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Issues in Regional Economic Integration: Evidence from ASEAN Free Trade Area (AFTA)

by

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ABSTRACT

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ISSUES IN REGIONAL ECONOMIC INTEGRATION: EVIDENCE
FROM ASEAN FREE TRADE AREA (AFTA)

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This thesis explores three major issues, namely trade, FDI and growth, and aims to
investigate the effect of the formation of ASEAN free trade area (AFTA) as well as the
expansion of ASEAN membership. Deriving from a variety theoretical framework and
empirical analysis, this thesis aims to highlight issues related to regional economic
integration arising from the ASEAN experience.

Chapter 2 empirically investigates the effect of trade creation and trade diversion in
ASEAN. Using the gravity model, this study examines whether the formation of the
ASEAN Free Trade Area (AFTA) and the enlargement of ASEAN membership resulted
in an increase in intra-and extra-regional trade for the period 1984 to 2003. From basic
gravity variables, the study found that GDP, population, relative endowment, distance
and common language are the main determinants of bilateral trade in ASEAN. The
ASEAN dummies used to measure the intra ASEAN trade indicate that there was trade
creation among the five ASEAN members, reinforced by the expansion of new
membership to ten members. Closer examination also shows that the trade creation
among the ASEAN5 is enhanced after the establishment of AFTA. The member countries
trade more with each other right after the formation of AFTA and during the financial
crisis than during the subsequent recovery period. There is no evidence of trade diversion
in pre-AFTA analysis but there is strong evidence of this during the post-AFTA period.

Chapter 3 addresses the effects of intra-regional-FDI as well as extra-regional-FDI in the
ASEAN free trade area. The gravity model is employed in this study. The model is

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estimated using cross section and panel data analysis. The major finding of this chapter is the ASEAN5 invest in each other less than they invested in the new ASEAN members. The results from extra-regional-FDI revealed that some regional economies such as those in Europe and North America preferred to invest in Singapore than other countries in ASEAN. Moreover, further investigation also found that the USA and Japan invested more in ASEAN5 than in the new members. This study also identified the determinants of FDI in ASEAN countries. The market size and income for both source and host countries, the extended market relative to distance, distance, common border and common language are the main factors attracting foreign investors. Other macroeconomic factors such as lower inflation rate, stability in exchange rate and good management in government budget are among the key factors that attract more FDI. In addition to economic factors, social factors such as good telecommunication and infrastructures and non-economic factors such as transparency also encourage more investors to ASEAN.

Chapter 4 is another empirical study that aims to examine the effect of convergence and growth in ASEAN countries including the period after the formation of AFTA. The growth model is derived from the neoclassical model namely the Solow model and modified in the dynamic form for empirical purposes by fully utilizing the dynamic heterogenous panel approach namely Pooled Mean Group Estimator (PMGE). Preliminary graphical observations find strong evidence of β and σ convergence after the formation of the ASEAN free trade agreements and the expansion of membership. The empirical evidence supports unconditional and conditional hypothesis in the ASEAN5 for the period over 1960-2004. The share of investment, population growth and openness are the main macro policy factors that increase ASEAN's growth. In addition, the expansion from five to ten members is also one of the factors that increase growth in ASEAN countries. In the second stage of estimation, data from ASEAN8 is estimated for the period over 1993-2004, the period after the formation of AFTA. This finds evidence that trade and FDI drove up growth in the ASEAN region.

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List of Abbreviation

ADF	Augmented Dickey Fuller
AEC	ASEAN Economic Community
AFTA	ASEAN Free Trade Area
AIA	ASEAN Investment Area
AICO	ASEAN Industrial Cooperation
APTA	ASEAN Preferential Trade Agreement
ASC	ASEAN Security Community
ASCC	ASEAN Socio-Cultural Community
ASEAN	Association of Southeast Asian Nation
ASEAN10	All ASEAN members
ASEAN4	Indonesia, Malaysia, the Philippines and Thailand
ASEAN5	Indonesia, Malaysia, the Philippines, Thailand and Singapore
ASEAN6	Indonesia, Malaysia, the Philippines, Thailand ,Singapore and Brunei
ASEAN8	Indonesia, Malaysia, the Philippines, Thailand ,Singapore, Cambodia, Laos and Vietnam
ASEANnew	Cambodia, Laos, Myanmar and Vietnam
CEEC	Central and Eastern European Countries
CEPII	Centre D'Etudes Prospectives Et D'Informations Internationales
CEPT	Common Effective Preferential Tariff
CGE	Computed general equilibrium
CM	Common Market
CPI	Consumer Price index
CU	Custom Union
CUSFTA	Canada and US Free Trade Agreements
EC	European Community
EEC	European Economic Community
EFTA	European Free Trade Agreements
FDI	Foreign Direct Investment
FEM	Fixed Effects Model
FTA	Free Trade Area
GATT	General Agreements on Tariffs and Trade
GDP	Gross Domestic Product
GMM	Generalised Methods of Moments
IL	Inclusion list
IMF	International Monetary Fund
IMP	Internal Market Program
LAFTA	Latin America Free Trade Area
LSDV	Least Square Dummy Variables

MG	Mean Group
MNC	Multinational Corporations
MNE	Multinational Enterprises
NAFTA	North America Free Trade Agreements
NIE	Newly Industrialize Economies
Non-ASEAN	Non ASEAN members
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PMGE	Pooled Mean Group Estimation
PTAs	Preferential Trade Agreements
REI	Regional Economic Integration
REM	Random Effects Model
RTA	Regional Trade Agreements
SAFTA	South Asia Free Trade Area
SL	Sensitive list
SM	Single Market
SUR	Seemingly Unrelated Regression Technique
TEL	Temporary exclusion list
TNC	Transnational Corporation
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
WTO	World Trade Organization

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ASEAN MAP

Chapter 1

Introduction

In recent years, there have been many moves towards trade liberalization. In many cases, this has taken the form of a Regional Trade Agreement (RTA) in which countries have come together in a multilateral agreement via the World Trade Organization (WTO). For other countries, moves towards trade liberalization have been through regional agreements or bilateral arrangements. According to WTO, by 2007, about 300 RTAs have been notified to the GATT/WTO of which 194 were notified after Jan 1995. It is said that almost every country in the world has become a member of at least one agreement.

The basic theory of Economic Integration was produced by Bela Balassa (1961) which shows that economic integration increases as trade barriers diminish. There are six degrees of economic integration. The weakest is a Preferential Trade Agreement (PTA), which allows for reduction in tariffs, but not their total elimination. A Free Trade Agreement (FTA) and Custom Union (CU) both aim to eliminate tariffs barrier between the member countries, but the former maintain their external tariffs on imports from the rest of the world. A Common market (CM) or Single Market not only establishes free trade area in good and services, sets external tariff among non-members but also allows for the free mobility of capital and labor between member countries. The most advanced type of economic integration is Economic and Monetary Union, which not only sets up a CM, but also gives the responsibility for fiscal policy to a supra-national authority and adopts a common currency amongst of the member countries. These types of Economic Integration are also referred to as regionalism. Burfisher et al. (2003) describe that there is a major transition in era regionalism which some RTA involves from a shallow to a deeper economic integration. The old version of regionalization is based on traditional trade theory that describes trade creation versus trade diversion adopted from the Viner-Meade (1950, 1955) theoretical framework. On the other hand, the new regionalism focuses more on

broader issues such as the linkages between trade and productivity, rent-seeking behaviour, the role of FDI and productivity growth and the integration between developed and developing countries.

Regionalism has come late to Asia. ASEAN was among the first agreement on regional economic co-operation in East Asia. Unlike other regional associations in the world, ASEAN has no supranational authority or responsibility. However, there is an annual meeting that discusses many issues including trade, investment, security, custom, tourism and others conducted by ASEAN Secretariat. Historically, ASEAN was formed on 8th August 1967 in Bangkok with the five original members namely Indonesia, Malaysia, Thailand, the Philippines and Singapore. Cooperation in the economic, social, cultural, technical and educational areas was the main objective in the Bangkok declaration. In addition, the aim was to promote regional peace and stability through abiding respect for justice and the rule of law in the region and adherence to the principles of the United Nations Charter.

The expansion of ASEAN's membership was the peak of a process of gradual rapprochement between the original ASEAN members and Brunei, Cambodia, Laos, Vietnam and Myanmar. On 8th January 1984, Brunei Darussalam became the sixth member of ASEAN followed by Vietnam on 28th July 1995, Laos and Myanmar on 23rd July 1997, and Cambodia on 30th April 1999. Since the birth of ASEAN, relationships among members have focused on political, social and security matters, with economic considerations being less prominent.

The process of regional economic integration in ASEAN continued with the formation of the ASEAN Free Trade Area (AFTA) at the fourth summit in Singapore in 1992, which became the first organization in the East Asia region aimed at encouraging integrated economic cooperation. The main objective of AFTA is to increase the ASEAN region's competitive advantage as a single production unit. In order to promote greater economic efficiency, productivity and competitiveness, the Common Effective Preferential Tariff (CEPT) scheme required tariffs to be gradually reduced to the range 0-5 percent in 2003 between the six original members, Vietnam

by 2006, Laos and Myanmar by 2008 and Cambodia by 2010. Meanwhile, AFTA is still maintaining trade barriers from non-members at a level which was agreed upon as part of the Uruguay round.

Prior to the membership, Vietnam and the three Indochinese countries were real threats and enemies to ASEAN, but now they are standing together and united to form regional cooperation. Through AFTA, they hope to stimulate domestic economic development, increase standards of living and have a further impact on global markets. Along with great diversity in size, economic and social institutions, natural and human resources, cultural background, language, race, religion and historical background, the countries are different at levels of economic development.

The (CEPT) scheme covers manufactured products as well as agricultural products. Under the CEPT scheme, tariffs on a wide range of products traded within the region should be totally eliminated or at least reduced to a maximum of 5 percent. The CEPT scheme classified products into three lists: the Inclusion list (IL), Temporary Exclusion List (TEL) and Sensitive List (SL). The elimination of tariff and non tariff barriers is expected to promote greater economic efficiency, productivity and competitiveness. The average tariff rates in ASEAN6[1] by mid 2004 had been reduced to 1.91% compared to 1993, when the CEPT was launched, when the average was 12.76%. By 2003, 98.8% of the total tariff lines (products) for ASEAN6 were already in the inclusion list, for which 99.6% had tariffs between 0 to 5 percentage ranges. In fact, for about 60.89% of the products tariffs were completely eliminated. Meanwhile for the new members, they were required to transfer products still on the temporary exclusion list to the inclusion list no later than 2003 (for Vietnam), 2005 (for Laos and Myanmar) and 2007 (for Cambodia). In 2003, their average tariff was about 6.22%. By the end of 2003, 79.13% of the products which were traded had been moved into the inclusion list, and tariffs on 69.88% of these products have already been brought down to the 0 to 5 percent range. According to the tariff schedule, the realization of AFTA for ASEAN6 should be in 2003 and would be completed by 2010. As for new

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[1] ASEAN6 represents the five original ASEAN5 and Brunei.

members, Vietnam has given until 2013 meanwhile Laos and Myanmar 2015 and Cambodia 2017 to complete the tariff reduction to 0 – 5 percent.

According to ASEAN Secretariat, the growth share of total ASEAN's trade continues to rise from 19.3% in 1993 to 22 % in 2003. In value terms, the level of trade volume has expanded more than double from US$82.46billion to US$174.25billion during the same period. In 1993, total ASEAN exports registered US$206.6billion which has doubled in 2003 to US$430.39 billion. Meanwhile the level of ASEAN's total imports has increased from US$223.3 billion in 1993 to US$539.32billion in 2003. Hence, the total trade for the region, which has a half billion people, was US$969.71billion. The United States, Japan, The European Union, China and Korea remained as ASEAN's largest trading partners who have about 50% share of ASEAN trade.

When ASEAN was established, trade among members was insignificant and relatively low. The share of ASEAN's trade between 1967 to early 1970s from ASEAN's total trade was between 12 to 15 percent only. AFTA should have contributed to the expansion of ASEAN's trade, both within and outside the region. In fact, in the last decade (1993-2003) intra ASEAN trade has been growing faster than total ASEAN exports.

It is important to examine the extent to which increased regional economic integration in the ASEAN region has contributed to this substantial expansion of trade. This thesis therefore explores three related and important areas in three separate chapters namely, trade, foreign direct investment and growth. In examining these issues, the approach adopted sets out a theoretical framework, and supports this with empirical testing in order to draw some policy implications.

The general objective of this thesis is to address some issues related to the regional economic integration in ASEAN. However, the specific objectives are as follows:

1. to investigate the effect of intra-and-extra regional trade in ASEAN
2. to examine the effect of intra-and-extra-regional FDI in ASEAN
3. to provide empirical evidence on the effect of convergence and growth in ASEAN
4. to draw some alternative policy and conclusion

Therefore, there are three hypotheses will be examined in this thesis:

1. the ASEAN Free Trade Agreement (AFTA) has had a significant impact on intra-and extra-ASEAN trade
2. the ASEAN Free Trade Agreement (AFTA) has had a significant impact on intra-and extra-ASEAN FDI
3. the ASEAN Free Trade Agreement (AFTA) has had a significant impact on convergence and growth

The traditional trade theory of trade creation and trade diversion proposed by Viner (1950) and Meade (1955) is the first issue tackled in this thesis as discussed in Chapter 2. They conclude that whether Regional Economic Integration can change the world welfare depends on the effects of trade creation and trade diversion. As a country joins in REI with another country by reducing or eliminating trade barriers, the reduction of import prices is expected to enhance trade between regions. However, Viner also pointed out that there is a possibility that a country might face a reduction on trade against trading partner – the rest of the world which can offer more efficient products. The growing empirical literatures include a number of studies that have examined various types of REI, such as European Union, NAFTA, Mercosur, and SAFTA. They find mixed results regarding the relationship between REI and trade creation as well as trade diversion. Therefore, chapter two aims to investigate the effects of trade creation by examining intra-regional-trade between the five original ASEAN members, namely Indonesia, Malaysia, Thailand, the Philippines and Singapore before and after the formation of free trade area as well as after the expansion of ASEAN's membership. The effects of trade diversion or the extra-

regional-trade from selected regional trading partners such as East Asia, South Asia, North America, South America and Australia-New Zealand are also examined.

A powerful method for estimating bilateral trade, namely the Gravity Model, is employed to estimate the bilateral trade between ASEAN and forty trading partners in the period 1984 to 2003. The gravity model has been applied in various empirical research including migration, patent rights, international trade and Foreign direct investment. The model is not only reliable and applicable but also justifiable in terms of the trade theories, from traditional theory such as the Ricardian Framework (Eaton and Kortum, 1997) and Heksher-Ohlin model (Deardorff, 1998; Evenett and Keller, 1998; Feenstra et. Al, 2001) to the new trade theories such as imperfect competition (Anderson, 1979; Bergstrand 1985, 1989) and economies of scale (Helpman and Krugman, 1985). In fact it has been improved in term of econometric issues such as the use of panel estimation against cross section and the inclusion of country characteristics in the Fixed Effect Model to control heterogeneity problems. Moreover, the model also allowed the estimation of ex-post analysis in which data for before and after the free trade agreement was able to be used for comparison purposes. Hence, with strong theoretical background and empirical methodology, this thesis fully utilized the gravity model in both bilateral trade and bilateral FDI in two separate analyses.

The original model focused on the relationship between bilateral trade and the ratio of the product between the GDP exporters and importers to the distance between them. However, many recent studies have included other variables such as population, GDP per capita, relative endowment, common language, common border as well as dummies for regional economic integration. The present study estimates the gravity model using panel data model. This study not only includes basic gravity variables such as GDP for importers and exporters and distance, but also augments the model to include dummy variables for border, language, together with an ASEAN dummy to capture trade creation and Non-ASEAN dummy variables to capture trade diversion. In addition, to allow for heterogeneity, time, exporter, importer as well as bilateral effects are also included in the regression. The gravity model is further modified by

adding up individual ASEAN country fixed effects and regional importer fixed effects with the aim of identifying intra-and-extra-regional trade based on the individual and regional country dummies.

For comparison purposes, the study also examines the period before the formation of AFTA (1984-1992) and the period of post AFTA (1993-2003) in order to find changes in the effect of intra regional ASEAN in this transformation period. The panel data is further divided based on three sub-models: four years after the formation of AFTA (1993-1996), three years during the financial crisis (1997-1999) and four years during the recovery period (2000-03).The purpose of this estimation is to examine whether there is increasing or decreasing in trade creation in the three sub models. Finally the bilateral trade between ten ASEAN members and the other forty trading partners is estimated to find for the effects of intra-extra-regional-trade after the expansion of ASEAN membership.

Trade liberalization via REI does not only directly affect intra-and-extra-trade but also affects intra-and-extra-FDI. Therefore, Chapter three in this thesis is devoted to investigating the relationship between trade liberalisation and flows of FDI.

Thirty years ago, ASEAN countries were worried about opening their market to allow foreign investment, which was expected to affect local economies. All ASEAN members except Singapore had adopted restrictive regulations to control FDI firms in order to alleviate the harmful effects of FDI. However, attitudes toward FDI shifted by the late 1970s due to the debt crisis of 1985 and the evocation of Newly Industrial Economies (NIEs)[2] via changes in investment incentives to promote FDI. In the mid 1980s, most ASEAN countries switched from inward to outward strategies, which coincided with a large influx of foreign direct investment from Japan and NIEs[3]. Net FDI inflows into ASEAN in 1972 were only US$539million, however there increased tremendously in 1982 by more than 500% which amounted to US$343095.85 million. In 1993, the amount of FDI inflows was registered as US$14.737 billion and

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[2] NIEs represent countries such as South Korea, Singapore, Taiwan and Hong Kong
[3] Japan and NIEs sought to relocate their labor-intensive operation overseas.

amounted to US$18.4 billion in 2003 which increased by 22% over a decade. Figure 1.1 in Appendix A1.1 shows the overall trend in FDI in ASEAN from 1972 to 2003. This shows a continuous increase in the inflows until the financial crisis that affected most ASEAN countries in 1997/1998. FDI inflows decreased by about 23% during the crisis. The decline was attributed to lower inflows of investment from some of the ASEAN's main sources of FDI due to economic situation specific to these countries particularly from Japan, South Korea and intra-ASEAN investments. The "time-lag effect" of the financial crisis and the weakened corporate sector in ASEAN have been the main reasons for the significant decline in intra-regional investments. On the other hand, the USA's FDI into ASEAN in 1999 has increased significantly to US$ 9.4 billion from US$1.1 billion in 1998 mainly due to the financing of FDI projects through reinvestment of earnings and cross-border mergers and acquisitions. Despite a slowdown in global FDI flows in 2001, FDI flows to ASEAN increased by 48%, up from $ 13.7 billion in 2002 to $20.2 billion in 2003, resulting in ASEAN being one of the highest FDI growth regions (ASEAN secretariat, 2004).

Total intra-ASEAN-FDI in 1995 was US$4654.4 million but reduced more than 150% in 1999 to US$1789.3 million (see figure 1.3 and 1.4 in Appendix A1.1). However, the amount has increased more than 20% in 2003 amounted US$2301 million. Among the members, Singapore is the highest in both intra ASEAN FDI with 57% and 28% contribution as investors and host country, respectively. However, the contribution of FDI in ASEAN as a provider of foreign investment has been more from the original ASEAN rather than the new members. In addition, the new ASEAN received about 7% FDI from ASEAN members. Recent figures of FDI flows in ASEAN have seen an increase in total FDI inflows by 39% from US$18.4 billion in 2003 to US$25.7 billion in 2004. The Financial Intermediaries and services and manufacturing sectors remained the top recipients as they account 30% and 25% respectively, of the FDI (refer to figure 1.5 in Appendix A1.1) Meanwhile the ASEAN's top FDI sources include the European Union (US$6.4 billion); the USA (US$5 billion); Japan (US$2.5 billion); and the ASEAN (US$2.4 billion). In 2003, the top ASEAN investors contributed for about 78% of total FDI in ASEAN

In the light of these developments, chapter 3 investigates the linkage between foreign direct investment and regional economic integration in eighteen source countries and nine ASEAN countries as hosts. There are two main effects considered in this study. The first effect is the effect of FDI within the members of regional economic agreement as a host as well as source country namely intra-regional-FDI. The second effect refers to the extra-regional-FDI which the relationship between ASEAN members as host countries and other non-member as a source country.

In Chapter 3, the gravity model is used to analyse bilateral FDI flows within and into ASEAN. The aim is to examine whether intra-and-extra-FDI flows were significant affected by the formation of the free trade agreement. Data of bilateral FDI flows are retrieved from ASEAN FDI Statistical Yearbook (2004) for a period 1995-2003 which allows the gravity model with the inclusion of fixed effect model. The first estimation compared the cross section versus panel approach to find the effects to be fully utilised. In addition to basic gravity variables, namely log of Distance and log of GDP for source and host country, the common border, common language and the log for GDP per capita for both source and host country are included in the estimation. The estimation also included the fixed effects model for the bilateral FDI from ASEAN to the individual host country-all ASEAN members. The effect of extra-regional-FDI is based on five regional of source group country namely ASEAN5, East Asian, Europe, North America and Australia-New Zealand. Moreover, the refined model also includes bilateral FDI from source group countries to Singapore, the four original ASEAN and the new ASEAN members.

This study also exploiting the use of semi-gravity model to test the determinant of FDI in the host country based on economic, social indicators as well as non-economic factors. Following Yeyati, Stein and Daude (2002), major economic factors other than log of GDP for source and host country are examined in this chapter. Moreover, social indicators such as skilled labour and infrastructure and also non-economic factors such as Trade Policy Index, Transparency and Economic Freedom Index are investigated to find the driving factors that attract foreign investors to the ASEAN.

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The third issue discussed in this thesis is the relationship between REI, convergence and growth as presented in chapter 4. The ASEAN members differ in terms of the level of development, Brunei and Singapore belong to high income economies, Malaysia, Thailand, Indonesia and the Philippines are medium income economies, and the other four new members are low income economies. There are four main objectives highlighted in this chapter. One of them is to investigate the effect of convergence and growth in the ASEAN5 spanning from 1960 to 2004. The second is to examine the effects of macro policy variables on growth in the ASEAN5. The third is to find whether the ASEAN integration through the expansion of membership enhances growth. The final objective is to estimate the effect of macro policy variables during the period of AFTA.

Before empirical testing is carried out, a graphical overview is provided regarding to β and σ convergence. The Solow model predicts that both poor and rich countries will converge to the same levels of per capita income in the steady state. 'Absolute convergence' refers to a scenario in which the poor country grows relatively faster than the rich country. However, if country heterogeneity is allowed in variables such as the investment ratio, population, educational attainment or other policy variables, this is referred to as 'conditional convergence'. Another type of convergence known as 'σ convergence' is defined as cross sectional dispersion of per capita income across countries.

The growth model used in this study is derived from the neoclassical model- the Solow Model. The equation is modified in dynamic form for empirical purposes. Following Bassanini, Scarpetta and Hemmings (2001), the Pooled Mean Group Estimator (PMGE) is employed in this study. The method restricts the long run coefficients to be identical for all countries but allows the short run coefficients to be different.

In chapter 4, unconditional and conditional convergence hypotheses are tested in the ASEAN5 over the period 1960 -2004. Dummy variables for ASEAN and AFTA are also included as a proxy for ASEAN integration. Macro policy variables such as the

inflation rate, the ratio of government spending to GDP, the ratio of trade to GDP as a proxy for openness are also included in order to identify the effects of macro policy variables on convergence and growth. Besides that, the dummies for ASEAN integration are included based on the time each country joined the ASEAN groups. Finally, the effects of macro policy variables after the formation of AFTA in the ASEAN8 is estimated with additional variables such as dummies for the Asian crisis and the ratio of FDI to GDP are included in the equation.

In summary, as far as ASEAN integration is concerned, this thesis presents major issues which are different in their theoretical framework as well as in empirical analysis. Chapter 2 examines the effects of economic integration in the ASEAN region on trade; Chapter 3 investigates the pattern of foreign direct investment flows; Chapter 4 explores issues relating to growth and convergence.

Chapter 2

Regional Economic Integration and Intra Regional Trade: The Evidence from the Association of Southeast Asian Nations (ASEAN) Free Trade Area

2.0   Introduction

Of late, the Association of Southeast Asian (ASEAN) Free Trade Agreement (AFTA) has been debated among economists as well as politicians. The AFTA's critics mostly question the credibility of the ASEAN to compete with the new giant economy in East Asia, China, which has already captured a larger market and attracted the bulk of new capital flows. ASEAN has been viewed as a 'zone of vulnerability' in the aftermath of the crisis, which exposed structural weakness. Subsequently, the ASEAN states fell to liberalization in a poorly designed, badly reshaped and weakly regulated form (Haggard, 2000; Low, 2003).

The expansion of ASEAN from six to ten members has also been hotly debated and questions have been raised as regards to the relevance of the function of the association as a whole. The new members, Vietnam, Laos, Myanmar and Cambodia have been poor and less developed whose combined GDP was $US405.8 million in 2003. At the same time, Singapore,[4] which claims one of the highest trade-to-GDP ratios in the world, has sought bilateral trade arrangements with other countries outside the region, and has exposed the region's weakness in pursuing a deeper stage of economic integration.

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[4] Singapore has suffered from lowered regional trade and capital from languishing ASEAN economies (Low,2003).

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Regarding the above issues, therefore, a question has been raised in this study whether there is any impact on intra-ASEAN-trade particularly after the free trade agreements have been signed. Based on previous studies, it seems that the results concerning regional economic integration (REI) and trade give ambiguous analytical results for different countries and regions. Therefore, in order to provide a rich picture of the bilateral effect of economic integration in ASEAN, two hypotheses are presented in this paper with the aim to analyze the contribution of ASEAN countries for the period from 1984 to 2003.

1. The formation of AFTA had a significant impact on intra-and-extra ASEAN trade in the five ASEAN economies.

2. The enlargement of ASEAN membership from six to ten had a significant impact on intra-and-extra ASEAN trade in the five ASEAN economies.

This study is significant for several reasons. Firstly, the difference in the historical background as well as the stage of economic development among members of the ASEAN is producing a unique relationship not only in economic cooperation but also towards the stability of the whole East Asian region. Secondly, in practice, AFTA does not create trade discrimination against non-members but gradually is implementing open and outward-looking policies towards outsiders which has had a significant impact not only on the association but also on the neighbouring countries. This new trend of economic integration is a so-called 'open regionalism' (Thandsillapakul, 2000). Therefore, in this study the extra regional trade will be estimated to find the openness of trade to other non-members. Finally, there has been a creation of a larger market for the intra-ASEAN trade through the expansion of new ASEAN free trade arrangement with Japan, China and South Korea, which has been a blessing to the new members[5] who have joined ASEAN. Therefore, this study would benefit not only individual countries in ASEAN5 but also reflect the impact of new membership of ASEAN.

