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PHAM Thi Hong Hanh

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***JEL Classification***: F13, F15, O18, O19, O47, O57.Keywords:
***Key words***: Growth, Trade Integration, Intra-regional disparities, Co-integration, ASEAN.

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# Does trade integration matter for reducing intra-regional disparities? ASEAN evidence from a panel co-integration approach

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## ABSTRACT

*Needless to say, it is necessary to study the relative scales of the trade creation effect and the trade diversion effect to evaluate success of ASEAN trade integration and to determine whether or not the intra-bloc trade share is appropriate as an indicator of the progress of reducing intra-regional disparities in ASEAN. Therefore, this paper first uses descriptive statistics and some key indicators to track the progress in economic growth and in trade integration that is the main pillar of building ASEAN Economic Community. Second, we make an attempt to provide answers to the question of whether trade integration matters for reducing intra-regional disparities among ASEAN member states over the period 1995-2007. We perform the panel co-integration method developed by Pedroni (1999) that allows for heterogeneity across ten ASEAN countries. Our major finding shows that trade integration, which is captured by intra-regional exports and imports flows, is appropriate as an indicator of progress of reducing income disparities in the ASEAN zone. Finally, applying the General Method of Moments (GMM) estimation, we also find that deepening of intra-regional trade integration creates more trade flows among ASEAN member states without diverting trade flows with non-members.*

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## 1. Introduction

The effect of trade integration has always been one of the most important issues studied in the area of international economics.

On one hand, the economic theories put stress on the effect of trade integration on industrial specialization. The neoclassical trade theory predicts a linear positive relationship between trade costs and specialization. Trade liberalization and economic integration will result in increasing specialization in sectors where a country has a comparative advantage due to differences in technology or factor endowments. The new economic geography theory developed by Krugman (1991a, 1991b) suggests that trade integration might lead to agglomeration and specialization of economic activities. According to Krugman (1991a), economic activities will agglomerate into one or a few countries or regions when trade costs fall. However, Fujita et al. (1999) show that firms will be dispersed further across countries and regions when trade cots are very low. More recently, Bernard et al. (2004) find that opening to trade will increase the probability of exporting in comparative advantage industries more as the neoclassical trade theory predicts.

On the other hands, the theoretical studies attempt to resolve whether trade integration can both cause trade creation and trade diversion. These two concepts originally developed by Viner (1950) and then by Kemp and Wan (1976) are closely related to the efficiency gains achieved through regional trade agreements (RTAs). The net effect of an RTA on global trade and welfare becomes ambiguous if it raises trade and welfare among its members but hurts the welfare of non-members. Therefore, a series of researches attempt to examine how some characteristics of member countries determine the net gains from an RTA. Especially, the hypothesis of "natural trading partners" introduced by Wonnacott and Lutz (1989), Krugman (1993), and Frankel et al. (1995) suggests that to maximize the positive welfare gains from RTAs, a lower transportation cost between members is the most desirable characteristic. In other words, an RTA constituting natural trading partners are more likely to create trade between member countries, and less likely to divert trade from non-member countries, thus leading to large improvements of economic welfare. The key point of this theory is that geographical transportation costs permits proximately situated countries to have higher volumes of trade with each other than countries further away from each other.

In line with this theory, a large number of empirical researches, which are based on gravity model, focus on testing whether geographical proximity contributes to maximizing net benefits of RTAs. Numerous empirical studies have demonstrated that the launch of a regional integration body under the RTA produces positive economic effects for the entire region. But it may not mean that these economic benefits are equally available to all parts of the region since the benefits of trade integration could potentially be monopolized by limited countries to aggravate intra-regional differences. The World Bank's research report (2000) on 17 regional integration organizations also admits that no clear tendency can be found. To fill this gap, retaining a case study of the Association of South-East Asian Nations (ASEAN), our paper aims at investigating the role of intra-regional trade integration on reducing intra-regional disparities.

Southeast Asia, which is the nucleus of the regional initiative in East Asia, has been and will in future remain one of developed countries' priority aid and investment destinations. This region itself is striving for integration under the framework of ASEAN. The current issue of ASEAN is that ASEAN members are almost developing countries and that trade integration among developing countries may widen disparities among member states since the trade diversion effect leads to a concentration of businesses in those member states that are richer in capital, in accordance with the principle of comparative advantage in region with heavy external tariffs. Therefore, one of the most important objectives of trade integration is to correct the disparities among ASEAN member states.

More than ever, it is necessary to study the relative scales of the trade creation effect and the trade diversion effect to evaluate success of ASEAN trade integration or in other words to determine whether or not the intra-bloc trade share is appropriate as an indicator of the progress of reducing intra-regional disparities in ASEAN. Moreover, regional integration in ASEAN will be more efficient if an increase in the intra-regional trade flows does not cause a decrease in extra-regional trade flows.

For this purpose, in stead of the classical Gravity method, we apply a panel co-integration technique to investigate the possible linkage among four following variables: intra-regional income disparities, intra-regional exports, imports and FDI flows in ASEAN. First, we test for the order of integration or the presence of unit root of our panel. Second, having established the order of integration, we use the heterogeneous panel

co-integration technique developed by Pedroni (1999) to test for the long run co-integrated relationships between the variables in question. In the last step, the General Method of Moments (GMM) for a dynamic heterogeneous panel will be used to assess explicitly the channels through which the variables studied can affect each other.

The remainder of this paper is organised as follows. Section 2 provides a brief discussion of economic growth, the recent trend of trade integration and preferential trade arrangements in the ASEAN zone. Section 3 describes the panel data, specifies the methodology employed and examines the effects of intra-regional trade integration on intra-regional disparities. Performing an additional GMM estimation, Section 4 explores the relationship between intra-ASEAN and extra-ASEAN trade. Concluding remarks follow in Section 5.

## 2. ASEAN in the age of globalisation

As shown in the ESCAP report (2007), ASEAN is a region of immense potential growth but is also marked by uneven results in economic, social and political development. So the end goal of fostering economic integration in ASEAN is to establish an effective ASEAN Economic Community (AEC) which will, by 2015, transform ASEAN "into a region with free movement of goods, services, investment, skilled labour, and freer flow of capital." (ASEAN, 2008, p.5). This section, on one hand, provides a brief discussion of ASEAN's economic development and on the other hand the progress in area of trade integration within the AEC and in integration of ASEAN member states into the Asian region and global economy.

### 2.1. Economic development in ASEAN: An overview

Since 1990s, ASEAN countries have made good progress in achieving the Millennium Development Goals (MDGs).

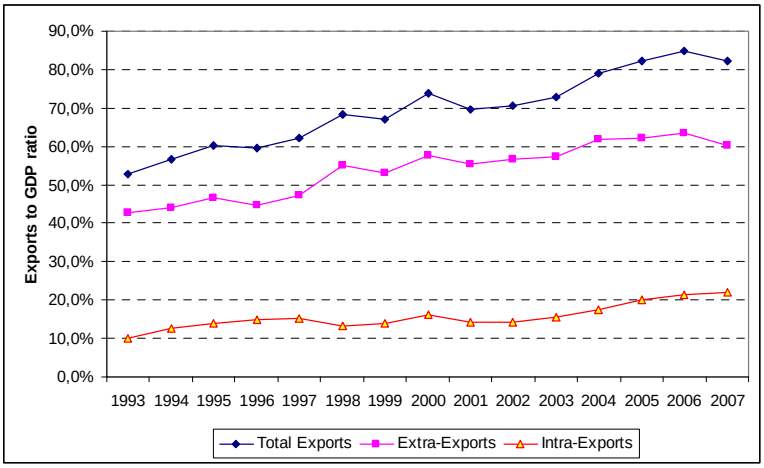
For the period 1991-1995, Malaysia attained this highest growth and as one of the Asian NIEs, Singapore held the second place. Indonesia, Thailand and Vietnam followed suit after their policy shift to promote export-driven growth starting the late 1980s. In the wake of the Asian financial crisis, these states exclusive of Vietnam saw growth rates shift to a downward trend. In contrast, the Philippines enjoy a rising growth rate, despite being the only country among the senior ASEAN countries, exclusive of Brunei

Darussalam, to have suffered low growth rates prior to that. Among the CLMV[1] countries originally at low income levels, the rates of growth started to rise in the 1990s and topped those of senior ASEAN members from the late 1990s until today. In this situation, the intra-regional gaps are being closed.

***<Table 1>***

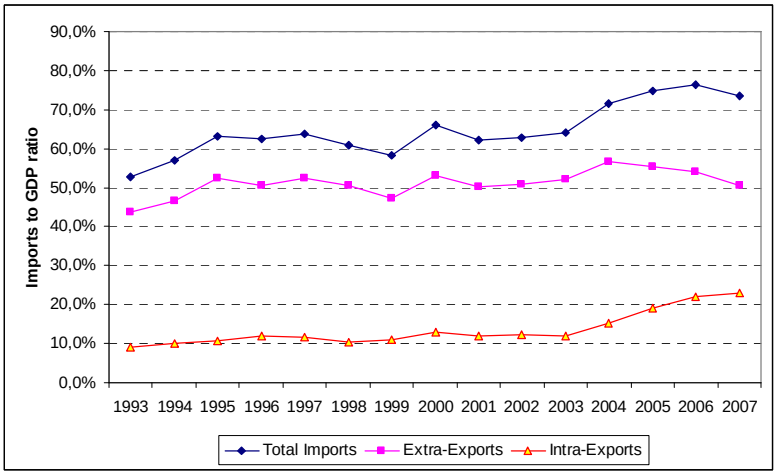
The remarkable economic growth of ASEAN member states resulted from their progress towards regional integration. Therefore, we now move on to look at the expansion of trade in the ASEAN zone.

**Figure 1: Exports to GDP ratio of the ASEAN zone**




*Source: Created from the ASEAN Trade Statistics (2005), ADB and UNESCAP database*

**Figure 2: Imports to GDP ratio of the ASEAN zone**




*Source: Created from the ASEAN Trade Statistics (2005), ADB and UNESCAP database*

[1] Including Cambodia, Lao PDR, Myanmar and Vietnam

Figure 1 and Figure 2 show the trend in ASEAN's external trade to GDP ratio. A similar trend is observed in both the exports and the imports to GDP ratios. In particular, the ratios of intra-regional and extra-regional exports to GDP ratios are both on the rise. This means that ASEAN is achieving export-driven economic growth.

***<Table 2-3>***

Table 2 shows the shares of ASEAN's import and export destinations. In this table, ASEAN is regarded as an integrated entity. In 2003, the USA was ASEAN's largest export partner while Japan was the largest importer. In the same year, mainland China combined with Hong Kong was a larger export partner than Japan. In 2007, the EU 15 became the largest export and also import partner of ASEAN. Within the ASEAN region, Malaysia and Singapore stand out both as import and export destinations.

***<Table 4>***

Table 4 shows the dependence of individual member states on intra-regional trade. Laos and Myanmar have somewhat higher percentages for intra-regional exports when compared with other member states. Laos directs a large portion of its exports to Thailand and Viet Nam while most part of Myanmar's exports goes to Thailand. As for Cambodia, only 4.3% of its exports were for intra-regional destinations in the period 2006-2007. In the aspect of imports, the CLM[2] states depend more on intra-regional trade. From 2006 to 2007, Laos sees nearly 78% of its imports come from ASEAN countries and around 60% from Thailand alone. Cambodia's imports largely come from Thailand, Singapore and Viet Nam while Myanmar from Singapore and Thailand. From a long-term perspective, ASEAN as a whole saw its intra-regional trade rates rise at an important pace between 1993 and 2007: from 18.9% to 27.9% in terms of exports and from 19.1% to 30.1% for imports.

