

In Search of FDI and Finance-Led-Growth in Southeast Asian Countries

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Abstract. The paper investigates the economic growth of the Association of Southeast Asian Nations (ASEAN) under financial crises in the last two decades. Inward foreign direct investment (FDI), financial market development and financial crisis are modeled to indicate the extent to which the economy in emerging ASEAN countries can recover from the financial crises. Using panel data of four ASEAN countries between 1981 and 2009 and applying the spatial panel data model, the study finds that inward FDI and financial crisis are important for growth in the ASEAN. Even though, the results are robust to different measures of financial development, they find strong negative impacts of financial market on ASEAN's economic growth. Despite the more the deepening regional economic integration the higher its economic development would be, it seldom finds strong evidence on the spatial effects of FDI inflows and financial development on the ASEAN's growth.

Keywords: foreign direct investment, financial market development, economic growth, ASEAN

1. Introduction

The prospects of ASEAN Economic Community (AEC) are generally recognized as some of the more important reasons for accelerating the implementations of Asian Bond Markets Initiative launched in 2000, Chiang Mai Initiative Multilateralism with China, Japan and the Republic of Korea in 2003, and ASEAN Comprehensive Investment Agreement in 2007. It is viewed that an increase in inward foreign direct investment and financial market stability will help ASEAN countries to achieve the ultimate goal of the AEC in 2015. That is because, in the past, the FDI inflows has enlarged substantially the economic activities of the ASEAN; and the regional financial and capital integration has resulted in the recovery of ASEAN economy from the Asian financial crises in 1997 and global economic crisis in 2008. However, the world databank statistics for the last decade indicated the uneven relationship between FDI and financial interactions in Indonesia, Malaysia, Philippines and Thailand during the period 2000-2009 [16]. While the FDI as a percentage of GDP changed upon GDP growth, the stock market capitalization to GDP and private sector credit to GDP are not clearly related to GDP growth. It may be due to the fact that FDI can affect economic growth and development directly by facilitating trade and transfer of knowledge and technology and by complementing domestic investment [5], whereas financial market always affects growth via improvement in foreign and domestic investment efficiency.

In fact, the identification of empirical studies on the long-run relationship among FDI, financial market and growth has so far been limited to a small sample of countries. Although the FDI growth and financial market development leading growth have already been discovered in the literature, the results are very rare and limited to the bilateral relationship among FDI, financial market and growth, with no particular attention to spatial effects. Moreover, the ASEAN countries have received extensive attention to their own FDI growth and the financial market development, but the impacts of FDI and financial market from other member countries are less well understood. The contribution to this paper is to broaden the results to ASEAN countries, and also establishes the role of spatial effects to FDI growth and financial development.

The paper is structured as follows. It begins with Section 2, which provides a brief review of the recent theoretical background and empirical evidence on FDI, financial market interactions and growth; model

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specification; econometric methodology and data sources. Section 3 estimates the long-run impacts of FDI, financial market on economic growth in ASEAN, followed by a discussion of the results. Section 4 provides the concluding remarks.

2. Analytical Framework

2.1. Literature Review

The theoretical framework from the knowledge-capital (KC) model is commonly used in studying the impact of foreign direct investment on economic growth. In fact, the KC model was earlier introduced by [10] and refined by [2] and [7]. Overall, not only the KC model gives a clear picture of how bilateral and third-country characteristics drive multinational activities, but it confirms a positive relationship between FDI and economic growth. In addition, the existing theoretical literature has clearly shown a positive relationship between financial development and growth. In spite of the studies made so far, there was still a lack of investigation of how economic growth is influenced by financial integration [18]. As well, very scarce studies were found in the spatial effects on financial market development. Recently, the literature by [12] showed that the intuition behind the FDI model can be best described in terms of the impact of FDI on financial market and economic growth. Whatever the entry of multinational it enhances the country's economic growth and local financial market. Empirically, in general, the financial market development is measured into two indicators: banking sector development and stock market development. The recent studies on the interdependence among FDI, finance market and economic growth are very extensive, for examples, [4], [8], [12], [13], [14] and [17]. The larger number of empirical studies found evidence on the positive relationship among FDI, financial development and growth. However, the studies with the particular attention to ASEAN economies are very limited. Moreover, the empirical studies on spatial FDI-finance-growth nexus are very rare to found. In order to fill this gap, in this paper, we perform the empirical relationship among FDI, financial development and growth in ASEAN and the spatial linkages of FDI and financial market.