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[5] New members of ASEAN are Brunei, Cambodia, Laos, Myanmar and Vietnam.

Inspired by studies carried out by Frankel and Wei (1997), Sharma and Chua (2000) and Elliot and Ikemoto (2004), this study combines all the information to seek more evidence and more robust results. This study is different from others for three reasons. Firstly, the time frame covers in this study form 1984 to 2003 allowed us to compare the effect of intra-regional trade before and after the free trade agreement in the Southeast Asian takes place. Secondly, Sharma and Chua (2000) undertook empirical testing on individual ASEAN countries. However, this study improves on their study by utilizing a panel approach with the inclusion of dummies for each individual ASEAN members to capture the trade size from these countries towards participation in AFTA. Finally, even though the method of this study is quite similar to Elliot and Ikemoto (2004), the effects on the degree of regional economic integration from the expansion of ASEAN memberships will be explored through empirical testing on intra-and-extra- regional-trade.

The rest of the paper is organised as follows. Section 2.1 contains the literature Reviews and set out the theoretical framework. Next, in section 2.2, the method employed in this study, namely the gravity model, will be briefly discussed. The results of the estimation will be explained in section 2.3. Finally, concluding remarks, suggesting policy and recommendations for further future research presented in section 2.4.

2.1 Literature Reviews

2.1.1 Theoretical Literature

The idea of trade creation and diversion was proposed by Viner (1950) and followed by Meade (1955). Both of them conclude that REI can either increase or decrease world welfare depending on the relative magnitude of the trade creation and trade diversion effects. As Viner (1950) pointed out, trade creation improves economic efficiency when a REI partner country turns out to be a lower-cost producer of a product that is imported more as a result of an REI, compared with producers at home. Trade diversion occurs with a shift in imports from an efficient non-partner exporter to a more expensive producer from the country's REI partner due to the reduction of trade barriers.

In addition, Meade (1955) extended the concept of trade creation and trade diversion to include trade expansion, which occurs whenever demand is highly price-responsive. For instance, if the price of manufactured goods declines following the imposition of REI or Free Trade Agreements (FTAs), imports expand if the price elasticity of demand is greater than one.

2.1.2 Empirical Literature

In general, economists analyze the effect of Regional Trade Agreements (RTAs) or Preferential Trade Agreements (PTAs) in terms of the volume of trade. The literature on trading blocs typically concentrates on Vinerian idea of trade creation and trade diversion (see Aitken, 1973; Bergstrand, 1985; Hamilton and Winters, 1992; Frankel et al, 1995; Frankel and Wei, 1997; Endoh, 1999; Sharma and Chua; 2000; Soloaga and Winters, 2001; Thorton and Goglio, 2002; Clerete et al., 2003 and Elliot and Ikemoto, 2004). Typically, there are two empirical methodologies used in analysing the effect of trade creation versus trade diversion.

The first one is computed general equilibrium (CGE) models which applied multi-sectoral analysis to determine the implications of RTA for aggregate welfare and trade patterns. Robinson and Tierfelder (1999) study various surveys of literature based on CGE models highlighted that the effects of trade creation exceeds the trade diversion. Another method that recently have been used in many bilateral trade model is gravity model which originated from the law of gravity that bilateral trade in two countries can be explained by the ratio of product of GDP and distance within two countries (see Tinbergen, 1962; Poyhonën, 1963).

Recently, the gravity model has been augmented to estimate the effect of trade creation and trade diversion from RTA by introduced the dummy for RTA. For instance, Bayoumi and Eichengreen (1995) and Frankel (1997) measured Trade creation and Trade diversion from PTA dummies which take the value one if the importing country is a member of the PTA and the exporting country is a non-member or zero otherwise. Positive value represents the trade creation; meanwhile negative value is evidence of trade diversion.

A number of studies have been carried out to investigate the effect on bilateral trade of PTA such as European Union, North America Free Trade Area (NAFTA), the Andean Pact, Latin America Free Trade Area (LAFTA). There are also studies in regional economic integration related to ASEAN or AFTA, and most of them have conducted research on the East Asian and Asian Pacific region of which ASEAN is a part. For example, Hamilton and Winters (1992) use a gravity model to investigate the intra-regional trade bias for Asia Pacific region, and find that ASEAN has a strong bias towards intra-regional trade.

Thorton and Goglio (2002) investigate the degree of regional bias in intra-Southeast Asian trade including Malaysia, Indonesia, Philippines, Thailand and Singapore. They found that the membership of ASEAN does promote intra-regional trade. Meanwhile, Soloaga and Winters (2001) have modified the gravity equation to test for significant changes in trade patterns by separating the effect of PTAs (including ASEAN) on intra bloc trade, members' total imports and total exports. Their results

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are similar to Frankel (1997) which showed that the intra bloc trade coefficient was negative for ASEAN whereas the coefficients for overall bloc imports were statistically significant and positive. However, a study by Clarete et al.(2003) on the effect of various preferential trade agreements (PTA) on trade flows with Asian countries finds that there was no effect on intra-bloc trade in ASEAN; in fact they found evidence of a reduction in imports and exports in that region including all its ten members.

Frankel and Wei (1997) study trade and FDI among ASEAN economies by using gravity equation for 1980, 1990, 1992 and 1994. They concluded that trade among ASEAN countries is higher than one would expect which are trade creation instead of trade diversion. With data limitation, they predicted that the new ASEAN members particularly Vietnam and Indochinese countries will have trade expansion amounting to seven-fold for the next decade.

Sharma and Chua (2000), using a gravity model, examine each of five ASEAN countries namely Malaysia, Indonesia, Philippines, Thailand and Singapore based on data 1980 to 1995 to find the impact of the APEC on the integration of ASEAN. They found that the dummy variables for intra ASEAN trade are negative for all ASEAN5 except Philippines. They conclude that the ASEAN (excluding Philippines) PTA did not increase intra-ASEAN trade.

Recently, Elliot and Ikemeto (2004), examine intra-and-extra bias in bilateral trade flows before and after the signing of AFTA as well as the year of prior to and the following the Asian crisis which cover the period from 1983 to 1999. They found that trade flows were not significantly affected immediately after 1992 but gradually increased. Following Endoh (1999) and Soloaga and Winters (2001), they found evidence that the Asian crisis has worked as a trigger for a further acceleration of the process of economic integration rather than as a hindrance.

Besides using the Gravity model, there is one piece of evidence found by Tho (2002) who uses a trade matrix analysis of manufactured products for ASEAN5 and three

major non ASEAN partners namely Japan, China and South Korea. The study shows that the trade and investment effect of the AFTA has not been as strong as the theory of free trade area predicted.

2.1.3 The linkages between Regional Economic Integration and Trade

Regional economic integration (REI) occurs when two or more countries form a group in a free trade agreement or market area by reducing or removing economic barriers such as tariffs or non-tariff barriers amongst member countries. REI can be seen to be varied in shape, size, income levels and trade openness. They even come in different types of economic integration namely preferential trade, free trade areas, custom unions, common markets or monetary and political union.

Recently, international participation in the forming of REI particularly in FTA[6] has been increasing in terms of deepening and widening economic integration. FTA is defined as an agreement between member countries to reduce or eliminate trade barriers amongst them, whilst maintaining an external trade policy for non-member countries. FTA is said to be an engine of growth enabling countries to exploit their comparative advantage, increase specialization, expand the size of export and import markets, and promote efficiency as well as competition between the members. In addition, the formation of a free trade area is preferable based on its effectiveness in encouraging wide trade liberalization, as it is much quicker and easier compared to multilateral agreements which involve many parties and procedures.

From one school of thought that proposed multilateralism instead of regionalism such as Bhagwati and Panagariya (1996) and Panagariya (1998) stressed on the welfare reduction in members of countries. They argued that the members of RTA might face lost in tariff revenue and at the same time they do not get any benefit from a lower price import because many traded goods are supplied from the rest of the world, as a price setter, rather than the members of RTA.

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[6] According to WTO (2007), there are 116 out of 194 regional trade agreements are notify as a free trade area.

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Although there are many critics regarding regionalism relative to multilateralism, the ongoing free trade agreements and preferential trade agreements which have increased in numbers seem to favour regionalism. According to the scholars of regionalism, REI, as a second best policy after free trade, provides a tremendous value added to member countries resulting from the removal of some tariff and non tariff barriers, thus leading to trade creation. It occurs if the high-cost domestic output of one member is replaced by imports of lower-cost production from another member. Trade creation is said to increase benefit to both producers' and consumers' welfare and indeed to the world welfare. However, Viner (1950) found the reverse effects of country's membership in REI known as trade diversion. Instead of gaining the benefit from importing commodities, a country will suffer a loss when imports are diverted from a low-cost third country to a high-cost member country because of tariff reduction between members. Therefore, a country's national welfare will be increased or improved if the positive effect of trade creation is larger than the effect of trade diversion.

A traditional domestic market which is relatively small is likely to face difficulty in producing profitably goods that are subject to increasing returns to scale. Although the producers gain profits, only few producers –usually with monopoly powers can survive, which not only leads to a higher domestic price but also lower quantity. However, when several countries within the region form an agreement to lower tariffs, the larger regional market allows economies of scale to be achieved which indirectly lowers domestic monopoly power and encourages more intense competition, possibly leading to enhanced efficiency and productivity. Furthermore, the enlargement of a regional market allows firms to benefit from greater scale to attract more investment particularly foreign direct investment (FDI).

Controversial issues have been raised regarding the formation of regional integration agreements based on politics rather than economics. In fact, security matters normally have become the main reason for regional integration. On the other hand, the effect of regional integration always associated with economic analysis particularly in intra-

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regional trade, trade creation and investments. In fact, the government, which acts as a main actor in the agreement to form any regional cooperation, faces the loss of tariff revenue and also from trade diversion –when imports switch away from external imports subject to tariffs. Another debating issue is related to some countries that have membership of FTA with more than one regional agreement. This phenomenon can lead to uncertainty and bias to trade which raise doubtful reaction among the members and also may confuse investors.

Whether regional integration gives benefits or reverse effects to a country depends on how they implemented the framework to become reality. From the theoretical analysis, the formation of regional economic integration has a positive impact on trade creation, however, empirical evidence has shown ambiguous effects.

2.2 Empirical Methodology

2.2.1 Theoretical Background

The gravity model, which originates from Newton's law of gravity[7], has been widely used in regional science, economic geography as well as international trade (Paas, 2000). The gravity model was first used in analysing international trade flows by Tinbergen (1962) and Poyhonën (1963)[8]. The model explained the volume of trade flows in terms of the ratio of the product of the gross domestic product (GDP) of countries i and j to the distance between them.

$$Trade_{ij} = A\frac{(GDP_i.GDP_j)}{DISTANCE_{ij}} \qquad (2.1)$$

By taking the logarithm of equation (1) we get the following:

$$Log(Trade_{ij}) = A + b_1 \log(GDP_i.GDP_j) - b_2 \log(distance_{ij}) + \varepsilon_{ij} \qquad (2.2)$$

The gravity approach is not only reliable and applicable but also justifiable in terms of the trade theories, from traditional theory such as the Ricardian Framework (Eaton and Kortum, 1997) and Heksher-Ohlin model (Deardorff, 1998; Evenett and Keller, 1998; Feenstra et. Al, 2001) to the new trade theories such as imperfect competition (Anderson, 1979; Bergstrand 1985, 1989) and economies of scale (Helpman and Krugman, 1985).

According to the Ricardian model, a country may trade with another country if they have different technologies. This is based on the theory of comparative advantage. Meanwhile, the Hecksher- Ohlin model explains that different countries have differences in factor endowments and technology, which results in gains from trade between them. Eaton and Kortum (1997) develop a Ricardian model to explore the

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[7] Ghosh and Yamarik (2004) defined as 'the flow of people, idea or commodities between two location positively related to their size and negatively related distance.
[8] He analyzed the trade flows among the European countries.

role of trade in spreading from benefits of innovation. The theory delivers an equation for bilateral trade that resembles the gravity specification. In this model, they reveal that there is possibility any country which posses the best technology in producing each good will export it to neighbouring country.

Anderson (1979) made the first attempt to derive the gravity equation from a product differentiation model. His work has been extended by Bergstrand (1985) with monopolistic competition models. He derived reduced form equation of bilateral trade flows using Constant Elasticity of Substitution (CES) preferences and includes prices in so called 'generalized gravity model'. Furthermore, Bergstrand (1989) exploit monopolistic competition framework with non-homothetic preference to obtain more general formulation of gravity equation. By integrating Chamberlin-Monopolistic Competition into Hecksher Ohlin Model, Helpman and Krugman (1985), show that differentiated products with increasing returns to scale can be justified by the gravity equation. They found that countries that are trading differentiated products because of their similarities in term of relative size. Meanwhile, Deardorff (1998) derived a gravity equation from the basic form based on the Hecksher-Ohlin Model without assuming product differentiation. He further suggests that any trade model that assume complete specialization in production at a firm level or at a country level can be used to derive a gravity equation.

In recent studies, Evenett and Keller (1998) and Feenstra et al. (2001) analyze two theories of international trade, namely the Hecksher –Ohlin- model and increasing returns to scale, by examining whether they can account for the empirical success of the so-called gravity equation and found that both models explain different components of the international variation of production pattern and trade volumes, with important implications for productivity growth, labour and micro economies.

2.2.2 The Gravity Model

Recently, there have been numerous empirical studies exploiting the gravity model to investigate the effects of bilateral trade on Preferential Trading Arrangements (PTAs). Most of the authors include additional variables extending from the original gravity equation in order to control for geographical factors and binary variables such as common language, common borders, countries that belong to the same island and belong to the same PTA. For instance, Linnemenn (1966) extended Tinbergen's work by adding population. In fact, some other researchers challenge the original gravity model by including other variables such as GDP per capita and the exchange rate (Frankel, 1992; Frankel and Wei, 1993), the product of GDP per capita and relative endowments (Frankel et al 1995), the difference in per capita income (Carrilo and Li, 2000; Elliot and Ikemoto, 2004), the average distance (Clerete et al, 2003) and the Complementary Index (Elliot and Ikemoto, 2004).

In this study, following Elliot and Ikemoto (2004), the contributions of the five ASEAN countries toward their participation in intra-ASEAN-trade are investigated throughout the period from 1984 to 2003. The model is extended to further investigate whether the trade performance in ASEAN has been improved after the ASEAN enlargement to new members. Although the net effects of trade creation are not the main objective to be measured, there are some changes in intra-regional trade that are expected to occur during the period of time of study.

The gravity equation used in this study is presented in equation (2.3). The dependent variable used is exports from country i (Indonesia, Malaysia, Singapore, Thailand and the Philippines) to forty trading partners j (importers country)[9]. For linearizing the model, variables are in logarithmic form in year t.

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[9] Other studies use imports as dependent variables such as in Soloaga and Winters (2001) and Elliot and Ikemoto (2004). However, this study following Sharma & Chua (2000); and Martinez & Norwak (2003) which use exports as dependent variables. This choice of bilateral exports is justified by the fact that the countries under consideration such as ASEAN5 have shown a strong export orientation in their economies.

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$$L(EX)_{ijt} = \alpha_0 + \gamma_i + \gamma_j + \gamma_{ij} + \lambda_t + \beta Z_{ijt} + \sigma T_{ij} + \varepsilon_{ijt} \qquad (2.3)$$

$Z_{ijt} = \text{lGDP}_{it}, \text{lGDP}_{jt}, \text{lPOP}_{it}, \text{lPOP}_{jt}, \text{lENDOW}_{ijt}$

$T_{ij} = \text{lDIST}_{ij}, \text{BOR}_{ij}, \text{LANG}_{ij}$

Where

GDP_i = gross domestic product of country i (exporters),

GDP_j = gross domestic product of country j (importers),

POP_i = population for country i,

POP_j = population for country j,

$ENDOW_{ijt}$ = absolute difference gross domestice product per capita (PGDP) between country i and j,

$DIST_{ij}$ = geographical distance between country I and j (proxy for transportation cost)

BOR_{ij} = dummy variable which is set equal to one if two countries share common border, zero otherwise,

$LANG_{ij}$ = dummy variable which is set equal to one if two countries share common language, zero otherwise.

In this study, the gravity model predicts that bilateral trade should increase with market size, log of absolute difference in GDP per capita between exporters and importers as a proxy for relative endowment, common border and common language, but decrease with distance. A higher level of income in the exporting country suggests a high level of production, which increases the availability of goods for exports. This suggests the idea that the larger and richer countries are more likely to have more trade links. A dummy variable (binary variable) for common border is used to control for countries that share a border which allows them to have border trade. Meanwhile the dummy variable for language is to control for countries which use the same language. Distance is a proxy for transportation cost[10] which shows the shorter the

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[10] Linnerman (1966) defined transportation cost as shipping cost including freight and insurance, the cost of time and cultural cost, meanwhile Bougheas et al. (1999) showed transportation cost is also considered as public infrastructure.

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distance, the lower the transportation cost and the higher the volume of trade between in two countries

However, the expected result of the size of population and FTA are ambiguous. According to Martinez (2003) and Martinez and Nowak (2003), the coefficient estimates of the size of population may have a positive or negative sign because it depends on the absorption effect[11] and economies of scale[12]. Frankel (1997) and Endoh (1999), considers that countries with a large population would be better able to exploit their own economies of scale in their larger domestic market than smaller countries. On the other hand, Brada and Mendez (1985) believe that a larger population in the importing country allows imports to compete better with domestic goods and compensates exporters for the cost of foreign sales activities.

The intercept has five parts: α_0 is a constant term which common to all years and country pairs, γ_i and γ_j are exporters and importers effects respectively which control country characteristics, γ_{ij}; is a bilateral effects used to capture the interaction effects between two countries and λ_t; time effects to capture business cycle and common to all countries in the sample. The disturbance term, ε_{ijt}, is assumed to be normally distributed with zero mean and constant variance for all observations and used to capture any other external shocks that may affect bilateral trade between the countries.

$$l(EX)_{ijt} = \alpha_0 + \gamma_i + \gamma_j + \gamma_{ij} + \lambda_t + \beta Z_{ijt} + \sigma T_{ij} + \Sigma ASEAN \ blocs + \Sigma indASEAN\text{-}IT + \Sigma other\_regbloc + \varepsilon_{ijt} \qquad (2.4)$$

The equation (2.4) is an augmented gravity model which includes the regional economic blocs as groups as well as individual countries. *ASEANblocs* are the group of ASEAN namely ASEAN5 and ASEANnew. ASEAN5 is a dummy that takes the value one if both the importing and the exporting countries are original mebers of

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[11] Absorption effects occur when a big country exports less.

[12] It depends on economies of scale whether a big country exports more than a small country.

ASEAN, namely Indonesia, Malaysia, The Philippines, Singapore and Thailand. Following Ghosh and Yamarik (2004), a positive value of the estimated coefficient can be interpreted as Trade Creation, which indicates that the two countries trade more than predicted by other variables. Therefore, the size and statistical significance of the coefficient on the ASEAN5 variables suggests the existence of intra regional trade between the five ASEAN economies. A negative and significance, on the other hand implies that they trade less with each other than what would be expected. However, it should be noted here that AFTA will not be fully implemented until 2010 for ASEAN5 including Brunei and 2015 to 2018[13] for new members. Therefore, these results should be seen as a preliminary look into AFTA's effect on trade.

ASEAN-new is a dummy which is equal to one for countries that are new members of ASEAN namely Brunei, Cambodia, Laos, Myanmar and Vietnam. To capture the contribution of individual ASEAN members towards the participation in AFTA, additional dummies have been added for each individual in ASEAN5 as well as new members of ASEAN (*indASEAN-IT*). For instance, MAL_IT dummy take value one if the importers or exporters country is Malaysia. However, for new members, the dummy captured only for a period after they become members, for instance, Vietnam_85 is a dummy equal to one if the importers or exporters after 1985 is Vietnam.

The model also includes other regional blocs (*other regbloc*) dummies which import from one country of ASEAN to a non-members country such as East Asia, South Asia, North America, South America, Australia-New Zealand and Europe to capture the extra regional trade of ASEAN. Meanwhile, *Non-ASEAN* is a dummy that relates to countries which do not belong to ASEAN, and thus captures the external effect of AFTA's trade with non members. A positive value of the coefficient implies that trade between the country within the AFTA and outside countries as extra-regional-trade. On the other hand, a negative value suggests that trade with efficient non-members is less which can interpret as Trade Diversion.

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[13] Refer to protocol to amend the agreement on the common effective preferential tariff (CEPT) scheme for the ASEAN free trade area (AFTA) for the elimination of import duties

2.3   Empirical Analysis

2.3.1   Data description

The estimation of panel data for 20 years (1984 to 2003) includes five exporter countries from ASEAN namely Malaysia, Indonesia, Singapore, The Philippines and Thailand. There are forty selected import countries[14] mainly from Asia and some developed and developing countries. Therefore, this study consists of an unbalanced panel data of 194 trading pairs with 3900 observations. Bilateral export[15] data are in dollar terms (current prices) taken from International Monetary Fund Direction of Trade Statistics. GDP, Per Capita GDP, GDP deflator and CPI (these two data used for data deflating) and Population were taken from World Development indicators, World Bank. Common language, common border and Distance measures are taken from Centre D'Etudes Prospectives Et D'Informations Internationales (CEPII)[16] meanwhile information about free trade agreement is built on the base of ASEAN secretariat information.

2.3.2   Some Econometrics issues

Some earlier studies analyze gravity equations by regressing each year of the sample period based on cross-sectional analysis to capture 'event study', which allows different parameters for each year (Soloaga and Winters, 2001). However, there were many criticisms of cross section results, as such analysis would neglect important dimensions of variation in bilateral trade flows such as time variation, and produce inconsistent estimators (Matyas, 1997). Therefore, a panel framework has been

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[14] The list of the importers countries refer to the appendix.

[15] The data consist of the value of merchandise exports and imports between each country and all its trading partners. All exports are valued free on board (f.o.b), meanwhile for imports are reported cost including insurance and freight (c.i.f)

[16] Distances are calculated following the great circle formula, which uses latitudes and longitudes of the most important city (in terms of population) or of its official capital (http://www.cepii.fr/anglaisgraph/bdd/distances.htm)

proposed by many researchers (Matyas, 1997; Egger, 2002, Kandogan, 2004; Cheng and Wall, 2005) as being the most appropriate approach to analyze time and country specific effects in gravity equations. This approach allows the capture of the overall business cycle faced by trading partners. In addition, with increases in sample size, the results relating to the role of the blocs would be more definite due to smaller confidence intervals.

Recently, issue whether to use a random effect model or a fixed effect model has raised attention in estimation by using gravity model. A random effect model is a more appropriate approach in estimating typical trade flows by randomly drawn sample of trading partners particularly from a larger population. However, the fixed effect model would be a better choice for estimating trade between an ex ante predetermined selection of nations (Egger, 2000). In the case of the absence of any correlation between observable and panel specific error terms, the random effect approach would be preferred. Implicitly, the fixed effect model assumes that all explanatory variables are correlated with the unobserved effects or the specific error term that eliminates this correlation within the transformation. Matyas (1997) and Egger (2000, 2002) suggest using the Hausman test [17]to decide whether to choose a fixed effect model or a random effect model. The null hypothesis of the test is no correlation between individual effects and the explanatory variables. This implies that both random and fixed effects are consistent but only the random effect is efficient. Meanwhile the alternative hypothesis stated that the individual effects are correlated with the explanatory variables, implying that only the fixed effect approach is consistent and efficient.

Another issue that arose in analyzing gravity equations is related to panel analysis that includes time, exporters, importers and bilateral effects. Time effects are said to capture the cyclical or business cycle influences which are common to all countries in the sample. Meanwhile, exporters and importers effects are used to control for country characteristics, particularly the openness of a country with respect to its partners.

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[17] Hausman (1978) suggested a test to check whether the individual effects are correlated with the regressors.

Matyas (1997) proposed the use of a triple way model which includes time, exporters and importers effects. According to Egger and Pfaffermayr (2003), from the econometric point of view, ignoring these effects may yield biased estimations. They even include additional effects called bilateral effects based on country pair specific effects.

2.3.3 Results and estimation

Table 2.1-2.6 reports the gravity estimation results[18]. The model is estimated in four ways. Table 2.1 and 2.2 reports the basic and augmented gravity model for full model covering the period from 1984 to 2003. Then the full sample is split into the period before (1984-1992) and after formation of AFTA (1993-2003) as presented in Table 2.3. Table 2.4 reports the estimation of three sub-periods for four years after the AFTA is formed (1993-1996), three years during financial crisis (1997-1999), and four years after the financial crisis (2000-2003). Finally, Table 2.5 and 2.6 report the estimation after the expansion of ASEAN membership for the period of 1993 to 2003.

2.3.3.1 The intra and extra ASEAN5 trade : Overall result

Table 2.1 presents the effect of intra-and-extra- regional trade of the five ASEAN countries and trading partners for the period of 1984 to 2003 with Fixed Effect Model (FEM). Prior to the analysis, the Pooled Ordinary Least Squares (POLS) with constant term and the Random Effect Model are estimated with the same sample. However, the OLS is said to be biased since it ignores the heterogeneity problem which carried from individual country characteristics as presented in column (1) for comparison. Meanwhile, the Hausman test that the null hypothesis that REM is consistent and efficient is rejected. Therefore, the FEM is preferred model and will be used in this study.

Column (2) represents the FEM estimation with the inclusion of exporters, importers and time effects. However, the coefficients of exporting country GDP, importing

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[18] In the estimation, the percentage of country that has zero trade with ASEAN countries is about 1%, so the zeros are treated as missing data.

country population and language are insignificant. In column (3), following Egger and Pfaffmayr (2003), the bilateral effects and time effects are included. The coefficients for the market size for both exporters and importers are positive and statistically significant. This suggests that the bigger market size implies higher trade flows of the countries. However, both the coefficients of log population for exporters as well as importers are negative and significant. These results suggest that a country in ASEAN with a big population such as Indonesia might produce goods for domestic consumers to serve the domestic population and trade less with other countries, whereas a country with a small population such as Singapore trades more with others. The absolute difference between exporters and importers per capita GDP as a proxy for relative endowment is positive and significant[19] which implies that the more different in relative endowment, the more the two countries trade with each, that support the Hecksher-Ohlin hypothesis.