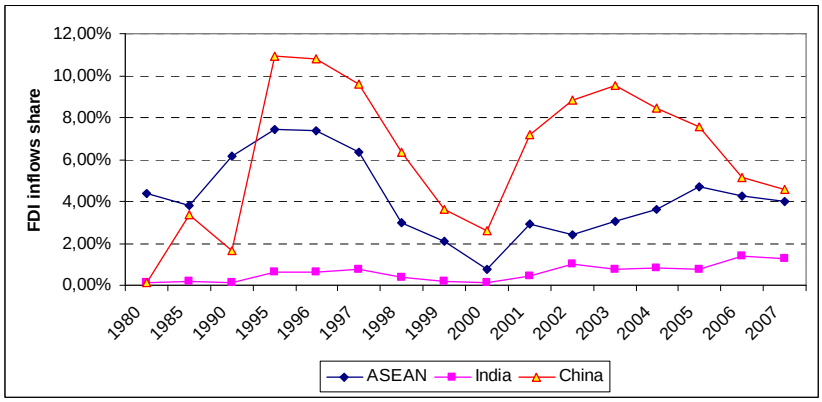
Another important determinant of economic growth in the ASEAN zone is FDI flows. Likewise, ASEAN takes into account to conduct investment cooperation agreements for ASEAN to function as an attractive investment destination and to contribute special conditions for multinational enterprises (MNEs) in order to stimulate the surge of FDI inflows.

***<Table 5>***

[2] Including Cambodia, Lao PDR and Myanmar

Table 5 lists the amounts of foreign direct investment by recipient state on the basis of the international balance of payments as well as the ratios of investment in ASEAN member states to their respective GDP. Over the past decade, ASEAN's FDI inflow was persistently fluctuated as a result of the Asian financial crisis in 1997-1998. After the Asian financial crisis in 1997-1998, the recovery of FDI inflow was remarkably swift in 1999, and it gradually decreased up to 2004 on account of the signs of the economic slowdown in the FDI home countries such as US and Europe and the recession in Japan. However, ASEAN's FDI inflow re-increased from 2005 and recovered in 2007 with US$ 73,407.8 million.

**Figure 4: World FDI inflows share**




*Source: Created from ADB, ASEAN secretariat(2005), UNCTAD and UNSD database (2008)*

Figure 4, comparing the ratios to total worldwide investment of India, China and ASEAN during 1980-2007, shows that the share of investment to ASEAN recorded a significant fluctuation. Recently, there have been signs of a turnaround in the share of investment in ASEAN and in 2007 ASEAN seemed to catch China in attracting FDI.

***<Table 6>***

Next, we look at a comparison among countries investing in ASEAN. Obviously, foreign investors have been using ASEAN countries as a site for making profits, cost effectiveness and global competitiveness by the largest FDI sources were, in order, EU, US, Intra-ASEAN and Japan. As shown in Table 6, the pattern and sources of FDI into ASEAN remained strongly unchanged during 1995-2004. In 2004, the share of ASEAN's FDI inflows of these four sources vis-à-vis total FDI inflow was as follows: 11.2% (Intra-ASEAN), 11.6% (Japan), 23.2% (USA) and 24.9% (EU-15). However, from 2005 the structure of FDI source in ASEAN has changed. Instead of FDI from the US, Asian NIES, namely Republic of Korea, Hong

Kong and Taiwan, played for a significant source of investments for ASEAN in the last year. In detail, Viet Nam is the top investment destination for Republic of Korea and Taiwan, while Hong Kong's top destination is Thailand. Additionally, Japan's FDI inflows have recorded a growth continuously since 2004.

***<Table 7>***

Table 7 shows a comparison of the significant Intra – ASEAN FDI flows for the period 1995-2007. The shares of ASEAN's investment in its own region seem to be equivalent to Japan's shares: 12.6% in 2003 and 11.2% in 2004. Between 2005 and 2007, intra-ASEAN FDI significantly increases from 4203.1 to 9502.2 million US$. Most of ASEAN's intra-regional investment is made by Singapore, contributing from 54.7% to 76.1% of intra-ASEAN FDI for the period 2005-2007, while Malaysia is the most important destination for intra-ASEAN FDI (40.1% in 2007). Needless to say, the upward FDI inflow trend for ASEAN was recorded remarkably. The greater FDI inflow is driven as a result of continued and pursued schemes under ASEAN cooperation agreements in order to become a global attractive FDI destination.

## 2.2. Regional Trade Agreements and ASEAN

The previous section provided descriptive statistics and some key indicators to track progress in ASEAN's economic growth, external trade and also FDI inflow trend. This section will briefly present ASEAN's commitment for economic integration and trade liberalisation.

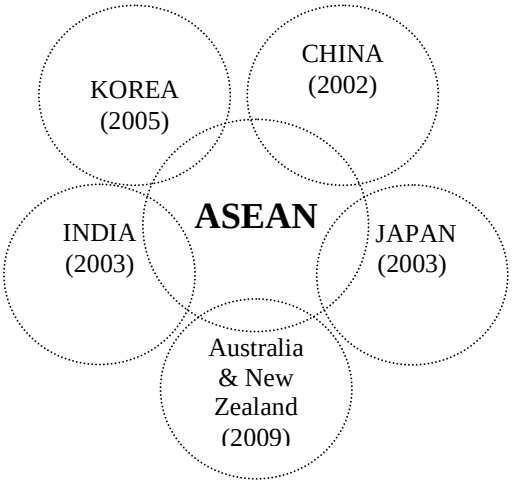
During the recent years, more and more countries have shifted towards regional trade liberalisation. This trend resulted in the increasing number of Regional Trade Agreement (RTAs) over the years[3]. ASEAN is no exception of this growing trend and has been actively engaging in regional and bilateral Free Trade Areas (FTAs) in the recent years.

The ASEAN Free Trade Area or more commonly known as AFTA was firstly concluded in January 1992. The basic feature of AFTA is liberalisation of trade in the region via the elimination of intra-regional tariffs and non-tariff barriers through the Common Effective Preferential Tariff (CEPT) Scheme for AFTA. AFTA has been considered to be an outstanding example of ASEAN's commitment to regional economic integration. In last 15 years, following the conclusion of AFTA, there have been a number of Free Trade

[3] As of July 2007, a total of 300 RTAs have been reported to the WTO, 205 of which are currently in force (WTO. 2007-7. http://www.wto.org/english/tratope/regione/regione.htm. Retrieved on 2008-07-20

Agreements (FTAs) concluded between ASEAN and other non-member countries and also a number of bilateral agreements concluded between individually ASEAN Member countries with other countries (See Figure 5).

**Figure 5: FTA between ASEAN and country partners**




*Source: Created from ASEAN Secretariat (May, 2009)*

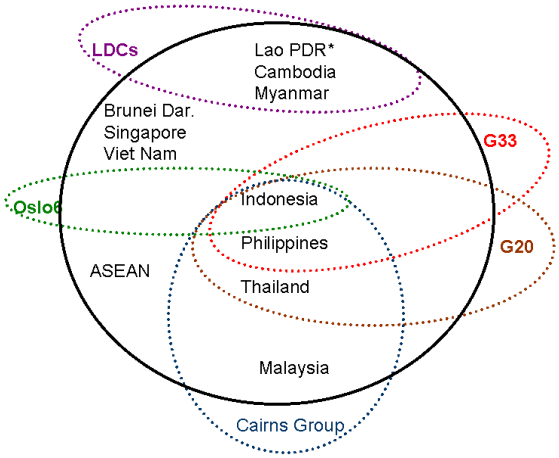
At the same time, individual ASEAN member is also concluding bilateral arrangements with a number of countries within and outside this region, such as, Singapore-Japan, Singapore-US, Singapore-India, Malaysia-Japan, Philippines-Japan, etc.

On the other hand, ASEAN tends to negotiate one or more free trade arrangements not only with countries within the Asian region but outside the region as well. For instant, to facilitate the integration of the East Asian economies, ultimately leading to an East Asia Economic Community, there have been talks to form an East Asian Free Trade Area (EAFTA). Furthermore, the objectives of EAFTA, which can take the form of encompassing bilateral and sub-regional free trade areas in the region, are not only to boost intra-regional trade and investments, but also to promote socioeconomic cooperation among East Asian countries. EAFTA has been considered as a prelude to the ASEAN Common Market by 2020 where there is free movement of goods, services, investments and people.

However, due to the lack of ASEAN-wide common trade policies, large disparities in economic and industrial development and trade dependence of ASEAN members, each ASEAN country can occasionally chose to join other country groupings with different objectives. For example, during the most recent Doha Developing Round,

Indonesia found an interest to be a member of four different groupings (G-33, G-20, Cairns Group and Oslo-6), Philippines and Thailand are members of two (different) groups while Malaysia joined only Cairns group. (See further Figure 6)

**Figure 6: ASEAN member states and coalitions in the WTO**

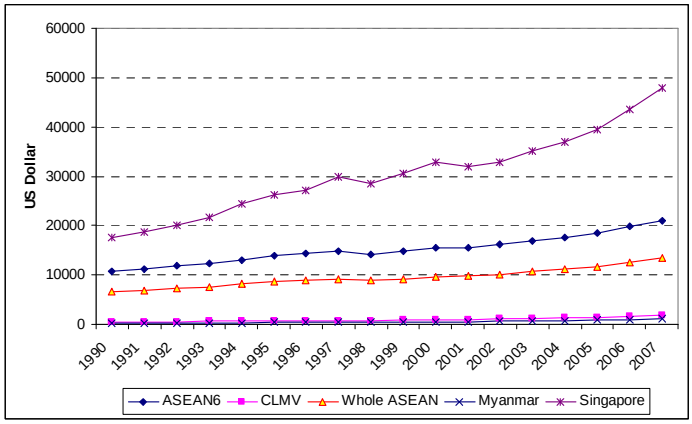



*Source: WTO (2008a)*
** WTO Observer*

## 2.3. Intra – Regional Disparities in ASEAN

The current issue of ASEAN recognises the existence of the development gap in term of GDP per capita as well as other human development dimensions between the ASEAN6, which refers to senior ASEAN members including Brunei Darussalam, Indonesia, Malaysia, The Philippines, Singapore and Thailand, and the CLMV countries and also within the ASEAN6 countries.

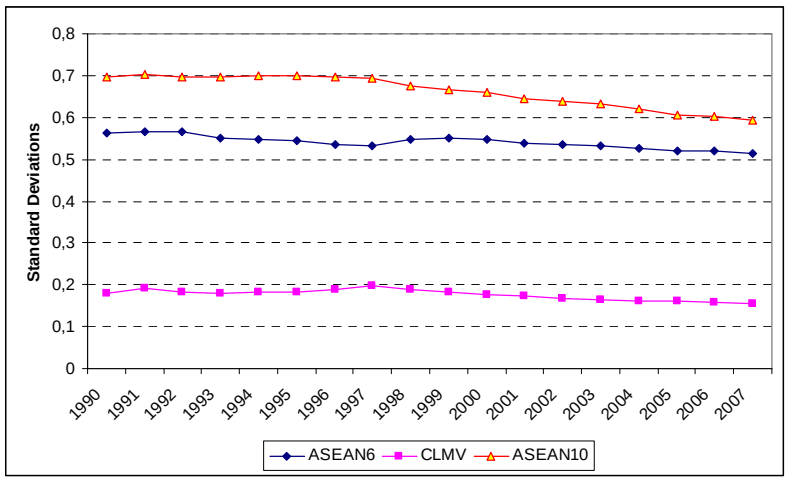
**Figure 7: Comparison of real GDP per capita in the ASEAN area**




*Source: Created from the World Development Indicator (WDI) database*

Figure 7 presents the income differences in term of real GDP per capita in the ASEAN area. We find that the average real GDP per capita of the CLMV countries is only around 13% and 8% of the six senior ASEAN members and the whole ASEAN respectively in 2007. Furthermore, there is a gap of more than 40-fold in real GDP per capita between Singapore, boasting the highest figure among the member states, and Myanmar that hold the lowest position.

**Figure 8: Intra-ASEAN income disparities**




Source: Created from the World Development Indicators (WDI) database
Note: - The ASEAN6 countries refer to senior ASEAN member states including Brunei Darussalam, Indonesia, Malaysia, The Philippines, Singapore and Thailand.
- CLMV countries include Lao PDR, Cambodia, Myanmar and Vietnam
- ASEAN10: Whole ASEAN

Figure 8 shows a long-term trend in intra-regional economic disparities among the ASEAN6, the CLMV and the whole ASEAN countries by focusing on their respective standard deviations of logarithms of real GDPs per capita in Purchasing Power Parity (PPP) equivalents[4].

