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THE SURGE IN INTRA-ASEAN OUTWARD FOREIGN DIRECT INVESTMENT AND ITS KEY DETERMINANTS: EVIDENCE USING POOLED MEAN GROUP APPROACH

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ABSTRACT

ASEAN is a fast growing region with economic diversity and complementarity among the member states. Since early 1990s, the regional economy experienced a surge in intra-regional outward foreign direct investment (OFDI) flows. This motivates the present study ascertaining what determines the rapid flows of regional OFDI by ASEAN firms using the Pooled Mean Group (PMG) panel cointegration approach. The empirical study reveals that there is a positive long-run relationship between intra-ASEAN OFDI and its determinants, viz. FDI inflows into the region, host market size of member states, political stability and the degree of trade openness of the regional economy. The significance of the FDI inflows variable suggests that the foreign multinationals operating in the region is one of the driving forces behind the intra-regional OFDI growth. Their presence could put the ASEAN on the world map as a potential regional production centre that encourages the ASEAN firms setting up their subsidiaries and affiliates in the region and be part of the regional value chains.

***Keywords**:* Outward FDI; intra-ASEAN; Pooled Mean Group Panel Cointegration Test.

1. INTRODUCTION

Intra-ASEAN[1] outward foreign direct investment (OFDI) serves as an important catalyst for the economic integration of Association of Southeast Asian Nations (ASEAN) member states in the face of the establishment of ASEAN Economic Community (AEC)[2] by the end 2015. According to the ASEAN Secretariat (2014), ASEAN firms operating in the region are instrumental in forging intra-regional production, trade and investment as well as intra- and inter-firm linkages. Besides, the region's economic diversity[3] could potentially contribute to economic complementarity among the region's member states through intra-regional OFDI (see Plummer, 2009). For instance, an ASEAN firm could set up subsidiaries or affiliates in different parts of ASEAN in order to benefit from the complementary locational advantages such as lower production cost, access to natural resources, abundant low-cost labour, the availability of

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sophisticated infrastructure, host government incentives, strategic location, to name a few. With further liberalisation of trade and investment in the wake of the AEC that could generate larger regional market size of six hundred million, more ASEAN firms could potentially extend their business operations horizontally or vertically in the region because many global players[4] have their presence in ASEAN and also, the ASEAN firms would like to play an increasing role in the region as a result of the expanding regional value chains and production networks.

As regionalisation unfolds, there is a significant change in foreign direct investment (FDI) pattern in the ASEAN region. The two notable trends in the changing of the FDI picture are, firstly, the intra-ASEAN OFDI rose rapidly by almost fivefold from US$3516.63 billion in 2004 to US$19906.85 billion in 2012.[5] The major contributors of intra-ASEAN OFDI over this period were Singapore (US$55262.80 million), Malaysia (US$18979.76 million), Indonesia (US$10708.7 million), Thailand (US$6380.07 million), the Philippines (US$1856.49 million) and Vietnam (US$1523.76 million).[6] Secondly, with sustaining FDI flows (except for 2007 and 2008 due to the global financial crisis), the intra-ASEAN OFDI became the largest investment source in the region followed by the European Union in 2011 (see ASEAN Secretariat, 2013). Being the major source of FDI in the regional economy, it is important to specify and estimate the intra-ASEAN OFDI because it not only can help us to understand the underlying economic relationship in regional perspective but also to draw economic policy implications for further ASEAN economic integration. Empirical study using ASEAN as a case is relatively less investigated but is yet, pertinent to the growing integration of the member countries into a single integrated market through intra-regional business linkages. The current study estimates the determinants of intra-ASEAN OFDI using the panel data econometric framework for the ten ASEAN economies from 1986 to 2012. The empirical study employs the likelihood-based pooled mean group (PMG) approach suggested by Pesaran *et al*. (1999). Given the smaller number of countries (*N*) but longer span of the times series (*T*) in our analysis, employing the PMG estimation is most appropriate (see Blackburne III and Frank, 2007). In addition, PMG method allows us to deal with heterogeneity problem by allowing the short run coefficients and error variances to differ across countries but assuming homogeneity of the long run coefficient by pooling countries over the long run.

The structure of this paper continues with Section 2 presents a review of the existing literature, followed by a discussion on the model specification, data and methodology in Section 3. Subsequently, Section 4 outlines the empirical results, whereas Section 5 concludes with some policy implications.