Since the FEM model includes bilateral effects, some explanatory variables that do not change over time such as distance, common language and common border cannot directly estimate with other variables because the inherent transformation will be wiped out. However, Egger and Pfaffemayr (2003) and Cheng and Wall (2005) suggested to employ a two-step procedure where in the first stage fixed effect model is estimated with time variant variables. In the second stage, the estimated parameters (from the first stage) are regressed on the time invariant explanatory variables using OLS. The R-squared and joint F-test for two-step is also reported in the table. As expected, distance exerts a strong negative impact on trade flow. This result seems consistent with the theory which stated that the shorter the distance, the less cost of transportation and the more trade would occur with the partners. The coefficient of common language is also positive and statistically significant. The common language becomes a very important factor to ASEAN5, as the results indicate that trade would increase by 18.2[20] times if they are sharing common language. Although every country in ASEAN has their own common language, for trade and business purposes the English Language is always become a medium for communications. However,

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[19] see also Yamarik and Ghosh (2004)

[20] exp (2.9)=18.2; since the dependent variable using logarithm, the way to interpret the coefficient on the dummy variable by taking the exponent.

the coefficient of common border is negative but not significant. This result suggests that the common border is not the main determinant in the ASEAN trade to their trading partners. All bilateral and time effects are highly significant.

The intra ASEAN dummy used to estimate the trade creation among the five ASEAN members is positive but insignificant as presented in column (4). In addition, with the inclusion of Non-ASEAN dummy in column (5) the intra ASEAN5 dummy is positive and significant. It means that if the two, exporter and importer countries in the sample are the members of ASEAN5, they will trade more each other than other countries. There is also evidence of trade diversion from trading partners which are not members of the free trade area in ASEAN. This result is quite similar to Frankel and Wei (1997) and Elliot and Ikemoto (2004) but contradicts Sharma and Chua (2000) and Soloaga and Winters (2001) which found a negative relationship, albeit for a different estimating equation, years and country coverage. Finally in column (6), the dummy for ASEAN during the financial crisis 1997-1998 was found to have a positive and highly significant coefficient which implied that the five ASEAN countries did trade more during the crisis as found in Elliot and Ikemoto (2004).

In order to further examine the effects of intra-and-extra-regional-trade, Table 2.2 reports the estimation for augmented gravity equation with the inclusion of dummies from individual country as well as regional trade partners such as East Asia, South Asia, North and South America, Australia-New Zealand and Europe. The results in column (1) reveals that all coefficients of the basic gravity model except border and common language are correctly sign and statistically significant. The dummy for individual country is set to equal to one if a country is the original ASEAN. From the results, only the coefficient dummy for Malaysia has a positive sign and statistically significant meanwhile Indonesian dummy is negative and significant. The other three dummies even though positive but they are not significant. Therefore, further analysis is needed to confirm these results.

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Table 2.1: The intra-and-extra-ASEAN5 trade from panel 1984 to 2003, basic gravity model

Dependent Variable: log of Exports (log EX_{ijt})

	(1)[a]	(2)[b]	(3)[c]	(4)	(5)	(6)
IGDPi	1.568***	.222	.254*	.254*	.246*	.254*
	(.066)	(.185)	(.149)	(.149)	(.148)	(.149)
IGDPj	.856***	.466***	.366***	.364***	.423***	.361***
	(.019)	(.040)	(.041)	(.041)	(.041)	(.040)
IPOPi	-.743***	-4.26***	-4.49***	-4.49***	-4.45***	-4.49***
	(.024)	(.449)	(.365)	(.365)	(.363)	(.365)
IPOPj	-.047***	-.233	-.410	-.448	-1.39***	-.550*
	(.018)	(.346)	(.281)	(.290)	(.327)	(.289)
endow	.130***	.243***	.413***	.414***	.365***	.416***
	(.025)	(.017)	(.043)	(.043)	(.043)	(.043)
Distance	-.00008***	-.00009***	-.00002***	-.00002***	-.000034***	-.000026***
	(2.58e-06)	(.00001)	(7.95e-06)	(7.96e-06)	(8.30e-06)	(7.98e-06)
Border	.627***	.458***	-.271	-.249	.186	-.196
	(.064)	(.043)	(.192)	(.193)	(.201)	(.193)
Language	.146***	-.050	2.09***	2.08***	1.93***	2.07***
	(.028)	(.030)	(.124)	(.124)	(.129)	(.124)
Intra-ASEAN5				.020	.161***	
				(.039)	(.049)	
Non-ASEAN					-.248***	
					(.040)	
Intra ASEAN-crisis						.082**
						(.041)
Constant	-17.85***	31.62***	31.40***	31.72***	37.91***	32.55***
	(.675)	(4.55)	(3.57)	(3.62)	(3.73)	(3.61)
Time effects		F(19, 3829) = 8.28***	F(18, 3681) = 12.13***	F(18, 3680) = 12.10***	F(18, 3679) = 13.19***	F(18, 3680) = 12.30***
Exporter effects		F(4, 3829) = 115.33***				
Importer effects		F(39, 3829) = 83.78***				
Bilateral effects			F(194,3681) = 42.14***	F(194,3680) = 40.47***	F(194,3679) = 41.08***	F(194,3680) = 41.03***
No Observation	3900	3900	3900	3900	3900	3900
R-squared	0.6244	0.5347	0.2786	0.2786	0.2860	0.2794
F-Statistics/wald stats	F(8,3891) = 760.68***	F(31,3829) = 141.93***	F(24,3681) = 59.22***	F(25,3680) = 56.85***	F(26,3679) = 56.69***	F(25,3680) = 57.06***
Two step						
R-squared			0.0681	0.0676	0.0559	0.0665
F-Statistics			F(3, 3896) = 94.85***	F(3, 3896) = 94.21***	F(3, 3896) = 76.87***	F(3, 3896) = 92.52***

Notes: Numbers in parentheses are White Standard Errors. ***,**, * indicate significance at the 1%, 5% and 10% level. (a) estimate with OLS; (b) include importers, exporters and time effects (c) column (3) onwards include bilateral effects and time effects , the Hausman Test found that FEM is preferred model (p-value=0.000)

Regression in column (2) includes all regional importers groups and found that only new ASEAN members have positive and significant impact. There is also evidence of trade diverting from South Asia. The other regional importers have mixed signs but statistically insignificant.

In summary, bilateral trade flows in ASEAN5 are associated with countries with relatively large market size. Conversely, the size of population is negatively with trade showing a positive absorption effects in both exporter as well as importers. The bilateral distance and common language are also equally important. However, the common border is not a main determinant in bilateral trade in ASEAN5. Furthermore, the estimation of intra regional trade from panel 1984 to 2003 on ASEAN5 found strong evidence of trade creation among the original ASEAN members. There is also evidence of trade diversion from non-ASEAN members. However, the effectiveness of the ASEAN Free Trade Agreement which has been established in 1992 cannot be measured from the above estimation. Therefore, the data has been split into two parts for pre and post AFTA estimation as presented in Table 2.3.

Table 2.2: The intra-and-extra-ASEAN5 trade from panel 1984 to 2003, augmented gravity model

Dependent Variable: log of Exports (log EX_{ijt})				
	(1)		**(2)**	
IGDPi	.256*	(.151)	.248*	(.148)
IGDPj	.366***	(.041)	.395***	(.042)
IPOPi	-4.58***	(.371)	-4.46***	(.362)
IPOPj	-.506*	(.293)	-1.05***	(.405)
endowment	.412***	(.043)	.382***	(.044)
Distance	-.00002***	(8.13e-06)	-.000029***	(8.13e-06)
Border	-.209	(.197)	.035	(.197)
Language	2.12	(.127)	1.99	(.127)
Intra-ASEAN5			.009	(.066)
Non-ASEAN				
Constant	32.76***	(3.708)		

Intra ASEAN trade from individual country

Indonesia	-.126**	(.061)
Malaysia	.103*	(.062)
Philippines	.054	(.062)
Singapore	.018	(.062)
Thailand	dropped	

Extra regional Trade

ASEAN new	.160***	(.067)
East Asia	.032	(.062)
South Asia	-.192***	(.069)
Australia-New Zealand	.023	(.072)
European	-.083	(.054)
North America	Dropped	
South America	-.076	(.060)

Time effects	F(18, 3676) = 12.03***	F(18, 3674) = 9.4***
Individual country effects	F(5, 3676) = 1.40***	
Regional Importer effects		F(6, 3674) = 9.98***
Bilateral effects	F(194, 3676) = 65.03***	F(194, 3674) = 55.09***
No Observation	3900	3900
R-squared	0.2799	0.2902
F-Statistics	F(29,3676) = 49.28***	F(31,3674) = 48.45***

Two step

R-squared	0.0674	0.0604
F-Statistics	F(3, 3896) = 93.80***	F(3, 3896) = 83.52***

*Note: ***, **, and * denote 1%, 5% and 10% level significance respectively. The number in parentheses are the white standard errors*

2.3.3.2 The intra and extra ASEAN5 trade: pre and post AFTA analysis

In the following analysis, due to smaller sample size the FEM only includes exporter and importers effects meanwhile time effects are excluded because they were insignificant in both pre and post AFTA analysis. In pre AFTA analysis, all coefficients have the correct sign except the coefficient of common language which is negative and significant before the AFTA but insignificant after the AFTA as shown in Table 2.3 column (1). The intra ASEAN5 dummy is found to be negative and highly statistically significant, implying that the five ASEAN members traded less with each other before the implementation of AFTA. The non-ASEAN dummy is also negative and significant which implies that trade with non-ASEAN members had also been decreasing during the pre AFTA period. Column (2) presents the regression with the inclusion of individual countries in ASEAN5 and found the coefficients on the dummies for Indonesia, Malaysia and Singapore are negative and highly significant. This confirms the result that the contribution of intra regional trade from individual members of the ASEAN is also less before the period of ASEAN free trade agreement took place.

After the implementation of CEPT scheme, trade between ASEAN not only benefited to producers but also consumers. The ASEAN5 dummy is positive and statistically significant[21] as presented in column (3). Within this period, if two countries were original ASEAN members, they would trade 22.6[22] times more than otherwise similar member countries. The coefficient for Non-ASEAN dummy is also positive and significant which implies the evidence of extra-regional trade between ASEAN and her trading partners in post AFTA analysis. The intra ASEAN trade from individual countries found only Singapore, The Philippines and Thailand are positive and highly significant. The coefficients on the dummies for Indonesia and Malaysia are found to be insignificant. In column (5) the dummy for trade creation during financial crisis has been added and found positive and significant. This confirmed the previous result (Table 2.1) that during the financial crisis, the five ASEAN members traded each other more than with other similar countries.

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[21] The result is similar with Elliot and Ikemoto (2004) which covers the period of 1993 to 1999.

[22] $\text{Exp}(3.122)=22.6$

To provide a clearer picture in post AFTA analysis, Table 2.4 presents the results of intra regional trade after the formation of AFTA based on three periods: four years after the CEPT scheme are introduced, three years during the financial crisis, and four years during the recovery time[23].All coefficients of standard gravity variables are of the correctly sign and statistically significant. There is evidence of trade creation in all these periods. After the free trade agreement has formed in 1993, the members seem to trade with each other by 1.61 times more than other countries. The CEPT scheme might be the main feature in enhancing trade within the region. The ASEAN5 dummy in 1997-1999 (column 2) appeared to be higher compared with the period after the financial crisis. In 1997, the ASEAN members set up the ASEAN Surveillance Process (ASP) which allowed them discuss solutions and methods to overcome the crisis. Furthermore, the devaluation of currency among the ASEAN members made trade among them become cheaper than other countries. This result is very similar to Elliot and Ikemoto (2004) which also found that during the financial crisis they did trade more each other. However, trade among ASEAN5 slightly decreased in the period 2000-2003. A possible explanation is that after the region's economy bounced back, there is evidence of some ASEAN member proposed new bilateral agreements[24] with other countries. There is also evidence that trade diversion in both periods as presented in column (2) and (3). However, trade diversion during the financial crisis is quite smaller than during recovery period. The intra trade from individual countries (reported in Appendix) reveals that Singapore is the highest trade contributor. However, the size of trade has increased during the financial crisis in all countries except Singapore. After the financial crisis, individual country has slightly decreased in the intra trade.

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[23] In the sub model analysis, only the time effect is included as reduction of sample size will reducing the degree of freedom if all effects are included in the estimation.
[24] For instance, Malaysia has proposed bilateral agreement with Japan, America, South Korea, Pakistan, China and India in 2003.

Table 2.3: The intra-and-extra-ASEAN5 for pre and post AFTA, basic gravity model

Dependent Variable: log of Exports (log EX_{ijt})

	Pre AFTA		Post AFTA		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
IGDPi	2.31***	2.32***	1.014***	1.015***	1.05***
	(.329)	(.328)	(.357)	(.349)	(.356)
IGDPj	.521***	.499***	.475***	.477***	.451***
	(.085)	(.085)	(.104)	(.101)	(.104)
IPOPi	-2.23**	-2.24**	-1.56**	-1.56**	-1.56**
	(1.09)	(1.08)	(.746)	(.729)	(.745)
IPOPj	-3.66***	-3.61***	-1.22**	-1.226**	-1.73***
	(1.06)	(1.06)	(.578)	(.565)	(.598)
Endowment	.238***	.260***	.200***	.206***	.200***
	(.029)	(.031)	(.017)	(.017)	(.017)
Distance	-.0001***	-.00013***	-.00008***	-.00009***	-.00008***
	(.000019)	(.000019)	(.000012)	(.000012)	(.000012)
Border	.416***	.556***	.482***	.723***	.482***
	(.070)	(.083)	(.044)	(.051)	(.044)
Language	-.152***	-.167***	.036	-.004	.036
	(.049)	(.050)	(.031)	(.031)	(.031)
Intra-ASEAN5	-2.42***		3.122***		
	(.637)		(1.05)		
Non-ASEAN	-2.33***		2.96***		
	(.662)		(1.028)		
ASEAN5 during crisis					.159***
					(.050)
Constant	17.92***	15.49***	4.45*	7.544***	11.00***
	(6.48)	(6.06)	(2.44)	(2.94)	(3.20)
Intra ASEAN trade from individual country					
Indonesia		-.454*		.367	
		(.257)		(.298)	
Malaysia		-.573**		.158	
		(.264)		(.303)	
Philippines		-.031		1.01***	
		(.247)		(.300)	
Singapore		-.485*		.574*	
		(.261)		(.301)	
Thailand		-.372		.550*	
		(.258)		(.300)	
Importer effects	F(35, 1703) = 53.09***	F(37, 1698) = 52.22***	F(36, 2093) = 45.94***	F(36, 2089) = 50.70***	F(37, 2092) = 50.37***
Exporter effects	F(4, 1703) = 31.68***	F(4, 1698) = 35.36***	F(4, 2093) = 57.21***	F(4, 2089) = 70.38***	F(4, 2092) = 56.55***
Individual country effects		F(5, 1698) = 3.81***		F(5, 2089) = 21.49***	
No Observation	1755	1755	2145	2145	2145
R-squared	0.7766	0.7791	0.8675	0.8738	0.8682
F-Statistics	F(47,1703) = 125.97***	F(52,1698) = 115.16***	F(47,2093) = 291.66***	F(51,2089) = 283.69***	F(48,2092) = 287.04***

Note: ***, **, *and* * *denote 1%, 5% and 10% level significance respectively. The number in parentheses are the white standard errors*

Table 2.4: The intra-and-extra-ASEAN5 various years, basic gravity model

Dependent Variable: log of Exports (log EX_{ijt})

	1993-1996 (1)		1997-1999 (2)a		2000-2003 (3)	
IGDPi	2.960***	(.176)	2.547***	(.190)	2.743***	(.185)
IGDPj	.862***	(.037)	1.006***	(.037)	1.143***	(.028)
IPOPi	-.969***	(.047)	-.676***	(.044)	-.640***	(.038)
IPOPj	-.071***	(.031)	-.129***	(.033)	-.130***	(.027)
Endowment	.226**	(.045)	.136***	(.040)	.133***	(.035)
Distance	-.000055***	(4.05e-06)	-.000067***	(3.99e-06)	-.000086***	(3.63e-06)
Border	.475***	(.134)	.372***	(.136)	.516***	(.087)
Language	.271***	(.050)	.266***	(.057)	.269***	(.048)
Intra-ASEAN5	.459***	(.110)	.336***	(.095)	.238***	(.074)
Non-ASEAN5	-.167	(.107)	-.354***	(.092)	-.360***	(.076)
Constant	-31.37***	(1.66)	-30.10***	(1.938)	-33.96***	(1.893)
Time Effects	F(3, 763) = 4.69***				F(3, 766) = 4.73***	
No Observation	780		585		780	
R-squared	0.7452		0.7854		0.8270	
F-Statistics	F(13, 766) = 198.48***		F(10, 574) = 219.92***		F(13, 766) = 289.97***	

Notes: Numbers in parentheses are standard error. ***,**, * indicate significance at the 1%, 5% and 10% level. (a) time effects excluded because it was insignificant

In summary, there is weak evidence of trade creating before the establishment of the free trade area in ASEAN. However, after the formation of AFTA, besides trade creation among members, there is also evidence of increasing in the extra regional trade.. In closer examination, the ASEAN members actively participated in trade right after the AFTA was launched. Furthermore, they trade each other more during the financial crisis than the period after the crisis.

2.3.3.3 The effect of intra regional trade after the expansion of ASEAN

Tables 2.5 and 2.6 present the estimation of the intra and extra regional trade with the inclusion of all members of ASEAN except Brunei which has been dropped due to lack of data. The estimation covers the period after the implementation of AFTA since all the new ASEAN members except Brunei become members after 1993. In fact, the dummy for the individual countries are also based on the year they become members. All coefficients of standard gravity variables except the coefficient of border are the correct sign and statistically significant. The coefficients for both exporters and importers are positive and statistically significant. However, in terms of the size of the coefficients, the size market for importers is higher than exporters.

In column (2) the intra ASEAN9 dummy is included to find the effect of the expansion of membership in ASEAN. The coefficient is found to be negative and significant. This implies that the expansion of membership has encouraged intra regional trade in ASEAN. This result contradicts with that of Clarete et al. (2003)[25] which found all the coefficients of intra bloc for export and import for AFTA with inclusion of new members are not statistically significant. Regression in (3) estimates the intra ASEAN dummy during the financial crisis and found to have a positive but statistically insignificant.

The estimation in Table 2.6 includes the individual new members dummy and the extra trade from other regional economic blocs. The intra trade from new members is presented in column (1). Among them, only Vietnam and Cambodia are found to have positive and highly significant effects meanwhile Myanmar has a negative sign and is significant. Vietnam which joined ASEAN in 1995 trades 0.75 times than the other three members. Meanwhile Cambodia which became the last member in 1999 trades with members 0.15 times more than the other three new members. In column (2), dummies for ASEAN5 and

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[25] However, they used the pool OLS estimation for the period of 1980 -2000.

ASEAN new members as a group of importers are included in the regression. This estimation revealed that the five original ASEAN imports more than the new members.

The last column estimates the equation with the inclusion of regional importers dummies which represent the rest of the world. The results are mixed. The coefficient dummies for South Asia and East Asia are negative and statistically significant. This implies that after the formation of AFTA and the expansion of ASEAN membership, some trade from these regions has been diverted. However, the results also reveal that trade has been increasing between ASEAN and some other regions such as Europe and Australia-New Zealand. The ASEAN-EU relationship since 1994 through ASEAN-EU meeting (ASEM) benefited both regions in economic and political exchange. Meanwhile, the relationship with Australia and New Zealand established since 1974/75 followed by Asia Pacific Economic Cooperation (APEC) in 1994 the recently AFTA-Closer Economic Relationship (CER) sign in 2002 become value added to both regions.

In summary, the expansion of membership does give significant results to both original and new members towards the realization of AFTA. Among new members, Vietnam and Cambodia are among active members in trade with ASEAN members. The effect from other regional importers group found trade diversion from Asian countries but trade creation from Europe and Australia-New Zealand.

Table 2.5: The intra-ASEAN10 trade after AFTA , augmented gravity model

Dependent Variable: log of Exports (log EX$_{ijt}$)

	(1)		(2)		(3)	
IGDPi	.225***	(.075)	.216***	(.075)	.226***	(.075)
IGDPj	.427***	(.100)	.384***	(.102)	.425***	(.100)
IPOPi	-5.02***	(.730)	-4.96***	(.731)	5.03***	(.731)
IPOPj	-6.09***	(.587)	-5.61***	(.633)	-6.10***	(.587)
Endowment	.428***	(.093)	.429***	(.093)	.430***	(.093)
Distance	-.00007***	(.00001)	-.00007***	(.00001)	-.00008***	(.00002)
Border	-.435	(.354)	-.409	(.328)	-.433	(.354)
Language	1.01***	(.374)	1.03***	(.349)	1.01***	(.375)
Intra-ASEAN9			.082**	(.040)		
Intra-ASEAN9 during crisis					.041	(.040)
Time effects	15.99***		15.90***		15.83***	
Bilateral Effects	45.977***		39.083***		44.251***	
No Observation	3859		3859		3859	
R-squared	0.9306		0.9306		0.9306	
F-Statistics	19.23***		18.31***		18.10***	

Notes: Numbers in parentheses are White Standard Errosr. ***,**, * indicate significance at the 1%, 5% and 10% level.

Table 2.6: The intra-and extra-ASEAN10 trade after AFTA, augmented gravity model

Dependent Variable: log of Exports (log EX$_{ijt}$)

	(1)		(2)		(3)	
lGDPi	.205***	(.083)	.076	(.082)	.216***	(.075)
lGDPj	.392***	(.103)	.882***	(.022)	.384***	(.102)
lPOPi	-3.39***	(.759)	-4.55***	(1.13)	-4.96***	(.731)
lPOPj	6.47***	(.574)	-.071***	(.021)	-5.61***	(.633)
Endowment	.442***	(.092)	.155***	(.022)	.429***	(.093)
Distance	-.0025***	(.00001)	-.00005***	(2.62e-06)	-.00017***	(.00010)
Border	-.557	(.363)	.809***	(.044)	1.071***	(.309)
Language	.422	(.380)	.363***	(.045)	1.72***	(.312)
Intra-ASEAN9					.082**	(.040)
Intra new ASEAN trade from individual country						
VNM_95	.563***	(.048)				
Lao_97	-.314***	(.043)				
MYM_97	.012	(.054)				
CAM_99	.143***	(.039)				
AS5_im			.583***	(.039)		
ASNew_im			.279***	(.049)		
Extra regional Trade						
East Asia					-2.58***	(.359)
South Asia					-6.06***	(.317)
AUNZ					2.93***	(.705)
Europe					1.47*	(.873)
North America					.626	(1.30)
South America					1.80	(1.65)
Time effects	9.23***		3.15***		15.90***	
Bilateral effects	0.059***				31.791***	
Exporter Effects			221.807***			
Importer effects			109.37***			
No Observation	3859		3859		3859	
R-squared	0.9347		0.8133		0.9306	
F-Statistics	26.34***		250.78***		18.31***	

*Notes: Numbers in parentheses are standard error. ***,**, * indicate significance at the 1%, 5% and 10% level. VNM (Vietnam), MYM (Myanmar), CAM (Cambodia), AS5 (ASEAN5), ASNew (ASEAN New), im(importers), ex (exporters)*

2.4 Summary, Conclusion and Further Research

In this study, the effects of intra-and-extra regional trade after the formation of ASEAN and the enlargement of ASEAN's membership are estimated for the period 1984 to 2003. The powerful method in estimating bilateral trade namely gravity model is employed.

Generally, the estimated coefficients of most basic determinants are correctly signed and statistically significant, indicating that GDP, population, relative endowment, distance between two countries and common language could influence bilateral trade flows.

The ASEAN dummies and other regional importer group dummy variables were used to capture the effect of intra-and extra trade. The results show different impact on different groups dummies based on different time frame. Overall, there is evidence of trade creation within the five ASEAN members for the panel of 1984 to 2003. Closer examination also found evidence of trade creation after the establishment of AFTA. They even trade more right after the formation of AFTA, during the financial crisis and after the financial crisis. The CEPT scheme was a key element in the establishment of free trade agreements. In addition, during the crisis the Association has designed many packages including ASEAN Surveillance Process, ASEAN Vision 2020 and ASEAN Economic Community to help each member to speed up the recovery process by fully utilizing the tariff scheme within the region. There is no evidence of trade diversion in pre AFTA but strong evidence from the post AFTA analysis

Additional individual dummy variables are introduced to capture the contributions of each individual member of ASEAN5 as well new members of ASEAN in their participation on AFTA. Each ASEAN member is found to trade with each other in the sample of period which The Philippines is the highest trade with contributor followed by Singapore and Thailand. They even trade each other more during the financial crisis, 1997-1999, rather than during the recovery period, 2000-2003.

This study also found that the expansion of ASEAN membership from five to ten did contribute to trade creation among the original as well as the new members. Vietnam is one of the new members that seriously participated in the intra-ASEAN-trade meanwhile the other four has shown weak evidence. However, the inclusion of the ASEAN dummy and other regional importers found evidence of strong trade diversion in Asian regional blocs, meanwhile increasing in extra-regional trade with European countries and Australia-New Zealand.

In summary, the AFTA, which refers to the free trade agreement among developing countries or South-South Agreement, benefits the members with trade creation to the original members as well as the new members. As far as the new members in ASEAN are concerned, the CEPT scheme is an important tool to improve not only domestic reformation but also to enhance the international trade liberalization. However, it is up to each individual country to further pursue trade and investment liberalization via ASEAN platform.

As this study focuses on the impact of regional economic integration on intra regional trade in ASEAN, future research should also focus on other impact such as foreign direct investment, growth, poverty, tourism and migration.

Chapter 3

Regional Economic Integration and Foreign Direct Investment: Evidence from the ASEAN Free Trade Area.

3.0   Introduction

Foreign direct investment (FDI) has played a crucial role in most of the ASEAN economies since the 1970s. From import-substituting to export-oriented countries, FDI has become one of the key vehicles in bringing success in growth to the Southeast Asian economies. FDI is viewed as a powerful means of transferring technology and management best practice. It also contributes to the integration of domestic production capacities into the global market. In the light of these developments, the role of regional economic integration as a determinant of the location of FDI has become a debated issue, particularly in emerging countries typified by the ASEAN economies. Etheir (1998) suggested that developing countries use Regional Economic Integration (REI) primarily as a means to attract more foreign investors.

