seems to be a threshold level of income which above FDI has positive effect on economic growth on above, and it does not in below. Countries that have reached a certain income level can absorb new technologies and benefits of technology transfer, and thus reap the extra advantages of FDI. This is because it takes a well-educated population (human capital) to understand and spread the benefits of new innovations to the whole economy.

Borensztein, et al (1998) suggested that countries may need a minimum threshold stock of human capital in order to experience positive effects of FDI.

UNCTAD (1999) submitted that FDI has either a positive or negative impact on output depending on the variables that are entered alongside it in the test equation. These variables include the initial per capita GDP, education attainment, domestic investment ratio, political instability, terms of trade, black market exchange rate premiums, and the state of financial development.

Bende-Nabende, et al (2002) found that the level of economic development may not be the main enabling factor in FDI-growth nexus.

In contrast to the modernizational perspective, dependency theorists argue that dependence on foreign investment is expected to have a negative effect on growth and the distribution of income. Bornschier and Chase-Dunn (1985) claimed that foreign investment creates an industrial structure in which monopoly is predominant, leading economy to be controlled by foreigners that would not develop organically, because the multiplier effect by which demand in one sector of a country creates demand in another is weak and therefore

leading to stagnant growth in the developing countries. This argument can be important if most of the FDI is in natural resources sectors.

The fact that openness to trade is associated with higher growth is documented in numerous studies. For example, we can mention to studies of Edwards (1998), Dollar (1992) and Ben-David (1993). Ben-David (1993) demonstrated that a sample of countries with open trade regimes displays absolute convergence in per capita income, while a sample of closed countries does not. Also Sachs and Warner (1995) showed that closed countries experienced annual growth rate a full 2 percentage points below open countries in the period of 1970-1989. They also confirmed Ben-David's result that open countries tend to converge, not closed ones.

There are many reasons that could explain a positive estimated coefficient in a regression of trade openness (however measured) on growth or income levels. Such effects could stem from better checks on domestic policies, an improved functioning of institutions, technological transmissions that are facilitated by openness to trade, increased foreign direct investment and scale effects.

Wacziarg (2001) had argued that trade openness exerts a positive and significant impact on economic growth due to the accelerated accumulation of physical capital, sustained technological transfer and improvement in macroeconomic policies.

Therefore, trade and FDI have been recognized as the important factors in the economic growth process. Studies both cross country and country specific on trade and FDI interaction on growth (Kohpaiboon, A., 2004), FDI-growth nexus and trade-growth nexus (Lipsey, R. E., 2000) and (Pahlavani, M., E. Wilson & A.C. Worthington, 2005) have mostly concluded that both FDI and trade promote economic growth. And Balasubramanyam (1996) had mostly concluded that both FDI and trade promote economic growth nevertheless, there are clear indications that the growth-enhanced effects from FDI and trade vary from country to country. For the same country's FDI and trade can even negatively affect the growth process (Borensztein, E., J. D. Gregorio & J. W. Lee, 1998; De Mello, L. R., Jr., 1999; Xu, B., 2000). According to Bhagwati's hypothesis that due to adjustments for differences among countries for their economic size, political attitudes towards FDI and stability, both the magnitude of FDI and their efficacy in promoting economic growth will be greater over the long run in countries pursuing the export promotion (EP) strategy than in countries pursuing the import substitution (IS) strategy (Bhagwati, J. N., 1978; Bhagwati, J. N., 1985). Thus, the growth-enhanced effect of FDI and trade interaction was not automatic but depends on various country specific factors such as the trade openness. Similar conclusion is made by Asiedu, E. (2002).

Observing theory about the possible growth-promoted roles of both FDI and trade, the used data is modeled in an aggregate production function (APF) framework.

The APF assumes that, along with conventional inputs of labor and capital used in the neoclassical production function, unconventional input like FDI and trade may be included in the model to capture their contribution to economic growth. The APF model has been used in many articles like Kohpaiboon (2004).