2. LITERATURE REVIEW

Succeeding Japan, Hiratsuka (2006) highlighted that the East Asian economies like Taiwan, South Korea and China are important sources of FDI in the global economy. Correspondingly, the multinationals from the ASEAN countries are also riding this trend by spreading their business operations abroad such as ASEAN and non-ASEAN markets. Due to the lack of secondary data, initial studies on OFDI from the individual ASEAN countries are mostly exploratory in nature using case study and survey approaches, for example, Malaysia (Ragayah, 1999; Sim, 2005; Ariff & Lopez, 2007; Tham, 2007). However, when the secondary data have been made available to researchers, there are an increasing number of empirical studies

ascertaining macroeconomic determinants of OFDI using country-level data, for example, ASEAN countries (e.g. Rammal and Zurbruegg, 2006); Malaysia (Aykut and Ratha, 2003; Zainal, 2005; Tham, 2007; Ariff and Lopez, 2007; Kueh et al. 2008; Kueh et al. 2009; Goh and Wong, 2011; Saad et al., 2012 and 2014; Chen et al, 2016a; 2016b), Malaysia and Philippines (Masron and Shahbudin, 2010); Asian countries (e.g. Hattari and Rajan, 2009; Rajan and Hattari, 2009; Hattari *et al*., 2014); Brazil (Calderón, 2014); BRIC (i.e. Brazil, Russia, India and China e.g. Gammeltoft *et al*., 2010); Brazil and China (Goldstein and Pusterla, 2010); China (e.g. Liu *et al*., 2005; Buckley *et al*., 2007; Morck *et al*., 2008; Cheung and Qian, 2009; Cui and Jiang, 2010; Wei and Alon, 2010; Yan *et al*., 2010; Amighini *et al*., 2011; Cui *et al*., 2011; Zhang and Daly, 2011; Miyamoto *et al*., 2011; Wang *et al*., 2011); China and India (Duanmu and Guney, 2009; Tolentino, 2010); emerging and post-communist economies (Stoian, 2013); European and non-European countries (Kyrkilis and Pantelidis, 2003); India (Athukorala, 2009; Kumar and Chadha, 2009; Pradhan, 2003 and 2004); Russia (Kalotay and Sulstarova, 2010); Singapore (Ellingsen *et al*., 2006); South Korea (Kim and Rhe, 2009); Turkey (Anil *et al*., 2011) and 34 economies from the North America, the EU, Asia and Australasia (Wei and Zhu, 2007).

Based on the literature review, it is found that the empirical work on OFDI either by a particular economy or a group of economies is extensive. However, empirical study focusing on intra-region FDI flows by its own regional countries has received relatively little attention with the exception of Hiratsuka (2006), Rammal and Zurbruegg (2006), Hattari and Rajan (2009) and Hattari *et al*. (2014). Rammal and Zurbreugg (2006) found that the regulatory factors (e.g. the quality of effectiveness of trade and investment regulations employed within the host country) had a strong influence on OFDI among ASEAN-5 countries. On the other hand, the estimated results are mixed and ambiguous with regard to incorrect sign and unreasonably large magnitude for the estimated coefficients for some ASEAN countries. One possible explanation for the mixed results is the small sample size. Whereas, Hattari and Rajan (2009) used the gravity model to examine what was the major impetus to the intra-Asian FDI outflows. The findings show that intra-Asian FDI outflows could be explained by market size, market intensity, real exchange rate changes, financial depth, institutional factors, an operational free trade agreement (FTA), and the level of financial openness of selected host countries from South Asia, Southeast Asia and East Asia. More recently, Hattari *et al*. (2014) used a gravity model to the study what determines the source of bilateral OFDI flows between China, India and other ASEAN-6 countries. Their findings show that bilateral OFDI flows could be explained by the larger host country size, the institution quality of host country, and financial depth in the host country. However, the data on bilateral OFDI in both studies by Hattari and Rajan (2009) and Hattari *et al*., (2014) had large missing observations[7] that may cause the analysis to be biased (see Hawthorne and Elliott, 2005).