As shown in Figure 8, the gaps between the ASEAN6 and the CLMV countries have been stable since 1990. In 1997 the disparities were narrowed. This was largely a reflection of the Asian financial crisis that generally reduced income levels across the senior ASEAN nations. However, the upward trend has been returned when the impact of the financial crisis was coming to an end since 2002, and has become stable until 2007. Figure 8 also shows that the gaps between the ASEAN6 countries and the whole ASEAN

[4] Basing the model used by Ben-David (1993) for measuring the trend in disparities within the EU zone.

zone have significantly diminished since 1997. This is a positive sign in progress of reducing the intra-regional disparities in ASEAN.

*To sum up, the review of ASEAN's recent economics makes clear that the integration efforts have been gathering momentum in the economic area. It is, however, necessary to clarify the relative scales of the trade creation effect and the trade diversion effect to confirm the economic advantage of regional integration. Since the launch of a regional integration body under the RTA produces positive economic effects for the entire region but the benefits may not be equally available to all parts of the region. In fact, economic integration among developing countries can make widen the disparities among member states because the trade diversion effect leads to a concentration of businesses in the country having a comparative advantage in capital, in labour or in other resources.*

*In any case, allowing trade integration is uncertain whether or not the regional disparity will be narrowed. In order to resolve this issue, in the next steps, we will econometrically investigate:*

*(i) First, whether or not the intra-bloc trade share is appropriate as an indicator of the progress of reducing the intra-regional disparities in ASEAN.*

*(ii) Second, whether or not a rise in intra-ASEAN trade decreases extra-regional trade.*

## 3. Trade integration and Intra-regional disparities

### 3.1. Data issues

To carry out our empirical analysis, we use a set of panel data covering annual data of ten ASEAN member states from 1995 to 2007. Trade integration is captured by intra-regional exports and imports flows of ASEAN. In addition, we also take care of intra-ASEAN FDI inflows and outflows in our econometrical models. The theoretical literature identifies a number of channels through which FDI may be beneficial to the host country. The most popular arguments giving prominence to the positive role of FDI on exports are that FDI is an important source of capital, which complements domestic private investment in developing productive capacity. It has the potential to generate employment and raise factor productivity *via* knowledge and skill transfers, adoption of new technology (de Mello, 1997). Furthermore, it enhances non-price export

competitiveness in the host country as the goods produced by foreign firms result from a better technology, and can then be sold more easily abroad. The brands they propose are also more popular and satisfy the quality standards required by the international market. Lastly, the role of FDI derives from better management and marketing strategies that foreign firms can bring with them (Pacheco-Lopez, 2005). All these points contribute to upgrade the host country's exports[5]. At these sights, we consider that intra-regional FDI may indirectly affect intra-regional disparities via its impacts on intra-regional trade flows. The variables studied are identified as follows:

- $EX_\text{int}ra_{it}$ : Exports flows per capita from ASEAN country *i* at year *t* to ASEAN.
- $IM_\text{int}ra_{it}$ : Imports flows per capita to ASEAN country *i* at year *t* from ASEAN.
- $inFDI_\text{int}ra_{it}$ : FDI inflows per capita into ASEAN country *i* at year *t* from ASEAN.
- $outFDI_\text{int}ra_{it}$ : FDI outflows per capita from ASEAN country *i* at year *t* into ASEAN.
- $income_DIS_{it}$ : Intra-regional disparities in terms of real GDP per capita among country member *i* and the average real GDP per capita of the ASEAN zone. This variable is calculated by their respective standard deviations of logarithms of real GDPs per capita in Purchasing Power Parity (PPP) equivalents[6].

Due to the data unavailability, we must collect our panel data from many reliable sources: World Development Indicators, ASEAN Foreign Trade Database, ASEAN Foreign Direct Investment Database, United Nations Statistics Division, Asian Development Bank Database…etc. In Appendix A, we present data sources for each variable. All data of international trade and FDI are collected in US dollars at 1995 constant price. All variables (excluding $income_DIS_{it}$) are expressed in natural log value in order to include the proliferate effect of time series.

Moreover, we include the Country Risk variable (labelled $control_i$) as control variable in our regression models. This variable is measured by the natural log value of International Country Risk Guide's (ICRG) country risk composite score. The ICRG rating comprises 22

[5] Adams and *al.* (2006) argued that FDI has been a critical consideration in upgrading China's export structure and supplying products that meet world market specifications.
[6] Basing the model used by Ben-David (1993) for measuring the trend in disparities within the EU zone.

risk components in three risk subcategories: political, financial and economic (see Appendix B). The composite scores, ranging from 0 to 100, higher scores are associated with lower risk. In our paper, the ICRG composite score is used as an aggregate control variable for institutional, legal, policy, financial and economic factors allowing us to determine the macroeconomic situation, which can directly affect FDI and trade flows of ASEAN countries. Because a number of ICRG risk components are themselves considered important determinants of trade and FDI flow, for instance, law and order, exchange rate stability and inflation rate.

To analyze the possible effects of trade integration on intra-regional disparities, our investigation will be performed in three steps. First, we test for the order of integration of the two variables or the presence of unit roots in our sector panel. Second, once the order of integration determined, we use heterogeneous panel co-integration techniques developed by Pedroni (1999) to test for the long run co-integrated relationship between among the variables in question. In the third step, Ordinary Least Squares (OLS) and the General Method of Moments (GMM) estimations for a dynamic heterogeneous panel will be applied to test for the impacts of trade integration on intra-regional income disparities.

### 3.2. Panel unit root Tests

Unit root tests are traditionally used to determine the order of integration or to verify the stationarity[7] of the variables. The traditional Augmented Dickey-Fuller (ADF) technique has become well-known to test for unit root of time series. However, to test for the panel unit roots, a number of recent developments has appeared in the literature, including: Levin, Lin and Chu (LLC test) (2002); Im, Pesaran and Shin (IPS test) (1997); Maddala and Wu (1999); Choi (2001); and Hadri (2000). Among these different panel unit root tests, the two former are the most popular. Both of these tests are based on the ADF principle. LLC test assumes homogeneity in the dynamics of the autoregressive (AR) coefficients for all panel members. Concretely, LLC test assumes that each individual unit in the panel shares the same AR(1) coefficient, but allows for individual effects, time effects and eventually a time trend. Lags of the dependent variable may be introduced to

[7] If a time series is found to be nonstationary or integrated of order *d*, denoted by I(d), it can be made stationary by differencing the series *d* times. If d = 0, the resulting I(0) process represents a stationary time series.

allow for serial correlation in the errors. The test may be viewed as a pooled Dickey-Fuller test, or an Augmented Dickey-Fuller (ADF) test when lags are included, with the null hypothesis that of non-stationarity (I(1) behavior). After transformation, the t-star statistic is distributed standard normal under the null hypothesis of non-stationarity.

IPS test is more general than the above test because of allowing for heterogeneity in dynamic panel. Therefore, it is described as a "Heterogeneous Panel Unit Root Test". It is particularly reasonable to allow for such heterogeneity in choosing the lag length in ADF tests when imposing uniform lag length is not appropriate. In addition, IPS test allows for individual effects, time trends, and common time effects. Based on the mean of the individual Dickey-Fuller t-statistics of each unit in the panel, IPS test assumes that all series are non-stationary under the null hypothesis. Lags of the dependent variable may be introduced to allow for serial correlation in the errors. The exact critical values of the t-bar statistic are given. IPS test thus relies on a technique which has higher power than the other tests, including LLC test.

***<Table 8>***

Statistical results of the LLC test for all variables are reported in *Table 8*. In the LLC test for the levels, the small negative statistics values for each variable do not exceed the critical values (in absolute terms). However, when we take the first difference of each variable, the large negative LLC statistics indicate rejection of the null of non-stationarity at least 10% level of significance.

***<Table 9>***

The IPS results reported in *Table 9* indicate, in general, that the null of a unit root for the individual series is not rejected for all of the series tested at their levels. Given the short span of the individual series, we are more confident to accept the more powerful IPS panel test results, which undoubtedly do not reject the unit root null of unit roots for the panel with 130 observations. On the other hand, the null of unit root is strongly rejected at the least 10% level of significance for all series at their first difference. The results strongly support the conclusion that the series are stationary only after being differenced once. Hence, the IPS test indicates that the series are integrated of order one, i.e., I(1) at the 1% significance level. Therefore, we conclude that all variables are non-stationary and integrated of order one in level but integrated in order zero in their first difference at least 1% level of difference.

Having established that the variables are integrated of the first order, the second step in testing the co-integration approach is applicable to determine the nature of the long-run relationship among the five variables of interest.

### 3.3. Panel co-integration Test

The traditional co-integration analysis presented by Engle and Granger (1987) allows identifying the relationship between the variables by eliminating the risk of spurious regression. However, the Engle and Granger approach cannot identify the number of co-integration vectors and cannot adequately estimate the parameters if the number of variables is more than two. Hence, Johansen (1988) uses maximum likelihood method within a vector autoregressive (VAR) framework to test for the presence of co-integration relationship between the economic variables. The Johansen's procedure is useful in conducting individual co-integration tests, but does not deal with panel co-integration test.

Therefore, most of recent empirical works use the two techniques of heterogeneous panel co-integration test developed by Pedroni (1999). Pedroni's test allows different individual cross-section effects by allowing for heterogeneity in the intercepts and slopes of the co-integrating equation.

The Pedroni panel co-integration technique makes use of a residual-based ADF test. Pedroni test for the co-integrated relationship between intra-regional disparities and trade integration in our panel is based on the estimated residuals from the following long-run model:

$$Income_DIS_{it} = \alpha + \beta_1 EX_\text{int}ra_{it} + \beta_2 IM_\text{int}ra_{it} + \beta_3 inFDI_\text{int}ra_{it} + \beta_4 outFDI_\text{int}ra_{it} + \beta_5 control_i + DU_CRI + DU_ASEAN + DU_WTO + \varepsilon_{1it} \quad \textbf{(1)}$$

where $i = 1,...,10$ countries and $t = 1,...,13$ period observations. *DU_CRI,* which is a dummy variable, takes the value of 1 from 1997 to 2000 and 0 in all other periods in order to account for the appearance of Asia financial crisis. *DU_ASEAN* and *DU_WTO* are also dummies that take care of the accession moment of each country in ASEAN and WTO respectively. The term $\varepsilon_{1it} = \rho_{1i}\varepsilon_{i(t-1)} + \xi_{1it}$ is the deviations from the modeled long-run relationship. If the series are co-integrated, $\varepsilon_{1it}$ should be a stationary variable. The null hypothesis in Pedroni's test procedure is whether $\rho_i$ is unity. In addition, Pedroni

technique permits to test the co-integrated relationship the variables in question in four different models: (***M1***) Model with heterogeneous trend and ignoring common time effect; (***M2***) Model with heterogeneous trend allowing common time effect; (***M3***) Model without heterogeneous trend and allowing common time effect; (***M4***) Model without heterogeneous trend and ignoring common time effect. All of the Pedroni's statistics under different model specifications are reported in *Table 10*.

***<Table 10>***

Pedroni test's results include seven different statistics for the test of the null hypothesis of no co-integration in heterogeneous panels. The first group of tests is termed "within dimension". This group includes: The "panel v-stat" and the "panel rho-stat" are similar to the Phillips and Perron (1988) test; the panel pp-stat (panel non-parametric) and the "panel adf-stat" (panel parametric) are analogous to the single-equation ADF-test. The second group of tests calling "between dimensions" is comparable to the group mean panel tests of Im et al. (1997). The "between dimensions" tests include three tests: group rho-stat; group pp-stat; and group adf-stat.

Large negative values for all six deferent statistics (except panel v-stat) under the different models allow the rejection of the null hypothesis of no co-integrated relationship among the variables in question at the 1% significance level. We can therefore point out the long-run co-integrated relationship among the variables in *Equation 1*.

