The Empirical Economics Letters, 6(1): (January 2007) ISSN 1681 8997

A Panel Data Analysis of FDI, Trade Openness, and Liberalization on Economic Growth of the ASEAN-5

Ramesh Mohan

Department of Economics, Bryant University
Smithfield, RI02917, U.S.A.

Email: rmohan@bryant.edu.

Abstract: Foreign Direct Investment (FDI) has contributed heavily to development of the Association of South East Asian Nations (ASEAN). In this study, the concentration is on five ASEAN countries: namely Malaysia, Singapore, Thailand, Indonesia, and the Philippines. FDI inflows into the ASEAN-5 multiplied spectacularly from 1980 to 1997, but the trend has reversed since the Asian financial crisis in 1997. This paper seeks to examine the contributions of FDI, trade openness, and liberalization to economic growth and development in the ASEAN-5.

JEL Classification: F21, O5

Keywords: Foreign Direct Investment, Development, ASEAN.

1. Introduction

Foreign Direct Investment (FDI) is one of the key catalysts to economic development strategies in many developing nations. Many growing nations have promoted FDI in the last two decades by providing financial incentives and reducing barriers (Rasiah, 1993). FDI is one of the channels for creating new employment opportunities and human capital formation in the host country, together with infrastructure enhancement and technology spillovers (Borenzstein, De Gregorio and Lee, 1995). FDI is believed to be important for local firms by creating linkages to technology spillovers, encouraging the presence of skilled foreign labor, and facilitating better export prospects through associations with multinational corporations (MNCs) (Blomstrom, Globerman and Kokko 2000; Lall, 1980). All of these contribute to higher productivity and economic growth. Basically, FDI institutes a competitive business environment, elevates efficiencies, and enhances industrial development (Moran, 1998). FDI is one of the most powerful instruments for upgrading developing nations from their current economic status (Balasubramanyam, Salisu and Sapford, 1996). FDI, on the whole, significantly helps the development process of growing nations (Galensen, 1985; Asian Development Bank, 1999).

FDI has contributed significantly to the development of the Association of South East Asian Nations (ASEAN). In this study, the concentration is on five ASEAN countries (hereafter ASEAN-5): namely Malaysia, Singapore, Thailand, Indonesia and the Philippines. FDI inflows into ASEAN multiplied spectacularly, an increase of over 800%, rising from US$25.2 million from 1980 to US$22.86 billion in 1997. However, this trend has reversed since the Asian financial crisis in 1997; FDI inflows continued declining to a level of only US$13.3 billion in 2001.

This paper was guided by one primary research objective that differs from other studies: To examine the contribution of FDI, openness, and trade liberalization to the economic growth and development of the ASEAN-5 using panel data model. There is very little empirical work in the literature concentrating on the ASEAN-5 as a group.

2. Literature Review

The Asian Development Bank (1999) in its Asian Development Outlook (ADO) 1999 stressed that low wages and openness are key factors that encourage the flow of FDI into ASEAN. The ADO has emphasized that FDI is also the basis for stimulating economic growth in Asia's developing nations. FDI benefits developing countries in terms of transferring technology, creating employment, supplying additional capital and promoting trade. Furthermore, the report stressed that developing nations attracted FDI with abundant resources, especially low wage labor. FDI provides a base for MNCs to avoid trade barriers on imported goods and to export finished labor-intensive goods.

Gani (1999) looked into the causal relationship of FDI and economic growth in Fiji. By utilizing annual data from 1976-1995, the study tested causality based on an error correction model. The results strongly supported the notion that FDI is important for economic growth in developing countries. The author stressed that FDI functions as an effective path for technology and human capital transfer in low-income countries.

Asafu-Adjaye (2000) examined the effects of FDI on Indonesian economic growth. The results in this paper showed that FDI played a positive role in boosting economic growth. The study further suggested that in order to alleviate any unfavorable impact on domestic industries, foreign-owned enterprises (FOE) should be encouraged to use domestic inputs and to engage in high technology industries. The author concluded that governments should persuade FOEs against investing in labor-intensive industries in which Indonesia has a comparative advantage. To maximize the benefit of FDI, the author emphasized the need to improve the quality of human capital.