2.2. Model Setup

This paper estimates the long-run impacts of foreign direct investment, financial market development, and financial crisis on economic growth in ASEAN economy. The model is particularly well suited to capture these impacts shown in the following threshold specification:

$$GDP_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 WFDI_{it} + \beta_3 FIN_{it} + \beta_4 WFIN_{it} + \beta_5 (CRIS * FIN)_{it} + \varepsilon_{it} \quad (1)$$

where GDP, FDI and FIN denote growth of gross domestic products, inward foreign direct investment and financial market interaction, respectively. All variables are in natural logarithms. WFDI and WFIN denote their spatial determinants. In general, the spatial determinants are introduced to capture the effects in third countries. They are represented by spatially weighted averages, based on the distance between the capital of destination (j) and third country (k). Based on [2], it can generate the spatially weighting matrix W_N which is $N_t \times N_t$ and row-normalised with typical elements $w_{jk} = d_{jk}^{-1} / \sum_{k=1}^N (d_{jk}^{-1})$ if $j \neq k$ and $w_{jk} = 0$ if $j = k$.

2.3. Data and Methodology

The data set consists of cross-country observations for four ASEAN member countries (Indonesia, Malaysia, Philippines, Thailand) during the period 1981 to 2009. GDP growth and FDI are extracted from the World Development Indicators. FDI is expressed as FDI inflows over GDP. Following [4], [13] and [17], we utilize six measures of FIN. The first is commercial bank assets (CBA), defined as the ratio of deposit money bank which claims on domestic non-financial real sector to the sum of deposit money bank and central bank which claims on domestic non-financial real sector. The second is liquid liabilities of the financial system (LLY), defined as the ratio of liquid liabilities to GDP. The third is bank credit (CBA), defined as the private credit by deposit money banks to GDP. The fourth is private sector credit (PRC), measured as the private credit by deposit money banks and other financial institutions to GDP. The fifth is stock market capitalization (CAP), measured as the value of listed shares to GDP. The final measure is stock value traded (TRA), defined as total shares traded on the stock market exchange to GDP. All of datasets are taken from Financial Structure Dataset of World Bank [16].

In our estimation, panel unit root test, panel cointegration test, diagnostic tests and spatial panel data model estimation are applied. The latter measure is a rich way of modelling the long-run spatial effects of FDI and financial development on growth. It begins with testing the stationarity of all determinants of FDI, FIN and GDP panel data by applying the unit root tests given Levin, Lin and Chu (LLC) test, Im-Pesaran-Shin (IPS) W-test and ADF-Fisher (ADF) Chi-square test [1], [6] and [11]. After getting the order of the integration, we use panel data setting to test the cointegration among variables in the model. This panel cointegration test is conducted using Pedroni approach [3] and [15]. To obtain the robust empirical results, the diagnostic tests are first conducted to choose an appropriate estimator, then, the spatial panel data model is estimated by the chosen estimators. The Moran's I test is used to check for spatial autocorrelation in residuals, the Hausman test is used for identify the correlation between the residuals and some independent variables (endogeneity test), the Breusch-Pagan test for the heteroskedasticity, the Jarque-Bera test for the normality, and the variance inflation factor (VIF) for the multicollinearity. Finally, the long-run spatial model is estimated using spatial fixed and random panel data to indicate the impacts of FDI and financial market development on economic growth. That is because the spatial econometrics can figure out the spatial autocorrelation problems. The estimations are performed with the spatial econometrics toolbox [9].