### 3.4. Panel causality tests

The previous section concluded the presence of a co-integrating relationship among the variables studied, but has not yet did not investigate concretely the possible effects of trade integration on intra-regional income disparities of the ASEAN zone. We use, therefore, two different approaches - OLS estimation and General Method of Moments (GMM) developed by Arellano and Bond (1991) - to tackle this issue.

#### 3.4.1. OLS Estimation

Table 11 reports the results of OLS estimations. The first column of Table 11 reports the results of estimation controlling only for the relationship between intra-regional exports flows and intra-regional disparities. The subsequent columns present the results of regression with an augmented set of explanatory variables. Column 2 reports the results of estimation controlling for the interaction term of intra-regional imports flows variable.

Column 3 and 4 show the results of regression when adding the interaction term of intra-regional FDI inflows and outflows. The influence of the *control* variable is reported in the 6th row. The 7th through the 9th rows present the impact of three different dummies, which are included in all regressions, on intra-regional income disparities.

***< Table 11>***

Firstly, in all above specifications, intra-regional exports variable maintain negative and statistically significant coefficient. This means that an increase in intra-regional exports will decrease intra-regional disparities among ASEAN member states. Inclusion of additional independent variables such as intra-regional imports, intra-regional FDI inflows and outflows also significantly affect our dependent variable – intra-regional income disparities. While the estimated coefficient of intra-regional imports is negative and significant, the coefficients at interaction terms of intra-FDI inflows and outflows have both positive and significant values. These results support that intra-regional FDI in/out flows has a negative effect on progress of reducing income disparities among ASEAN countries: a rise in intra-regional FDI causes an increase in income disparities. This issue may be explained by a concentration of intra-regional FDI in some member states since investors compare the investment climate among different states. In this case, investors pay more attention to the country that has a comparative advantage in infrastructure and in accessibility to administrative functions. In fact, turning to Table 7, we can observe that in 2007, 89.23% of intra-regional FDI came into the four older ASEAN countries (including Indonesia, Thailand, Malaysia and Singapore), while only 10.77% of intra-regional FDI is invested in the rest. This imbalance widened the intra-ASEAN income disparities, since FDI is one of the most important determinants of economic growth.

Next, we investigate the effects of three dummy variables on income disparities variable. On one hand, the results show that, in the financial crisis period, income disparities tended to reduce. This result is consistent with our descriptive statistics. On the other hands, negative and significant values of WTO and ASEAN dummies allow us concluding that ASEAN countries benefit from accessing to the WTO and also to ASEAN community. Becoming a member of ASEAN or WTO helps an individual country narrow its development gaps with other member states.

Finally, our control variable generally has significant impact on intra-regional disparities, and its impact seems to be homogeneous in all model specifications. Yet still our results may suggest its role in determining cross country differences of economic growth. The control variable - ICRG country risk rating (proxy for institutions, higher rating means lower risk) appears in all cases to be significant, and their slope coefficients are usually negative. This result suggests that an increase in ICRG score meaning a decrease in country risk may reduce income disparity among ASEAN country members.

### 3.4.2. *GMM Estimation*

The results of the OLS estimation cannot be taken as conclusive evidence since OLS method may produce biased and inconsistent estimates. Therefore, in the next step we apply the General Method of Moments (GMM) developed by Arellano and Bond (1991), which can help reduce the estimation bias and control for problems often associated with cross-sectional estimators such as some unobserved problems concerning sector-specific and time-specific effects, and endogeneity in explanatory variables. A brief outline of the GMM estimation is given below.

First, a time-stationary vector auto-regression (VAR) model is constructed as follows:

$$Y_{it} = \alpha_0 + \sum_{j=1}^{m} \alpha_j Y_{it-j} + \sum_{j=1}^{m} \delta_j X_{it-j} + f_{yi} + u_{it} \qquad (2)$$

where $Y_{it}$ and $X_{it}$ are the co-integrated variables, *i* = 1,….., n represents cross-sectional panel members, $u_{it}$ is error terms. This model differs from the standard causality model in that it adds individual fixed effects $f_{yi}$ for each panel member *i*. In Equations 2, the lagged dependent variables are correlated with the error term $u_{it}$, including the fixed effects. Hence, Ordinary Least Squares (OLS) estimates of the above model will be biased. The remedy is to remove the fixed effects by differencing. However, differencing introduces a simultaneous problem because lagged endogenous variables will be correlated with the new differenced error term. In addition, heteroscedasticity is expected to be present because, in the panel data, heterogeneous errors might exist with different panel members. To deal with these problems, instrumental variable procedure is traditionally used in estimating the model, which produces consistent estimates of the parameters. In this case, GMM method proposed by Arellano and Bond

(1991) has been shown to produce more efficient and consistent estimators compared with other procedure.

***< Table 12>***

Table 12 presents results of GMM estimation. The first two columns are identical to the first two columns from Table 11. The coefficient at the interaction term of intra-regional exports and imports remains negative and significant at least 5% significance level in all two specifications. Interestingly, that after instrumentation, the coefficient at the interaction term of intra-regional FDI inflows and outflows remains positive but becomes insignificant. This result suggests that intra-regional FDI does not affect on ASEAN income disparities. On the other hand, for the control variable and the three dummies we observe the same results as the results of OLS estimation.

In the lower part of Table 12, we report weak instrument test suggested by Stock and Yogo (2002), partial R squared measure suggested by Shea (1997) as well as Hansen/Sargan test of over-indentifying restrictions. The first two stage regressions results suggest that our excluded instruments are highly correlated with the endogenous variables. The F statistics from these two regressions are around 15.45 and 17.12, which are above the rule of thumb value of 10 proposed by Yogo and Stock for weak instrument test in the presence of one endogenous variable. The Cragg-Donald statistic, which is suggested by Stock and Yogo in the presence of several endogenous regressors in the regression, is also reported. Both tests reject the null hypothesis of weak instrument.

Besides, in order to make sure that our choice of instruments was ideal, we test for the over-identifying restrictions using Sargan test[8], which is common test of the validity of instrumental variables used in estimation. The hypothesis being tested is that the instrumental variables are uncorrelated with residuals, and therefore may be used in estimation. The statistic is asymptotically distributed chi-squared if the null hypothesis is true. The Sargan/Hansen test does not reject null hypothesis at least 10% level of significance in two first regressions. This implies that the instruments (Exports and Imports variables) satisfy the required orthogonality conditions.

In sum, the above results have demonstrated that the launch of intra-ASEAN trade integration produces positive economic effects on reducing income disparities among

[8] Null hypothesis of Sargan test is that the overidentifying restrictions are valid

the member states. In detail, a rise of 1% in intra-regional exports and of 1% in intra-regional imports decreases intra-regional income disparities around of 0.1% and 0.07%. This positive effect allows us explaining why the intra-regional trade integration efforts have been gathering momentum in ASEAN particularly since the economic crisis in 1997. As noted in ASEAN (2008), the end goal of fostering economic integration in ASEAN is to establish an effective ASEAN Economic Community which will, by 2015, transform ASEAN "into a region with free movement of goods, services, investment, skilled labor, and freer flow of capital". The main objective of ASEAN economic integration is that by the removal of all man-made barriers to flows of produced and tradable goods and services, resources and ideas, their better allocations is achieved and therefore they are used with greater efficiency and provide greater total benefits. A single market in ASEAN, where producers will benefit from better supply or resources and ability to serve larger market, while consumers will have enjoy greater variety and lower prices for consumption, is the basic element of economic community. It will be achieved once barriers that now restrict flows of goods, services and investment and capital as well as manpower are fully removed.

Turning to the effect of intra-regional FDI on intra-regional disparities, results are ambiguous. According the OLS estimation, intra-regional FDI affect negatively income disparities among member states, this means that an increase in intra-FDI extends intra-regional income gaps. While GMM results show that the coefficient of the interaction term of intra-FDI inflows and outflows is always positive but stays insignificant for all regressions. In sum, we do not find robust relationship between intra-regional FDI and intra-regional disparities.

**4. Does intra-ASEAN trade discourage extra-ASEAN trade?**

The above section discussed creation effect of regional trade integration through reducing income disparities among ASEAN member states. We know however that another possible economic effect of regional trade integration is to escalate trade diversion. This means that preferential treatment for intra-regional trade may discourage member states from importing efficient products from non-member states and encourage them to import less efficient goods from other members.

With regard to the case of ASEAN, we perform an additional GMM to resolve the following question "*Does ASEAN intra-regional trade really matter for reducing extra-*

*regional trade?"*. To do this, we use two sets of data. The first one consists of annual aggregate data of intra-regional exports and imports of the ASEAN zone from 1995 to 2007. The second set of data contains annual aggregate data of exports and imports flows among the ASEAN members and the rest of the world. In addition, to reinforce our empirical contribution, we also test for the possible effects of intra-regional trade flows on extra trade flows between the ASEAN countries and its five important partners: the United States; Japan; China excluding Hong Kong; Korea; Australia and New Zealand. In the Appendix A, we present data sources as well as estimated variables in our GMM models. For each regression, we include ASEAN and crisis dummies and FTA dummy instead of WTO dummy. The FTA dummy takes care of the effect of FTA on extra-trade flows between ASEAN and its country partners. *Appendix C* presents our GMM results. Following the GMM results, the relationship between ASEAN intra-trade and extra-trade is resumed as below:

**Table 13: Relationship between intra-regional trade and extra-regional trade in ASEAN**

| Extra-regional trade flows | Country partners | Intra-regional trade flows | |
|---|---|---|---|
| | | Intra-regional exports | Intra-regional imports |
| Exports to | Rest of the world | No | No |
| Imports from | | No | No |
| Exports to | United States | No | No |
| Imports from | | No | Yes/Positive |
| Exports to | Japan | Yes/Positive | No |
| Imports from | | No | Yes/Positive |
| Exports to | China | No | No |
| Imports from | | No | Yes/Positive |
| Exports to | Korea | No | No |
| Imports from | | No | No |
| Exports to | Australia & | No | No |
| Imports from | New Zealand | Yes/Positive | No |

The results show that no trade-diversion occurred in all regressions, meaning that intra-regional trade flows do not decrease trade flows between the ASEAN zone and non-

member countries. About this statement, some considerations must be made. First, non-member countries play an important role for the growth of international trade of ASEAN member states. Therefore, besides increasing intra-regional trade flows among the member states, ASEAN countries have to maintain and promote their corporation in international trade with such important partners such as the U.S, Japan, China, Korea, Australia and New Zealand. Second, ASEAN has become one of the most important destinations of FDI from developed countries, in particular from the U.S and Japan. Objective of foreign investors is to benefit the investment environment for producing and then use the ASEAN countries as a platform for selling their products to third-country market even to domestic market in the home FDI countries. Therefore, extra-ASEAN trade flows do not depend on intra-ASEAN trade flows.

Furthermore, some curious results about trade-creation were presented. Basing on GMM estimation, we observe some positive and significant linkages between intra-regional and extra-regional trade, for example: between intra-exports and imports to Australia and New Zealand, between intra-imports and imports from China…etc. These results suggest an open question concerning other economic determinants, which can influence directly or indirectly the relationship between intra-ASEAN trade and extra-ASEAN trade. This question may be resolved by using disaggregated data at the economic sectors level, by adding other controlling variables and by performing other econometrical tests. We leave this issue for further research.

## 5. Concluding Remarks

In this paper, we made an attempt to provide answers to the question of whether progress of trade integration matters for reducing intra-regional disparities among ASEAN member states. We use ASEAN annual panel data for the period 1995 - 2007 by means of panel co-integration techniques developed by Pedroni (1999). We have also extended our empirical research to investigate the possible linkage between intra-ASEAN trade and extra-ASEAN trade by employing the GMM model. Our working provides evidence of a number of statistically major findings.

First, the econometrical results show that intra-regional trade, which is captured by intra exports and intra imports flows, is appropriate as an indicator of the progress of reducing income disparities in the ASEAN zone. Moreover, a high intra trade ratio reported in this

paper means that trade among ASEAN member states is active and that they have close interrelationships. However, basing on regional panel data, our result may not mean that these economic benefits are equally available to all ASEAN countries, since the impact of trade integration on income disparities can vary from country to country. At this point, it is important to raise a question about whether our findings at the ASEAN regional level are also applicable at the national level. We leave this issue for the next research.