Many previous studies have investigated the determinants of foreign direct investment or have examined the effects of REI on trade. However, there are relatively few that consider the relationship between REI and FDI, and even fewer studies that focus on the ASEAN Free Trade Area (AFTA). Therefore, the first part of this study will investigate the effect of bilateral FDI flows into Southeast ASEAN countries from members and

non-members. The second part will be focused on the determinants of FDI in ASEAN and how REI affects these determinants.

The analyses will focus on the effect of the implementation of the AFTA in 1992 and the subsequent establishment of the ASEAN Industrial Cooperation (AICO) in 1996 and the ASEAN Investment Area (AIA) in 1998. The AICO scheme is the industrial cooperation program of ASEAN intended to promote joint manufacturing industrial activities between ASEAN-based companies. The main objectives of this scheme are to enhance ASEAN industrial production, to attract investment from ASEAN and non-ASEAN sources and to increase intra-ASEAN trade. Another important tool of ASEAN economic integration schemes is the AIA which aims to provide an environment that will facilitate the free flow of direct investment, technology and skilled professionals. In addition, the AIA arrangement also provides an opportunity for investors to adopt regional business strategies and establish network operations in the region.

However, the main concern in this study is to highlight whether the ASEAN Free Trade Agreement can be credited with making ASEAN countries more attractive to FDI from members and non-members, noting that the agreements have been followed by many packages to enhance FDI flows into the region.

This study is organized as follows: Section 3.1 presents a theoretical framework that explains how regional economic integration can be linked with foreign direct investment. This is followed by theoretical and empirical literature reviews of relationship between REI and FDI as well as the determinants of FDI in section 3.2. Section 3.3 presents the empirical analysis (including data and methodology) used in this study, the model, the results, and a discussion. Finally, summaries of the main findings, conclusions, policy implication and recommendations for further study are presented in section 3.4.

3.1 Theoretical Framework

3.1.1 Regional Economic Integration

Regional economic integration typically encompasses the reduction of tariffs and non-tariff barriers. However, in a deeper process of economic integration, some regional groups include the adoption of a common external tariff policy to the rest of the world, the free mobility of capital and labour and the harmonization of tax systems and regulation.

The theory of economic integration was originally based on a study by Balassa (1961), and further elaborated on by other scholars such as Robson (1993) and El-Agraa (1997). Regional economic integration has become a popular tool for countries wishing to stimulate growth through trade and investment. Whether in Europe (the European Union), North America (NAFTA), Latin America (MERCOSUR) or Southeast Asia (AFTA), countries have joined an REI because it promises various economic benefits—in particular, enhanced trade and investment, and a larger, more integrated market. In theory, REI should create a larger market through combining fragmented markets into a single, larger one, which indirectly can stimulate the GDP growth rate of member countries.

3.1.2 Foreign Direct Investment

There is no clear cut definition of foreign direct investment (FDI). According to the World Trade Organization (WTO), "FDI occurs when an investor is based in one country and owns an asset based in a second country (the host country) with the intent to manage that asset. The management dimension is what distinguishes FDI from portfolio investment in foreign stocks, bonds and other financial instruments." UNCTAD defined

FDI as an investment involving management control of a resident entity in one economy by an enterprise resident in another economy.

The International Monetary Fund (IMF) defined FDI as "an investment that is made to acquire a lasting interest in an enterprise operating in an economy other that of the investor, the investor's purpose being to have an effective voice in the management of the enterprise"[26]. OECD defined Foreign Direct Investment (FDI) as the acquisition of 10% or greater share of ownership of an asset by a single investor located in a different country. FDI is viewed as bringing potential benefits to the host country such as capital, technology and managerial skill which can stimulate the economic growth. However, from an investor point of view, the most important motive is profit maximisation, whether by investing in a foreign market or by expanding domestic production for export. The earliest studies explain FDI as arising due to capital seeking to earn the highest possible return. Hence, capital is predicted to flow from capital abundant countries into countries in which capital is scarce and should earn a higher return.

According to Dunning (1992, 1997), multinational enterprises (MNEs) will invest abroad only if they possess three types of advantages: Ownership advantages (O), Location advantages (L) and Internalization advantages (I)—the OLI framework also known as the Eclectic Paradigm. The Ownership advantage[27] refers to a firm which possesses some product, technology or intangible asset (e.g. branded name) not possessed by its foreign competitors. Specific characteristics include high levels of research and development, large professional employment and technical workers, product differentiation, new-sophisticated product and advertising. These advantages allow the firm to exploit a consistent degree of market power and to obtain monopolistic rents on every market the firm operates. Meanwhile, the locational advantages explain why firms locate production

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[26] International Statistical Financial Yearbook 2004, IMF.

[27] Altomonte (1998) explained that the firm possesses specific ownership advantage because of structural market failure and gain from international investments.

in foreign markets rather than producing in local markets. This type of advantages is often referred to as a 'tariff jumping' strategy because of some other advantages in the foreign market such as low factor price and transport cost and trade barriers[28]. Finally, the Internalisation advantages explain why firms prefer foreign direct investment rather than licensing proprietary assets for foreign-owned firms to use [29] in production.

3.1.3   The linkages between Regional Integration and Foreign Direct Investment:

Many previous studies relating to REI focus on trade creation and trade diversion, as proposed by Viner (1950). The relationship between REI and FDI became a concern after the formation of the EEC in the 1960s. However, very few studies have specifically focused on the FDI-REI relationship. In addition, the predictions of existing theoretical frameworks are ambiguous with regards to the relationship between REI and FDI. According to Yeyati Daude and Stein (2002), the impact of REI on bilateral FDI depends on whether the source and host countries are members of an REI. For instance, FDI flows to Canada and Mexico from the United States would be differently affected than flows from France. In the same way, FDI flows from Unites States to NAFTA's member will be affected differently than flows to other countries belonging to other regional groups. In addition, FDI flows also depend on other individual characteristics[30].

However, many researchers (such as Blomstrom and Kokko, 1997 and Yeyati, et. al., 2002) agree that the impact of REI on FDI depends on the structure or motive of FDI— specifically, whether it is horizontal or vertical FDI. Horizontal FDI (HFDI) occurs when a firm locates production abroad because it is cheaper to produce in a foreign country

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[28] Examples of location advantages are market size and growth, local demand pattern, transport costs, low wage costs relative to labour productivity, abundant natural resources and trade protection (Billington, 1999).

[29] It is in terms of protection and prevention technological leaking to other foreign competitors.

[30] A country may attract more FDI if they can provide cheaper resources, excellent communication and infrastructure, macro and political stability, and skilled workers.

rather than export their domestic production and pay tariffs. Generally, such firms produce homogenous goods with multiple production facilities, and each production facility serves its domestic market. Meanwhile, Vertical FDI occurs when a firm locates its production process and facilities in countries which have human capital and infrastructure facilities required by the investor in order to take the advantage of international differences in factor prices. Some production involves several stages, each carried out in a different country. A firm's production serves not only its domestic market, but also foreign markets.

According to Markusen and Venables (1998) and Markusen et al. (2000), and if countries differ in relative factor endowments, and trade costs are low then vertical FDI will dominate. On the other hand, if countries are quite similar in terms of relative size and factor endowment, and trade cost are medium to high then horizontal FDI is expected to dominate.

3.1.4   The effect of Regional economic integration and Foreign Direct Investment

From a theoretical standpoint, the effects of REI on FDI are ambiguous. It depends upon the FDI motive and the geographical location of foreign investors. It may vary between regional economic groups, countries and industries

However, there are two main effects that will be considered in this study. First is the effect of REI upon intra-regional FDI. If FDI within a region is primarily horizontal or tariff-jumping then REI within that region is likely to lead to a reduction in FDI flows. This is because a firm which was initially attracted to foreign production for these purposes can now produce and supply from production bases elsewhere within the region. Furthermore, free trade amongst member countries makes exporting relatively cheaper vis-à-vis FDI as a way to serve the regional market (Blomstrom and Kokko, 1997). However, for a firm which invests in the form of vertical FDI, a reduction of trade

barriers would lead to increased FDI as it becomes easier to export the finished product back to the home country or elsewhere in the region

The second effect of REI is on extra-regional FDI. A reduction of tariff protection within the free trade area will increase flows of both horizontal and vertical FDI from the rest of the world. In addition, according to Blomstrom et al (1998), FDI flows from non-member countries are likely to rise if the average level of protection of the rest of the world increases, or if the formation of REI raises fears of future protection.

Kindleberger (1966) introduced 'investment creation' and 'investment diversion' as analogous to Viner's (1950) concepts of trade creation and trade diversion. Investment creation is said to occur when firms from third countries invest in the region due to both increased market size and the impact of tariff reductions on the cost of exporting. After FTA has taken place, the third countries that face trade diversion may take the opportunity to invest in one of the member countries within the region. Therefore, the flows of FDI would be increased in the region. Investment diversion occurs when the third countries reduce their investment or shift their investment from a relatively efficient location to an inefficient location. Yeyati, Daude and Stein (2002) noted that investment diversion could occur when FDI in a host country decreases because a source country joins another FTA, and firms thus divert their investment to take advantage of the new agreement.

Since REI is always associated with a larger market, this allows some firms to grow stronger and larger to serve the entire market in the region. Some other firm may seek to form strategic alliances, or merge with former competitors so that they can establish more investment in research and development and marketing within the region as well as the rest of the world (Blomstrom and Kokko, 1997).

Overall, the theory predicts a positive effect on extra-regional FDI, but an ambiguous effect on intra-regional FDI that depends upon the structure and motives for pre-existing investment in the region or countries (Jaumotte, 2004).

3.2 Literature Review

This section is divided into two parts - theoretical literature and empirical literature. The theoretical section discusses approaches to modelling FDI in an REI context, and the empirical literature section will discuss some evidence on the relationship between FDI and REI, as well as some other factors that may attract FDI into the region

3.2.1 Theoretical Literature

Recently, there have been several papers that try to explain whether economic integration causes FDI. For instance, Motta and Norman (1996) analyze the effects of economic integration on oligopolist multinationals in a three country setup: two integrating (host) countries that are members of an RIA, and a source country, which is external to the same RIA. They distinguish between the effects of market accessibility (the extent of a reduction in intra-regional tariff and non-tariff barriers to trade) and the impact of individual country size. Their results are consistent with the existence of parallel trade and FDI flows. In particular, they show how economic integration, by improving market accessibility, will induce outside firms to invest in the integrated regional bloc, generating intra-regional platform FDI from the external country, ultimately leading to increased trade volumes between the integrating countries.

Further, Neary (2002) focuses on a single industry and on the location decision of a single potential investor in order to explore the effects of internal trade liberalization by a group of countries on the level of inward investment and finds that the tariff jumping

motive encourages plant consolidation. He noted that a firm may find it more beneficial to undertake FDI in a FTA than exporting to countries in the FTA. This is the *export-platform* motive. Finally, a reduction of internal tariffs has led to increased competition from domestic firms that dilutes both the tariff jumping and export platform motives.

Conversely, Heinrich and Konan (2000) examine how preferential trading agreements affect MNCs' incentives to invest in the integrating countries. They find that the extent to which MNCs will invest depends on the size of the barriers to trade (transportation costs). They also examine the induced welfare effects for the integrating countries and find that they are beneficial. In that study, they consider a partial-equilibrium three-country world in which two countries join a PTA. The third country is the MNC parent country. On a similar issue, but with a different setup, Donnenfeld (2003) uses n-country analysis of trade barriers to examine the impact of the emergence of regional blocs on the patterns of inter-bloc and intra-bloc trade when firms have the option to engage in foreign direct investment (FDI). He finds that, for exogenously given external tariffs, and when firms have the option to engage in FDI, all inter-bloc trade may cease—complete trade diversion that is replaced by inter-bloc FDI investment creation. He also finds that the formation of two regional blocs enhances the welfare of all countries.

3.2.2 Empirical Literature

Available empirical studies tend to relate intra and extra regional FDI into the region. It is said that the effect of REI on FDI may vary between different regional groups, countries and industries. Moreover, numerous studies have also found that there are other country characteristics that attract foreign investors into the host country

3.2.2.1 Regional Economic Integration and Foreign Direct Investment

There exists a vast literature regarding the relationship between REI and FDI, either internal or external that focuses on the experiences of the European Community (EC). For instance, Egger and Pfaffermayr (2004) study the impact on bilateral European FDI relations of three different events in the EU integration process during the 1990s: the Single Market Program (SMP), the 1995 enlargement and the Europe Agreements between the EU and the CEEC. They found that anticipation effects on FDI typically take place between the announcement and the formal establishment of an integration event. They also found that FDI does not increase before the official announcement of an integration step, but with the formal completion. However, Dunning (2000) found that both intra and extra European Community FDI have been stimulated after the Internal Market Program (IMP) in Europe was launched in 1985. They also found that the growth of FDI has been complementary to the growth of trade. Similar results are found by Pains and Lansburry (1997) who show that intra-regional FDI increased in the UK and Germany after the IMP was implemented. They also find evidence of investment diversion from the US and Austria to the benefit of European Community.

There is also one study that undertakes an empirical investigation of the effects of the EU enlargement process in the Central Eastern European Countries (CEEC). Clausing and Dorobantu (2005) examine the ability of CEECs to attract FDI during the first decade of transition. They find empirical support for market size and cost factors as determinants of

the multinational enterprise location decision within Europe. In addition, the effect of EU announcements regarding the accession process indicates a statistically significant effect upon FDI in the CEEC candidate countries. Moreover, Bevan and Estrin (2000) also found that the announcement of progress in EU accession directly affected FDI receipts. They studied FDI flows from 18 established market economies to 11 transition economies for the periods 1994 to 1998 and also found that political announcements concerning timetables for admission to the EU increase levels of FDI.

On the other hand, Balasubramanyam et al (2002), studying the EU and NAFTA, find that the presence of REI or RIA does not determine the direction of bilateral FDI flows. However, economic characteristics such as population, income, market-size and distance are the main determining factors in both host and source countries. Buch et al. (2003) study FDI from German firms during the accession of CEEC states to the EU and also find that economic integration and the transition per se are not the main factors in motivating German investors. The study confirmed that there is substantial amount of German FDI into the accession states; however, the FDI is distributed in a relatively uneven pattern. They also find evidence that German multinational firms select the host country based upon other factors such as factor endowment, the legal environment and distance.

However, many recent studies have focused more attention on the regional economic integration in North America. Examples include Blomstrom and Kokko (1997), and Blomstrom et al, (1998). Conceptually, in a purely descriptive analysis, a positive impact of REI upon FDI can occur when regional integration agreements coincide with domestic liberalization and macroeconomic stabilization in the member countries. They found that North-North agreements like CUSTFA did not appear to cause any radical change in the inflows of FDI to Canada. However, the NAFTA North-South agreement has created new opportunities for domestic and foreign investors in Mexico as well as the Canadian market. There is also a significant increase in inward FDI from outside of the NAFTA

region. The North American experience suggests a more modest impact of regional trade agreements on intra-regional trade creation and extra regional FDI stimulation than associated with the earlier stages of EU integration. In addition, Waldkirch (2001) also investigates the impact of NAFTA on inward FDI in Mexico and finds that FDI has substantially increased in Mexico, mostly from its intra-regional partner's - Canada and the US.

Regarding south-south agreements, where developing countries form free trade agreements with other developing countries there have been mixed results. For instance, Jaumotte (2004), focusing on south-south regional trade agreements in developing countries, finds a positive effect of RTA market size on FDI, but a negative partial correlation between FDI received by RTA countries. He concluded that the investment received from non-RTA possibly reflected investment diversion effects of FDI from non-RTA to RTA country. However, the results of Blomstrom and Kokko (1997), who study the effects of Mercosur in Latin America, indicate that a strong investment expansion has coincided with the integration process. In fact, the inflows of FDI are not equally distributed to all participating countries, with Argentina and Brazil receiving particularly strong FDI flows. From the authors suggest that this is a result of stabilization programs in place there, rather than a direct consequence of regional integration.

In relation to FDI and ASEAN, Bende-Nabende et al (2001) studied whether the ASEAN Preferential Trade Agreement (APTA) from 1970 to 1996 had a significant effect in attracting FDI to the region and found a positive effect in the cases of Malaysia, Singapore and Thailand, but a negative one for The Philippines and Indonesia. Mirza and Giroud (2004) interview 113 companies in Singapore, Malaysia, Thailand, Vietnam and Cambodia, and find that flows of FDI to the ASEAN region have increased, particularly after the signing of AFTA. However, the experience of individual economies differs widely. They find that many TNCs have located their centre or head quarters in

Singapore, research and development in Malaysia and Thailand and basic assembly type operations in Vietnam and Cambodia.

3.2.2.2 The Determinant of Foreign Direct Investment

FDI towards developing countries flows to labor-intensive, low technology production, whilst FDI towards developed states is concentrated in high technology production. Moreover, identification of the determining factors of FDI is a complex problem, which depends on several characteristics specific to each country, sector and company. For developing countries, FDI has been a very important source of funding especially during the debt crisis. Numerous empirical studies have been conducted to investigate the main factor that can attract FDI to the host countries. While GDP as a proxy for market size is said to be important in attracting foreign investors, many other variables are also found to be associated with FDI. For instance, Jaumonte (2004) investigates whether the market size of RTA is important in attracting FDI and found positive and significant effects. In fact, there are also other variables such as population, higher levels of education and financial stability that are important factors to attract FDI. Chen, (1997) studied the location of FDI inflows into ten developing countries; namely China, India, Singapore, Hong Kong, Taiwan, Korea, Malaysia, Indonesia, Philippines and Thailand. By using OLS, he found that GDP, the degree of development and the level of accumulated FDI stock of developing host countries are positively significant location determinants—affecting the magnitude of FDI inflows. Moreover, Billington (1999) studied the determination of the choice location for FDI by using a multi country model containing seven industrialized countries and a multi regional model consisting of eleven regions from the UK. He found that at a country level; market size, unemployment, level of host country imports and certain policy variables are significant determinants of location. At a regional level; population density, unit labour costs and unemployment are the most influential factors.

The study of FDI has not only focused on developing countries that have already opened their market to the world, but also on transition economies such as Russia that have realized the benefits a country could gain from attracting FDI flows. Manaenkov (2000) conducts an empirical study to find the determinants of the choice of region and industry investment placement by MNCs. He conducted a cross-regional study on the Russian economic reform process, and employed a firm-level-panel data approach. He found that economic reform progress and the efficiency of institutions influence FDI placement. Other findings such as the availability of skilled labour, and the political characteristics of the region proved to be an important determinant of the inflow of FDI. Besides that, MNCs also tend to invest in more tariff-protected industries and choose the region with a high degree of local market monopolization.

Many studies emphasizes that the effectiveness of FDI depends on the stock of human capital in the host country. For example, Borensztein et al (1998) tested the effect of FDI on economic growth by using the Seemingly Unrelated Regression (SUR) Technique on panel data for a sample of 69 developing countries from 1970-1989. They concluded that FDI, by itself, has a positive but insignificant effect on economic growth. Their results suggested that FDI has a strong complementary effect on human capital. In addition, the result implies that FDI is more productive than domestic investment if and only if the host country has a minimum threshold stock of human capital. Meanwhile, Balasubramanyam et al (1999) used cross sectional annual data averaged over the period 1970-85 for a sample of 46 developing countries and found that the size of the domestic market, the competitive climate in relation to local producers, and the interaction between FDI and human capital have an important influence upon growth performance. Their analysis indicates that FDI is more productive in countries that have pursued export promotion rather than import substitution policies

In Noorbahksh and Paloni (2001), the importance of human capital as a resource that can attract FDI into a host country was examined. They employed three different levels of

education for a country's human capital such as the number of accumulated years of secondary, tertiary education (based on the number of accumulated years of secondary education) and tertiary education in the working age population. The data covered the period of 1980-94 for 36 developing countries from Africa, Asia and Latin America. They found that the three level of education tested statistically significant as determinants of FDI. They also tested other variables, such as the growth rate of the labour force, the growth of domestic markets, the availability of energy, and the presence of a stable macroeconomic environment, and found them to be equally important for FDI flows. They concluded that the countries that rely on low-cost, low skill labour, or on natural resources to attract FDI will face difficulty in inducing FDI into high value-added industries and may suffer slower economic growth.

There are numerous studies including Hobday (1995), Dowling and Cheang (2000), and Noorbahksh and Paloni (2001), and also organizations such as UNIDO and the WTO emphasize that foreign investment through MNCs bring not only capital, but also accessibility technology into developing countries. FDI has become a very important agenda item which is not only a source of finance and employment, but can also be a medium for acquiring skills, technology, organizational and managerial practices and access to markets. Authors such as Hobday (1995) and Dowling and Ray (2000) have stressed that computers and electronics are embedded in most production processes, consumer and capital goods, which are very important to determine industrial competitiveness. In fact they are key enabling technologies in the communications and information revolution of the modern knowledge economy. More advanced R&D capabilities give better opportunities for East Asian firms to capture the latest technology and spill over benefits created by the operation of MNCs and TNCs (Hobday, 1995; Lall, 1996; and Dowling and Cheang, 2000).

Recently, there are also many studies focusing on non-economic factors such as the Economic Freedom Index , Corruption Perception Index, political risk index, rule of law,

quality of the bureaucracy and transparency (see Drabek and Payne, 1999; Balasubramanyam et. al , 2002; Buch et al., 2003; Jaumotte, 2004). For instance, the economic freedom index and political risk are found to have a negative relationship with FDI. However, the rule of law, quality of the bureaucracy, and corruption perception indices are all found to have a significant and positive relationship with FDI.

In the recent literature many studies related to spillover effects[31] from FDI provide theoretical framework (see e.g. Helpman, 1984; Ethier, 1986; Varian, 1996; and Markusen and Venables, 1998, 1999) as well as empirical evidence (see e.g. Kokko 1994; Aitken and Harisson, 1999; Kugler, 2000, 2006; Haskel et al., 2002; Keller and Yeaple, 2003; Blalock and Gertler, 2004; and Bloom et al. 2005). For instance, Haskel et al. (2002) and Aitken and Harisson found a positive effect of FDI on local productivity in the United Kingdom and the United States, respectively. Another research that uses firm-level data from Lithuania found evidence of positive vertical FDI spillovers through backward linkages (see Smarzynska, 2002).In recent paper, Kugler (2006) uses industry level panel data of Colombian manufacturing sectors shows that spillovers occur only through backward linkages which is from foreign firm across (between) industries, not horizontally (within industries).

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[31] However in this study we do not consider estimating spillover effects from FDI.

3.3   Empirical Methodology

This section discusses empirical analysis in this study. For this purpose, the section is divided into three parts. The first part discusses data and methodology, the subsequent part covers the construction of the gravity model and the selection of the variables, finally results and a discussion are presented in the last part

3.3.1   Data and methodology

In this study the powerful method that has been widely used in testing trade models, namely the gravity model, will be employed to examine the effect of intra- and extra-regional FDI in ASEAN countries. According to Eaton and Tamura (1996), the gravity model which has been used in many studies that have explained bilateral trade, can be transposed to bilateral FDI. In addition, the gravity model has been applied more recently in finding the relationship between REI and FDI and the determinants of FDI across countries and regions (see Carlo Almonte (1998); Brenton et al (1999); Bevan and Estrin (2000); Balasubramanyam et al (2002); Yeyati et al (2002) and C.M.Buch et al (2003)).

The data on bilateral FDI flows are derived from ASEAN FDI Statistical 2004-05 covering the period from 1995 to 2003. The dataset covers 18 source countries[32] from various investors in the world and 9 host countries[33] which include all ASEAN members except Cambodia. The choice of source countries is based upon the fact that some of them are major sources of world FDI flows, such as the USA, Japan and European countries, whilst other investors are from emerging countries

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[32] The source countries included in this study are Japan, China, Hong Kong, Taiwan, South Korea, Singapore, Malaysia, Indonesia, The Philippines, Thailand, and Unites States of America, Canada, Australia, New Zealand, France, Germany, United Kingdom and Netherland.
[33] The host countries included in the study are from all ASEAN members such as Malaysia, Indonesia, Thailand, The Philippines, Singapore, Laos, Myanmar and Vietman.

In this study following Yeyati, Stein and Daude (2002), both host and source country factors will be included in the estimates. They estimated the effect of economic integration and FDI within the same REI[34], however, this study focuses on the effects of the economic integration of ASEAN and FDI. This empirical analysis will be undertaken three stages. The first will focus on the effect of FDI within ASEAN (intra-regional-FDI). The second stage will involve estimating the effect of FDI from non-members of ASEAN (extra-regional-FDI) from various regional groups such as East Asian, North America, Australia-New Zealand and Europe. Finally, the factors that determine the attractiveness of a host country—among ASEAN members—will be estimated based upon demand factors such as market size, macroeconomic stability and supply factors such as technology development, skills availability and infrastructure. In this estimation, the semi-gravity type approached will be employed as proposed by Brenton et al (1999); Ekhlom (1998) and C.M. Buch et al (2003) used the semi-gravity type approach which focuses only on pull factors i.e. host country factors.

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[34] They studies on 20 source countries and 60 host countries for period from 1982 to 1999, which covers general effect of REI and FDI.

3.3.2 The Gravity Model

The dependent variable is bilateral FDI inflows into the ASEAN countries. However, many observations whose value is zero cannot simply be excluded because they may contain important information. Therefore, to avoid losing observations which represent about 20 percent of the sample, following Eichengreen and Irwin (1995, 1997) and Yeyati, Stein and Daude (2002), the dependent variable will be log (1 + FDI), instead of the log of FDI[35]., The full specification is presented in (3.1).

$$\text{Log } (1+\text{FDI})_{ijt} = \alpha + \beta Y_{ijt} + \mu X_{ij} + \tau \text{REI1} + \sigma \text{REI2} + \varepsilon_{ijt} \qquad (3.1)$$

where

$$\alpha = \eta + \xi_t + \lambda_i + \gamma_j + \delta_{ij}$$

$$Y = (\text{logGDP}_{it}, \text{ log GDP}_{jt}, \text{ log PGDP}_{it}, \text{ logPGDP}_{jt})$$

$$X = (\text{ log DIST}_{ij} + \text{LANG}_{ij} + \text{BORDER}_{ij})$$

log (1+ FDI)ijt:	the log of FDI inflows from source country (i) to host country (j) with respect to year (t),
GDPit, GDPjt:	proxies of the size of market –gross domestic product,
PGDPit, PGDPjt:	proxies of level of development – gross domestic product per Capita,
DISTij:	represent the distance between capital cities of source country i and host country j in kilometers as a proxy to transport cost,
LANGij:	Dummy variable to control for two countries that share a common language,
BORDERij:	Dummy variable to control for two countries that share a common border,
REI-1:	Dummy variable, value of one if two countries are ASEAN5

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[35] Since the log form of zero does not exist.