3. Empirical Results

Table 1 presents the results of panel unit root tests. At the 1% significance level, the LLC, IPS and ADF statistics provide strong evidence that eight series (GDP, FDI, CBA, LLY, BCR, PRC, CAP and TRA) have a unit root, while just four statistics reject the unit root in the LLC test. Moreover, while all statistics provide strong evidence that WFDI, WCBA, WLLY, WCAP and WTRA series have a unit root, they indicate that WBCR and WPRC series are stationary. A similar test also shows that all variables are of the I(1) process. Afterwards, we employ all panel first-difference series to test for cointegration in order to determine if there is a long-run relationship in the model specification. Table 2 shows the panel cointegration test for six panel models (Model 1 to Model 6). Almost of Pedroni test statistics reject the null hypothesis of no cointegration for all estimated models. It implies that most variables in five panel models are cointegrated with each other.

Table 1 : Panel unit root test results

	LLC			IPS			ADF			LLC			IPS			ADF		
	Panel Level			Panel First-difference			Panel Level			Panel First-difference								
FDI	-2.47*	-2.03	16.20	-7.77*	-6.53*	51.73*	WFDI	-1.73	-1.39	12.60	-8.73*	-7.77*	55.81*					
CBA	-2.04	-1.46	13.25	-1.96	-2.32*	17.31*	WCBA	-1.54	-2.33*	17.65	-4.67*	-4.53*	35.39*					
LLY	-1.97	-1.73	14.61	-2.26*	-2.72*	17.97*	WLLY	-0.62	-1.00	11.15	-5.42*	-5.00*	36.12*					
BCR	-1.30	-1.51	12.69	-2.40*	-2.79*	18.36*	WBCR	-2.93*	-2.66*	20.90*	-8.24*	-7.71*	54.90*					
PRC	-2.19*	-0.76	8.43	-4.42*	-3.65*	23.63*	WPRC	-2.83*	-2.35*	18.42*	-8.22*	-7.69*	54.75*					
CAP	-2.23*	-1.02	12.79	-4.98*	-4.48*	31.82*	WCAP	-0.42	-0.37	6.78	-9.16*	-8.67*	62.04*					
TRA	-2.70*	-1.69	21.18*	-6.55*	-6.95*	49.59*	WTRA	-1.97	-1.61	16.08	-8.33*	-7.47*	53.02*					
GDP	-1.63	-1.98	13.67	-12.13*	-12.66*	100.58*												

Note: a. The optimal lag length is selected by the minimum SIC with maximum lag 3. b. * denotes rejection of null hypothesis: Panel series has a unit root at the 1% level of significance.

Table 2 : Panel cointegration test results

Model	Panel v-stat	Panel rho-stat	Panel PP-stat	Panel ADF-stat	Group rho-stat	Group PP-stat	Group ADF-stat
Model 1: dGDP,dFDI,dWFDI,dCBA, dWCBA,CRIS*dCBA	0.32	-2.42*	-2.08*	-2.02	-1.55	-1.94	-1.87
Model 2: dGDP,dFDI,dWFDI,dLLY,dWCBA,CRIS*dLLY	-0.23	-3.95*	-3.43*	-3.88*	-2.31*	-2.75*	-3.28*
Model 3: dGDP,dFDI,dWFDI,dBCR,dWCBA,CRIS*dBCR	0.45	-3.82*	-3.34*	-3.35*	-2.90*	-3.65*	-3.65*
Model 4: dGDP,dFDI,dWFDI,dPRC,dWCBA,CRIS*dPRC	0.31	-1.80	-1.66	-1.69	-1.09	-1.50	-1.52
Model 5: dGDP,dFDI,dWFDI,dCAP,dCAP,CRIS*dCAP	-0.12	-5.32*	-4.95*	-5.29*	-3.00*	-3.89*	-4.62*
Model 6: dGDP,dFDI,dWFDI, dTRA,dTRA,CRIS*dTRA	1.26	-1.84	-1.50	-1.39	-0.96	-1.24	-1.05

Note: a. The lag length is selected by the SIC with maximum lag 3. b. * denotes rejection of null hypothesis: Panel model has cointegration at the 1% level of significance.