Te Velde and Morrissey (2002) provided convincing evidence that FDI contributes to economic growth in developing countries. In their paper, based on analysis from five Asian and African countries, they concluded that the benefits of FDI are not equally distributed. It is apparent that skilled workers benefit more than less-skilled workers in developing countries.

3. Data, Variables and Empirical Methodology

3.1. Data and Variables

The study uses data from World Development Indicators 2003. Some missing observations were replaced by comparable data from statistical offices of the respective countries. Table 1 provides descriptions of the growth regression variables, the expected signs, and the rationale for using the variables. The sample period is 1980-2001, and annual data were used. Most of the ASEAN countries gained independence in the late 1940s or 1950s.[1] After independence, these countries concentrated on restructuring their socio-political structures. During the subsequent 10 years, they focused on import substitution from their colonial masters. Only in the late 1970s did most of the ASEAN countries start to shift from an agriculture base to industrialization. The ASEAN then started to attract the interest of developed nations and promoted FDI. Thus, the starting-point of data was chosen based on this factor.

Table 1: Variables, Descriptions, and the Relationships with GDP Growth

Acronym	Description	Expected sign	Rationale
GROWTH CONTROL VARIABLES (Q_{it})			
GDPPC	Initial GDP per capita (1980)	_	Weighting variable. On the assumption that the standard deviation of the disturbances in the growth equation is negatively related to initial GDP per capita.
LINV	Lag of investment to GDP ratio	+	Higher investment rate, higher GDP growth per capita.
GOV	Government consumption to GDP ratio	_	High government consumption implies high government intervention, less market freedom, or market distortion.
INFLA	Annual inflation rate (%)	_	High inflation indicates macroeconomic instability and uncertainty.
EDU	Literacy rate (%)	+	Higher literacy rate increases economic productivity.
POP	Age dependency ratio	_	Higher dependency ratio will reduce the growth rate of GDP per capita.

[1] Malaysia in 1957, Singapore in 1963, Indonesia in 1945, the Philippines in 1946.

Table 1 continued

OPENNESS VARIABLES (Rit)			
FDI	FDI inflow	+	FDI encourages economic growth.
IMPDUTY	Import duties (% of import)	Ambiguous	Depending on the economy, positive in cases where the country is defending import-competing industry.
EXPDUTY	Export duties (% of exports)	_	Export barriers have a negative impact on growth.
BOPD	Balance of payments (BOP) deficit	_	High BOP deficits reduces economic growth.
OPEN	Sum of exports and imports (% of GDP)	+	Openness encourages international trade, thus economic growth.
TAXINT	Tax on international trade (% of current revenue)	Ambiguous	Higher trade restriction is detrimental to international trade, thus economic growth. However, trade restrictions in import-competing sector, has a positive impact on growth.
LIBERALIZATION VARIABLES (S_{it})			
FINLIB	Gross claim of financial system to GDP	+	Liberalized financial system will have a positive impact on economic growth through competitive financial intermediaries.
TELELIB	Fixed lines and mobile phone subscribers (% of population)	+	Telecommunication liberalization will enhance business environment, thus economic growth.
TRANS	Transport services (% of commercial services export)	+	Developed infrastructure is an indication of service sector growth.

3.2 Growth Regression

The growth regression tested the sensitivity of economic growth to openness, FDI, trade restriction, and liberalization. The fixed effects regression specification was estimated in the form of:

$$GDPGR_{it} = \eta_1 \delta_{1it} + \eta_2 \delta_{2it} + \ldots\ldots\ldots + \beta' Q_{it} + \alpha' R_{it} + \gamma' S_{it} + \mu_{it} \qquad (2)$$

where $GDPGR_{it}$ is the *GDP* per capita in country i =1,……, N; year t = 1,….,T(i); Q_{it} is the vector of growth control variables; R_{it} is the vector of openness and/or trade barrier variables; S_{it} is the vector of economic liberalization variables; δ_{jit} is the group specific year dummy variables; η_i is the individual specific constant or the country effect;

μ_{it} is a classical disturbance term with $E[\mu_{it}] = 0$, $var[\mu_{it}] = \sigma^2_{\mu}$; White's robust, heteroscedasticity corrected covariance matrix was used.