Following (Herzer, D., D. F. Nowak-Lehmann & B. Siliverstovs, 2006, p.3), the general APF model to be estimated is:

$$Y_t = A_t K_t^{\alpha} L_t^{\beta} \tag{1}$$

That Y_t denotes the aggregate production of the economy at time t and A_t, K_t, L_t are the total factor productivity, the capital stock and the stock of labor respectively. According to Lipsey (2001), the impact of FDI on economic growth possibly operates through total factor productivity. In this study, the authors want to

investigate the impact of FDI and trade on economic growth through changes in total factor productivity, assuming that total factor productivity is a function of FDI and trade and other exogenous factors (C_t), thus:

$$Y_t = C_t K_t^{\alpha} L_t^{\beta} FDI_t^{\phi} TR_t^{\delta} \tag{2}$$

In section 3, the authors will present the used model and explain that how we use APF framework for surveying the impact of FDI and trade on growth of selected countries.

3. Data and methodology

The entered variables in model are: *Y* is defined as real GDP per capita, *FDI* is real gross foreign direct investment flows, *TR* is the sum of export and import values to GDP ratio, *L* is total labor force and *K* is real value of gross fixed capital formation that is proxy of capital stock.

For the benefits of using the linear logarithmic models, which contained the obtained coefficients through these models showing elasticity, all of the variables have been used as logarithmic to estimate the model.

In this study, the authors use the panel unit root test proposed by Breitung (2000). The reason for using this panel unit root test is that a recent large-scale Monte Carlo simulation studied by Hlouskova and Wagner (2006) found that the Breitung (2000) panel unit root test generally had the highest power and smallest size distortion of any of the so called first generation panel unit root tests.

If the model contains a panel unit root, the issue arises whether there exists a long run equilibrium relationship among the variables. The authors test for panel co-integration using Kao (1999) test (Engle-Granger based) method.

4. Model and result

The results of Breitung (2000) panel unit root test suggested that there are panel unit root variables in model (see Table 1). Therefore, the authors use Kao (1999) co-integration test to test whether there is a long-run relationship among variables or not. The result of co-integration test shows that there is long-run relation among variables (see Table 2).

Table 1 Breitung unit root test

Null hypothesis: unit root	t-statistic	Probability
lnY	1.02868	0.8482
lnK	-0.98374	0.1626
lnL	1.71981	0.9573
lnFDI	0.56473	0.7139
lnTR	-0.76434	0.2223
D (lny)	-2.73663	0.0031∗
D (lnK)	-5.31073	0.0000∗
D (lnL)	-2.96013	0.0015∗
D (lnFDI)	-4.91679	0.0000∗
Dln (TR)	-4.73619	0.0000∗

Note: ∗ Null hypothesis is rejected at 5% significant level.

Table 2 Kao residual co-integration test

Null hypothesis: no co-integration	t-statistic	Probability
ADF	-2.453110	0.0071*

Note: * Null hypothes is rejected at 5% significant level.

The estimated model is:

$$\ln Y_t = c + \alpha_1 \ln K_t + \alpha_2 \ln L_t + \alpha_3 \ln FDI_t + \alpha_4 \ln TR_t + \varepsilon_t \quad (3)$$

Those variables are presented in section2.

Selected method for estimated model is fixed effect, because there is structural variation in economy of selected countries that lead to expecting that the effects of foreign direct investment and trade on growth are various. In this method, researchers can see the structural variation in different economies and also they can explain these effects on exogenous variables. With notice of constant coefficients of fixed effect model, it is obvious that differences between the structures of selected countries exist. Therefore, to achieve growth, there are very obvious structural differences.

The estimated coefficients in Table 3 show that capital investment that peroxided by real gross fixed capital formation has a very high significant impact on per capita GDP (economic growth) in set of selected countries. A 1% increase in capital investment leads to approximately 0.6% increase in per capita GDP in set of selected countries. We can see that the capital investment is important for economic growth and development of selected countries.