3. MODEL SPECIFICATION, DATA AND METHOD

3.1. Determinants of Intra-ASEAN OFDI

3.1.1. Market Size

First and foremost, according to the ASEAN Secretariat (2012), the market size of the ASEAN member states is a potential determinant of intra-ASEAN OFDI because a large growing regional market could encourage ASEAN firms to take part in the regional production and distribution

networks in view of the region's economic diversity and complementarity. In addition, a larger host (home) market size in the region could also attract market- and efficiency-seeking intra-region OFDI owing to better business opportunities to ASEAN firms in terms of new markets and efficient regional sourcing. Previous studies that show host market size could have a positive influence on OFDI can be found in Hiratsuka (2006), Buckley *et al*. (2007), Goh and Wong (2011) and Hattari *et al*. (2014). Thus, intra-ASEAN OFDI could be positively driven by the market size of member states.

3.1.2. Inward FDI in the ASEAN region

Global multinationals in ASEAN at large tends to play a vital role in transforming the region into a global supply chains due to their established connections to the global production and distribution networks. Hence, the presence of global multinationals in the region could induce more ASEAN firms to participate in the production and distribution networks by extending their business activities intra-regionally. Hiratsuka (2006) characterised this phenomenon as "supplier following assembler" FDI i.e. "ASEAN multinationals follow their customers when the customers expanded their facilities to lower wage countries" (p. 15-16). Besides, the participation of more efficient global multinationals in ASEAN host countries could promote greater competition in the industry and force domestic firms to raise their productivity to survive and becoming potential MNCs in the region (Ruane and Uğur 2006). Inefficient domestic firms will be forced out of the industry if they cannot keep up with the competition from superior foreign entrants. Hence, foreign presence in the region is instrumental in promoting intra-ASEAN OFDI.

3.1.3. Political Stability

By and large, political stability is an important determinant of OFDI. A host country that has high degree of political instability (such as the anti-government protests in Thailand) may discourage foreign multinationals to invest in the host market because the political instability could disrupt the orderly economic process, which in turn would cause smaller profit (see Haftel, 2006). Hence, given that FDI projects involve high sunk cost, multinationals tend not to locate their affiliates in host markets where political conflicts and violence are taking place (see Buckley *et al*., 2007). Historically, the Philippines is a good example of a Southeast Asian state that is politically unstable and experiences lower FDI inflows relative to its counterparts (see Sjöholm, 2013). Therefore, host (home) countries that enjoy high political stability, *ceteris paribus*, are prone to have higher intra-ASEAN OFDI (higher intra-ASEAN IFDI).

3.1.4. Trade openness

One of the objectives of AEC is to produce a single market and production base unimpeded by the flows goods and services. An increase in trade openness among ASEAN member states is instrumental in generating friendly investment climate, which could have a positive influence on intra-region FDI flows (see Kyrkilis and Pantelidis, 2003; Sekkat and Veganzones-Varoudakis, 2007). Furthermore, a higher degree of openness to trade could provide ASEAN exporting firms more exposure in terms of gaining knowledge on regional markets and have the ability to set up operations regionally. Empirical studies that support the positive influence of trade openness on OFDI can be found in Kueh *et al*. (2008 and 2009) and Goh and Wong (2011).

Consistent with the theory and hypotheses formulated, the specification of the empirical model is:

$$OFDI_{it} = \beta_i + \beta_{1i}Y_{it} + \beta_{2i}IFDI_{it} + \beta_{3i}PS_{it} + \beta_{4i}O_{it} + \mu_{it} \quad (1)$$

where $OFDI_{it}$ is intra-ASEAN OFDI, Y_{it} is the host market size, $IFDI_{it}$ represents inward FDI in the ASEAN region, PS_{it} is the domestic political stability and TO_{it} is the degree of trade openness. Accordingly, in order to linearise the model, we take logarithmic transformation of equation (1) so that we can interpret the estimates in elasticity form. Hence, the log-linear model can be written as

$$LOFDI_{it} = \alpha_i + \alpha_{1i}LY_{it} + \alpha_{2i}LIFDI_{it} + \alpha_3 LPS_{it} + \alpha_{4i}LTO_{it} + \mu_{it} \quad (2)$$

where *L* denotes the natural logarithm and μ_{it} is the residuals.