4. Empirical Results

The purpose of the study is to measure the impact of FDI, trade openness, and liberalization on economic growth in the ASEAN-5. The means and standard deviation of the growth regression variables used in this study are given in Table 2.

Table 2: Descriptive Statistics of the Growth Regression

Variable	Mean	Std.Dev	Variable	Mean	Std.Dev
LINV	1.28	0.262	EXPDUTY	0.035	1.504
GOV	2.364	0.213	BOPD	3.683	0.734
INFLA	4.301	0.812	OPEN	3.526	0.501
EDU	4.452	0.08	TAXINT	2.431	0.93
POP	0.627	0.492	FINLIB	4.093	0.702
FDI	19.481	4.504	TELELIB	3.909	1.66
IMPDUTY	2.323	0.848	TRANS	3.185	1.167

Standard growth control variables (Q_{it}) used in the empirical growth literature were used as the basis for the regression model. Before detailing the empirical results, it is important to emphasize this paper's boundaries. In estimating the growth regression, the study does not intend to establish causal links or identify growth determinants. The primary purpose was to look at the effect of FDI, openness, and liberalization on economic growth in the ASEAN-5. Table 3 presents the empirical estimation of the growth regression based on the fixed-effects model.

Growth Control

The estimated model in the first column in Table 3 uses seven independent variables: six standard growth control variables[2] and the FDI variable. Initial GDPPC (1980), the weighting variable, was used as the convergence variable. The empirical result of GDPPC was consistent with the assumption that the standard deviation of the disturbances in the growth equation was negatively related to the initial GDP per capita. Of the six standard growth control variables used, four variables were statistically significant: GDPPC (at 1% level), LINV (at 1% level), GOV (at 1% level), and EDU (at 10% level). However, INFLA

[2] See Barro (1996) for more information.

and POP were not statistically significant. Since the primary intention of this study was to examine the effect of FDI, openness, and liberalization on growth, the focus was on these variables.

Table 3: Sensitivity of Per Capita Economic Growth in ASEAN-5 to FDI, Openness, Trade Barrier, and Liberalization

	(1)	(2)	(3)	(4)
GDPPC	-0.0503***	-0.0613***	-0.0519**	-0.0599***
LINV	0.1616***	0.1437***	0.1599***	0.1599***
GOV	-0.0457***	-0.0571***	-0.0489***	-0.0489***
INFLA	-0.0311	-0.0345	-0.0322	-0.0322
EDU	0.0683*	0.0676*	0.0655*	0.0655*
POP	0.0886	0.0449	0.0579	0.0499
FDI	0.043***	0.042***	0.041***	0.041***
IMPDUTY		0.0006***		
EXPDUTY		-0.0010		
BOPD			-0.0005	-0.0005
OPEN			0.0225***	0.0205***
TAXINT			-0.1085	-0.1074
FINLIB				0.0015***
TELELIB				0.0005**
TRANS				0.0002
Adj. R^2	0.2744	0.3183	0.3607	0.4068
F-Statistics	4.61***	4.59***	4.86***	6.07***

Note: ***, **, * denote significance at 1%, 5%, and 10%, respectively.

Foreign Direct Investment

The FDI variable estimate was significant at the 1% level. The parameter estimate of FDI is consistent with the results of Gani (1999) and Te Velde and Morrissey (2002). The estimate indicated that FDI was positively associated with economic growth in the ASEAN-5. Bloomstorm, Lipsey, and Zejan (1994) found that FDI has a positive stimulus on economic growth in higher-income developing countries with the ability to absorb new technology. The ASEAN-5 are economies capable of absorbing the new technology that accompanies FDI.