The final step is to estimate the long-run impacts of inward foreign direct investment, financial market interactions and economic growth in ASEAN based on the spatial panel data model technique. We start with the diagnostic tests for economic growth and Table 3 provides their results. The Moran's I test indicates the presence of spatial correlation of the residuals in the data. This suggests that the spatial regression model with spatially correlated residuals should be provided. Thus, the Maximum Likelihood (ML) estimator on fixed effect model (FEM) and random effect model (REM) is particularly appropriate in testing our model. The complementary tests suggest that the error term is normally distributed (Jarque-Bera), the hypothesis of

homoskedasticity is not rejected (Breusch and Pagan), and the VIF statistic indicates no multicollinearity problems.

Table 3 : Impacts of FDI and financial market development on Growth

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM
dFDI	0.03 (0.69)	0.14 (2.06)*	0.02 (0.45)	-0.06 (-1.53)	0.02 (0.57)	0.02 (0.91)	0.02 (0.45)	0.02 (0.85)	-0.07 (0.01)	0.04 (4.27)*	0.04 (0.08)	0.01 (2.24)†
dFIN	0.16 (2.32)*	-0.01 (-1.75)‡	-0.08 (-1.96)†	-0.01 (-1.62)	0.04 (0.13)	-0.01 (-1.81)‡	-0.08 (-1.96)†	-0.01 (-1.71)‡	0.04 (3.57)*	-0.02 (-2.71)*	0.01 (1.98)†	-0.01 (-1.67)‡
dWFDI	-0.01 (-1.99)†	0.02 (0.37)	-0.01 (-1.75)‡	0.08 (0.47)	-0.01 (-2.21)†	0.01 (1.11)	-0.01 (-1.75)‡	0.01 (0.91)	-0.02 (-2.87)*	0.09 (1.70)‡	-0.01 (-1.94)†	0.03 (0.09)
dWFIN	0.02 (0.39)	0.05 (0.13)	0.06 (0.35)	-0.21 (-0.89)	0.01 (0.93)	-0.05 (-0.37)	0.06 (0.35)	-0.07 (-0.44)	0.09 (1.56)	-0.01 (-0.38)	-0.18 (-0.05)	-0.05 (-0.33)
CRIS*dFIN	0.09 (0.02)	0.75 (2.38)*	-0.27 (-1.20)	0.81 (2.39)*	-0.12 (-0.88)	0.76 (2.40)*	-0.27 (-1.20)	0.76 (0.01)*	0.03 (0.68)	0.68 (2.39)*	0.04 (0.24)	0.72 (2.38)*
Rho	0.24 (2.73)*	0.25 (3.15)*	0.29 (3.44)*	0.29 (3.81)*	0.26 (3.08)*	0.22 (2.74)*	0.29 (3.44)*	0.23 (2.85)*	0.19 (2.10)†	0.16 (1.94)†	0.23 (2.67)*	0.24 (2.99)*
Constant	0.02 (5.91)*	0.02 (0.62)	0.03 (6.07)*	0.02 (0.50)	0.02 (5.75)*	0.03 (0.74)	0.03 (6.07)*	0.03 (0.74)	0.02 (5.19)*	-0.07 (-0.17)	0.02 (5.45)*	0.08 (0.01)
Goodness of fit:												
Observations	112	112	112	112	112	112	112	112	112	112	112	112
Adj. R ²	0.16	0.06	0.17	0.06	0.13	0.04	0.17	0.04	0.24	0.20	0.15	0.07
Log Likelihood	203.25		203.64		201.36		203.64		209.65		202.83	
Variance σ_v^2	0.0015		0.0015		0.0016		0.0015		0.0014		0.0015	
Diagnostic tests:												
Jarque-Bera	120.2*		122.7*		150.1*		151.3*		105.8*		107.2*	
Breusch-Pagan	2.26‡		2.22‡		1.12		1.42		4.31‡		2.17‡	
Moran's I	60.0*		19.0*		60.0*		58.0*		120.0*		40.0*	
VIF	1.26		1.24		1.17		1.14		1.41		1.21	
Hausman test		4.59		3.28		9.84		10.29		1.51		5.66