Second, GMM estimation allows us concluding that a rise in intra-regional trade does not decrease trade flows between the ASEAN zone and non-member countries. In other words, ASEAN trade integration does not cause the trade diversion effect on non-member states.

Finally, our results are inconclusive about the impact of intra-regional FDI on regional intra-regional income disparities. One possible interpretation of our results could be that intra-regional FDI affect intra-ASEAN income disparities mostly indirectly via their impacts on intra-regional exports and imports. Although, at this sight, further analyses are needed before any firm conclusions can be reached.

For conclusion, our major finding has demonstrated that the launch of regional trade integration produces positive economic effects on the entire region by reducing income disparities. Deepening of trade integration in the ASEAN zone should be an important and permanent ingredient of regional policy for the purpose of narrowing regional disparities.

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## Appendix A: Data Sources

| | |
|---|---|
| Exports from an ASEAN member to the ASEAN zone | Asian Development Bank (ADB); ASEAN Secretariat; UN comtrade Database |
| Imports to an ASEAN member from the ASEAN zone | Asian Development Bank (ADB); ASEAN Secretariat; UN comtrade Database |
| Exports from an ASEAN member to the rest of the World | ASEAN Secretariat; United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) |
| Imports to an ASEAN member from the rest of the World | ASEAN Secretariat; United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) |
| Exports from an ASEAN member to: the U.S; Japan; Korea; China (excluding Hong Kong); Australia and New Zealand | ASEAN Secretariat; United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) |
| Imports to an ASEAN member from: the U.S; Japan; Korea; China (excluding Hong Kong); Australia and New Zealand | ASEAN Secretariat; United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) |
| FDI flows into an ASEAN member from the ASEAN zone | Asian Development Bank (ADB); ASEAN Secretariat; United Nations Conference on Trade and Development (UNCTAD) |
| FDI flows into the ASEAN zone from an ASEAN member | Asian Development Bank (ADB); ASEAN Secretariat; United Nations Conference on Trade and Development (UNCTAD) |
| Gross Domestic Product by ASEAN member states | United Nations Statistics Division |
| Real Gross Domestic Product in terms of PPP | World Development Indicators |
| Population by ASEAN member states | United Nations Statistics Division |

## APPENDIX B: The International Country Risk Guide (ICRG) Risk Components

In total, there are 22 risk components in the ICRG System, which are as follows:

**Political Risk Components**

- Government Stability
- Socioeconomic Conditions
- Investment Profile
- Internal Conflict
- External Conflict
- Corruption
- Military in Politics
- Religious Tensions
- Law and Order
- Ethnic Tensions
- Democratic Accountability
- Bureaucracy Quality

**Financial Risk Components**

- Foreign Debt as a Percentage of GDP
- Foreign Debt Service as a Percentage of XGS
- Current Account as a Percentage of XGS
- Net Liquidity as Months of Import
- Cover Exchange Rate Stability

**Economic Risk Components**

- GDP per Head of Population
- Real Annual GDP Growth
- Annual Inflation Rate
- Budget Balance as a Percentage of GDP
- Current Account Balance as a Percentage of GDP

## Appendix C: Intra – Trade and Extra Trade relationship / GMM Estimations

| ASEAN Extra-Trade with | INDEPENDENT VARIABLES | DEPENDENT VARIABLES | | | | | |
|---|---|---|---|---|---|---|---|
| | | Intra_EX | Intra_IM | ASEAN_DU | FTA_DU | CRI_DU | Constant |
| **Rest of the World** | **Extra_EX** | 0.085031 | | 0.1220634*** | | -0.04665*** | 0.0388822*** |
| | | (0.0375392) | | (0.0440656) | | (0.0127988) | (0.0032406) |
| | | 00.0556262 | 00.0727678 | 0.1291803*** | | -0.0498974*** | 0.0375827*** |
| | | (00.0376813) | (00.0302481) | (0.0425248) | | (0.0124498) | (0.0032507) |
| | **Extra_IM** | | -0.0241623 | 0.1831958 | | -0.0098297 | 0.0293672*** |
| | | | (0.1238781) | (0.1865433) | | (0.0513844) | (0.0090215) |
| | | 0.2187752 | -0.081904 | 0.0626935 | | 0.0021968 | 0.0229086*** |
| | | (0.1257108) | (0.1202716) | (0.1679736) | | (0.0497531) | (0.0096864) |
| **USA** | **EX_USA** | -0.0486459 | | 0.1366381** | | -0.0869091*** | 0.0187083*** |
| | | (0.0447905) | | (0.0528138) | | (0.0144438) | (0.0027315) |
| | | -0.0388111 | -0.0251155 | 0.142477** | | -0.0860886*** | 0.019405*** |
| | | (0.0460546) | (0.0317649) | (0.0518718) | | (0.0145128) | (0.0029571) |
| | **IM_USA** | | 0.4591901*** | 0.1501013** | | -0.0010555 | -0.0120654** |
| | | | (0.0799991) | (0.0788217) | | (0.0325878) | (0.0055627) |
| | | 0.0354431 | 0.4425954*** | 0.1494530*** | | -0.0014977 | -0.0127678* |
| | | (0.1084742) | (0.0817485) | (0.0773356) | | (0.0326469) | (0.0066136) |
| **Japan** | **EX_Japan** | 0.1389547** | | 0.1585334** | 0.0890611*** | -0.0154426 | 0.0014693 |
| | | (0.0631616) | | (0.0719059) | (0.0310845) | (0.0225762) | (0.0052251) |
| | | 0.1362673** | 0.0169328 | 0.1583849** | 0.0862489*** | -0.0142933 | 0.001277 |
| | | (0.0638613) | (0.0521475) | (0.0717208) | (0.0319972) | (0.0228141) | (0.0052688) |
| | **IM_Japan** | | 0.2066334** | 0.0979997 | 0.0593422 | -0.0184959 | -0.0046038 |
| | | | (0.0952251) | (0.1504099) | (0.0532539) | (0.0386035) | (0.0087983) |
| | | 0.2224249 | 0.1669296* | -0.1056051 | 0.039383 | -0.0091058 | -0.0091058 |
| | | (0.0954446) | (0.0894528) | (0.1322009) | (0.0514149) | (0.0085204) | (0.0085204) |
| **China (Excluded Hong Kong)** | **EX_China** | 0.0614665 | | 0.8085755*** | -0.0400677 | -0.0965001** | 0.0582489*** |
| | | (0.2138462) | | (0.2804127) | (0.1172732) | (0.0845212) | (0.0201201) |
| | | 0.1889959 | -0.2279926 | 0.7172393*** | -0.0360817 | -0.0899838** | 0.0664295*** |
| | | (0.2220472) | (0.2013039) | (0.2755647) | (0.1177326) | (0.0852478) | (0.0216841) |
| | **IM_China** | | 0.2214051*** | 0.4414992*** | 0.1092014** | -0.0492602** | 0.0451985 |
| | | | (0.0798404) | (0.1211933) | (0.0505774) | (0.034924) | (0.0089712) |
| | | 0.1289805 | 0.1917434** | 0.3345765*** | 0.1071174** | -0.0438178 | 0.0421963*** |
| | | (0.0834994) | (0.0789542) | (0.1099736) | (0.0486856) | (0.0336589) | (0.0088337) |
| **Korea** | **EX_Korea** | -0.2368937 | | -0.1736116 | -0.0338015 | -0.0580053* | 0.0792494*** |
| | | (0.2099928) | | (0.2735354) | (0.1040722) | (0.0834635) | (0.01737) |
| | | -0.3064885 | 0.2938428 | -0.1592941 | -0.1010703 | -0.077092* | 0.0770045 |
| | | (0.2151996) | (0.203292) | (0.2692599) | (0.1134148) | (0.0844379) | (0.0174021) |
| | **IM_Korea** | | -0.0211101 | 0.2572828** | 0.129456** | -0.0344486** | 0.023256*** |
| | | | (0.0941219) | (0.1292115) | (0.054376) | (0.0394828) | (0.0073124) |
| | | 0.0256224 | -0.1054487 | 0.2841696** | 0.1404452** | -0.0317516* | 0.0258447*** |
| | | (0.100079) | (0.0921099) | (0.1300966) | (0.0548499) | (0.0396589) | (0.0077759) |
| **Australia & New Zealand** | **EX_AN** | 0.0963255 | | 0.033683*** | | -0.0152557* | 0.0782436*** |
| | | (0.2499754) | | (0.3851377) | | (0.0991693) | (0.0184455) |
| | | 0.1293225 | -0.1659608 | 0.168694** | | -0.0024233* | 0.0851893*** |
| | | (0.2597383) | (0.2320477) | (0.3813648) | | (0.1002575) | (0.0205786) |
| | **IM_AN** | | 0.0126872 | 0.9814099*** | | -0.020635** | 0.0284448*** |
| | | | (0.1122649) | (0.1957125) | | (0.0513562) | (0.0095779) |
| | | 0.4657273*** | -0.1247096 | 0.837569*** | | -0.0082433** | 0.0203002** |
| | | (0.1295544) | (0.1024171) | (0.1792203) | | (0.0469249) | (0.0091824) |

*Robust standard errors in parentheses. *** (**,*): Rejection of the null hypothesis at the 1%, 5% and 10% significance level respectively.*

**Table 1: Real GDP growth rates of ASEAN countries**

| ASEAN countries | 1980-1990 | 1991-1995 | 1996-2000 | 2001-2005 | 2006-2007 |
|---|---|---|---|---|---|
| Brunei Darussalam | 0.1 | 1.6 | 2.6 | 2.1 | 2.8 |
| Cambodia | 8.6 | 6.5 | 7.2 | 9.4 | 10.5 |
| Indonesia | 5.4 | 7.8 | 1.0 | 4.7 | 5.9 |
| Lao PDR | 5.6 | 6.4 | 6.2 | 6.3 | 8.2 |
| Malaysia | 6 | 9.5 | 4.9 | 4.8 | 6.1 |
| Myanmar | 1.3 | 5.9 | 8.3 | 12.9 | 9.1 |
| Philippines | 1.7 | 2.2 | 4.0 | 4.5 | 6.4 |
| Singapore | 7.3 | 9.0 | 6.5 | 4.3 | 8.0 |
| Thailand | 7.9 | 8.6 | 0.6 | 5.1 | 5.0 |
| Vietnam | 5.9 | 8.2 | 7.0 | 7.5 | 8.3 |
| ASEAN | 4.7 | 6.6 | 4.8 | 6.1 | 7.0 |
| ASEAN5 | 5.2 | 7.4 | 3.4 | 4.7 | 6.2 |
| BCLMV | 0.5 | 6.7 | 7.2 | 9.0 | 9.0 |

*Source: Calculated from United Nation Division Statistics database*
*Notes: ASEAN5 covers Indonesia, Malaysia, Philippines, Singapore and Thailand*
*BCLMV stands for Brunei Darussalam, Cambodia, Lao PDR, Myanmar and Vietnam*