3.2. Data sources and measures

The data set is yearly and is a balanced panel covering ten ASEAN countries, namely, Brunei Darussalam, Cambodia, Indonesia, Lao, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam from 1995 to 2012. In this study, we use net FDI, which is the sum of equity, net inter-company loans and reinvested earnings to measure intra-ASEAN outward FDI ($OFDI_{it}$). With respect to the presence of foreign multinationals in ASEAN, it is represented by inward FDI in the region ($IFDI_{it}$), which is FDI inflows from the entire world into the ASEAN countries. Both the data for $OFDI_{it}$ and $IFDI_{it}$, are obtained from the *ASEAN Secretariat – ASEAN FDI Database*.[8] With regard to the market size of host countries in ASEAN, we use real GDP of their respective economies as a proxy. The data source for this variable is retrieved from the World Bank's *World Development Indicators and Global Development* database. As for the data on political stability (PS_{it}), which represents the political stability and absence of violence/terrorism in the host country, is accessible from the World Bank's *World Governance Indicators* (WGI). According to the World Bank's definition, this variable measures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. Finally, the degree of trade openness (TO_{it}) can be measured by each ASEAN country's trade (i.e., the sum exports and imports) as a share of its GDP, where the data of exports and imports are obtained from the United Nations Conference on Trade and Development (UNCTAD) Database. All data are expressed in 2005 constant prices and denominated in US dollar.

The summary statistics and correlation of *LOFDI*, *LY*, *LIFDI*, *LPS* and *LTO* can be found in Tables 1 and 2 respectively. Compared with *LOFDI*, *LIFDI* has a larger mean size, whereas the former has a larger standard deviation relative to the latter (see Table 1). Overall, all the variables have smaller spread in the data with *LPS* and *LTO* taking the lowest and highest standard deviation respectively. In addition, all the variables behave well in terms of normality. Table 2 shows the correlation matrix, the pair of variables that has the highest correlation (i.e. 0.61) is *LOFDI* and *LIFDI* followed by *LOFDI* and *LTO* (i.e. 0.37) and *LOFDI* and *LY* (i.e. 0.05). As highlighted by Hsiao (2000), one of the purposes to show correlation is to check for evidence of multicollinearity, which is not an issue in the case of panel data *vis-à-vis* time-series data.

Table 1: Descriptive Statistics for *LOFDI*, *LY*, *LIFDI*, *LPS*, *LTO*

	LOFDI	*LY*	*LIFDI*	*LPS*	*LTO*
Mean	6.701	13.579	9.126	0.305	1.269
Median	6.376	13.546	9.002	0.290	0.980
Maximum	9.461	14.098	10.767	0.504	4.603
Minimum	4.416	12.944	5.505	0.221	0.002
Std. Dev.	0.740	0.264	0.527	0.063	1.006
Skewness	1.363	0.054	− 0.902	0.798	1.654
Kurtosis	5.330	2.221	15.872	3.036	5.588
Jarque-Bera	96.447	4.640	1267.065	19.099	132.249
Probability	0.000	0.098	0.000	0.000	0.000
Sum	1206.096	2444.305	1642.721	54.879	228.466
Sum Sq. Dev.	98.135	12.437	49.640	0.718	181.083
Observations	180	180	180	180	180

Table 2: Correlation

	LOFDI	*LY*	*LIFDI*	*LPS*	*LTO*
LOFDI	1.0000				
LY	0.0463	1.0000			
LIFDI	0.6103	0.0693	1.0000		
LPS	-0.3874	-0.6258	-0.3626	1.0000	
LTO	0.3695	-0.0368	0.2729	-0.1306	1.0000

3.3. PMG Panel Cointegration Test

This section presents a panel econometric method. This method not only deals with any possible endogeneity issues concerning intra-regional OFDI regression, but also improves heterogeneity of this relationship across ASEAN countries. There are two popular approaches to estimate parameters for dynamic heterogeneous panel data. Firstly, the Mean Group (MG) method introduced by Pesaran and Smith (1995) which relies on estimating N time series regressions and averaging the individual coefficient (Blackburne III and Frank, 2007). The other approach is the PMG method introduced by Pesaran *et al*. (1999). The PMG model takes the cointegration form of the autoregressive distributed lag (ARDL) model and adapts it for a panel setting. This method has the advantages over the MG method by allowing the long-run coefficients to be identical, but the intercepts, short-run coefficients and the speed of adjustment to differ across countries. For instance, owing to intensive intra-ASEAN trade and investment, there is a good reason to believe in common long-run coefficient across ASEAN countries.