	(Malaysia, Indonesia, the Philippines, Thailand and
	Singapore), ASEAN4 (Brunei, Laos, Myanmar and Vietnam);
	or otherwise zero,
REI-2:	Dummy variable, value of one if source country (i) is ASEAN

REI-2: Dummy variable, value of one if source country (i) is ASEAN (Malaysia, Indonesia, the Philippines, Thailand and Singapore); East Asian (Japan, South Korea, China, Taiwan, Hong Kong), North America (United States of America and Canada); AUNZ (Australia and New Zealand); and Europe (France, Germany, United Kingdom and Netherlands) or otherwise zero.

η_0, ξ_t, λ_i, γ_j, δ_{ij}: η_0 is a constant term common to all years, ξ_t is a time-effects term to capture business cycles common to all countries in the sample, λ_i represent the fixed effect for source country, γ_j represent the fixed effects for the host countries, and δ_{ij} is bilateral effects between two countries in the sample.

GDP and PGDP for both source and host country which are used to capture market size and the level of development, and are expected to have a positive relationship with FDI. However, distance as a proxy of transportation cost is expected to be negatively related with FDI. A common border and a common language are expected to be positively related with FDI, especially for intra-regional FDI since foreign investors from neighboring countries might take the opportunity to invest in a country which shares a common culture, language or border.

Based on past studies, there are many internal and external factors that determine foreign direct investment inflows into the host country. Therefore, several hypotheses can be developed regarding some potential determinants attracting FDI to the ASEAN region. In addition to gravity variables, other variables such as regional market size, capital-labor ratio, absolute difference of GDP per capita, real exchange rate, real interest rate, inflation rate, openness, government budget balance, infrastructure and skilled labor will

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be included in the estimation to determine the factor most responsible for attracting foreign investors to the region.

In addition to gravity variables, other variables such as regional market size, capital labor ratio, absolute difference of GDP per capita, real exchange rate, real interest rate, inflation rate, openness, government budget balance, infrastructure and skilled labor availability will be included in the estimation to determine the factor that most attract foreign investors to the region.

Yeyati, Stein and Daude (2002) introduced the concept of extended market for host and source countries, being the sum of domestic market size for all countries that have no tariffs within the same REI. They found that FDI is positively and significantly affected by the extended market of host countries, which will bring more FDI to the regions as a whole but may be distributed unevenly to individual country. However, the extended market for the source country was found to have a negative and significant effected on FDI. This effect will capture the FDI diversion effects as FDI in host country reduces when firms from source country divert investment to other regional groups or other countries. They even introduced an alternative measurement to construct the regional market for host countries by calculating a weighted sum of host GDPs with weights equal to the inverse of the distance between the host and the source countries. However, in this study only the extended market for host countries will be considered.

Other than GDP, the basic indicators for macroeconomic stability such as the inflation rate, real exchange rate, real interest rate, openness and the government budget balance are included. A country that has a good record in managing low inflation rates may be one of the factors that encourage investors to invest in a country. This is also true in managing financial stability such as maintaining a stable exchange rate and low real

interest rates. Therefore, the real interest rate and inflation rate[36] are expected to be negative. In the case of the exchange rate, many studies (Kohlhagen, 1977; Cushman, 1985; Froot and Stein, 1991) concluded that devaluation in the host country's currency induces a reduction in local production costs in term of foreign currency and therefore stimulates the inflows of FDI. Therefore, the exchange rate is expected to be positively related with FDI. The government budget balance is a measure of how successful the host government has been in managing the fiscal balance. On one hand, a surplus in budget balance leads a positive relationship and may encourage more investment, on the other hand, a large budget deficit may also implying that the host government needs more foreign financing[37]. Meanwhile, total trade is a proxy for openness, measuring how much a country has liberalized trade to the world market, and is expected to exhibit a positive relationship with FDI.

The absolute difference in GDP per capita between source and host countries is included to measure the difference in relative endowments as proposed by Helpman (1998), Egger (2000) and Mauro (2000). Alternatively, the ratio of capital (gross fixed formation) to labor will also be included in the estimation to seek a robust result. If the result is positive, vertical FDI dominates as countries differ in their factor composition, however, if it is negative then horizontal FDI dominates.

The quality of labor, and its capacity to adopt new technologies may also be relevant for foreign investment decisions. Therefore, as a proxy for the availability of skilled and educated labor, the percentage of government spending going to education will be used in the analysis. In addition, the number of telephone lines and mobile phones is a proxy for infrastructure that might encourage investors to operate a business. The relationship with FDI is expected to be positive.

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[36] See Kinoshita and Campos (2002).
[37] However, this case is more relevant to portfolio investment, which has a higher liquidity than FDI.

Besides macroeconomic factors and social indicators, non-economic factors such as the degree of economic freedom, transparency and Trade Policy Index are also equally important. The Economic Freedom Index[38] is a grading based on a score from 1 to 5 with lower scores representing greater economic freedom. Therefore, the relationship with FDI is expected to be negative, indicating that the freer a host country is, the greater is the flow of FDI that it attracts. The Transparency International Corruption Perception Index is measured on a scale ranging from 0 to 10, with higher values representing the cleanest and most transparent countries. This variable is expected to be positively associated with FDI flows. The other non-economic measure is a trade policy index which measures a country's weighted average tariff rate, and is expected to be negatively related with FDI—the lower the score, the lower the level of protection and the more likely that foreign investors will consider investing in the country.

The above-mentioned factors are expected to be the most important determinants of FDI flows into ASEAN. Therefore, the semi-gravity type model, which includes the basic gravity variables as well as the host country effects, will be employed to model FDI in ASEAN. The form of this model is as presented in equation (3.2).

$$\text{Log } (1+\text{FDI})_{ijt} = \alpha_0 + \xi_t + \beta_1 \text{lGDP}_{it} + \beta_2 \text{lGDP}_{jt} + + \mu X_{ij} + \lambda Z_{jt} + \varepsilon_{ijt} \qquad (3.2)$$

Where

$X = (\log \text{DIST}_{ij} + \text{LANG}_{ij} + \text{BORDER}_{ij})$

Z = (extended market host, regional market relative to distance, absolute difference in GDP per capita, Capital-labor ratio, inflation rate, real exchange rate, Government budget balance, Openness, Trade Policy, Education, Infrastructure and Communication, Economic Freedom Index and Transparency)

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[38] The Index of Economic Freedom includes ten factors that cover trade policy, the fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property rights, regulation and informal market activity.

3.3.3 Results and estimation

3.3.3.1 The effect of Intra-ASEAN-FDI

Table 3.1 presents the estimation of the effect of ASEAN on FDI from the members of free trade agreements. The first two columns are regressions based on panel data from 1995 to 2003; meanwhile the remaining columns are regressions for each year to capture an event study. Column 1 represents the estimation including gravity variables and reveals that all variables are significant and have the correct sign, with the exception of border, which is positive but insignificant. As predicted by the theory, the size of market and income per capita for both source and host countries are positive and significant. By contrast, the coefficient of distance is negative and significant, implying that the lower the transportation cost of the host and source countries, the more FDI will flow to the host country. Language is positive and significant indicating that, when the source and host countries share a common language, more FDI is expected to flow into the host country. However, the border coefficient is insignificant which implies that a common border is not an important factor in attracting more FDI into the countries.

Column 2 shows the results when the dummies for intra-regional FDI in ASEAN5 and other ASEAN countries are included. All gravity variables including Border are correctly signed and significant. However, in this estimation the time effects are included to capture the trend of FDI within the period of time. The coefficient of the dummy for intra regional FDI in ASEAN5 is positive but insignificant. This implies that if the source and host countries are among the five original members of ASEAN (Indonesia, Malaysia, The Philippines, Singapore and Thailand) they invest less in each other. However, the coefficient dummy for intra regional FDI between ASEAN5 and the other four ASEAN members (Brunei, Laos, Myanmar and Vietnam) is positive and significant. This implies that after the formation of AFTA in 1992, the introduction of investment packages such as AICO in 1996 and AIA in 1998 benefited Brunei and the three new members of

ASEAN. The result indicates that the bilateral FDI flows from ASEAN5 to ASEAN4 have grown 75 percent[39] faster than intra FDI in ASEAN5 between 1995 and 2003. Further investigation of the effect of intra-regional FDI by the introduction of a bilateral dummy for FDI from the five original members to ASEAN5 and the other ASEAN4 (the result not listed in the table) confirms that all FDI flows from Indonesia, Malaysia, The Philippines, Thailand and Singapore to the other ASEAN4 are positive and significant. However, the coefficient for the original ASEAN members remains insignificant.

Column 3 onwards presents the estimation of the gravity equation for each year. The coefficients of the market size and income per capita in both source and host countries are positive and significant for all years. Conversely, the coefficients of distance are negative, whilst the coefficients of border are positive. Both are significant for each year except 1999 and 2003. The dummies for intra-regional FDI in ASEAN5 are insignificant through out the years except in 2003 where the coefficient is positive (0.65366) and significant. On the other hand, the dummy for intra-regional FDI to ASEAN4 are all positive and significant for all years except in 1995 and 1999. Furthermore, intra-regional FDI to new ASEAN has increased tremendously starting from 1996 to 1998, which suggests that the packages introduced by AFTA such as AICO (1996) and AIA (1998) have benefited them. However, in 2003 intra-regional FDI between both ASEAN5 and the new ASEAN are positive and statistically significant, with the latter having increased 123 percent faster than the former. All regressions explain about 41 to 58 percent of the cross section variation of ASEAN FDI flows.

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[39] $(\exp^{0.5582}-1) *100 = 74.75 \%$

Table 3.1: The effect of FDI in ASEAN after the formation of AFTA

Dependent Variable: Bilateral FDI Flows

	1995-2003		1995	1996	1997	1998	1999	2000	2001	2002	2003
IGDP source	.4785***	.5386***	.5455***	.5831***	.6337***	.7051***	.4813***	.5099***	.4952***	.4207***	.4472***
	(.0411)	(.0410)	(.1182)	(.1134)	(.1170)	(.1063)	(.1331)	(.1313)	(.1367)	(.1348)	(.1374)
IGDP host	.6578***	.7296***	.6957***	.7577***	.8028***	.8317***	.7485***	.7829***	.7659***	.5851***	.6067***
	(.0316)	(.0331)	(.0948)	(.0899)	(.0923)	(.0887)	(.1099)	(.1062)	(.110)	(.1084)	(.1131)
IPGDP source	.6065***	.7065***	.6511***	.7614***	.6814***	.6899***	.7426***	.5944***	.6232***	.7973***	.8410***
	(.0460)	(.0471)	(.1301)	(.1265)	(.1392)	(.1262)	(.1671)	(.1461)	(.1506)	(.1567)	(.1602)
IPGDP host	.2977***	.3266***	.3080***	.3070***	.2458***	.3094***	.2966***	.3366***	.2855***	.4902***	.3771***
	(.0323)	(.0318)	(.0928)	(.0902)	(.0920)	(.0834)	(.1038)	(.1031)	(.1019)	(.1036)	(.1032)
IDISTANCE	-.9424***	-.8160***	-1.139***	-.9946***	-1.095***	-1.074***	-.849***	-.516	-.5295**	-.645**	-.395
	(.0767)	(.0778)	(.2266)	(.2154)	(.2184)	(.2038)	(.2565)	(.2490)	(.2602)	(.2534)	(.2594)
IBORDER	.0562	.1698*	-.0197	.1232	-.0177	.0929	.1784	.1951	.0947	.5248*	.4604
	(.0886)	(.0874)	(.2518)	(.2409)	(.2514)	(.2277)	(.2998)	(.2770)	(.2869)	(.2915)	(.2856)
ILANGUAGE	.5449***	.4777***	.7063***	.5180**	.6677**	.4050	.3565	.6833***	.4452	.0064	.3137
	(.0915)	(.0891)	(.2385)	(.2294)	(.2581)	(.2474)	(.3101)	(.2776)	(.2777)	(.3115)	(.3296)
INTRA		.0238	-.2699	-.0088	-.0574	.0389	-.1843	-.1686	-.0633	.3458	.6536***
ASEAN5		(.0875)	(.2468)	(.2360)	(.2421)	(.2413)	(.3079)	(.2811)	(.2926)	(.2860)	(.2838)
ASEAN5 TO		.5581***	.2787	.6343***	.6495***	.6900***	.3669	.5694**	.5607***	.5143**	.8058***
NEW		(.0763)	(.2203)	(.2112)	(.2206)	(.2011)	(.2530)	(.2411)	(.2433)	(.2520)	(.2601)
Constant	-11.23***	-13.58***	-11.80***	-13.92***	-14.08***	-15.56***	-13.14***	-14.69***	-14.32***	-12.45***	-13.91***
	(.5116)	(.6108)	(1.711)	(1.634)	(1.744)	(1.618)	(1.984)	(1.925)	(1.967)	(2.10)	(2.15)
No. Observation	1265	1265	153	154	149	141	139	135	126	135	133
R^2	0.4697	0.5085	0.5215	0.5494	0.5556	0.6103	0.4767	0.5142	0.4891	0.4497	0.4621
Adjusted R^2	0.4668	0.5018	0.4914	0.5212	0.5268	0.5836	0.4402	0.4792	0.4495	0.4101	0.4227
F-test	159.06***	75.90***	17.32***	19.51***	19.31***	22.80***	13.06***	14.70***	12.34***	11.35***	11.74***
Time effects		5.16***									

Notes: ***, ** and * denote 1%, 5% and 10% level significance, respectively. The number in parentheses are the t-statistics.

Table 3.2 presents refined results with bilateral FDI flows between ASEAN investors and ASEAN host countries. All coefficients of GDP, GDP per capita, distance, border and language are of the correct sign and are statistically significant. Time and bilateral effects are also included in the analysis. Among the original ASEAN host countries, only Singapore and Thailand have a positive and statistically significant coefficient; the other three, although positive, are insignificant. On the other hand, all of the other ASEAN host members such as Brunei, Laos, Myanmar and Vietnam have positive coefficients and are statistically significant for at least 90 percent significance levels. The results confirm the previous findings as presented in Table 3.1 that most FDI flows from the ASEAN5 mainly benefited the other ASEAN host members.

In sum, market size, income per capita for both source and host countries are positively related with FDI in both panel and cross section analysis owing to greater market opportunities for investors. The effect of FDI flows from insiders- within the members of ASEAN- favor Brunei and the other three new ASEAN members rather than the original ASEAN members.

3.3.3.2 The effects of Extra-ASEAN-FDI

The next analysis focuses on the effects of FDI from outsiders, or the extra-regional FDI, and is presented in Table 3.3. Column 1 illustrates that the coefficients of host and source countries' GDP and GDP per capita are positive and highly significant. The distance's coefficient is negative and significant; meanwhile language's coefficient is positive and significant. The estimation includes regional source countries, which reveal that only the investors from Australia, New Zealand and Southeast Asian countries namely Indonesia, Malaysia, Singapore, The Philippines and Thailand are significant for at least a 90 percent significance level. There are positive FDI flows from ASEAN investors, however, less investment from Australia and New Zealand. For other regional groups in

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the sample such as investors from East Asian North America, and European countries, the coefficients are mixed but insignificant.

Table 3.2: The effect of FDI on ASEAN bilateral FDI to individual ASEAN host countries

Dependent Variable: Bilateral FDI flows	
Constant	-14.152*** (.6353)
lGDP source	.5471*** (.0409)
lGDP host	.7177*** (.0353)
lPGDP source	.7536*** (.0485)
lPGDP host	.3598*** (.0355)
lDISTANCE	-.7433*** (.0806)
lBORDER	.2670*** (.0938)
lLANGUAGE	.4086*** (.0939)

Bilateral ASEAN source to individual ASEAN host	
ASEAN-Brunei	.2414* (.1318)
ASEAN-Indonesia	.0355 (.1553)
ASEAN-Lao	.8979*** (.1271)
ASEAN-Malaysia	.0652 (.1462)
ASEAN-Myanmar	.5555*** (.1303)
ASEAN-Philippines	.0410 (.1316)
ASEAN-Singapore	.4854*** (.1612)
ASEAN-Thailand	.2349* (.1328)
ASEAN-Vietnam	.9397*** (.1232)

No Observation	1265
F-statistics	$F(24, 1240) = 56.99$***
R^2	0.5245
Adjusted R^2	0.5153
Time effects	$F(8, 1240) = 5.39$***
Bilateral Effects	$F(9, 1240) = 11.22$***

Notes: ***, ** and * denote 1%, 5% and 10% level significance, respectively. The number in parentheses are the t-statistics

Table 3.3: The effect of FDI on regional group source and host countries

Dependent Variable: Bilateral FDI flows

	(1)		(2)	
Constant	-11.44 ***	(.0648)	-5.938**	(2.930)
lGDP source	.4294***	(.0648)	.4827***	(.0377)
lGDP host	.6481***	(.0309)	.2437	(.5056)
lPGDP source	.7209***	(.0674)	.6118***	(.0420)
lPGDP host	.2893***	(.0314)	-.1845	(.7536)
lDISTANCE	-.7882***	(.1461)	-.9614***	(.0707)
lBORDER	.0851	(.0932)	-.0040	(.0835)
lLANGUAGE	.5269***	(.0905)	.5177***	(.0893)

SOURCE REGIONAL GROUPS

ASEAN5	.2102*	(.1154)
East Asian	.0030	(.1103)
Europe	.1241	(.1115)
North America	-.2022	(.1285)
Australia-New Zealand	-.2962**	(.1377)

HOST COUNTRIES

Brunei	.5835	(1.037)
Indonesia	.8397	(.7308)
Malaysia	1.218***	(.2784)
Myanmar	.1648	(.6184)
Philippines	.3394	(.5027)
Singapore	1.853***	(.6200)
Thailand	1.035***	(.4196)
Vietnam	.7544	(.5823)

No Observation	1265		1265	
F-statistics	F(20, 1244) =	63.38***	F(23, 1241) =	70.49***
R2	0.5047		0.5664	
Adjusted R2	0.4967		0.5584	
Time effects	F(8, 1244) =	4.98***	F(8, 1241) =	5.83***
Source regional Effects	F(5, 1244) =	9.49***		
Host Effects			F(8, 1241) =	28.85***

Notes: ***, ** and * denote 1%, 5% and 10% level significance, respectively. The number in parentheses are the t-statistics.

The second column in Table 3.3 estimates the gravity variables with the inclusion of time and host country effects. All coefficients of country dummies are positive, but only for Malaysia, Singapore and Thailand are they significant. Among these three countries, Singapore is the highest recipient FDI, which is 6.38 times, received FDI within the sample of period. However, the gravity variable has shown slightly changes where GDP and GDP per capita are significant only for source countries. The distance and language coefficients are also significant and have the correct sign.

Table 3.4 presents the refined estimation of the effect of extra-regional FDI in ASEAN. Column 1 represents the estimation of bilateral investors from other regional groups to Singapore, the other four original ASEAN (IMTP) and new ASEAN (BLMV). The gravity variable coefficients are all significant and have the correct signs. The results reveal that the dummy coefficients from investors to IMTP are all negative and significant. This implies that, in general, investors from East Asia, North America, Europe and Australia-New Zealand invest less in IMTP[40]. Similarly, the new ASEAN members also received less investment from other regional groups. Conversely, Singapore, which is one of the original members of the ASEAN, received more FDI from Europe and North America as both coefficients are positive and significant.

Since Japan and the USA are among the top five investors in ASEAN, Column 2 introduced refined analysis in which the dummies for bilateral investment from Japan and the USA to Singapore, IMPT and BLMV are included. All gravity variable coefficients are significant and have the correct sign with the exception of border, which is positive but insignificant. The regression includes time effects which are also highly significant. The coefficients of the Japan and USA to Singapore and IMPT dummies are both positive and highly significant. On the other hand, the results for BLMV are negative and significant. These results imply that investors from both Japan and the USA favor

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[40] In this case, the refined bilateral effect from source regional groups to individual ASEAN host countries (not include in the table due to limited space) found that there is evidence that the coefficient is positive and significant—especially investment from East Asia to Malaysia, Thailand and Vietnam.

investment in the original ASEAN countries rather than new members. IMPT and of the total FDI into ASEAN, Singapore received respectively 44% and 64% from Japan and 93% and 133% from the USA within the sample period.

Table 3.4: The effect of bilateral FDI on selected regional group on ASEAN

Dependent Variable: Bilateral FDI flows

	(1)		(2)	
Constant	-11.178***	(.7254)	-10.091***	(.6107)
IGDP source	.5275***	(.0497)	.4596***	(.0536)
IGDP host	.5388***	(.0387)	.5963***	(.0315)
IPGDP source	.7667***	(.0489)	.6294***	(.0460)
IPGDP host	.1660***	(.0330)	.2782***	(.0317)
IDISTANCE	-.6990***	(.1399)	-.9947***	(.0819)
IBORDER	.2073**	(.0883)	.0739	(.0865)
ILANGUAGE	.1928**	(.0939)	.4095***	(.0945)
East Asia-Singapore	.1300	(.1509)		
East Asia-IMPT	-.3626***	(.0849)		
East Asia-BLMV	-.6216***	(.0835)		
Europe-Singapore	.5919***	(.1748)		
Europe- IMPT	-.2660*	(.1377)		
Europe- BLMV	-.5455***	(.1301)		
North America-Singapore	.4966*	(.2636)		
North America- IMPT	-.4948***	(.1648)		
North America- BLMV	-.9944***	(.1611)		
AUNZ-Singapore	-.1189	(.2339)		
AUNZ- IMPT	-.8210***	(.1351)		
AUNZ- BLMV	-.5644***	(.1312)		
Japan-Singapore			.4963**	(.2461)
Japan- IMPT			.3637***	(.1505)
Japan- BLMV			-.4723***	(.1392)
USA-Singapore			.8479***	(.2742)
USA- IMPT			.6558***	(.1548)
USA- BLMV			-.2334*	(.1370)
No Observation	1265		1265	
F-statistics	F(27, 1237) =	57.43***	F(21, 1243) =	61.38***
R^2	0.5563		0.5091	
Adjusted R^2	0.5466		0.5008	
Time effects	F(8, 1237) =	6.08***	F(8, 1243) =	4.91***
Bilateral groups effects	F(12, 1237) =	16.36***	F(6, 1243) =	9.82***

Notes: IMPT: Indonesia, Malaysia, The Philippines and Thailand; BLMV: Brunei, Laos, Myanmar and Vietnam

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In summary, the effect of extra-regional FDI from outsiders generally favors Singapore over other countries in ASEAN. However, closer investigation found that Japan[41] and the USA positively increase investment in ASEAN5 rather than new ASEAN.

3.3.3.3 The Determinant of FDI in ASEAN

Earlier analyses as presented in Table 3.1 to 3.4 confirm that the size of market and income per capita in the host and source country are important factors in attracting foreign investors. In addition, geographical factors such as distance and common language also contribute to encouraging FDI. Of the ASEAN members, the original members such as Singapore, Malaysia and Thailand are among the favourite FDI destinations in Southeast Asia. Therefore, the following analysis (Table 3.5) presents the determinants of FDI in Southeast Asia from economic factors and social indicators to non-economic factors.

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[41] This result supports one of the surveys conducted by Japan External Trade Organisation (JETRO) 2003. AFTA and the proposed ASEAN-Japan free trade area are expected to increase the investment and networks of Japanese operation in ASEAN (UNCTAD, 2003).

Table 3.5: The determinants of FDI in ASEAN

Dependent Variable: Bilateral FDI flows

	(1)	(2)	(3)	(4)
Constant	-21.566***	-18.738***	-21.564***	-20.581***
	(7.282)	(1.186)	(1.077)	(1.2513)
lGDP source	.5942***	.6265***	.7030***	.7363***
	(.0430)	(.0439)	(.0411)	(.0440)
lGDP host	.6786***	.6690***	.6622***	.6186***
	(.0312)	(.0309)	(.0328)	(.0477)
lDistance	-.7135***			
	(.0891)			
lBorder	-.2360***	-.1213	-.0238	-.0968
	(.0773)	(.0740)	(.0788)	(.0834)
language	.9127***	.8926***	.5449	.9158
	(.0818)	(.0835)	(.0837)	(.090005)
Extended market host	.9733			
	(.6384)			
Regional market relative to distance_host		.7072***	.9134***	.8506***
		(.0884)	(.0829)	(.0898)
Absolute difference in GDP per capita			.1756***	
			(.0492)	
Capita-labor ratio_host			.000077***	
			(6.65e-06)	
Inflation rate_host				-.0074***
				(.0029)
Real interest rate_host				-.0054
				(.0052)
Real exchange rate_host				.000015***
				(5.10e-06)
No of observation	1265	1265	1103	1049
F statistics	F(14, 1250) = 66.46***	F(13, 1251) = 71.27***	F(15, 1087) = 108.68***	F(16, 1032) = 73.40***
R^2	0.3820	0.3809	0.4766	0.4197
Time Effects	F(8, 1250) = 3.94***	F(8, 1251) = 4.29***	F(8, 1087) = 5.98***	F(8, 1032) = 5.67***

Notes: ***, ** and * denote 1%, 5% and 10% level significance, respectively. The number in parentheses is the t-statistics

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The determinants of FDI in ASEAN (continued)

	(5)	(6)	(7)	(8)
Constant	-22.509***	-20.958***	-19.960***	-23.277***
	(1.273)	(1.352)	(1.659)	(3.565)
lGDP source	.7418***	.7573***	.7714***	.8450***
	(.0438)	(.0420)	(.0508)	(.0463)
lGDP host	.7824***	.2157	.5907***	.6759***
	(.0547)	(.1365)	(.0747)	(.2356)
lBorder	-.0617	-.0873	.1048	-.1553
	(.0912)	(.0866)	(.0945)	(.0974)
language	.6631***	.6070***	.5026***	.5399***
	(.0928)	(.0884)	(.0930)	(.0873)
Regional market relative	.8533***	.8774***	.7320***	.91006***
to distance_host	(.0909)	(.0901)	(.1078)	(.1031)
Inflation rate_host	-.0020	-.0027	.0021	-.0056
	(.0029)	(.0029)	(.0036)	(.0084)
Real interest rate_host	-.0033	-.0064	.0062	.0049
	(.0053)	(.0052)	(.0072)	(.0119)
Real exchange rate_host	.000015***	.000026***	.000024	.000050***
	(5.26e-06)	(6.01e-06)	(.000016)	(.000011)
Government budget	.0932***	.0352***	-.0032	-.0235
balance_host	(.0103)	(.0147)	(.0165)	(.0206)
Openness_host		.3886***		
		(.1002)		
Trade policy Index		-.0997***		
		(.0284)		
Skill labor_host			7.24e-06	
			(6.39e-06)	
Infrastructure_host			.0012***	
			(.00016)	
Economic Freedom Index				-.1277
				(.1618)
Transparency				.1619***
				(.0350)
No of observation	906	888	633	690
F statistics	90.01***	87.67***	80.49***	65.46***
R^2	0.4700	0.4899	0.5604	0.4786
Time Effects	2.00***	4.34***	8.01***	4.19***

Notes: ***, ** and * denote 1%, 5% and 10% level significance, respectively. The number in parentheses are the t-statistics

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The regression in column (1) shows that both source and host country's GDP are positive and statistically significant. Distance and Border are both negatively significant. Meanwhile, the language dummy is positive and statistically significant. The coefficient of extended market for host country which includes economies belonging to the same free trade area (as proposed by Yeyati et al, 2002) is positive but insignificant. The estimation includes a time effect dummy which is highly significant. Alternatively, the measure of regional market for the host country, weighted with relative inverse distance[42] is positive and significant as presented in column (2) which implies that the regional market in ASEAN is still important factor for attracting foreign investors.