Openness/Trade Restrictions

In the second column of Table 3, two trade restriction variables were added to the estimated model: import duties as a percentage of imports (IMPDUTY) and export duties as a percentage of exports (EXPDUTY). IMPDUTY had a positive sign and was significant at the 1% level. The positive impact of IMPDUTY on economic growth showed that by imposing import restrictions, the policy protects local industries competing with imports, thus encouraging economic growth. This is not a surprise since all five countries under investigation impose heavy import duties to protect their local industries. For example, Malaysia imposes a 300% import duty on imported cars to protect locally manufactured cars, the Proton and the Perodua. This reconfirms Rodriguez and Rodrik's (1999) view that in the presence of positive production externalities in import-competing sectors, trade restrictions have a positive effect on GDP. Further, they stressed that in the event the data set covers a relatively shorter period, as in this study, trade restriction and economic growth would have positive correlation. However, in the long run trade restrictions would have a negative impact on the economy. Protecting infant-industries in the long run creates inefficiency.

EXPDUTY was not a statistically significant determinant of economic growth. This result is not surprising since Rodriguez and Rodrik (1999) found export duty to be negative and insignificant in their study. Many countries, including Malaysia, Thailand, and Indonesia, have introduced more than one export platform[3] so that exporters can choose the best facility, providing exporters access to duty-free imports of capital and intermediate goods, and usually provide special administrative procedures to speed up customs clearance. There have been, however, very few studies of the FDI export platforms that are the focal point of export-led growth in many developing countries.[4]

In column three of Table 3, three more variables were added to the growth model: TAXINT (replacing IMPDUTY and EXPDUTY), OPEN and BOPD. The parameter estimates for sum of exports and imports as a percentage of GDP (OPEN), a proxy for trade openness, had a relatively strong and significantly positive effect at the 1% level on

---

[3] Export-platform foreign direct investment is when the output is mostly sold in third markets rather than in the home or host country markets.

[4] Steven Radelet, *Manufactured Exports, Export Platforms, and Economic Growth*, briefing note for consulting Assistance on Economic Reform II, Discussion Paper No. 43. http://www.cid.harvard.edu/caer2/htm/content/papers/confpubs/bns/dp43bn.htm.

economic growth. However, parameter estimates of TAXINT and BOPD were not significant.

Liberalization

To measure the state of liberalization in the financial, telecommunication, and transportation sectors and their impacts on economic growth, FINLIB, TELELIB and TRANS were added to the growth model in column four of Table 3. FINLIB and TELELIB were positive and significant at the 1% and 5% levels, respectively. These results were similar to those of Ben-David (1993), Sachs and Warner (1995), and Edwards (1993). All three studies found that the impact of liberalization on economic growth is convincingly positive. The econometric results indicated TRANS had a positive sign but was insignificant.

Moran (1998) and Dees (1998) argued that a liberal investment climate would generate stronger spillover effects to the economy by attracting more dynamic FDI via MNCs. Dynamic MNCs are large, highly efficient, and use "cutting edge" technology. The presence of large MNCs would help technology transfer and increase productivity in the economy through backward linkages. This also attracts other foreign firms, where the economy would also benefit from the clustering effect.

Limitations

There are two limitations to the growth regression. First, generally growth regressions use a five-year average to examine the long run impact. Five-year average data was not used in this study, since the number of observations would be too small to conduct a panel data analysis. Second, the proxy for openness and liberalization used in this study could be replaced with a better index such as the Openness and Liberalization Index (Edwards, 1993), Index of Import Distortion (Dollar, 1992), Trade Distortion Index, or tariff and non-tariff barrier related data. However, such indexes were not available for ASEAN-5 for the period of this study.