According to Pesaran *et al*. (1999), the long-run coefficient under the PMG estimator is consistent and more efficient than the MG estimator, as the MG method consists of averaging the estimates of the individual regressions. In addition, the PMG method allows the short-run coefficient and error variances to vary across countries. This feature surpasses the dynamic fixed effect techniques that allows only intercepts to differ across countries.[9] The Hausman test is conducted to identify the efficient estimates between MG and PMG, particularly, for the homogeneity of long-run coefficients between the MG and PMG estimators.

Prior to the estimation of the MG and PMG methods, the lag order of the variables is determined using the Akaike Information Criterion (AIC) and Schewarz Bayesian Criterion (SBC). Both criteria show that the ARDL (1,1,1,1) is the most appropriate form. Hence, equation (2) can be written as:

$$\begin{aligned} LOFDI_{it} = {} & c_i + \alpha_i LOFDI_{it-1} + \beta_{1i} LY_{it} + \beta_{2i} LY_{it-1} + \beta_{3i} LIFDI_{it} + \beta_{4i} LIFDI_{t-1} + \beta_{5i} LPS_t \\ & + \beta_{6i} LPS_{t-1} + \beta_{7i} LTO_t + \beta_{8i} LTO_{t-1} + \varepsilon_{it} \end{aligned} \tag{3}$$

Equation (3) can also be expressed as an error-correction representation of the ARDL model as follows:

$$\Delta LOFDI_{it} = c_i - (1-\alpha_i) ECT_{it} + \beta_{1i} \Delta LY_{it} + \beta_{3i} \Delta LIFDI_{it} + \beta_{5i} \Delta LPS_{it} + \beta_{7i} \Delta LTO_{it} + \varepsilon_{it} \tag{4}$$

where $$ECT_{it} = \left[LOFDI_{t-1} - \frac{(\beta_1 + \beta_2)}{1-\alpha} LY_{t-1} - \frac{(\beta_3 + \beta_4)}{1-\alpha} LIFDI_{t-1} - \frac{(\beta_5 + \beta_6)}{1-\alpha} LPS_{t-1} - \frac{(\beta_7 + \beta_8)}{1-\alpha} LTO_{t-1} \right]$$

and the coefficient of the ECT_{it} i.e. $-(1-\alpha_i)$ is the speed of adjustment of $LOFDI_{it}$ towards its long-run equilibrium following a shock in the short-run.

4. EMPIRICAL RESULTS

It is essential to pre-test each variable for unit roots before estimating the panel cointegration regression using the PMG approach. The appropriate test statistics to determine the series that contain a unit root with and without a time trend are the unit root tests by Levin *et al*. (2002) (hereafter referred to as LLC), Im *et al*. (2003) (hereafter referred to as IPS), Fisher-type using augmented Dicky Fuller (ADF) (hereafter referred to as ADF-Fisher) and Phillips Perron (PP) (hereafter referred to as PP-Fisher) tests by Maddala and Wu (1999), Choi (2001) and Hadri (2000).