Column (3) introduces two variables that are related to factor endowment. The first is absolute difference in income per capita, which illustrates that the income gap between source country and host country is an important factor in encouraging foreign firms to invest in the country. The second is the ratio of capital and labour which proxy for factor endowments. Both coefficients are positive and highly statistically significant, implying that differences in factor endowments may bring FDI into a country.

Macroeconomic factors such as inflation, exchange rate and real interest rate are introduced in the column (4) results. The coefficient of the real exchange rate is positive and significant at the 90 percent significance level. This result suggests that a depreciation/devaluation of the host currency stimulates more investment to the country since it induces a reduction in local production costs in term of foreign currency. Meanwhile, the coefficient of inflation is negative and statistically significant, representing the fact that lower inflation rates in the host country brings more investment into that country. The coefficient of the real interest rate is negative but insignificant. Column (5) represents the results when the government budget balance is introduced into the regression. Other results remain the same as presented in previous regressions except

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[42] In this regression, the log of distance is dropped due to multicollinearity with extended market relative to distance.

border which are negative but insignificant. The coefficient of the government budget balance is positive and statistically significant. This result supports many empirical studies that suggest that sound macroeconomic management and the ability of the host government to monitor the fiscal budget are among the factors that encourage foreign investors into the country, particularly in ASEAN.

Column (6) introduces the openness of trade as a proxy for the trade liberalization in ASEAN and reveals that the coefficient is positive and highly significant. This implies that increased openness of the host country causes more FDI because of lower trade barriers. There is also evidence that the predominant structure or type of FDI in ASEAN is vertical FDI[43]. Furthermore, the additional variable for external trade policy in ASEAN has a negative coefficient. This result confirms that the lower is a country's average tariff rate, the lower is the level of protection and the more investment will be coming to the country.

In line with economic factors, social indicators are also important as factors to attract foreign investors to the host country. Regression in column (7) includes an additional two variables, namely skilled labour and infrastructure. The coefficient of the skilled labour is positive but not significant. However, the coefficient of the proxy for infrastructure is positive and statistically significant for at least the 99 percent significance level. This result supports the evidence that a good infrastructure represents value added factors that lead investors to choose to invest.

Finally, non-economic factors are included in column (8), which reveals that the coefficient for Transparency Corruption Perception Index is found to be positive and highly significant. This result—that the degree of transparency can increase a country's attractiveness to foreign investors—is similar to that of Drabek and Payne (2001). The

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[43] Since lower trade barriers encourage vertical type of FDI by facilitating the imports of input and machinery (Jaumotte; 2004)

coefficient of Economic Freedom Index is negative, but is not significant. In this regression, other coefficients remain the same as previous regressions, the extended market relative to distance of host country is positively significant .This result suggests that lowering trade barriers alone should not be the main concern to the investors; a country which takes steps to ensure political stability and to increase the degree of transparency in its policies could expect to see higher levels of FDI flowing into their country.

In summary, besides the market size for each host country as a major determinant in attracting foreign investors, the extended market relative to the distance for the host country that are members in ASEAN is also equally important. In addition, slightly increase in of the exchange rates, low inflation rate, good government in managing the budget balance, good facilities for communication and infrastructure and the external policy in opening up the market to the rest of the world with reduced average tariffs also contribute to encouraging more investors. In fact, non-economic factors like the transparency Corruption Perception Index is a value added to the host country.

3.4   Summary, Conclusion and Further Research

The key focus of this study is the relationship between regional economic integration and FDI with reference to ASEAN and AFTA. AFTA can be an example of the south-south agreements, or free trade agreements between developing countries with other developing countries. There are mainly two effects considered in this study: intra-ASEAN FDI and extra-ASEAN FDI. The first effect shows that the original ASEAN members invest less in each other. However, they invest more to the other ASEAN members such as Brunei, Laos, Myanmar and Vietnam. In fact, the implementation of AFTA in 1992, which brought along investment packages such as the ASEAN Industrial Scheme in 1996 and ASEAN Investment Area in 1998, benefited the new members in term of FDI receipts from ASEAN members.

However, the effect of ASEAN on FDI from non-members found that regional economic groups such as North America, East Asia, Europe and Australia-New Zealand invest less in ASEAN countries. The financial crisis that occurred in 1997 might be one of the reasons that the investment has been diverted to other regional groups or newly emerging countries like China and India. Moreover, the global investment downturn appeared in 2001, also slowing the process of recovery from financial crisis. However, the cross-section analysis found that more FDI flowed to the region in 2003, when most of the countries in ASEAN recovered from the preceding economic turmoil. In fact further investigation also found that, even though as regional economic groups East Asia and North America have been reducing their investment, Japan and the USA still maintained their investment level in ASEAN countries. However, they invest more in the original ASEAN, which is known to consist of newly emerging industrial countries, rather than in Brunei and the new ASEAN. Moreover, the investors can still market their products to the new ASEAN—using the original ASEAN as a base for their headquarters and assembly operations before exporting to all ASEAN countries with a minimum expenditure on tariffs.

By employing a semi-gravity type model, this paper has enabled the identification of several key determinants of FDI inflows into the ASEAN countries. The market size, GDP per capita, and gravity factors such as distance, border and language are among factors that attract FDI to the region. In fact, the extended market relative to distance was also found to be a positively significant determinant of FDI. Moreover, the macroeconomic factors such as lower inflation, slightly higher in the exchange rate relative to local currency and good management of the fiscal budget are among key factors in attracting more FDI. In addition to economic factors, social factors such as good telecommunications and infrastructure facilities and non-economic factors such transparency also encourage more investors to the ASEAN. The result might not represent the true picture of each ASEAN country as it depends on the motive of FDI to the host country.

In conclusion, regional economic integration can be as a medium to attract more FDI to the countries via the introduction of more attractive investment packages in free trade agreements. However, it is also up to the individual country to further liberalize their national investment policy and provide competitive and attractive investment environments.

Finally, as regional economic integration and free trade area always associated with reductions in tariff rates and the impact on trade, further investigation into the relationship between trade and FDI in the ASEAN Free Trade Area (AFTA) may be considered for future research.

Chapter 4

Regional Economic Integration, Convergence and Economic Growth: Evidence from the ASEAN Free Trade Area.

4.0 Introduction

Since the creation of ASEAN in 1967, member countries particularly Singapore, Malaysia and Thailand have aggressively reformed their domestic, as well as their international policy to economic growth at a rate of more than twice that of other East Asian countries. Singapore had reformed its policies in the 1960s, even before joining ASEAN; the same true of Malaysia in the early 1970s, Thailand in the late 1970s, and Indonesia and The Philippines in the mid-1980s. From import substitution countries, most ASEAN countries except Singapore gradually switched to more export oriented trade policies, specifically in their manufacturing sectors. Moreover, the original ASEAN members namely Indonesia, Malaysia, Thailand, The Philippines and Singapore (ASEAN5) followed the path of the Newly Industrialised Economies (NIE) namely Hong Kong, Taiwan and South Korea with adoption of the export-led growth and foreign investment-led growth strategies. The New ASEAN members, namely Cambodia, Myanmar, Laos and Vietnam (ASEAN4) also introduced policy reforms towards market-oriented strategies and liberalised trade and investment policies in the mid 1980s. However, the new members joined ASEAN after the ASEAN Free trade Area was established; Vietnam on 28th July 1995, Laos and Myanmar on 23rd July 1997, and Cambodia on 30th April 1999.

Hence, in the light of these developments, there are many questions that can be raised regarding the relationship between regional economic integration and growth-in the context of ASEAN. There is a vast literature on the topic of growth modelling, from neoclassical framework models (such as Solow, 1956; Cass, 1965; and Koopmans, 1965) to the new endogenous growth model (such as Romer, 1986 and Lucas, 1988). There are also many studies that have been carried out theoretically on the growth effect of regional economic integration (such as Baldwin, 1989, 1992; Rivera-Batiz and Romer , 1991 and 1994; Krugman and Venables, 1993; Waltz, 1997a, 1997b, 1998; Deardoff and Stern, 2002 and Bretscheger and Steger, 2004) as well as empirically (such as Brada and Mendez, 1985; Landau, 1995; Henrekson et al ,1996; Tortensson, 1999; Vanhoudt, 1999; Vamvakidis, 1999; Badinger, 2001 and Brodzicki, 2003, 2005).

With regards to the empirical studies, most of the literature has tended to examine the growth effects in the OECD countries and European countries, but none of the existing studies examine the ASEAN countries. The available literature tends to relate the growth effects with ASEAN5 and other East Asian countries such as Frankel et al. (1996), Lloyd and MacLaren (2000) and Radelet et al. 2001. Therefore, this study empirically investigates the impact of ASEAN on economic growth by using a new panel technique which allows the estimation of the long run relationship between GDP per capita and its determinants in ASEAN countries. The econometric specification is derived from an augmented neoclassical growth model which allows for a non-diminishing return to scale of production, which has become a standard approach in empirical growth studies. This study not only focused on convergence and growth in ASEAN but also contributes to the empirical literature on the effects of ASEAN Integration with the expansion of ASEAN memberships. With aim to exploit the most up-to-date dynamic methodology, this study also adding an extra dimension by shedding light on the effect of REI and financial crisis which goes beyond just explaining growth.

ASEAN is a diverse group of countries, which are not only different in cultural, linguistic, racial, religious and historical backgrounds, but also differ in their level of economic development. Singapore, a Newly Industrial Economy (NIE),[44] and Brunei Darussalam are classified as 'high-income countries' with a 2003 GDP per capita of $23,636 and $15,971 respectively. Malaysia and Thailand's GDP per capita are $4,220 and $2,399 which are categorized as 'upper-middle-income countries'. Meanwhile, the other two original members-the Philippines and Indonesia-are considered as 'lower-middle-income' countries with GDP per capita of $1,079 and $906 respectively. The new members are said to belong to the 'low-income' group, having a GDP per capita within the range $327-$500. The main contribution of this study is not only filling the gap of the ASEAN studies in the growth literature, but also to examine the development of ASEAN itself with regard to the establishment of a Free Trade Area as well as the enlargement of ASEAN membership.

Earlier empirical studies in ASEAN's growth literature tend to deal with time series analysis and focused on an individual countries smaller and than comparing with a leader country such as the USA and Japan (for example see Lim and McAleer, 2004; Lee et al., 2005). However, none of them attempt to employ panel data or even include new members in the estimation. Therefore, within the constraint of available data, especially data from the new ASEAN members, this paper aims to provide preliminary evidence related to the convergence and growth by employing dynamic panel data in ASEAN.

Therefore, this study represents four objectives:
1. to estimate the effect of convergence and growth for the original ASEAN members (ASEAN5), covering the period from 1960 to 2004;
2. to examine the macro effect on the long term growth in the ASEAN5;

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[44] Other countries that are considered NIE are South Korea, Taiwan and Hong Kong

3. to find the effect of ASEAN Integration from the period 1985 to 2004;

4. to investigate the effect of macro variables on growth after the ASEAN Free Trade Area was formed.

This study is structured as follows: Section 4.1 discusses the previous empirical literature review related to convergence, growth and regional economic integration. The following section derives the theoretical framework as used by many empirical growth studies. Then, the empirical methodology is explained in Section 4.3. In Section 4.4, the empirical results and discussion will be presented. Finally, Section 4.5 concludes and proposes policy implications and future research.

4.1   Literature Review

This section will present a brief empirical literature review as a guideline and comparison with this study. It has three main topics, namely, growth and convergence, regional economic integration and growth, and the determinants of growth.

4.1.1   Growth and Convergence

Much of the growth literature is inspired by Barro (1991) Sala-i-Martin (1996) and Mankiw et al. (1992) who empirically tests the convergence theory based on the Solow Growth Model (Solow, 1956; Swan 1956).   The convergence theory, based on the neoclassical framework, predicts that both poor and rich countries will converge to their steady state. Since then there have been many empirical studies of the augmented Solow model—using different data, countries, and methodology—with various series of variables that are predicted to have relationship with growth. According to Sala-i-Martin (2002), the convergence issue has become more important because people want to know whether the standard of living for those in poor nations has been improved or has

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increased more rapidly than that of the richer countries, or conversely whether the rich are getting richer, and the poor are becoming poorer.

The rate of convergence has been a crucial focus of debate since different methodologies have produced different results. For instance, Sala-i-Martin (1996) employed OLS estimation in cross section analysis and found that the speed of convergence was about 2% per year, meanwhile Islam (1995) proposed a panel approach with the inclusion of time invariant country characteristics using Fixed Effects or LSDV[45], and found an extremely high rates of convergence between 3.8% and 9.1%. Alternatively, recent studies have been focusing on the dynamic growth equation in panel estimation by using the Generalised Methods of Moments (GMM) with first difference and the system GMM estimator. The GMM system, which is said to be preferable,[46] yields a speed of convergence is estimated to be about 2 to 4% per annum (see Arrelano and Bover, 1995; Caselli et al, 1996; Blundel and Bond, 1998; Bond et al., 2001).

Recently, some studies have used provincial data to examine the convergence rate. For instance, Ralhan and Dayanandan (2005) apply a GMM first differences technique using Canadian data from 10 provinces for the period 1981 to 2001, and found that the speed of convergence is about 6% to 6.5%. Meanwhile Badinger et al (2002) estimates the speed of convergence of 196 European NUTS2[47] regions over the period 1985 to 1999 to be 6.9% using the system GMM approach. Similarly, Weeks and Yao (2002) investigate convergence income across provinces in China before and after the reformat period using the system GMM and found that the speed of convergence before the reform period was 0.41%, but there was divergence at a rate of 2.23% during the reform period.

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[45] see also Knight et al (1993); de la Fuenta (1996); and Tondl (1999)

[46] Caselli et al. (1996) using GMM with first difference found the convergence rate was 10% which similar to LSDV approach.

[47] Nonmenclature of Territorial Units for Statistics 2 (NUTS2)

There is also some studies related to the ASEAN countries have generally analysed income convergence hypotheses in individual countries and compare the results with a leader countries such as Japan and the USA. Lee, Lim and Azali (2005) use the Augmented Dickey Fuller (ADF) test in time series analysis on ASEAN5 data for the period 1960–1997. They found evidence of divergence of income between Japan and each ASEAN5 country. However, after employing jointly crash and changes, they obtained income convergence between the leader country and Singapore, whereas the other four remained unchanged.

4.1.2   Regional economic integration and growth

In the more recent growth literature, many studies have attempted to relate regional economic integration and growth, with examples being Landau (1995); Henrekson et al. (1997); Vamvakidis (1999); Tortensson (1999); Badinger (2003); Berthelon (2004); and Brodzicki (2005). The inclusion of dummies, which take the value one if a country belongs to regional economic integration or zero otherwise has become common in estimating growth relationship with regional economic integration. For example, De Melo et al. (1992), tested for long run effects of regional economic integration, conducted a cross section analysis of 101 countries from the Summer-Heston (1988) database. They found that none of the included dummies proved to be significant suggesting that there are no long run effects of regional integration. Similar results have been obtained by Vamvakidis (1999) who found that only countries that participated in global liberalization (through GATT) have positive and significant changes to growth, but not those countries which join regional trade agreements.

Among other literature, the European countries have been the most often studied. There have found mixed results, albeit produced by studies using different time frames and methods. For instance, Landau (1995) tested the growth effects between EEC members

and non-members from 17 OECD countries for the period of 1950 to 1990. Dummies for EU membership were included. The result was that there is no long term growth effect associated with membership in the European Community. On the other hand, Henrekson et al. (1997) evaluate whether there is a long run growth effect from the European economic integration via EC and EFTA. With the inclusion of dummies of EC/EFTA membership and other control variables such as schooling and real exchange rate distortion to control trade policy, they found the EC/EFTA dummy is positive and significant for a range of 0.6% to 0.8%. Similar results were also found in Tortensson (1999) who examined 20 OECD countries for the period 1976 to 1990. By using OLS, and with the inclusion of country specific effects, he concluded that knowledge transfer is important across integrated countries which lead to increased growth in total factor productivity.

Brodizicki (2005) investigates whether the process of regional economic integration within the EU affected growth rates of its members and concluded that REI stimulates growth, benefiting equally to both current and accession countries. By using the GMM approach, he also found that there is a positive long term relationship between EU membership and growth rates. Similarly, Herz and Vogel (2003) examine regional growth and convergence in 31 CEECs for the period 1990-2000. They found evidence of conditional convergence in CEECs which suggested that poorer regions conditionally grow faster than the richer ones. They also concluded that regional disparities between countries have diminished, whereas disparities within countries have remain stable. Another study by Kaitila (2005) is related to EU and growth, and also supports the evidence of conditional convergence of GDP per capita in the EU15 in 1960–2002. Using the latest time series of dynamic panel data, namely PMGE, he found that the membership in the custom union contributed positively to growth.

There is also one study, carried out by Fukase and Winters (2003), that considered the growth effect in ASEAN. The authors identified factors such as knowledge that induced

productivity growth, the accumulation of physical and human capital, and accelerated domestic reforms are the main factor in the dynamic effects of regional integration in ASEAN. They further note that the growth depends on the change of these variables; meanwhile the changes of these variables can be affected by a regional integration.

Two studies which propose a new ways to measure regional integration so that this can be included in the regression. For instance, Berthelon (2004) introduced a new measure of regional integration by interacting country membership of an RIA and the partners' share of world GDP, finding that RIAs have exerted positive effects on growth. He also found that North-North agreements have significant growth effects, whilst the South-South agreements have ambiguous effects depending on the size of the countries joining the RIAs. Another study that proposed a new method for measurement of regional integration was carried out by Badinger (2001) who constructed an index of integration for each member state. By fully utilizing the first difference GMM estimator applied to a dynamic growth accounting framework, he found no evidence of permanent growth effects in the EU.

4.1.3 Growth and its determinants

In the Solow model, the initial GDP per capita and population growth are always expected to have a negative correlation with GDP per capita. Conversely, the share of investment to GDP is said to increase capital stock which exhibits a positive relationship with growth.

There are many empirical evidence suggest causality between government expenditure and economic growth. For instance, Benjamin and Lai (1997) examines the causality between government expenditure and economic growth along with money supply by applying Vector autoregressive (VAR) technique for South Korea found that there is bidirectional causality between these two variables. By using the same technique, Yuk

(2005) found evidence that GDP growth granger-causes the share of government spending. He consider the long run relationship between government expenditure and economic growth for the United Kingdom for the period 1830 too 1993.

The role of government is also a crucial factor associated with growth. Government consumption is related to growth reduction as it result in disincentive effects through various methods of financing government including through distortionary taxes, borrowing or the printing of money (Daniel, 2005). Much empirical studies support the notion that the government size and government consumption is negatively associated with growth. For instance, Landau (1983) examines rich country and finds that the government size reduces economic growth of per capita incomes. In another study Landau (1986) which defines government consumption as a ratio of GDP, using cross section data for developed and developing countries confirms the previous results. Based on cross country estimation, Barro (1991) estimates the average annual growth rate in real GDP per capita on the ratio of real government consumption to real GDP. The result indicates negatively relation between government consumption and economic growth. The same results also support from Ghura (1995) who uses data for developing countries and also Bassanini et al. who estimates panel data for OECD countries.

Existing studies on the relationship between inflation and economic growth provide conclusive evidence that the inflation negatively affected economic growth. For example, Barro (1995) estimates the average growth rates of 100 countries for the period 1960 to 1990. He includes an average inflation rates and other explanatory variables such as schooling, life expectancy, public education spending ratios and democracy indexes. He finds that the average inflation rate is negatively affects the growth rates. Meanwhile, Javier and Hernando (1997) who study the correlation between growth and inflation for the OECD countries found negative relationship. He even stressed that the relationship would never been positive. Similarly, Gillman et. al (2002) empirically estimates based on OECD and APEC members for the period 1961-1997 also find robust result that

support the hypothesis that negative inflation effect on growth. However, there is also study that finds positive relationship between inflation and economic growth. By using Cointegration and error correction model, Malik and Chowdhury (2001) find the evidence of long run positive relationship between GDP growth and inflation in four South Asian Countries. They suggested that moderate inflation is helpful to the growth but faster economic growth feeds back to inflation.

Trade openness and FDI shares to GDP are commonly used as indicators of globalization. The positive effects of trade and FDI are associated with technology spillover through the introduction of new methods, learning-by-doing that can spur the productivity growth (see also Boreinztein et al., 1998). For instance, Bende-Nabende et al. (2001) empirically investigated whether FDI caused spillover effects. They found the positive result that FDI stimulated growth in the ASEAN5 economies over the period 1970 to 1996. They also concluded that, the spillover process occurs mainly through human factors and through new technology learning-by-doing effects. Influential papers by Dollar (1992) and Ben-David (1993) measured trade distortion and growth and found a negative relationship. On the other hand, Sachs and Warner (1995) used dummy variables for trade openness, and confirmed that trade fosters growth. Frankel et al (2000), using the gravity model of bilateral trade, also found that the effect of openness on growth is positive and significant in East Asian Countries. Recently, many empirical studies have come out to support the hypothesis that trade openness and FDI are the main factors affecting growth enhancement (Bassanini et al. (2001)).

4.2 Theoretical Framework

In the following section, the theoretical framework will be derived from the Solow model for empirical purposes.

Winters (1996) defines 'dynamic' as 'anything that affects a country's rate of economic growth over the medium term. This includes both permanent increments to the rate of growth and temporary but long-lived increases as countries move from one growth path to another. Such improvements in growth stem from the accumulation either of a factor of production—particularly capital, physical or human (or knowledge)'.

Therefore, in this section, the growth equation from the Solow Model is derived from a standard neoclassical framework of production function as proposed by Mankiw, Romer and Weil (1992) (MRW), which has been used extensively in the growth literature. The equation is derived in dynamics form, which will be used in the empirical application to estimate both the convergence rate and the growth relationship with other specific variables in the following section.

4.2.1 The definition of convergence

The main idea regarding the income convergence effect is based upon the neoclassical growth model developed by Solow (1956), Cass (1965) and Koopmans (1965). If all countries have access to the same 'preferences' such as technology, population rate and investment ratio (savings propensity) but differ in terms of their initial levels of per capita income (capital labour-ratio), then all countries should converge to the same steady-state. The Solow model predicts that both poor and rich countries will converge to the same levels of per capita income in the steady state but the poor country will grow relatively

faster than the rich country[48].This type of convergence is known as 'absolute β convergence', which Barro (1991) tests using cross section analysis, finding that the β coefficient demonstrates a negative relationship with the average growth rate. However, if country heterogeneity is allowed in variables such as the investment ratio, population, educational attainment or other policy variables, then this type of convergence is said to be 'conditional β convergence'. This kind of convergence is said to converge to the same steady state growth rates but not necessarily at the same levels of per capita income. Hence, there is conditional β convergence if the coefficient of the initial per capita income is negatively related with the average growth rate.

Alternatively, 'σ convergence' is defined in terms of cross sectional dispersion of per capita income across countries (Barro and Sala-i-Martin, 1995). Essentially, the standard deviation of the log of per capita income that decreases over time is used to test for σ convergence. On the one hand, the presence of σ convergence suggests the equalization of income per capita across countries, on the other hand, it does not necessary imply the presence of β convergence (Sala-i-Martin, 1996).

4.2.2 Derivation of augmented growth model

Following a common approach in growth modelling and using the standard notation (see Mankiw et al., 1992 and Barro and Sala-i-Martin, 1995) the model is derived from a standard neoclassical approach known as the Solow model with constant returns to scale a Cobb-Douglas production function and two inputs: capital and labour. At time t, this production function looks like the following:

$$Y_t = K_t \left(A_t L_t \right)^{1-\alpha} \qquad ; 0 < \alpha < 1$$

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[48] This happens when capital and output in poor countries grow faster than the population growth rate. Moreover, marginal product of capital relative to labour is higher in the poor countries than in the rich ones, and therefore the poor will accumulate more capital and grow at a faster rate than the rich.

Where

Y_t is output, K_t is physical capital, L_t is labor (input), A_t is the level of technology and economic efficiency.

The dynamics of capital and labour are as follows:

$$\hat{K}_t = s_t Y_t - (n + g + \delta) K_t$$

$$\hat{L}_t = n_t L_t$$

Where n is population growth, δ is the rate of depreciation, st is the fraction of output that is invested in physical capital.

The level of technology progress (Ω) and economic efficiency can be presented as follows:

$$A_t = I_t \Omega_t$$

The level of technological progress grows as the exogenous rate g_t such that;

$$\hat{\Omega}_t = g_t \Omega_t$$

Whereas the level of economic efficiency is a log linear function of institutional and policy variables V_{jt};

$$\ln I_t = p_0 + \sum_j p_j \ln V_{jt}$$

Let the output and physical capital per unit of effective labour:

$$y = \frac{Y}{AL}, k = \frac{K}{AL} \quad \text{respectively.}$$

The economy converges at a steady state:

$$k_t^* = \left(\frac{s_t}{n+g+\delta} \right)^{\frac{1}{1-\alpha}}$$

Since, $y^* = \dfrac{Y}{AL} = k^{*\alpha}$, therefore

$$\frac{Y}{L} = A k^{*\alpha} = A \left[\frac{s_t}{n+g+\delta} \right]^{\frac{\alpha}{1-\alpha}}$$

By substituting and taking logs the following expression can be obtained for the steady state for per capita income.

$$y_t^* = \ln\left(\frac{Y_t}{L_t} \right)^* = \ln \Omega_t + p_0 + \sum_j p_j \ln V_{jt} + \frac{\alpha}{1-\alpha} \ln s_t - \frac{\alpha}{1-\alpha} \ln(n+g+\delta) \qquad (4.1)$$

Equation (4.1) represents the output per capita in steady state which depends on the accumulation of physical capital, population growth, the technological progress, the rate of depreciation and the level of economic efficiency where V represents some policy and macro variables such as consumption and government share in GDP, trade openness, inflation and ASEAN Integration dummy variables[49].