**Table 2: ASEAN's exports to country destination (%)**

| DESTINATION | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***World*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** |
| USA | 18.1 | 18.4 | 17.8 | 18.1 | 19.6 | 18.0 | 19.1 | 17.1 | 15.2 | 14.0 | 12.8 | 13.5 | 14.2 | 14.7 | 13.6 |
| EU 15 | 13.5 | 13.1 | 14.3 | 14.2 | 12.9 | 12.8 | 15.2 | 14.6 | 13.7 | 12.3 | 11.9 | 12.5 | 13.9 | 15.4 | 18.2 |
| Japan | 13.4 | 12.8 | 13.8 | 13.1 | 11.7 | 9.6 | 10.3 | 11.7 | 11.7 | 10.1 | 10.5 | 11.5 | 10.6 | 11.0 | 11.0 |
| China | | | | | | | | | | | | | | | |
| Mainland | 2.0 | 2.0 | 2.0 | 2.3 | 2.6 | 2.6 | 2.6 | 3.3 | 3.5 | 4.4 | 5.6 | 7.0 | 7.9 | 9.2 | 10.0 |
| Hong Kong | 0.0 | 0.0 | 0.0 | 3.2 | 5.6 | 4.5 | 4.6 | 5.1 | 4.9 | 5.1 | 6.0 | 5.5 | 6.5 | 6.9 | 7.3 |
| Taiwan | 2.7 | 2.8 | 2.8 | 3.4 | 3.5 | 1.9 | 2.4 | 2.4 | 0.9 | 4.2 | 2.9 | 3.2 | 3.6 | 4.2 | 5.2 |
| Republique of Korea | 2.6 | 2.6 | 2.8 | 2.9 | 3.0 | 2.2 | 3.0 | 3.4 | 3.6 | 3.6 | 3.6 | 3.6 | 3.8 | 3.8 | 4.1 |
| Australia | 1.6 | 1.7 | 1.7 | 1.9 | 1.8 | 2.0 | 2.1 | 2.1 | 2.1 | 2.2 | 2.4 | 2.9 | 3.0 | 3.3 | 3.8 |
| New Zealand | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 1.5 | 0.4 | 0.4 | 0.4 | 0.5 |
| Brunei Darussalam | 2.1 | 2.0 | 1.8 | 4.8 | 1.4 | 0.9 | 1.3 | 0.7 | 0.9 | 1.0 | 1.0 | 0.9 | 0.2 | 0.2 | 0.2 |
| Cambodia | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | 0.1 | 0.4 | 0.1 | 0.2 | 0.3 | 0.3 |
| Indonesia | 1.1 | 1.2 | 1.4 | 1.7 | 1.5 | 1.3 | 1.3 | 1.6 | 1.4 | 1.6 | 1.7 | 2.1 | 4.8 | 4.8 | 5.6 |
| Lao PDR | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 |
| Malaysia | 3.8 | 4.1 | 4.0 | 4.5 | 4.0 | 3.6 | 3.4 | 3.7 | 3.7 | 3.9 | 3.0 | 4.7 | 6.7 | 7.1 | 7.3 |
| Myanmar | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 |
| The Philippines | 0.8 | 0.9 | 0.8 | 1.2 | 1.4 | 1.2 | 1.2 | 1.2 | 1.1 | 1.3 | 1.3 | 1.5 | 1.5 | 1.6 | 1.9 |
| Singapore | 8.1 | 8.3 | 7.9 | 8.3 | 8.5 | 6.6 | 7.2 | 7.7 | 7.0 | 6.9 | 6.5 | 6.7 | 6.3 | 6.5 | 6.5 |
| Thailand | 2.4 | 2.6 | 2.8 | 3.0 | 2.3 | 1.5 | 2.2 | 2.4 | 2.4 | 2.4 | 2.6 | 2.9 | 3.2 | 3.4 | 3.5 |
| Vietnam | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.0 | 1.7 | 2.0 |
| ***ASEAN*** | ***18.9*** | ***19.6*** | ***19.3*** | ***23.9*** | ***19.6*** | ***15.7*** | ***17.5*** | ***18.0*** | ***17.7*** | ***18.1*** | ***17.4*** | ***19.8*** | ***23.4*** | ***26.0*** | ***27.9*** |

*Source: Author's calculate from ASEAN Trade Statistics database (2005), UNESCAPE database and ADB database (2008)*

**Table 3: ASEAN's imports from country source (%)**

| DESTINATION | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| World | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.1 | 100.2 | 100.3 |
| USA | 14.6 | 14.5 | 14.3 | 15.4 | 16.8 | 15.9 | 14.4 | 12.6 | 12.4 | 11.1 | 11.8 | 10.9 | 8.4 | 8.2 | 8.3 |
| EU 15 | 13.7 | 14.3 | 14.3 | 16.6 | 13.9 | 10.4 | 10.9 | 10.2 | 10.8 | 10.2 | 10.2 | 10.3 | 11.3 | 12.6 | 14.9 |
| Japan | 24.1 | 24.9 | 24.2 | 21.2 | 19.4 | 14.6 | 16.1 | 17.0 | 14.4 | 13.5 | 13.8 | 14.4 | 12.0 | 11.0 | 12.1 |
| China | | | | | | | | | | | | | | | |
| (Mainland) | 1.9 | 2.1 | 2.2 | 2.7 | 3.7 | 3.5 | 3.9 | 4.7 | 4.7 | 5.9 | 6.7 | 8.6 | 8.7 | 10.2 | 12.9 |
| (Hong Kong) | 0.0 | 0.0 | 0.0 | 1.6 | 2.4 | 2.0 | 2.2 | 2.2 | 2.0 | 2.1 | 1.9 | 1.8 | 2.8 | 0.3 | 0.2 |
| Taiwan | 3.5 | 3.5 | 3.5 | 3.7 | 4.0 | 1.8 | 2.3 | 2.2 | 1.9 | 3.2 | 3.7 | 3.9 | 4.5 | 5.1 | 6.3 |
| Republique of Korea | 3.1 | 3.3 | 3.5 | 3.9 | 4.0 | 2.9 | 3.8 | 3.9 | 3.6 | 3.8 | 3.7 | 4.1 | 4.2 | 4.5 | 5.1 |
| Australia | 2.3 | 2.4 | 2.2 | 2.5 | 2.2 | 1.8 | 1.9 | 2.3 | 2.6 | 1.8 | 1.8 | 1.8 | 1.6 | 1.7 | 1.9 |
| New Zealand | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 |
| Brunei Darussalam | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 |
| Cambodia | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Indonesia | 2.2 | 2.2 | 2.0 | 2.4 | 2.4 | 2.9 | 2.6 | 2.8 | 2.6 | 2.5 | 2.5 | 2.6 | 2.4 | 2.6 | 3.0 |
| Lao PDR | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 |
| Malaysia | 5.6 | 5.6 | 5.7 | 6.6 | 6.3 | 6.7 | 6.9 | 6.3 | 5.7 | 5.6 | 6.3 | 6.3 | 6.1 | 6.3 | 6.6 |
| Myanmar | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.3 | 0.3 | 0.7 | 0.6 | 0.4 | 0.5 | 0.5 |
| The Philippines | 0.3 | 0.5 | 0.7 | 0.9 | 0.9 | 1.2 | 1.6 | 1.6 | 1.4 | 1.4 | 1.6 | 1.4 | 1.2 | 1.2 | 0.6 |
| Singapore | 8.0 | 10.2 | 9.8 | 10.0 | 9.8 | 8.1 | 9.2 | 9.8 | 8.9 | 8.7 | 8.5 | 8.7 | 11.7 | 12.5 | 13.7 |
| Thailand | 2.6 | 3.0 | 3.3 | 3.5 | 3.7 | 2.6 | 3.1 | 3.4 | 3.4 | 3.4 | 3.9 | 4.2 | 3.5 | 3.6 | 4.2 |
| Vietnam | 0.2 | 0.2 | 0.2 | 0.4 | 0.3 | 0.4 | 0.4 | 0.3 | 0.4 | 0.3 | 0.3 | 0.4 | 1.0 | 1.0 | 1.1 |
| ***ASEAN*** | ***19.1*** | ***22.0*** | ***21.9*** | ***23.9*** | ***23.6*** | ***22.0*** | ***23.9*** | ***24.6*** | ***22.8*** | ***22.5*** | ***24.2*** | ***24.3*** | ***26.8*** | ***28.2*** | ***30.1*** |

*Source: Author's calculate from ASEAN Trade Statistics database (2005), UNESCAPE database and ADB database*

**Table 4: Share of intra-regional trade by ASEAN member states (%)**

| Member State | EXPORTS | | | | IMPORTS | | | |
|---|---|---|---|---|---|---|---|---|
| | 1993-1995 | 1996-2000 | 2001-2005 | 2006-2007 | 1993-1995 | 1996-2000 | 2001-2005 | 2006-2007 |
| Brunei Darussalam | 14.4 | 14.5 | 20.3 | 26.1 | 33.0 | 48.4 | 45.7 | 58.6 |
| Cambodia | 0.0 | 1.4 | 5.2 | 4.3 | 0.0 | 7.7 | 59.3 | 50.5 |
| Indonesia | 14.2 | 17.4 | 17.2 | 15.8 | 10.0 | 16.6 | 28.2 | 52.1 |
| Lao PDR | 49.5 | 45.9 | 37.0 | 52.8 | 52.4 | 75.9 | 74.3 | 77.7 |
| Malaysia | 10.2 | 8.6 | 6.4 | 6.6 | 7.0 | 6.0 | 6.3 | 9.9 |
| Myanmar | 0.0 | 6.9 | 69.0 | 64.0 | 0.0 | 8.6 | 39.5 | 45.2 |
| The Philippines | 10.4 | 14.2 | 16.6 | 11.3 | 9.9 | 13.3 | 15.8 | 21.3 |
| Singapore | 28.0 | 25.3 | 22.4 | 29.1 | 25.8 | 23.8 | 20.3 | 18.2 |
| Thailand | 17.2 | 19.1 | 19.8 | 16.8 | 12.2 | 14.2 | 16.5 | 17.1 |
| Vietnam | 13.2 | 12.4 | 9.6 | 15.8 | 18.2 | 14.3 | 11.9 | 24.1 |

*Source: Author's calculate from ASEAN Trade Statistics database (2005), UNESCAPE database and ADB database*