Table 3: Panel unit root test results

Variables	Levin, Lin & Chu t*		Im, Pesaran & Shin W-Stat		ADF - Fisher Chi-Square		PP - Fisher Chi-Square	
	Level	**1st Difference**	**Level**	**1st Difference**	**Level**	**1st Difference**	**Level**	**1st Difference**
Without Trend (AIC)								
LOFDI	1.6016	−8.5182***	0.4485	−8.1894***	34.6030**	102.375***	48.9121***	192.660***
	(0.9454)	(0.0000)	(0.6731)	(0.0000)	(0.0223)	(0.0000)	(0.0003)	(0.0000)
LY	−0.7561	−13.9362***	4.4809	−8.3948***	17.8920	89.3896****	1.6946	87.4853***
	(0.2248)	(0.0000)	(1.0000)	(0.0000)	(0.5945)	(0.0000)	(1.0000)	(0.0000)
LIFDI	−2.6780***	−12.4485***	−3.1448***	−10.5382***	50.3888***	123.228***	51.4097***	532.830***
	(0.0037)	(0.0000)	(0.0008)	(0.0000)	(0.0002)	(0.0000)	(0.0001)	(0.0000)
LPS	−1.6539 **	−7.4097***	2.7254	−6.2380***	6.7035	73.5269***	24.3855	69.8769***
	(0.0491)	(0.0000)	(0.9968)	(0.0000)	(0.9976)	(0.0000)	(0.2260)	(0.0000)
LTO	−5.2765***	−11.1540***	−3.2838***	−9.4436***	45.9192	111.251***	34.6281**	239.050***
	(0.0000)	(0.0000)	(0.0005)	(0.0000)	(0.0008)	(0.0000)	(0.0222)	(0.0000)
With Trend (AIC)								
LOFDI	−3.1629***	−10.3216***	−1.4600*	−9.3461***	34.9188**	102.775***	44.3767***	182.310***
	(0.0008)	(0.0000)	(0.0721)	(0.0000)	(0.0205)	(0.0000)	(0.0013)	(0.0000)
LY	−21.1754***	−9.1800***	−6.1596***	−7.5631***	31.3005*	81.3894***	10.6721	82.4091***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0513)	(0.0000)	(0.9543)	(0.0000)
LIFDI	−4.0864***	−11.4459***	−2.7314***	−9.0550***	39.3111***	98.6615***	66.9115***	150.822***
	(0.0000)	(0.0000)	(0.0032)	(0.0000)	(0.0061)	(0.0000)	(0.0000)	(0.0000)
LPS	−2.9373***	−6.0509***	−0.3767	−3.9900***	19.2219	48.0896***	11.4980	50.3848***
	(0.0017)	(0.0000)	(0.3532)	(0.0000)	(0.5074)	(0.0004)	(0.9323)	(0.0002)
LTO	−2.3329***	−7.2361***	−1.1350	−7.3670***	28.5412*	81.0239***	37.7323***	142.416***
	(0.0098)	(0.0000)	(0.1282)	(0.0000)	(0.0972)	(0.0000)	(0.0095)	(0.0000)

***Notes*:** The asterisks *** and ** denote the significance level at 1 and 5 per cent, respectively. *L* denotes natural logarithm. The optimal lag length is selected using the AIC while the bandwidth is selected using Neway-West Barlett kernel. The panel regression model includes an individual intercept, and individual intercept and trend.

Table 3 presents the panel unit root test statistics, which show mixed results with respect to the variant test statistics. For instance, *LOFDI* is non-stationary in level without trend based on *LLC* and *IPS* test statistics. On the other hand, both ADF-Fisher and PP-Fisher test statistics indicate *LOFDI* is stationary without trend in level. Likewise, all test statistics cannot reject the null hypothesis of a unit root for *LY* in level without trend. However, if *LY* is expressed in level with trend, all tests (except for PP-Fisher test statistics) reject the null hypothesis of a unit root, implying it is stationary. Comparable mixed unit root test results also apply to *LPS* and *LTO* that are stationary in level with and without trend for one or another panel unit root test statistics. Thus, the unit root tests for *LOFDI*, *LY*, *LPS* and *LTO* are inconclusive except for *LIFDI*, which is confirmed by all panel unit root test statistics that it is stationary in level with and without trend. Despite the mixed unit root test results, as pointed out by Kim *et al*. (2010) and Iwata *et al*. (2011), the MG and PMG estimation of an ARDL regression provides consistent estimators irrespective of whether the variables are *I(0)* or *I(1)* if there exists a unique vector defining the long-run relationship among variables with suitable lag order chosen.

Table 4: PMG/MG Panel Cointegration Test (ARDL – 1,1,1,1) – *LOFDI, LY, LIFDI, LPS and LTO*

	PMG			**MG**			**Hausman Test**
Long-Run (Dependent Variable: *LOFDI*)							
	Coef.	**Std. Err.**	***p*-value**	**Coef.**	**Std. Err.**	***p*-value**	
LY	0.2889*	0.1544	0.0638	−0.1401	2.0755	0.9460	Chi^2=2.70
LFDI	1.2789***	0.3157	0.0001	−0.3136	0.3318	0.3450	$Prob>Chi^2$ =0.6099
LPS	0.2985**	0.1484	0.0467	0.9287	0.5678	0.1020	(PMG > efficient)
LTO	0.1419***	0.0481	0.0039	0.1438	0.9011	0.8730	
Short-Run							
EC	−0.3630**	0.1476	0.0154	−0.8652***	0.1387	0.000	
Δ *LY*	1.3356	0.8342	0.1121	−0.1662	0.7916	0.834	
Δ *LFDI*	0.0054	0.3880	0.9890	0.5164	0.5780	0.372	
Δ *LPS*	−0.6435	0.7324	0.3814	−1.1758	0.8950	0.189	
Δ *LTO*	−0.5128	0.5889	0.3857	−0.5634	0.4262	0.186	
C	−3.1821**	1.2948	0.0155	−12.6472	9.2864	0.142	