Table 3 Estimate of fixed effect model 1

Variables	Coefficient	t-statistic	Probability
C	-7.595961	-8.542192	0.0000
lnK	0.607657	20.12724	0.0000
lnL	-0.061411	-0.893849	0.3731
lnFDI	0.035184	3.792062	0.0002
lnTR	0.168895	5.862128	0.0000
R-squared: 0.992901		F-statistic: 2185.301	

The labor force variable is negative and insignificant statistical effects on per capita GDP of selected countries, which shows that these economies are based on technology. Also results indicate that the number of labor force is not important factor for growth in these countries. Also results indicate the decrease in the share of active labor force on GDP of selected countries.

The coefficient of trade openness for these countries is positive and significant. The coefficient of trade openness investigates that a 1% increase in trade openness leads to a 0.16% increase in per capita GDP of selected countries. This coefficient sign shows that increase in trade volume leads to economic growth in these countries.

Also result supports the positive relation between foreign direct investment and economic growth in sum of selected countries, and its coefficient is equal to 0.03, therefore a 1% increase in FDI leads to a 0.03% increase in economic growth in set of selected countries.

To continue, the authors estimate two other panel regression with assuming that trade openness and foreign direct investment variables have a special coefficient on each countries. Results of this estimate show that the coefficients of trade in Thailand, Philippine, Malaysia, Korea and China are equal to: 0.26, -0.78, -0.63, 0.36 and 0.33. This result indicates that the effect of trade on economic growth in Philippine and Malaysia is negative.

Special coefficients of foreign direct investment in Thailand, Philippine, Malaysia, Korea and China are equal to: 0.12, -0.067, -0.074, 0.08 and 0.11 (see Table 4). This result shows that the effect of foreign direct investment on economic growth of Philippine and Malaysia are negative but other countries are positive.

Table 4 Estimates of fixed effect model 2 and model 3

Model 2 Trade coefficients			Model 3 FDI coefficients		
Countries	Coefficient	t-statistic	Countries	Coefficient	t-statistic
China	0.335574	9.122114	China	0.111005	5.375450
Korea	0.366485	7.522971	Korea	0.085755	5.731011
Malaysia	-0.639822	-8.976158	Malaysia	-0.074071	-2.436942
Philippines	-0.781934	-13.62488	Philippines	-0.067554	-5.284726
Thailand	0.266453	7.891350	Thailand	0.120640	5.163556

Also we can investigate that in Malaysia and Korea, other factors that affect growth and aren't included in model are more than in other countries, such as management, social development, politics, cultural, personal freedom etc, which exert their effects on constant coefficients.

5. Conclusion

This study uses panel co-integration techniques to examine the existence of long-run relationship among foreign direct investment, trade and economic growth in China, Korea, Malaysia, Philippines and Thailand. Panel co-integration test shows that the variables of interest put in an aggregate production function model are co-integrated.

The results indicate that capital investment has great impact on economic growth in selected countries. We can gather from the study that labor force does not have significant effect on economic growth in selected countries.

According to results, trade openness' effects on growth imply that trade liberalization of the economy is positive in China, Korea, Thailand but negative in Malaysia and Philippines. Also the effects of foreign direct investment on economic growth of selected countries see the same sign with trade effect results.

Also, from the study, we can investigate that the effect of FDI on economic growth in China and Thailand is near together, instead, the effect of trade on economic growth in China and Korea is higher than in other countries and near together. From the effect of gross fixed capital on economic growth, we can obtain that this coefficient is higher in China and Korea than in other countries.

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When the decision maker acts rationally, the normative approach is often considered superior to the descriptive approach, because it is based on formal theories of rational decision making (Beroggi, 1999, p.50). In the author's opinion, when rationality of the decision makers can be expected, the normative approach to decision making would be preferred.

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