**Table 5: Inflow of foreign direct investment (Millions US$)**

| | 1990-1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***ASEAN*** | ***149956*** | ***24299.8*** | ***27545.8*** | ***29275.2*** | ***20523*** | ***22347.3*** | ***11498.8*** | ***21460.9*** | ***13472.4*** | ***18213.4*** | ***22862.4*** | ***45211.7*** | ***59663.9*** | ***73407.8*** |
| Brunei Darussalam | 117.2 | 582.8 | 653.6 | 701.7 | 573.3 | 747.6 | 549.2 | 526.4 | 1035.3 | 3123 | 212 | 2885 | 4335 | 2602 |
| Cambodia | 31.2 | 150.8 | 293.6 | 203.7 | 120.7 | 143.6 | 111.7 | 206.7 | 145.1 | 84 | 131.4 | 3812 | 4832 | 8673 |
| Indonesia | 1692.8 | 4346 | 6194 | 4677 | -356 | -2745 | -4550 | -1445.9 | 145.1 | -596.9 | 1894.5 | 8336 | 4913.8 | 6928.3 |
| Lao PDR | 22 | 95.1 | 159.8 | 86.3 | 45.3 | 51.5 | 33.9 | 83.3 | 25 | 19.5 | 16.9 | 27.7 | 187.4 | 323.5 |
| Malaysia | 4228 | 4178.2 | 5078.4 | 5136.5 | 2163.4 | 3895.3 | 3787.6 | 3548.8 | 3203.4 | 2473.2 | 4624.2 | 4063.6 | 6059.7 | 8401.2 |
| Myanmar | 173.1 | 277.2 | 310.4 | 387.2 | 314.5 | 253.1 | 254.8 | 330 | 152 | 251.5 | 213.5 | 235.9 | 427.8 | 257.7 |
| Philippines | 830.2 | 1478 | 1517 | 1222 | 2287 | 573 | 1241 | 1620.7 | 1542 | 491 | 688 | 1854 | 2345 | 2928 |
| Singapore | 5180.6 | 8787.7 | 8608 | 10746.1 | 63889 | 11803.2 | 5406.6 | 8608.8 | 4871 | 8969 | 11754 | 13928.6 | 24743.6 | 25317 |
| Thailand | 1974.5 | 2068 | 2335.9 | 3894.7 | 7314.8 | 6213 | 3366 | 5791.5 | 953.4 | 1949.3 | 1717.8 | 8048.1 | 9459.6 | 11238.1 |
| Viet Nam | 746.4 | 2336 | 2395 | 2220 | 1671 | 1412 | 1298 | 2190.6 | 1400 | 1450 | 1610 | 2020.8 | 2360 | 6739 |
| **FDI Share in GDP (%)** | | | | | | | | | | | | | | |
| ***ASEAN*** | ***3.6*** | ***4.7*** | ***5.0*** | ***5.1*** | ***3.9*** | ***4.1*** | ***2.0*** | ***3.6*** | ***2.2*** | ***2.6*** | ***3.7*** | ***6.1*** | ***7.6*** | ***8.8*** |
| Brunei Darussalam | 3.3 | 15.6 | 16.9 | 17.4 | 14.3 | 18.1 | 12.9 | 12.1 | 22.9 | 43.1 | 66.7 | 61.4 | 87.7 | 52.5 |
| Cambodia | 1.9 | 7.9 | 14.6 | 9.6 | 5.4 | 5.8 | 4.1 | 7.0 | 4.6 | 2.5 | 3.5 | 90.0 | 103.0 | 167.7 |
| Indonesia | 1.1 | 2.4 | 3.1 | 2.3 | -0.2 | -1.5 | -2.4 | -0.7 | 0.1 | -0.3 | 0.8 | 3.5 | 1.9 | 2.6 |
| Lao PDR | 2.3 | 8.1 | 12.7 | 6.4 | 3.2 | 3.4 | 2.1 | 4.9 | 1.4 | 1.0 | 0.8 | 1.3 | 8.0 | 12.8 |
| Malaysia | 7.7 | 5.8 | 6.4 | 6.1 | 2.8 | 4.7 | 4.2 | 3.9 | 3.3 | 2.4 | 4.3 | 3.5 | 5.0 | 6.5 |
| Myanmar | 3.0 | 4.0 | 4.2 | 5.0 | 3.9 | 2.8 | 2.5 | 2.9 | 1.2 | 1.7 | 1.3 | 1.3 | 2.0 | 1.2 |
| Philippines | 1.8 | 3.0 | 2.9 | 2.2 | 4.2 | 1.0 | 2.1 | 2.7 | 2.4 | 0.7 | 1.0 | 2.5 | 3.0 | 3.5 |
| Singapore | 11.9 | 15.5 | 14.0 | 16.1 | 9.7 | 16.8 | 7.0 | 11.4 | 6.2 | 11.0 | 13.2 | 14.6 | 24.0 | 22.8 |
| Thailand | 2.0 | 1.6 | 1.7 | 2.9 | 6.1 | 4.9 | 2.5 | 4.3 | 0.7 | 1.3 | 1.1 | 4.8 | 5.3 | 6.0 |
| Viet Nam | 9.9 | 24.3 | 22.8 | 19.6 | 13.9 | 11.2 | 9.7 | 15.3 | 9.1 | 8.8 | 9.0 | 10.5 | 11.3 | 29.8 |

*Source: Author's calculation from ADB database, ASEAN secretariat database (2005) and UNSD database*

## Table 6: FDI in ASEAN by investing countries

| Source Country | 1995 | | 1996 | | 1997 | | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mil. $ | % | Mil. $ | % | Mil. $ | % | Mil. $ | % | Mil. $ | % | Mil. $ | % | Mil. $ | % | Mil. $ | % | Mil. $ | % | Mil. $ | % |
| ASEAN countries | 4654.4 | 16.6 | 4271.8 | 14.3 | 5236 | 15.4 | 2731 | 12.3 | 1789 | 6.6 | 763.1 | 3.4 | 2495.4 | 13.4 | 3634.4 | 26.5 | 2301.8 | 12.5 | 2433 | 11.2 |
| REST OF THE WORLD | 23425 | 83.4 | 25643 | 85.7 | 28695 | 84.6 | 19433 | 87.7 | 25461 | 93.4 | 21909 | 96.6 | 16089 | 86.6 | 10070 | 73.5 | 16145 | 87.5 | 19371 | 88.8 |
| Asian NIEs | 2845.2 | 10.1 | 2242 | 7.5 | 3521 | 10.4 | 1930 | 8.7 | 1692 | 6.2 | 1459.8 | 6.4 | 1828 | 9.8 | 567.6 | 4.1 | 1558.9 | 8.5 | 2428 | 11.1 |
| China | 136.7 | 0.5 | 117.9 | 0.4 | 62.1 | 0.2 | 291.3 | 1.3 | 62.5 | 0.2 | -133.4 | -0.6 | 147.3 | 0.8 | -80.9 | -0.6 | 188.7 | 1.0 | 225.9 | 1.0 |
| India | 108.1 | 0.4 | 68.8 | 0.2 | 90.2 | 0.3 | 92.6 | 0.4 | 41.7 | 0.2 | 79.5 | 0.4 | 32.3 | 0.2 | 96 | 0.7 | 81.2 | 0.4 | 46.3 | 0.2 |
| Japan | 5649.3 | 20.1 | 5283.3 | 17.7 | 5230 | 15.4 | 3938 | 17.8 | 1688 | 6.2 | 455 | 2.0 | 1606.3 | 8.6 | 3366.2 | 24.6 | 2317.7 | 12.6 | 2538 | 11.6 |
| EU – 15 | 5049.6 | 18.0 | 7362 | 24.6 | 6334 | 18.7 | 5553 | 25.1 | 9806 | 36.0 | 13480 | 59.5 | 6006.5 | 32.3 | 4235.9 | 30.9 | 5230.4 | 28.4 | 5421 | 24.9 |
| Canada | 609.2 | 2.2 | 204.7 | 0.7 | 1111 | 3.3 | -207 | -0.9 | -14.2 | -0.1 | -397.6 | -1.8 | -555.4 | -3.0 | -191.7 | -1.4 | -10.7 | -0.1 | 92.1 | 0.4 |
| USA | 4318.4 | 15.4 | 5177.2 | 17.3 | 4950 | 14.6 | 3222 | 14.5 | 5932 | 21.8 | 7311.6 | 32.2 | 4569.4 | 24.6 | 357.6 | 2.6 | 1395.3 | 7.6 | 5052 | 23.2 |
| Australia | 534.9 | 1.9 | 325.1 | 1.1 | 245.6 | 0.7 | -302.2 | -1.4 | -935 | -3.4 | -302.8 | -1.3 | -95.1 | -0.5 | 202.6 | 1.5 | 181.1 | 1.0 | 392.5 | 1.8 |
| New Zealand | 35.4 | 0.1 | 31.2 | 0.1 | 29.1 | 0.1 | 25.3 | 0.1 | 80.2 | 0.3 | 43.1 | 0.2 | 14.7 | 0.1 | 53.7 | 0.4 | 88.5 | 0.5 | -1.9 | 0.0 |
| **Subtotal** | **28080** | **100** | **29915** | **100** | **33930** | **100** | **22163** | **100** | **27251** | **100** | **22672** | **100** | **18584** | **100** | **13705** | **100** | **18447** | **100** | **21804** | **100** |

*Source: ASEAN Secretariat (2005)*

*Notes: Asian NIEs include Hong Kong, South Korea and Taiwan (POC)*

## Table 7: Intra-ASEAN FDI Flows (Millions US$)

**FDI in ASEAN Member Countries (Host) from ASEAN**

| Year | 1995 | | 1996 | | 1997 | | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Host country | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) |
| Brunei Darussalam | 311.3 | 53.4 | 353.1 | 54.0 | 384.9 | 54.9 | 247.2 | 43.1 | 4.3 | 0.6 | 10.6 | 1.9 | 10.6 | 2.0 | 21.2 | 2.0 | 36.8 | 1.4 | 19.7 | 0.7 | 19.4 | 0.5 | 9.7 | 0.1 | 62.1 | 0.7 |
| Cambodia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37.2 | 18.0 | 8.5 | 5.9 | 19.9 | 0.7 | 31.9 | 1.1 | 129.2 | 3.1 | 155.5 | 2.0 | 271.2 | 2.9 |
| Indonesia | 608.3 | 14.0 | 193.3 | 3.1 | 272.5 | 5.8 | -38.4 | 10.8 | -427.8 | 15.6 | -232.6 | 5.1 | -240 | 16.6 | 1336.6 | 21.2 | 383.5 | 14.2 | 204.2 | 7.0 | 883.3 | 21.0 | 1353.9 | 17.0 | 1108.2 | 11.7 |
| Lao PDR | 6.5 | 6.8 | 102.6 | 64.2 | 64.6 | 74.9 | 28.3 | 62.5 | 31.4 | 61.0 | 13.7 | 40.4 | 3.1 | 3.7 | 7.9 | 31.6 | 3 | 0.1 | 7.8 | 0.3 | 6.7 | 0.2 | 10.6 | 0.1 | 100.4 | 1.1 |
| Malaysia | 1676.5 | 40.1 | 1475.8 | 29.1 | 2261.5 | 44.0 | 469.9 | 21.7 | 536 | 13.8 | 258.1 | 6.8 | 80 | 2.3 | 0 | 0.0 | 251.1 | 9.3 | 980.2 | 33.6 | 720.9 | 17.2 | 467.8 | 5.9 | 3809.3 | 40.1 |
| Myanmar | 96.7 | 34.9 | 228.6 | 73.6 | 323.3 | 83.5 | 153.9 | 48.9 | 41.2 | 16.3 | 74 | 29.0 | 67.4 | 20.4 | 25.1 | 16.5 | 24.3 | 0.9 | 9.3 | 0.3 | 38.4 | 0.9 | 71 | 0.9 | 40.4 | 0.4 |
| Philippines | 241.6 | 16.3 | 74.9 | 4.9 | 142.9 | 11.7 | 106.9 | 4.7 | 110.9 | 19.4 | 126.5 | 10.2 | 222.3 | 13.7 | 37.9 | 2.5 | 175.4 | 6.5 | 71.1 | 2.4 | 12.7 | 0.3 | -95.6 | -1.2 | 2.9 | 0 |
| Singapore | 1165.1 | 13.3 | 1206.7 | 14.0 | 941.6 | 8.8 | 794.6 | 12.4 | 632.1 | 5.4 | -78.8 | -1.5 | 423.4 | 4.9 | 773.6 | 15.9 | 647.3 | 24.0 | 658.7 | 22.6 | 1138.2 | 27.1 | 1165.5 | 14.7 | 994.4 | 10.5 |
| Thailand | 160.6 | 7.8 | 308.1 | 13.2 | 297.5 | 7.6 | 569.6 | 7.8 | 572 | 9.2 | 389 | 11.6 | 1650 | 28.5 | 1223 | 28.3 | 1060.4 | 39.2 | 688.7 | 23.6 | 1089.6 | 25.9 | 4626.5 | 58.2 | 2566.9 | 27.0 |
| Viet Nam | 378.3 | 16.2 | 328.7 | 13.7 | 547.2 | 24.6 | 398.7 | 23.9 | 289.3 | 20.5 | 202.4 | 15.6 | 241.5 | 11.0 | 200.4 | 14.3 | 100.4 | 3.7 | 242.9 | 8.3 | 164.7 | 3.9 | 181.9 | 2.3 | 546.3 | 5.7 |