Notes: ***, ** and * denote the significance level at 1 per cent, 5 per cent and 10 per cent respectively. Coefficient for the error-correction term, the constant term and the short-run coefficients are averages of individual country coefficients while the standard errors are those of their means.

Table 4 reports the results for PMG and MG panel cointegration tests. The Hausman test is adopted to determine whether there is consistency between the PMG and the MG estimators. Based on the results, the Hausman test statistic is 2.70 with a *p*-value of 0.6099, suggesting that we cannot reject the slope homogeneity restriction at conventional significance levels, which implies that the PMG method produces consistent and efficient estimates. Therefore, the estimates using the PMG approach are applicable to the analysis of the empirical results. The Jarque-Bera test statistic does not reject the null hypothesis of normality, indicating the normality conditions in this model are satisfied. The estimated coefficient for the error-correction term ECT_{t-1} is - 0.363, which has correct sign and is significant at 5 per cent level, confirming exist a long-run relationship in at least one of the panel countries. For *LOFDI* across the ten ASEAN member states to converge to long-run equilibrium, it would take about 2.75 years (i.e. one divided by the estimated coefficient of ECT_{t-1}).

All the estimated long-run elasticity parameters have expected sign. Both the *LIFDI* and *LTO* are significant at 1 per cent level relative to *LPS* and *LY* which are significant at 5 per cent and 10 per cent levels respectively. Among the estimated long-run elasticity parameters, *LIFDI* is the most elastic with a magnitude equals to 1.28, implying the presence of foreign multinationals in the ASEAN region is one of the main drivers of intra-regional OFDI flows. The growing operations of foreign multinationals in the region had strongly encouraged ASEAN firms to grow their regional footprint and be part of the regional production and distribution networks in order to fully exploit the full potential of ASEAN as a regional market. Therefore, ASEAN as host member states should continue to attract ASEAN and non-ASEAN foreign multinationals to operate in the region by creating a more business-friendly environment, good physical infrastructure facilities, special investment incentives and tax holidays.

Moreover, political stability of the regional host economies is an important consideration for cross-border direct investment by domestic firms. If there is a political upheaval in a host economy, it might have an adverse impact on the flows of intra-regional OFDI because political instability could disrupt the productivity of foreign business operations in the host economy. The estimated coefficient of *LPS* suggests that more sound and stable political environment in the long run are favourable to the flows of intra-regional OFDI even though it is found to be political stability inelastic. The estimated long-run elasticity of *LOFDI* with respect to *LY* is 0.29, supporting the previous studies like Goh and Wong (2011) and Hattari *et al*. (2014) that host market size is an important pull factor of attracting intra-regional OFDI in the long run. According to the ASEAN Secretariat (2013), there are significant market-seeking OFDI activities[10] by ASEAN companies[11] that could contribute to their parent companies' overall revenue growth, indicating the absolute host market size in the region has a positive effect on domestic firms' decisions on going regional for better profit opportunities.

Last of all, the trade openness could facilitate more intra- and inter- firm trade within the region, which in turn may drive intra-regional OFDI through regional sourcing as well as regional production and distribution networks. The estimated coefficient of *LTO* with a magnitude of 0.14 confirms that to some degree, trade openness could play an important role in promoting intra-ASEAN OFDI in the long run. Further liberalisation of regional trade (e.g. an increase in the number of tariff lines with zero tariff rate for intra-ASEAN imports) could expedite the flows of intra-region OFDI. Whilst in the short run, *LY*, *LFDI*, *LPS* and *LTO* are insignificant in explaining the intra-ASEAN OFDI.