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[49] See Bassanini et al (2001)

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4.3   Empirical Methodology

From equation (4.1), the lagged dependent variables is subtracted from both sides derive an empirical specification. This yields the growth equation in general form as follows:

$$\Delta \ln y_{i,t} = a_{0,i} - \Phi_i \ln y_{i,t-1} + a_{1,i} \ln sk_{i,t} - a_{2,i} \ln n_{i,t} + \sum_{j=3}^{m} a_{j,i} \ln V_{i,j,t} + a_{m+1,i} t$$

$$+ b_{1,i} \Delta \ln sk_{i,t} + b_{2,1} \Delta \ln n_{i,t} + \sum_{j=3}^{m} b_{i,j} \Delta \ln V_{i,j,t} + \varepsilon_{i,t} \tag{4.2}$$

where y_{t-1} is the lagged dependent variable which measures the convergence effect which Φ is a covergence parameters, sk is the share of investment in GDP, n is population growth, V is a vector of variables affecting economic efficiency, and t is time trend. The coefficient b captures short term dynamics and ε is a country-specific error term.

4.3.1   Some econometric Issues

Convergence studies used to be estimated by Ordinary Least Squares (OLS) estimation in cross section analyses (see Barro and Sala-i-Martin, 1991; Levine and Renelt, 1992 ; de la Fuenta, 1996; Fagerberg and Verspagen, 1996; and Tondl, 1999). However, there are many critics have argued that OLS estimation leads to biased results in which regressors are correlated with the error term. In response to these criticisms, Islam (1995), using Fixed Effect Model (FEM) or Least Square Dummy Variables (LSDV), proposed to set up the analyses within a panel framework in order to control for the individual specific effects such as country characteristics, which are time invariant. However, the convergence rates using this method are found to be extremely high—up to 20% (see also de la Fuenta, 1996; Tondl, 1999).

According to Bassanini, Scarpetta and Hemmings (2001), the equation in (4.2) can be estimated in different ways such as purely time series where all coefficients are treated as unrelated across countries, or using dynamic-fixed effect estimation which would entail the assumption of homogeneity in both dynamics and the long-run equilibrium relationship. However, this approach would yield identical slope coefficients albeit with a different intercept—a fact that might prove problematic if the speed of convergence between the countries were to differ[50]. Alternatively, the mean group (MG) approach, which imposes no restriction at all, involves estimating a separate regression for each country, and then calculating averages of the country coefficients[51]. Even though the MG estimator is consistent, it can be easily affected by outliers in finite sample.

Given the long-run growth of ASEAN countries, the Pooled Mean Group Estimator (PMGE) would be an appropriate approach as it allows for heterogeneity in the short run coefficients but imposes restrictions in the long-run. In PMGE, the long run coefficient (a's) will be identical for all countries, however, the intercept, the speed of convergence and the short run coefficient (b's) will differ. The Hausman Test (Hausman, 1978) is used to test the null hypothesis of homogeneity in the long run parameters[52].

Hence, after imposing the long run homogeneity restrictions, the estimated growth equation is as follows:

$$\Delta \ln y_{i,t} = -\Phi_i \left\{ \ln y_{i,t-1} - \theta_1 \ln sk_{i,t} + \theta_2 n_{i,t} - \sum_{j=3}^{m} \theta_j \ln V_{i,j,t} - a_{m+1} t_i - \theta_{0,i} \right\} +$$

$$b_{1,i} \Delta \ln sk_{i,t} + b_{2,i} \Delta \ln n_{i,t} + \sum_{j=3}^{m} b_{j,i} \Delta \ln V_{i,j,t} + \varepsilon_{i,t}$$

(4.3)

where $\theta_s = a_{s,i} / \Phi_i$

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[50] See also Kaitila (2005).

[51] See also Evans (1997) and Lee et al. (1997)

[52] However, the hypothesis of homogeneity in the long run parameters cannot be assumed priori and should be tested empirically in all specifications.

4.3.2 The Pool Mean Group Estimation (PMGE)

The empirical analysis is based on a panel data set for ASEAN countries, mainly from Penn World Tables 6.2 database over the period of 1960 to 2004. The analysis will include a dummy for ASEAN as a proxy for regional economic integration in ASEAN (formed in 1967), and a dummy for AFTA as a proxy for the ASEAN Free Trade Area (established in 1992). In the second phase, the estimation will include the original and the new ASEAN. However, the estimation of all ASEAN members except Brunei and Myanmar will be covered only after the implementation of AFTA since most of the new members joined the ASEAN after 1993.

The powerful method in pooled cross country time series namely the Pooled Mean-Group Estimator (PMGE) proposed by Pesaran, Shin and Smith (1999) is used to explain cross-country differences in growth as well as growth performances in the long-run over period. PMGE allows for heterogeneity in the short term coefficients, but restricts the long-run coefficients to be the same for all countries (Pesaran et al, 1999).

In addition to the lagged dependent variable, as the main variable to capture the convergence effect, the right hand side of the estimated equation also includes the share of capital (log sk), and the sum of population growth, growth, and depreciation $(n+g+d)$ to test for conditional convergence as is commonly used in the empirical growth literature (Barro,1991; Sala-i-Martin ,1996;Mankiw et al.,1992; Islam,1995; Bassanini et al., 2001). The growth equations estimated is being augmented by adding three macro variables, namely government consumption share to GDP (GOV), trade share to GDP (OPEN) and the inflation rate (INF). The coefficient for GOV and INF are expected to have a negative sign, whilst OPEN as a proxy for openness is expected to have a positive sign.

Dummies for the ASEAN free trade area will be included which represent into three types of dummies: the AFTA dummy is for the twelve years (1993 to 2004) after that the free trade was launched; an AFTA97/98 dummy for the period of 1997–1998 where financial crisis hit the region; and an AFTA00 dummy is for the period of 2000-2004, which was a recovery period in most of the region's countries. The ASEAN dummy represents the period when all five countries in Southeast Asia formed the ASEAN in 1967. Finally, the time trend and country specific terms as presented in the equation will also be included[53]. In addition, the long run homogeneity restrictions ($\theta_s = a_{s,i}/\Phi_i$) are checked by the Hausman Test as proposed by Pesaran and Smith (1996) applied in the model selection of specification.

Due to limited data availability, the effect of growth after the expansion of ASEAN membership will only include eight ASEAN members for the period of 1993 to 2004. In this analysis, the dummy for the new ASEAN and the original ASEAN will be estimated together with the growth equation. Besides the three macro variables mentioned in the first analysis, the variable of FDI relative to GDP will be also included in this estimation.

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[53] Bassanini and Scarpetta (2001) replace the time trend with 5-year time dummy and tested with the null of homogeneity of time dummies across country.

4. 4   Empirical Analysis and Discussion

Before empirical testing is applied, a graphical overview will be presented to provide preliminary indication of expected results. Then, the empirical analysis of ASEAN5 and ASEAN8 will be carried out by using the equation derived in the previous section.

4.4.1   Convergence / Divergence: Graphical analysis

Figure 4.1: GDP per capita growth rates in ASEAN5 from 1960 to 2004
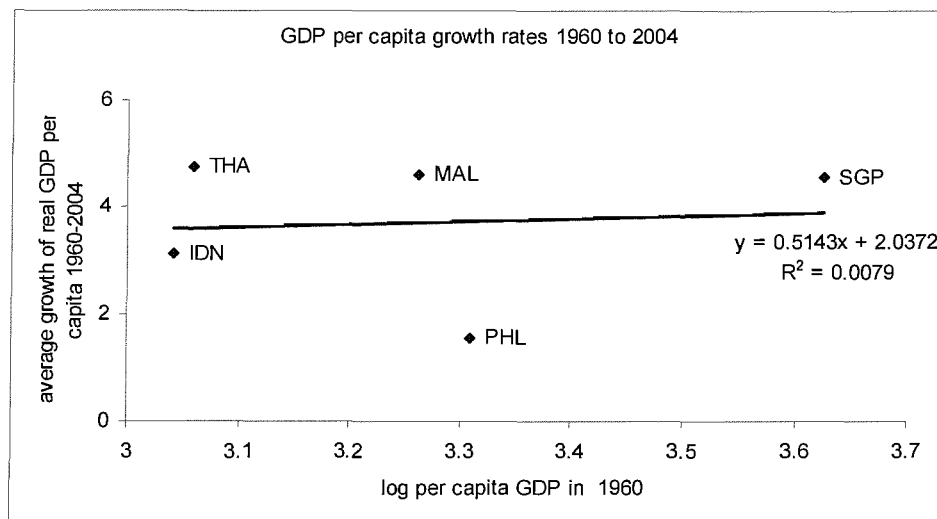
Figure 4.1 presents a scatter plot for ASEAN5 provides a preliminary indication of income convergence/divergence in ASEAN for the period 1960 to 2004. Positive relationship between the log of GDP per capita in 1960 and the average growth rate shows that there is no evidence of (unconditional) β-convergence within the sample period.

In addition, figure 4.2 shows a scatter plot for the period 1960 to 1992—the period before the establishment of the ASEAN Free Trade Area (AFTA). Figure 4.3 presents a scatter plot after the formation of AFTA took place. From these figures, there is no evidence of

income β-convergence before and after the formation of AFTA. However, the slope in Figure 4.2 is slightly flatter than that in figure 4.3.

Figure 4.2: GDP per capita growth rates for ASEAN5 from 1960-1992 (Pre AFTA)
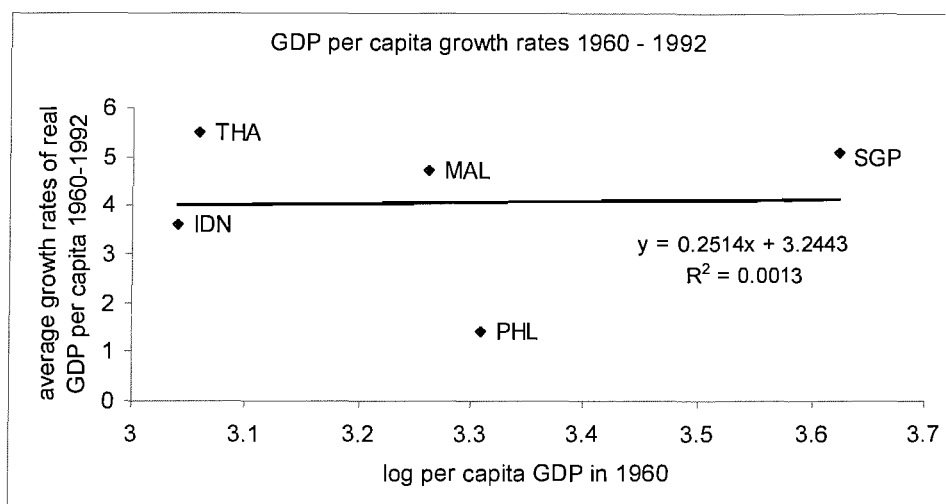
Figure 4.3: GDP per capita growth rates for ASEAN5 from 1993-2004 (Post AFTA)
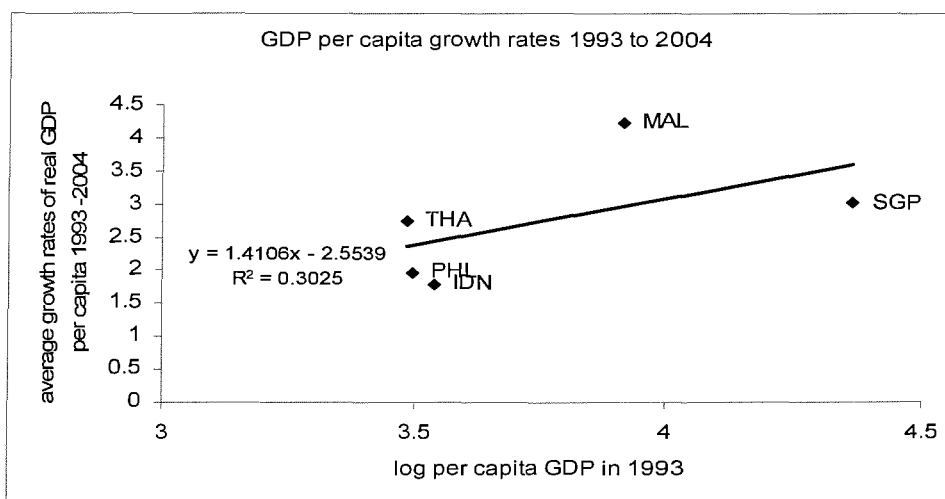
Figure 4.4: Real GDP per Capita dispersion in ASEAN5 (1960 to 2004)
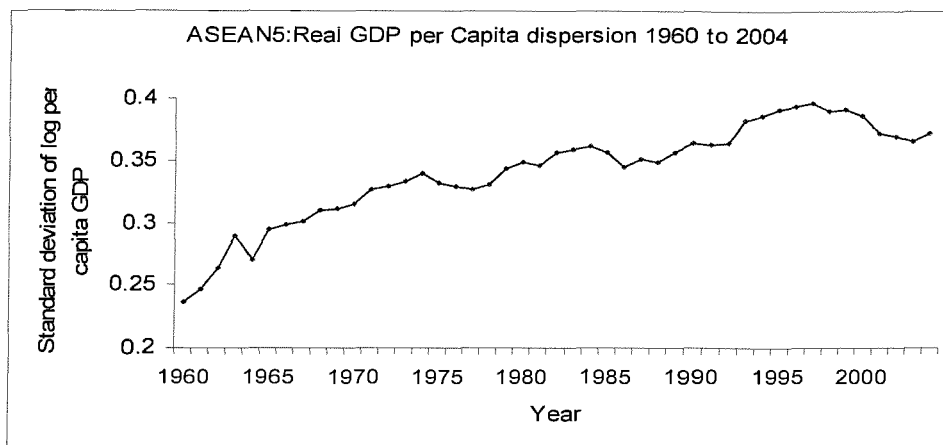
Figure 4.4 represents the evolution of the standard deviation of GDP per capita from 1960 to 2004. Before the formation of AFTA, the positive trend over time represents evidence of σ-divergence until 1997, when financial crisis hit most of the ASEAN countries. The subsequent trend of diminishment over time provides some evidence of σ convergence.

Further investigation found that there is evidence of σ - convergence as well as β-convergence after the expansion of ASEAN membership from five to ten[54] for the period 1993 to 2004 as presented in figures 4.5 and 4.6. The trends for the standard deviation of log per capita GDP between the original members and the new ASEAN members also coincide with each other, indicating that the income gap between these two groups of economies has been narrowing over time. The fact that convergence theory predicts that poorer countries grow faster than relatively rich ones may explain these phenomena. The same pattern also appears in figure 4.6 as the line trend indicates a negative relationship between the average growth rates and the initial GDP per capita in 1993.

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[54] However, in this study the countries involved are only nine in number, with Brunei having been dropped due to of lack of data.

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Figure 4.5: GDP per capita dispersion in ASEAN (1993-2004)

ASEAN: GDP per capita dispersion
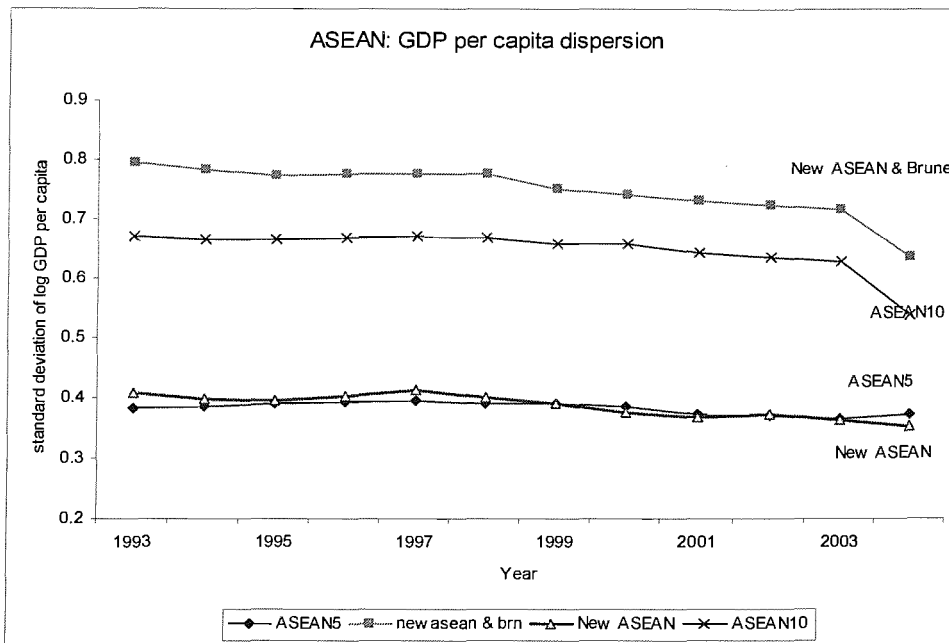
Figure 4.6: GDP per capita growth rates in ASEAN9 (post AFTA)

GDP per capita growth rates for ASEAN9 after the AFTA
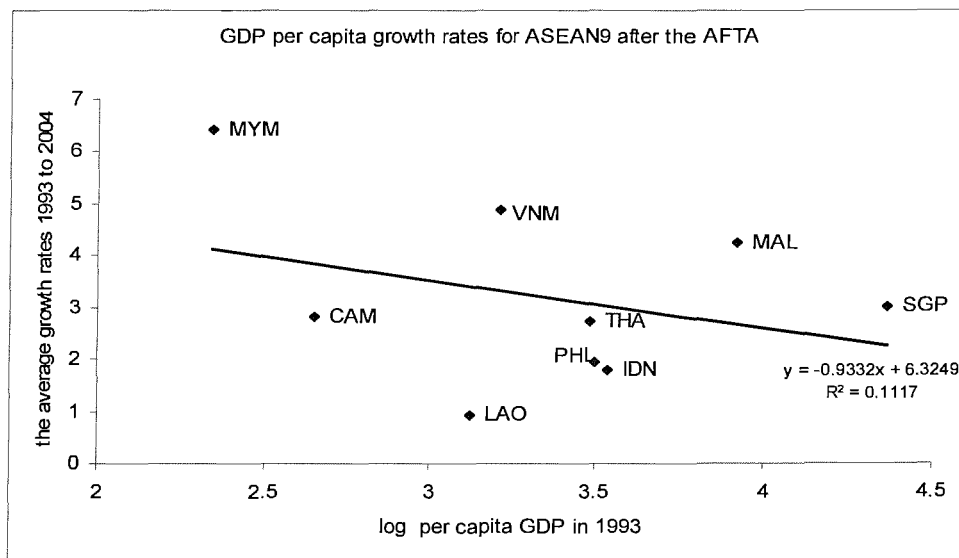
4.4.2 Unconditional Convergence in ASEAN5

In this section, a simple AR(1) model which includes the lagged dependent variable and dummies for ASEAN and AFTA is estimated. Both coefficients on the variables dummy are positive but insignificant. However, the convergence effect is negative and significant at about 3.8% which suggests evidence of unconditional effects in the ASEAN dummy for about 45 years starting in 1960. The Hausman test of the homogeneity assumption for the long run coefficient (in this model, only dummies for ASEAN and AFTA) is accepted.

Table 4.1: Unconditional convergence with ASEAN dummy: 1960 – 2004

Dependent Variable: Log of GDP per capita					
	Coefficient	St.error	t-ratio	Hausman test	p-value
ASEAN	0.836	0.193	0.333	1.22	0.27
AFTA	0.040	0.127	0.316	1.24	0.26
Constant	0.122***	0.038	3.229		
Convergence coefficient	-0.038***	0.012	-3.033		
No of observations	215				
Log likelihood	512.261				

Note: ***, **, * *denote 1%, 5% and 10% level of significance respectively. The Hausman test accepted the null hypothesis that the homogeneity restriction imposed in the long run coefficient.*

4.4.3 Conditional Convergence in ASEAN5

Table 4.2 presents the conditional convergence analysis which includes not only convergence variable (the lagged dependent variable) but also the additional variables as in the Solow model, namely the sum of population growth, exogenous growth and depreciation ($n+g+d$), as well as the log share of investment (physical capital). In column (1) both coefficients have the expected sign and are highly significant, with the coefficient for population growth being negative and the investment share positive. This confirms the results of earlier findings such as Caselli et al. (1996), Bond et al. (2001), and Bassanini et al. (2001) albeit from a different sample of countries and methods. The convergence coefficient, which represents the speed of adjustment, is negative and highly significant, suggesting that the GDP per capita in the ASEAN5 countries will converge to the common steady-state path at 17% per year. The Hausman test also fails to reject that the homogeneity restriction has been imposed in the long run coefficient as reported in the Appendix. However, the individual speed of convergence for ASEAN5 member's ranges from the low of 4 percent for Thailand followed by Indonesia (13%), Singapore (14%), and The Philippines (17%) to the highest of Malaysia of about 35%.

The three specifications present the estimation of conditional convergence but with the inclusion of dummies such as ASEAN, AFTA, AFTA97-98 and AFTA00-04. In column (2), the dummy for AFTA is positive but insignificant and the convergence coefficient, even though negative, is also insignificant. However, with the inclusion of the ASEAN and AFTA dummies in column (3) results in only the coefficient of the ASEAN dummy being positive and significant. This estimation implies that the positive growth after the five ASEAN countries formed the regional corporation in 1967 until 2004 led to a positive growth in per capita GDP. The convergence coefficient is also significant at about 2.2%. Finally, in the last specification, all ASEAN/AFTA dummies are included, however only the coefficients for ASEAN and AFTA97-98 are significant. The AFTA dummy shows no effect on growth. This result is quite similar to Vanhoudt (1999) and

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Vamvakidis (1999), who found that regional economic integration through RTA or FTA has no impact on growth. The coefficient for the ASEAN dummy is positive and higher than in the specification (3) showing a positive growth in income per capita with ASEAN membership. Conversely, the dummy for AFTA 97/98 is negative which reflects that for two years, during the financial crisis, income per capita in the ASEAN countries was decreasing. This result is quite similar to Barro (2001), who found that South Korea and the ASEAN countries (except Singapore) experienced a sharp initial decline in GDP per capita for about one year and sharply appreciated in 1998 which was described as a V-pattern of GDP growth.

Table 4.2: Conditional convergence with and without ASEAN5 dummy from 1960 to 2004

Dependent Variable: log of GDP per capita

	(1)		(2)		(3)		(4)	
(n+g+d)	-0.055***	(0.019)	-0.163***	(0.033)	-0.283***	(0.085)	-0.538***	(0.255)
Sk	0.004***	(0.001)	0.012***	(0.003)	-0.009	(0.007)	-0.050	(0.033)
ASEAN					0.880**	(0.352)	1.413***	(0.670)
AFTA			0.126	(0.023)	-0.050	(0.149)	-0.131	(0.798)
AFTA97/98							-1.407*	(0.817)
AFTA (2000-04)							-0.773	(0.523)
Convergence coefficient	-0.166***	(0.051)	-0.067	(0.061)	-0.022**	(0.010)	-0.016**	(0.008)
Trend	0.003***	(0.001)						
Constant	0.563***	(0.176)	0.263	(0.226)	0.091**	(0.034)	0.087**	(0.034)
No. Observation	208		213		218		218	

*Note: ***, **, * denote 1%, 5% and 10% level of significance respectively. The numbers in parentheses are the Standard errors. All regressions include short-run dynamics terms. The Hausman test accepted the null hypothesis that the homogeneity restriction imposed in the long run coefficient. Detailed about the results are presented in Appendix.*

In summary, there is evidence of unconditional as well as conditional convergence in ASEAN for a panel spanning 1960 to 2004. The speed of convergence ranges from 1.6% to 16.6%. The formation of ASEAN was positively associated with growth. However, the free trade area in ASEAN did not have any significant impact on growth.

4.4.4 The effect of macroeconomic variables on the long run growth in ASEAN5

Table 4.3 presents the estimation of conditional convergence with macro policy variables such as trade relative to GDP, the rate of inflation and government expenditure relative to GDP. In all specifications, the Hausman test used to test the homogeneity restriction imposed in the long run coefficients cannot be rejected, suggesting that the difference between the Mean Group (MG) and Pool Mean Group (PMG) estimates is not significant (reported in the Appendix). The convergence coefficients in all specifications are negative and significant except in specification (1) ranging from 4.3% to 9.6% indicating that there is a long-run equilibrium relationship between the variables considered in this model.

In Column (1), the trade to GDP ratio as a proxy for trade openness is estimated with the basic variables in the Solow model and is found to have a positive and highly significant coefficient. However, the share of capital and the convergence coefficients are insignificant. In the following specification, inflation as proxy for price stability has been added to the model; the coefficient is also negative but insignificant. According to Bassanini et al (2001), the effect of the level of inflation is less clear-cut, and they found that the inflation rate is negatively related with growth after the inclusion of trade openness in the equation. However, there is some improvement in the estimation, with both the coefficients for population growth and the share of capital as well the convergence coefficient are of the correct sign and statistically significant. In column (3) the government expenditure relative to GDP is added, having a negative sign and being

statistically significant. This result indicates that excessive government spending is slowing down growth by using up resources.