**FDI in ASEAN from ASEAN Member Countries (Source)**

| Year | 1995 | | 1996 | | 1997 | | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOME country | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) | Value | (%) |
| Brunei Darussalam | 85.7 | 14.7 | 146.7 | 22.4 | 36.2 | 5.2 | 67.2 | 11.7 | 18.7 | 2.5 | 33.1 | 6.0 | 37.3 | 7.1 | 16.6 | 1.6 | -6.4 | -0.2 | 17.5 | 0.6 | 26.1 | 0.6 | -39.6 | -0.5 | -7.3 | -0.1 |
| Cambodia | 1.8 | 1.2 | 2.2 | 0.7 | 3.8 | 1.9 | 0.1 | 0.1 | 1.4 | 1.0 | 2.4 | 2.1 | 0.4 | 0.2 | -0.2 | -0.1 | 5.5 | 0.2 | 4.1 | 0.1 | 0.3 | 0 | 0.2 | 0 | 0.6 | 0 |
| Indonesia | 538.3 | 12.4 | 618.3 | 10.0 | 501.1 | 10.7 | 333.2 | -93.6 | 436.3 | -15.9 | 109.6 | -2.4 | 361.7 | -25.0 | 471.5 | 325.0 | 260 | 9.6 | 290.7 | 10.0 | 198.5 | 4.7 | 617.8 | 7.8 | 216.8 | 2.3 |
| Lao PDR | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0.6 | 1.2 | 9.8 | 28.9 | 0.2 | 0.2 | 0 | 0.0 | 0 | 0 | 1.1 | 0 | -0.2 | 0 | 41.6 | 0.5 | 8.3 | 0.1 |
| Malaysia | 769.5 | 18.4 | 713.8 | 14.1 | 623.8 | 12.1 | 578.6 | 26.7 | 327.2 | 8.4 | 87.2 | 2.3 | 205.2 | 5.8 | 423.4 | 13.2 | 614.4 | 22.7 | 663.3 | 22.8 | 1348.8 | 30.6 | 953.3 | 12. | 1088.5 | 11.5 |
| Myanmar | 3.9 | 1.4 | 2.2 | 0.7 | 7 | 1.8 | 0.5 | 0.2 | 2.4 | 0.9 | 5.5 | 2.2 | 3.7 | 1.1 | 12.8 | 8.4 | 7.8 | 0.3 | 7.2 | 0.2 | 12.9 | 0.3 | 38.4 | 0.5 | 66.2 | 0.7 |
| Philippines | 89.6 | 6.1 | 71.1 | 4.7 | 17.4 | 1.4 | -26.4 | -1.2 | -22.4 | -3.9 | 92.1 | 7.4 | 28.3 | 1.7 | -26.6 | -1.7 | -12.6 | -0.5 | 158.8 | 5.4 | 82.8 | 2.0 | 159.3 | 2 | 85.6 | 0.9 |
| Singapore | 2983.4 | 33.9 | 2394.9 | 27.8 | 3573 | 33.2 | 1620 | 25.4 | 897 | 7.6 | 641.9 | 11.9 | 1939.2 | 22.5 | 2413 | 49.5 | 1683.5 | 62.3 | 1593.4 | 54.7 | 2560.8 | 60.9 | 5869.1 | 73.9 | 7227.8 | 76.1 |
| Thailand | 181.4 | 8.8 | 312.9 | 13.4 | 472.1 | 12.1 | 155.7 | 2.1 | 123.7 | 2.0 | -225 | -6.7 | -82.7 | -1.4 | 259.8 | 27.2 | 143.9 | 5.3 | 171.3 | 5.9 | 28.7 | 0.7 | 301.8 | 3.8 | 668.1 | 7.0 |
| Viet Nam | 0.8 | 0.0 | 0.4 | 0.0 | 1.3 | 0.1 | 1.8 | 0.1 | 4.4 | 0.3 | 6.3 | 0.5 | 2.2 | 0.1 | 64.1 | 4.6 | 5.9 | 0.2 | 7 | 0.2 | 8.3 | 0.2 | 5 | 0.1 | 147.7 | 1.6 |
| ***TOTAL ASEAN*** | ***4656.4*** | | ***4271.8*** | | ***5235.7*** | | ***2730.8*** | | ***1789.3*** | | ***763.1*** | | ***2495.4*** | | ***3634.4*** | | ***2702*** | | ***2914.4*** | | ***4203.1*** | | ***7946.9*** | | ***9502.2*** | |

*Source: ASEAN FDI Database, ASEAN Secretariat*

## Table 8: LLC Unit root tests

| | VARIABLES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Level | | | | | | First Difference | | | | | |
| **Model** | **Income_DIS** | **EX_intra** | **IM_intra** | **inFDI_intra** | **outFDI_intra** | **Control** | **Income_DIS** | **EX_intra** | **IM_intra** | **inFDI_intra** | **outFDI_intra** | **Control** |
| | 1.93 | -1.93 | 2.44 | -1.09 | -1.58 | 1.24 | 5.46** | -5.79*** | -8.50*** | -7.77*** | -5.79*** | 4.71** |
| (1) | (2.51) | (-2.14) | (-3.46) | (-2.42) | (-2.35) | (1.98) | (2.41) | (-3.46) | (4.18) | (3.08) | (-2.41) | (2.56) |
| | 2.26 | -2.39 | -2.33 | -1.73 | -1.42 | 1.45 | -5.88*** | -6.83*** | -9.54*** | -6.73** | -5.37* | 4.87** |
| (2) | (2.64) | (-2.50) | (-3.20) | (-2.20) | (-2.68) | (2.05) | (2.53) | (-3.78) | (6.04) | (2.25) | (-2.99) | (3.01) |
| | 1.20 | -2.37 | -3.11 | 1.10 | -2.46 | 1.37 | 4.25** | 7.90*** | -7.51*** | -6.36** | 9.97*** | 5.25*** |
| (3) | (2.14) | (-3.64) | (-3.26) | (-2.14) | (-2.57) | (2.11) | (3.99) | (-7.57) | (-7.22) | (-1.58) | (9.39) | (3.34) |

*Value in parentheses is critical value. (1): Model with heterogeneous intercepts. (2): Model with heterogeneous intercepts and heterogeneous trend. (3): Model without heterogeneous intercepts. *** (**,*): Rejection of the null hypothesis at the 1%, 5% and 10% significance level respectively.*

## Table 9: IPS Unit root tests

| | Variables | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Level | | | | | | First Difference | | | | | |
| With common time effect | **Income_DIS** | **EX_intra** | **IM_intra** | **inFDI_intra** | **outFDI_intra** | **Control** | **Income_DIS** | **EX_intra** | **IM_intra** | **inFDI_intra** | **outFDI_intra** | **Control** |
| (1)[a] | 1.72 | -0.18 | 0.04 | -1.09 | -2.41 | 1.12 | -4.32*** | -2.26*** | -1.97* | -2.65* | 3.14*** | -3.76*** |
| (2)[b] | -1.01 | -2.09 | -1.58 | -1.12 | -1.75 | -1.45 | -3.86*** | 2.63** | 2.84** | -2.33*** | 2.10* | -3.45*** |
| Without common time effect | **Income_DIS** | **EX_intra** | **IM_intra** | **inFDI_intra** | **outFDI_intra** | **Control** | **Income_DIS** | **EX_intra** | **IM_intra** | **inFDI_intra** | **outFDI_intra** | **Control** |
| (1)[a] | 1.61 | -1.83 | -1.89 | -1.19 | -2.14 | 1.07 | -2.48*** | -2.32*** | -2.11** | -2.77*** | -2.89*** | -2.64*** |
| (2)[b] | 0.55 | -2.51 | -1.77 | -1.45 | -1.73 | -0.95 | 2.86** | -2.83** | -2.86** | -2.67** | -2.63*** | -2.89*** |

*(1): Model with heterogeneous intercepts. (2): Model with heterogeneous intercepts and heterogeneous trend. [a]: The critical value at 1%, 5% and 10% is -1.90, -2.02 and -2.24 respectively. [b]: The critical value at 1%, 5% and 10% is -2.54, -2.66 and -2.88 respectively.*

**Table 10: Pedroni panel co-integration tests**

| Test statistics | M1 | M2 | M3 | M4 |
|---|---|---|---|---|
| panel v-stat | -3.16 | -3.41 | -0.65 | -0.36 |
| panel rho-stat | -3.44 | -3.42 | -6.48 | -6.49 |
| panel pp-stat | -23.88 | -28.20 | -25.83 | -20.90 |
| panel adf-stat | -13.26 | -11.76 | -10.28 | -12.40 |
| group rho-stat | -7.89 | -6.91 | -4.92 | -4.75 |
| group pp-stat | -26.38 | -30.32 | -30.43 | -27.14 |
| group adf-stat | -14.98 | -11.96 | -11.27 | -15.53 |

**Table 11: Trade integration – Income disparities / OLS Estimation**

| VARIABLES | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Income_DIS | 0.0251444* | 0.0276838** | 0.0255948* | 0.017363* |
| | (0.0141273) | (0. 0139485) | (0.0139661) | (0.0038324) |
| EX_intra | -0.0764142*** | -0.072468*** | -0.0713279*** | -0.0684805*** |
| | (0.0086074) | (0.0086606) | (0.0086605) | (0.0084496) |
| IM_intra | | -0.0178349*** | -0.0200597** | -0.0162427** |
| | | (0.0081968) | (0.008312) | (0.0081626) |
| inFDI_intra | | | 0.0059655* | 0.0083391** |
| | | | (0.0004238) | (0.0041818) |
| outFDI_intra | | | | 0.0111207*** |
| | | | | (0.0038742) |
| Control | -0.036028** | -0.0401083** | -0.034879** | -0.0223741** |
| | (0.0154719) | (0.0153375) | (0.0157142) | (0.00158365) |
| DU_CRI | -0.0136166** | -0.0117929** | -0.0111284*** | -0.010259** |
| | (0.0040741) | (0.0040951) | (0.0041043) | (0.0039881) |
| ASEAN_Dummy | -0.049798*** | -0.0473826*** | -0.0463882*** | -0.0434083*** |
| | (0.0084061) | (0.0083447) | (0.008338) | (0.0081452) |
| WTO_Dummy | -0.0335181** | -0.0335181** | -0.039831*** | -0.0557323*** |
| | (0.0135006) | (0.0134398) | (0.01411) | (0.014751) |
| Constant | 0.7229859*** | 0. 752063*** | 0.7504121*** | 0.7395561*** |
| | (0.0235705) | (0.0267653) | (0.0266737) | (0.0261195) |
| R-square | 0.7772 | 0.7862 | 0.7900 | 0.8046 |

*Robust standard errors in parentheses. *** (**,*): Rejection of the null hypothesis at the 1%, 5% and 10% significance level respectively.*

## Table 12: Trade integration – Income disparities / GMM Estimation

| VARIABLES | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Income_DIS | 0.9047625*** | 0.8737221*** | 0.911665*** | 0.930483*** |
| | (0.0527979) | (0.1059083) | (0.0538852) | (0.052993) |
| EX_intra | -0.1021874*** | -0.076016** | -0.036449** | -0.0031717** |
| | (0.0006445) | (0.0072194) | (0.0068248) | (0.0066269) |
| IM_intra | | -0.0708929*** | -0.0311523** | -0.0404196** |
| | | (0.0042293) | (0.004198) | (0.0041021) |
| inFDI_intra | | | 0.001247 | 0.0020472 |
| | | | (0.002249) | (0.0022433) |
| outFDI_intra | | | | 0.0043138 |
| | | | | (0.0049918) |
| Control | -0.0120043** | -0.0101635** | 0.0121667* | 0.011214** |
| | (0.0083537) | (0.0092232) | (0.0086573) | (0.0084355) |
| DU_CRI | -0.0035017*** | -0.0060019** | -0.0035081** | -0.0032371* |
| | (0.0001442) | (0.0031152) | (0.0002171) | (0.0005279) |
| ASEAN_Dummy | -0.0162125*** | -0.091767*** | -0.0166169*** | -0.01655*** |
| | (0.005087) | (0.0055323) | (0.0052595) | (0.0051503) |
| WTO_Dummy | -0.0045622*** | -0.0063056** | -0.0041245** | -0.0028992** |
| | (0.0004298) | (0.0016394) | (0.0006947) | (0.0006842) |
| Constant | 0.7229859*** | 0.5063007*** | 0.0981435*** | 0.1870661*** |
| | (0.0235705) | (0.0006378) | (0.004039) | (0.000395) |
| R-square | 0.8944 | 0.8968 | 0.7772 | 0.8973 |
| Stock-Yogo F-statistics | 15.45 | 17.12 | 14.12 | 21.09 |
| Cragg-Donald F-statistics | 105.1 | 97.02 | 51.20 | 61.07 |
| Shea Partial R2 | 0.8146*** | 0.1609*** | 0.0029 | 0.0012 |
| Sargan/Hansen P_value | 0.0571 | 0.0474 | 0.5492 | 0.5441 |

*Robust standard errors in parentheses. *** (**,*): Rejection of the null hypothesis at the 1%, 5% and 10% significance level respectively.*