5. Conclusion

The primary goal of the first part of this study was to identify the determinants of FDI in the ASEAN-5, namely Singapore, Malaysia, Thailand, Indonesia, and the Philippines. Using panel data, a fixed effects model was estimated to test the sensitivity of economic growth to FDI, trade openness and barriers, and liberalization. Results implied that

ASEAN-5 economic growth is very sensitive to FDI, trade openness, import duty, and financial market and telecommunication market liberalization. Many previous studies do not consider the effects of openness and liberalization on economic growth. These two variables were found to have a significant effect on economic growth. Foreign investment and international trade are most likely to occur in regions where openness and liberalization are evident. Economic reforms, the open-door policy, and the rapid expansion of international trade enabled ASEAN-5 to obtain the latest technologies from the industrial countries and to adopt best practices of management, organization, training, and research and development (R&D).

The regression results provide useful information on the impact of FDI, openness, and liberalization on regional economic growth. It is possible to say that by liberalizing the telecommunication and financial sectors, and promoting international trade and regional co-operation, ASEAN-5 can raise productivity and, thus, economic growth. Although this has become one of the most important policy objectives of the ASEAN-5 governments in the last few years, a more serious approach is needed. In the last 20 years, rapid economic growth has led to rising factor costs, which, together with increasing competition, have become critical hurdles to the region's FDI inflow and sustainable development.

References

Asafu-Adjaye, J., 2000, The Effects of Foreign Direct Investment on Indonesian Economic Growth, 1970-1996, Economic Analysis & Policy Vol. 30, No. 1. pp. 49-62.

Asian Development Bank, Asian Development Outlook 2002, available at http://www.adb.org/Documents/Books/ADO/2002/default.asp

Balasubramanyam, V.N., Salisu, M., Sapsford, D., 1996, Foreign Direct Investment as An Engine of Growth, Journal of International Trade and Economic Development, Vol.8, No.1:27-40.

Barro, R.J., 1996, Determinants of Economic Growth: A Cross-country Empirical Study, NBER Working Paper 5698, Cambridge MA.

Ben-David, D., 1993, Equalizing exchange: Trade Liberalization and Economic Convergence, Quarterly Journal of Economics, 108: 3.

Bloomstorm, M., Lipsey, R.E., and Zejan, M., 1994, What Explains Developing Country Growth? NBER Working Paper No 4312.

_____, Globerman, S., and Kokko, A., 2000, The Determinants of Host Country Spillovers From Foreign Direct Investment, Center for Economic Policy Research, No. 2350.

Borenzstein, E., DeGregorio, J., Lee, J.W., 1995, How Does Foreign Direct Investment Affect Economic Growth? NBER Working Paper No.5057.

Dees, S., 1998, Foreign Direct Investment in China: Determinants and Effects, Economics of Planning, Vol. 31:175-94.

Dollar, D., 1992, Outward-Oriented Developing Economies Really Do Grow More Rapidly: Evidence From 95 LDCs, 1976-85, Economic Development and Cultural Change, 1992:523-44.

Galensen, W., (ed.) 1985, Foreign Trade and Investment: Economic Development in the Newly Industrializing Asian Countries, University of Wisconsin Press, Madison.

Gani, A., 1999, Foreign Direct Investment in Fiji, Pacific Economic Bulletin, Vol. 14, No. 1, June 1999.

Moran, T., 1998, Foreign Direct Investment and Development: The New Policy Agenda for Developing Countries and Economies in Transition, Institute for International Economics, Washington D.C.

Rasiah, R., 1993, Free Trade Zones and Industrial Development in Malaysia, in Industrializing Malaysia, Policy, Performance and Prospects, ed. by Jomo, K.S., Routledge, London.

Rodriguez, F., and Rodrik, D., 1999, Trade Policy and Economic Growth: A Skeptic's Guide to Cross-National Evidence, NBER Working Paper Series No. 7081.

Sachs, J.D., and Warner, A., 1997, Fundamental Sources of Long-Run Growth, American Economic Review, Paper and Proceedings, Vol.87, No. 2:184-88.

Te Velde, D.W. and Morrisey, O., 2002, Foreign Direct Investment: Who Gains? ODI Briefing Paper, Overseas Development Institute, London.