Note: a) Model 1 to Model 6 refer to the sample of financial interactions on CBA, LLY, BCR, PRC, CAP and TRA, respectively. b) The t- and z-statistics are shown in parentheses underneath the coefficients. c) The subscripts *, † and ‡ denote the 1%, 5% and 10% significance levels.

Table 3 summarizes the results from the ML estimation for ASEAN's economic growth with the FEM and REM. Model 1 to 4 refer the sample of financial interactions on banking sector development: CBA, LLY, BCR and PRC, respectively, whereas Model 5 to 6 refer the sample of stock market development: CAP and TRA, respectively. The estimated results show that most significant explanatory variables are in line with the theoretical hypotheses. In the discussion of the results, we focus on the REM estimates because the Hausman test accepts the REM. There is obvious similarity in the estimates between banking sector (Model 1) and stock market (Model 5) model. First of all, there is indeed positive long-run relationship between FDI and growth in ASEAN. Intuitively, it implies that if ASEAN countries promote to attract FDI, it tends to expand their economic growth. The results also indicate that financial crisis exhibits positive and significant sign. The presence of financial crisis tends to obstruct the economic growth. Surprisingly, the estimated coefficients in commercial bank assets and stock market capitalization are negative and significant signs. In other word, there is negative long-run relationship between financial market development and economic growth. It is perhaps due to financial market instability or inadequate financial market development in this region. Finally, most estimated coefficients in spatial effects of FDI and financial market are insignificant. It indicates that changes in the FDI and financial market development in such ASEAN countries do not affect the ASEAN's economic growth as a whole. However, at least one of the estimated coefficients in spatial effects of FDI (Model 5) is positively significant. It implies that inward FDI growth in the neighbours can enhance the growth in their own ASEAN countries.

4. Concluding Remarks

This paper focuses on the long-run impacts of foreign direct investment, financial market development on economic growth. One major contribution of the paper is the adoption of the long-run spatial model to capture the relevance of FDI and financial market on economic growth. The panel unit root tests, panel cointegration test and spatial panel data model, namely Maximum Likelihood estimation technique are used to investigate the FDI and finance-led-growth. Data on FDI, GDP, financial interactions for four ASEAN economies over the period of 1981-2009 are employed. The long-run model results reveal that FDI inflows tend to enhance economic growth in ASEAN, whereas financial market development has no any support growth. Moreover, they suggest that the financial crisis tends to destroy the ASEAN economy. Finally, the findings indicate that growth of FDI in neighbouring countries will support the ASEAN's economic growth.

In fact, FDI flows and financial market play a crucial role on increasing productivity, innovation, knowledge and skills, and vice versa, either directly or indirectly. In order to achieve the ASEAN economic community in 2015, policies on FDI liberalization and monetary and financial stability policies must be immediately implemented. Especially, it would develop new FDI strategy in heterogeneous firms and financial strategy. Moreover, trade facilitation policies, policies for promoting trade and investment alliance network in ASEAN, enhancing services integration and liberalization, are very necessary, as well as accelerating the implementation of the existing economic agreements. They are indeed beneficial to enhance economic growth and sustainable development in the ASEAN.

Sincerely, this study is unable to accomplish the best empirical results, there are three extensions that would be addressed in the future research. First, the model extension on macroeconomic factors such as real exchange rate, inflation, financial and economic integration, financial openness, and political stability would be resolved. Second, the present work employs data at country level that data at industry level would be helpful to investigate with more accuracy the FDI-finance-growth nexus. Third, with improvements in analytical and empirical measurement technique, it obtains better consistent of the empirical results.

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