5. CONCLUSIONS

ASEAN is a fast growing region with economic diversity among the member states that engender locational complementarity. With a regional market size of 600 million people, ASEAN has become one of the major destinations of FDI and also, is becoming an impending regional production centre. As a result, both foreign and ASEAN firms have growing interest to invest and expand their business operations in the region in order to exploit the full potential of ASEAN as a diverse regional market. Interestingly, ASEAN experienced a surge in intra-regional OFDI flows, which has motivated the present study ascertaining what determines the rapid flows of the intra-regional OFDI by ASEAN firms using the PMG panel cointegration approach. This area of empirical research is scanty in the context of ASEAN, if any. The main findings of this paper suggest that there is a positive long-run relationship between intra-ASEAN OFDI and its determinants, viz. FDI inflows into the region, host market size of member states, political stability and the degree of trade openness of the regional economy. The empirical study helps to gain more insight in terms of the ASEAN economic integration through intra-ASEAN OFDI.

Based on the empirical evidence, the foreign multinationals operating in the region is the major impetus to the intra-regional OFDI growth owing to their massive resources and international networks. The ASEAN governments should continue to remove investment barriers for foreign multinationals and collectively promote ASEAN as an investment-friendly region so that their presence could put ASEAN on the world map as a potential regional production centre that could draw ASEAN firms to set up their subsidiaries and affiliates in the region and be part of the regional value chains. The findings also suggest that intra-ASEAN OFDI is market-seeking type, which not only can attract non-ASEAN firms but also the ASEAN firms from within the region. Undeniably, owing to the economic diversity and complementarity among member states, it can be inferred that efficiency-seeking incentive is also pertinent for intra-regional OFDI. Political stability is one of the key factors for ASEAN firms to decide where to pursue or relocate their operations when making investment decision in the region. The empirical study suggests that if political instability (such as the occurrence of civil wars and terrorist attacks) in a potential host economy persists in the long run, the ASEAN investors would be discouraged to extend their business operations regionally as profitability of intra-ASEAN FDI is susceptible to political instability. To mitigate political instability in the long run, the ASEAN host governments should take a more active role in developing a political and institutional environment that is friendly to both non-ASEAN and ASEAN investors. Last but not least, the increase in the degree of trade openness matters for ASEAN firms' decision on investing horizontally and vertically in the region in the long run because the experience involved in international trade activities by ASEAN firms could provide them with more exposure in terms learning about the business operations in the regional markets. Therefore, the adoption of outward-oriented policies could expedite the flows of intra-regional OFDI.

End Notes

1. ASEAN denotes the Association of Southeast Asian Nations that comprises 10 member states, namely, Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam.

2. One of the three fundamental pillars of AEC is to achieve an open, outward-looking, inclusive, and market-driven economy within the region (ASEAN, 2008).
3. Economic diversity refers to the differences in income level, economic structure, economic system and natural resource endowment among the ASEAN member states.
4. For example, Coca-Cola, GM, Honda, Ikea, Samsung, Toyota, Unilever, Volkswagen, to name a few (ASEAN Secretariat, 2014).
5. Authors' own calculation from ASEAN Secretariat, *ASEAN FDI Database* as of 30 October 2013.
6. Authors' own calculation from ASEAN Secretariat, *ASEAN FDI Database* as of 30 October 2013.
7. This was acknowledged by Hattari and Rajan (2009) in the section on data, p.124.
8. The source of OFDI and IFDI data was compiled from the central banks and national statistical offices of the respective ASEAN countries through the ASEAN Working Group on International Investment Statistics.
9. See Pesaran *et al*. (1999) for more discussion on the comparison between MG, PMG and dynamic fixed effects methods.
10. From a firm's point of view, tapping into new markets abroad tends to have higher profit opportunities than smaller market at home.
11. For examples, ASEAN companies that embarked on intra-regional market-seeking OFDI are: **Malaysia:** Axiata, CIMB, Maybank, GHL System, Top Glove, Royal Selangor, Hong Leong and many Malaysian construction, infrastructure and property developers; **Singapore:** Wilmar International, Singapore Telecommunication, CapitalLand, Nepture Orient Lines, Sembcorp Industries, Hong Leong Asia, Keppel Corporation, Fraser and Neave; **Thailand:** PTT, Thai Beverage, S&P, Siam Cement, Saha Union, Thai Union; **Philippines:** San Miguel, Jollibee, Ayala, SM Group; **Indonesia:** Lippo Group, Sinar Mas Group, Ciputra Group. **Vietnam:** Song Da, Petro Vietnam, Vietnam Rubber Group (ASEAN Secretariat, 2012, p. 87).

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