Table 4.3: Augmented growth model in the ASEAN5 from 1960 to 2004

Dependent Variable: log of GDP per capita

	(1)	(2)	(3)	(4)	(5)	(6)
(n+g+d)	-0.504***	-0.062***	-0.020**	-0.025	-0.017	-0.143***
	(0.072)	(0.023)	(0.011)	(0.018)	(0.022)	(0.027)
sk	-0.005	0.006***	0.008***	0.019***	0.017***	0.009***
	(0.006)	(0.002)	(0.001)	(0.004)	(0.004)	(0.002)
OPEN	0.004***			0.003***	0.003***	0.005***
	(0.001)			(5.90e-5)	(2.48e-4)	(0.001)
INF		-0.0001		-0.002	-0.001	-0.0001
		(1.64e-4)		(0.002)	(0.001)	(0.0012)
GOV			-0.006*		0.016	0.009
			(0.003)		(0.012)	(0.001)
ASEAN						0.306***
						(0.068)
Convergence coefficient	0.015	-0.147***	-0.165***	-0.043*	-0.049*	-0.096**
	(0.028)	(0.044)	(0.046)	(0.025)	(0.030)	(0.050)
Trend		0.002***	0.003***			0.0001
		(0.001)	(0.001)			(2.05e-4)
constant	-0.046	0.507***	0.543***	0.135**	0.146**	0.317**
	(0.119)	(0.015)	(0.148)	(0.65)	(0.076)	(0.154)
No. Observation	213	204	208	214	214	209

Note: ***, **, * denote 1%, 5% and 10% level of significance respectively. The numbers in parentheses are the Standard errors. All regressions include short-run dynamics terms. The Hausman test accepted the null hypothesis that the homogeneity restriction imposed in the long run coefficient. Detailed about the results are presented in Appendix.

Column (4) reports the estimation with the addition of the openness and inflation variables. However, only the coefficient of openness is positive and significant whereas the coefficient of inflation has a negative sign but was insignificant. The speed of adjustment is low (at about 4.3%) which implies that it will take more than 23 years to correct disequilibrium and return to long run equilibrium. In the next specification, all

three macro variables are estimated with the two basic Solow variables. However, besides the two Solow variables only the coefficient of openness is statistically significant. This result implies that openness is a very important determinant of growth in the ASEAN. Further analysis, in which an additional dummy for ASEAN is added, confirmed this conclusion and found that openness is positively related with growth. The coefficient for the ASEAN dummy is positive and significant indicating that the formation of ASEAN contributed to growth enhancement in the region.

In summary, in the augmented growth equation, the share of investment contributes to growth, and the trade share to GDP as a proxy for openness is also positively related to growth. Conversely, population growth and the government share are growth reducing factors in the ASEAN. The ASEAN dummy is positively associated with growth, however, the financial crisis of 1997-98 reduced growth in the region.

4.4.5 The effect of ASEAN Integration on the growth

Table 4.4 presents the relationship between ASEAN integration and growth for the period from 1985 to 2004. All ASEAN dummies are estimated along with variables for population growth and the share of capital. The ASEAN integration dummies are based on the year that they entered as a member of ASEAN. For example, Indonesia, Malaysia, The Philippines, Thailand and Singapore (ASEAN5 joined ASEAN since 1967) + Vietnam (ASEAN6 – joined in 1995) + Lao (ASEAN7- joined in 1995) + Cambodia (ASEAN8-joined in 1999—this result is not reported because it was insignificant).

Table 4.4: The effect of ASEAN Integration and growth

Dependent Variable: log of GDP per capita

	(1)	(2)	(3)
n	0.002	-0.034	0.004
	(0.029)	(0.023)	(0.006)
Sk	0.238***	0.317***	0.009
	(0.050)	(0.076)	(0.017)
ASEAN5	0.776***		
	(0.052)		
ASEAN6		0.928***	
		(0.189)	
ASEAN7			0.907***
			(0.018)
convergence	-0.519*	-0.663**	-0.671*
	(0.311)	(0.235)	(0.409)
Trend	0.012**	0.003*	0.005
	(0.006)	(0.002)	(0.005)
constant	2.135**	2.380**	1.803
	(1.101)	(0.873)	(2.189)

Note: ***, **, * denote 1%, 5% and 10% level of significance respectively. The numbers in parentheses are the Standard errors. All regressions include short-run dynamics terms. The Hausman test accepted the null hypothesis that the homogeneity restriction imposed in the long run coefficient. Detailed about the results are presented in Appendix.

In the first column, the estimated coefficient of the dummy for ASEAN5 is positive and statistically significant, with the speed adjustment being about 52%. In the next estimation, the dummy for ASEAN6 is also positive and significant. In this specification, Vietnam joined ASEAN in 1995. Finally the last column reports the estimated dummy coefficient for ASEAN7, which includes the ASEAN6 and Lao which became a member in 1997, is also positive and significant. Since all ASEAN dummies are positive and significant, this implies that the ASEAN integration contributes to growth enhancement. Overall, the marginal speed of adjustment or the speed of convergence rate is also increasing from 1% to 14% as new members join the regional economic integration.

4.4.6 The effect of macroeconomic variables in the long-run for ASEAN8 after the expansion of membership

Table 4.5 presents the results for the augmented growth equation in the ASEAN8 from the period 1993 to 2004. The first column reports the basic variables in the growth equation and shows that only the share of capital is positive and highly significant. Meanwhile, the coefficient for population growth, even though positive, is insignificant. The convergence coefficient is negative and highly significant at about 30%. However, the individual coefficients reported in the Mean Group reports that the lowest convergence coefficient is Cambodia (1.28%) followed by Singapore (3.8%), Malaysia (3.9%), Thailand (5.7%), Indonesia (17%), Lao (22%), The Philippines (52%) and Vietnam (61%). Specification (1) includes a constant and trend which are found to have a positive sign and were highly significant.

In column (2), the proxy for trade openness has been added and the coefficient was positive and significant. Both the coefficients for population growth and share of capital also have the correct sign and are statistically significant. Meanwhile, the convergence coefficient has increased from the previous specifications to a value of 38%. In the next two specifications, the variables for government expenditure relative to GDP, and inflation are added in the equations. The coefficient for inflation in column (4) has a negative sign, but is insignificant. However, the convergence coefficients in both specifications are negative and significant at about 40% and 54%. In column (5) the variable of FDI relative to GDP is added into the equation and found to have a positive sign and be highly significant coefficient. This implies that, the enlargement of ASEAN enhanced growth through participation in foreign direct investment. In the next specification, both variables for trade openness and that for FDI are included in the equation. However, only the coefficient of trade openness is positive and highly significant. Meanwhile, the coefficient of FDI was positive, but insignificant. The speed of adjustment is reported as having decreased to 19%. Finally, the dummy for the

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financial crisis of 1997/1998 was included and found to have a negative relationship with growth.

Table 4.5: Augmented growth equation in the asean8 from 1993 to 2004

Dependent Variable: log of GDP per capita							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
(n+g+d)	-0.005	-0.019***	-0.037***	-0.042***	-0.009	-0.013***	-0.049***
	(0.012)	(0.003)	(0.012)	(0.014)	(0.0014)	(0.005)	(0.012)
sk	0.028***	0.007***	0.006***	0.014***	0.003***	0.008***	0.003***
	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
OPEN		0.001***				0.001***	
		(5.32e-5)				(8.51e-5)	
GOV			0.002				
			(0.002)				
INF				-0.002			
				(-1.448)			
FDI					0.006***	0.0001	
					(0.001)	(0.001)	
CRISIS							-0.032***
							(0.011)
Convergence coefficient	-0.303**	-0.382**	-0.401**	-0.537*	-0.355**	-0.198*	-0.291
	(0.171)	(0.135)	(0.168)	(0.326)	(0.169)	(0.120)	(0.188)
Trend	0.003***	0.003	0.003	0.003***	0.004**		
	(0.002)	(0.002)	(1.580)	(0.001)	(0.002)		
constant	0.858***	1.267**	1.386***	1.546*	1.267**	0.469	0.924**
	(0.443)	(0.444)	(0.574)	(0.890)	(0.586)	(0.385)	(0.536)
No. Observation	85	83	84	80	80	80	85

*Note: ***, **, * denote 1%, 5% and 10% level of significance respectively. The numbers in parentheses are the Standard errors. All regressions include short-run dynamics terms. The Hausman test accepted the null hypothesis that the homogeneity restriction imposed in the long run coefficient. Detailed about the results are presented in Appendix.*

In summary, the ASEAN Integration is significantly contributing to growth enhancement. In addition, the increasing numbers of members in the ASEAN free trade area, along with population growth and the share of capital accumulation, trade openness, and FDI are very important determinants of growth in ASEAN countries. Meanwhile, the financial

crisis discouraged growth enhancement in the region. The convergence coefficient varied from 19% to 53%, albeit with different additional variables in the regression.

4.5   Conclusion and future research

In this study, convergence and growth effects in the ASEAN region are estimated using a dynamic, heterogeneous panel approach, namely pool mean group estimation. The panel was estimated in two stages, where the first covered the full period from 1960 to 2004 for the five original members in ASEAN. The second stage covered only eight out of ten members in the ASEAN including three new members for the period 1993 to 2004, the period after the establishment of the ASEAN free trade area.

In preliminary graphical observation, β and σ convergence were examined to see whether intra regional inequality increased or decreased, particularly after the AFTA was launched. The evidence found neither of β nor σ-convergence in ASEAN5 throughout the period 1960 to 2004. However, a scatter plot of GDP per capita revealed that there is evidence of β and σ-convergence during the period of AFTA (1993-2004). Thus, after the expansion of membership, the income gap between regions appears to have been decreasing. This provides evidence that poor countries in ASEAN do catch up with the rich ones.

The econometric application supports both the unconditional and the conditional convergence hypotheses. Hence, the ASEAN5 tend to converge to a steady state growth rate of per capita GDP with a speed of convergence of between 1.6% and 16.6%. However, the speed of convergence increases from 4.3% to 16.5% after some macro variables are added into the equation. The share of investment and trade openness are the main driving factors for growth enhancement in the ASEAN5. Conversely, population growth and the government consumption are found to have a negative relationship with growth. In addition, the establishment of ASEAN did contribute to improved growth. The

estimated coefficient on the ASEAN Integration dummy provides evidence that the increasing members in ASEAN is associated with positive growth and an increase in the speed of convergence from 2% to 15%.

This study also identified the driving factors that foster the rate of convergence as well as growth in ASEAN8, namely the share of investment, trade share in GDP and the ratio FDI to GDP. This implies that the more are the countries that join the FTA—and hence the larger the scale of the regional economy, the higher investment, trade and FDI, and thus the higher is the growth rate. The rate of convergence has accelerated from 19% to 54%, albeit with different variables included in the equation. There is also evidence from both estimations to support the conclusion that the financial crisis drove down the growth in the ASEAN region.

Therefore, policy makers in each ASEAN country should place more emphasis on trade and FDI, especially the new members by encouraging them to improve internal as well as external policies to realize long-term growth enhancement. Efficiency and correct management by governments—especially in government spending—would also improve long term growth prospects.

There are also many other driving forces that could play an important role in ASEAN's growth, such as from the financial sector, labor sector or education, communication and infrastructure, the efficiency of public administration and transparency may also be important, however, due to data limitations, these factors may be considered in the future research.

Chapter 5

Summary and Conclusion

This thesis has presented major issues in studying regional economic integration in the ASEAN Free Trade Area (AFTA) and carried out under the following three main headings: 1) intra-and-extra-regional trade 2) intra-and-extra-FDI, and 3) convergence and growth.

The first issue tackled in this study is the effect of intra as well as extra regional trade in the ASEAN as an analogy from trade creation and trade diversion from the traditional trade theory proposed by Viner (1950). The gravity model which has been used in the trade literature in analysing bilateral trade between exporters and importers is employed in this study as presented in chapter 2. This study exploited gravity variables with panel estimation from 1984 to 2003 between ASEAN and forty trading partners. The dummy for ASEAN integration was included to estimate trade creation for the period before and after the formation of AFTA. There are three major findings in this chapter. First, the model predicts that GDP as a proxy for market size, the absolute difference in GDP per capita as a proxy for relative endowment and common language will be positively associated with bilateral trade. Conversely, the distance and the population are negatively associated with bilateral trade.

Second, the ASEAN dummy used to estimate intra regional trade found evidence of trade creation within the five original ASEAN5. Further investigation in pre-and-post AFTA analysis also revealed that the ASEAN5 trade more after the period of AFTA. This study also identified that the ASEAN countries trade more right after the introduction of CEPT

scheme in 1993 and during the financial crisis rather than after the period of financial crisis. The individual country dummy introduced in the regression also supports the same pattern of results. There is evidence of trade diversion in the full sample and in the post AFTA period.

The third finding in this chapter is based on the expansion of ASEAN Integration which covers the period from 1993 to 2003. The intra ASEAN5 dummy as well as the intra ASEAN10 dummy confirmed that trade creation has been increasing in the region. Moreover, the dummy for the ASEAN crisis also supports the evidence of trade within ASEAN increasing during the financial crisis. Among the new members, Vietnam is found to have a positive relationship with ASEAN bilateral trade reflecting the way in which a country that joined ASEAN in 1995 been able to take advantage of free trade agreement packages.

Chapter 3 studies another issue related to regional economic integration, namely intra-and-extra-FDI. The method used in this study is again the gravity model, which is typically used in the estimation of trade models. This is major contributor to the gravity literatures which employed bilateral FDI as dependent variables with the inclusion of fixed effect model. There are three major findings in this study. First, the effect of FDI within the same REI found that the original ASEAN members invest less in each other but more in the new members. Secondly, the source regional groups such as North America, East Asia, Europe and Australia-New Zealand invest less in ASEAN. However, European countries and North America invest more in Singapore than other ASEAN countries. Further investigation also revealed that major investors like the USA and Japan invested more in the five original ASEAN than in the new members.

Finally, this paper used a semi gravity model to identify the determinants of FDI in ASEAN countries. The results revealed that besides the market size for host and source

country, other criteria such as the shorter the distance, common in language and border, the extended market relative to distance also attracts more foreign investors. Other macroeconomic factors such as lower inflation rate, the slightly higher in exchange rate and good management of the government budget are among the key factors that attract more FDI. In addition to economic factors, social factors such as good telecommunication and infrastructure and non-economic factors such transparency and trade policy also encourage more investors to the ASEAN.

In sum, the formation of ASEAN free trade area encouraged trade creation and also investment creation within the ASEAN members especially to the new members. The gravity model which is capable of estimating both bilateral trade and bilateral FDI has proven to explain not only factors determining in trade and FDI but also the effect of ASEAN Integration on intra-and-extra-regional trade as well as FDI.

Chapter 4 investigates the effect of convergence and growth in the ASEAN. The growth model is derived from the Neoclassical Model namely The Solow Model and modified in the dynamic form for empirical purposes. Before empirical analysis is carried out, a scatter graph for β and σ convergence is presented. Preliminary graphical observations find strong evidence of β and σ convergence after the expansion of membership. This results support the convergence theory that poor countries in ASEAN do catch up with the rich ones.

The convergence and growth effects in the ASEAN integration is estimated by using the dynamic heterogenous panel approach namely Pooled Mean Group Estimator (PMGE). The method proposed by Pesaran, Shin and Smith (1999) allows for heterogeneity in the short term coefficients, but restricts the long-run coefficients to be the same for all countries. The main variables to capture convergence effect such as lagged dependent

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variable, population growth and the share of investment are included in the estimation to test for conditional convergence as is commonly used in the empirical growth literature.

The empirical evidence supports unconditional and conditional convergence hypotheses in the ASEAN5 for the period over 1960-2004. The ASEAN5 tend to converge to a steady state growth rate of per capita GDP with a speed of convergence of between 1.6% and 16.6%. The share of investment, population growth and openness are the main macro policy factors that increase ASEAN's growth. In addition, there is evidence to support the conclusion that the expansion from five to ten members is also one of the factors that increase growth in the ASEAN. The estimated coefficient on the ASEAN Integration dummy provides evidence that the increasing members in ASEAN is associated with positive growth and an increase in the speed of convergence from 1% to 14%. In the second stage of estimation, data from ASEAN8 is estimated for the period over 1993-2004, the period after the formation of AFTA, the coefficient for the trade ratio to GDP and FDI ratio to GDP are both positive and significant. This evidence supports the conclusion that trade and FDI drove up the growth in the ASEAN region.

Since 1992, the implementation of AFTA has created opportunities for greater expansion of both extra and intra-regional trade. Hence, to the new members, there are vast opportunities to be exploited from the original members through not only intra and extra-ASEAN-trade but also through intra as well as extra-ASEAN-foreign direct investment. Furthermore, the expanding membership in the ASEAN is seen as a process of learning and building confidence to face competition from outside the region. To the original members, the opportunity of becoming an investor is a golden chance to gain benefit by exploiting the supply of cheap labour. On the other hand, to the new members, the opportunity of opening up the market within the region can be seen as a trial before they really open up the market seriously to the global economy. The stability in the ASEAN

region is important as it reflects the stability of the East Asia region specifically and the global economy as a whole.

At the beginning, the implementation of AFTA gave its original members challenges, since they produced similar products and competed in the same market which then resulted in low intra-ASEAN trade. When new members were admitted to ASEAN, the challenges increased, since those new member countries were relatively low in their level of economic development. However, the blend of challenges and strong determination of all ASEAN members have created a new formula to boost the economy within the region. As a result, AFTA has had a positive impact on consumers, with a greater choice offered from a broad range of better quality products as well as an increase in economic growth, job creation and rise in income. As far as FDI is concerned, it also gives investors more choices in deciding where to locate their operations for the increasingly integrated ASEAN market or for production for export elsewhere in the world. Whether a potential investor looks for high-technology capability, efficiency in services, abundant raw materials, or low-cost labor, the investor can find it in one or another ASEAN country.

The 1997 financial crisis which hurt most of the ASEAN countries was the biggest challenge to the association which reached 30 years old. It has not only brought countries to poverty but also impaired the economic systems which have been built for more than three decades. Some experts predicted that it would take a decade for ASEAN economies to recover and would result in broken ties of ASEAN10. On the other hand, the financial crisis appears to have accelerated progress towards closer integration. The ASEAN economy has bounced back within two years of crisis which shows fundamental strength and resilience. As pointed out earlier, the intra regional trade within the ASEAN were increasing during the financial crisis.

Taking a lesson from the past economic turmoil, ASEAN took one step ahead to prevent recurrence of the crisis by setting up a framework for closer economic policies called ASEAN Surveillance Process (ASP). The vision 2020 becomes an ultimate goal to make the realization of mission and vision of ASEAN and AFTA. The establishment of ASEAN community which contains ASEAN Economic Community (AEC), ASEAN Security Community (ASC) and ASEAN Socio-Cultural Community (ASCC) has served as a roadmap of integration to be a single market and production base by the free movement of goods, services, investments and capital by year 2020. The ASEAN Investment Area for instance, aims to provide the environment that can facilitate a free flow not only FDI but also technologies and skilled workers. In addition, the scheme has been expanded covering priority sectors not only in trade but also in services such as tourism, healthcare and air travel.

The growing concern related to the regional economic integration has raised attention to researchers to focus more on the impact of the formation of economic integration. The ASEAN, an example of the South-South Agreement at which the agreement signed between developing countries represents the only free trade area in the East Asia can be as a model to other regional economic integration to involve deeper and wider in the economic integration. To make each ASEAN country more competitive, there is much work to be done especially at the national level such as strengthening political stability, fostering a business-friendly environment and improving education and training sectors for global and regional competition. Three topics explored in this thesis confirmed the need to exploit tariff reductions and investment packages offered in the free trade agreements because increases in trade and FDI contribute to growth enhancement in the region.

Besides trade, FDI, convergence and growth, there are many other issues should also be given more attention and focus in the future research such as migration, tourism and

poverty. As studies in this thesis used aggregate bilateral trade and FDI data, another area of potential research might use disaggregated data by sector or industry to investigate the new trade theory.

Appendices

Appendix 1.1: FDI inflows in ASEAN (1972-2003)

Foreign Direct Investment in ASEAN (1972 -2003)
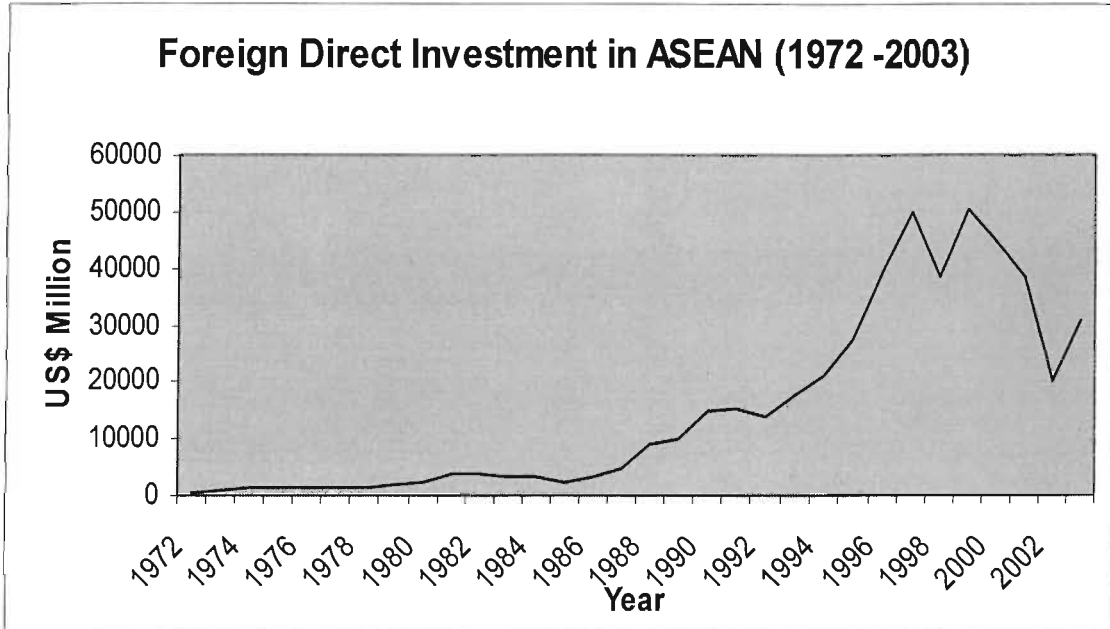
Appendix 1.2: FDI growth in ASEAN from 1995 to 2003

FDI growth in ASEAN from 1995 to 2003

Legend:
- Brunei Darussalam
- Cambodia
- Indonesia
- Lao PDR
- Malaysia
- Myanmar
- Philippines
- Singapore
- Thailand
- Viet Nam
- ASEAN TOTAL
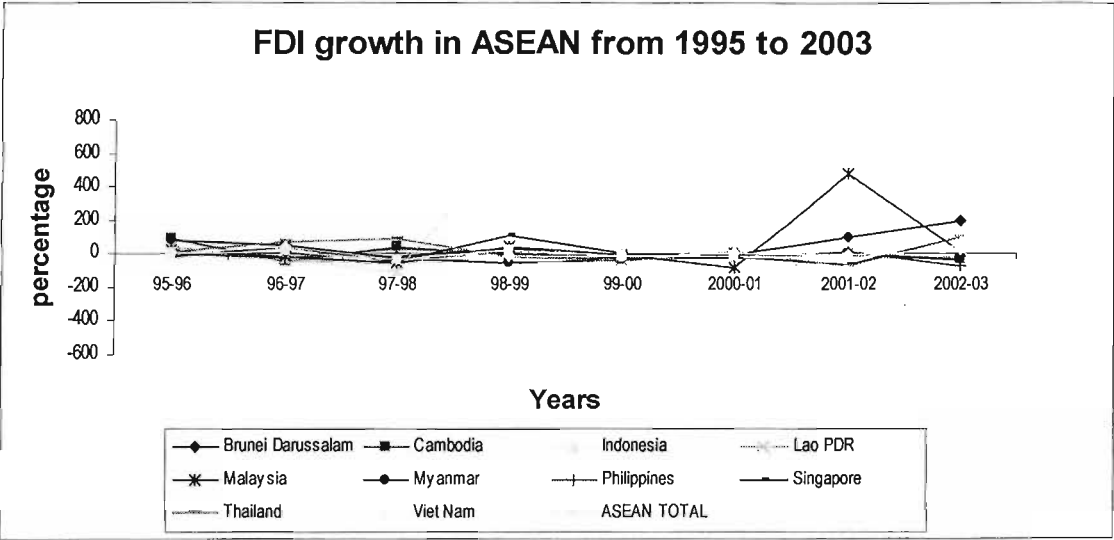
Source: ASEAN Secretariat - ASEAN FDI Database

Appendix 1.3: FDI flows in ASEAN6 (1995-2003)

FDI flows in ASEAN6 (1995 - 2003)
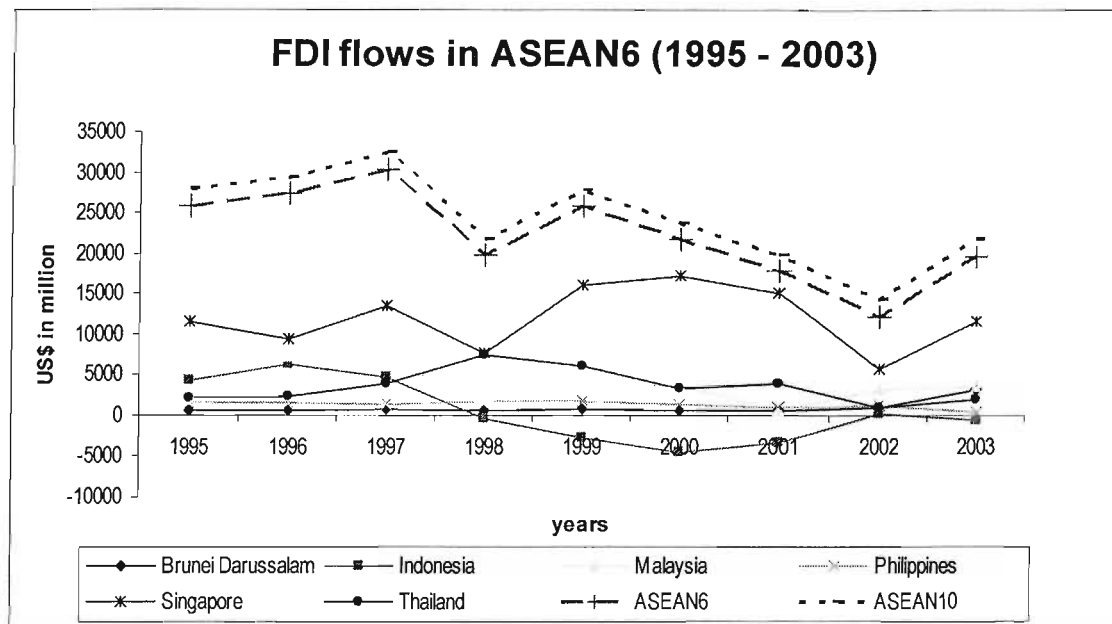
Source: ASEAN Secretariat - ASEAN FDI Database

Appendix 1.4: FDI Inflows into ASEAN by Source Country, 2003
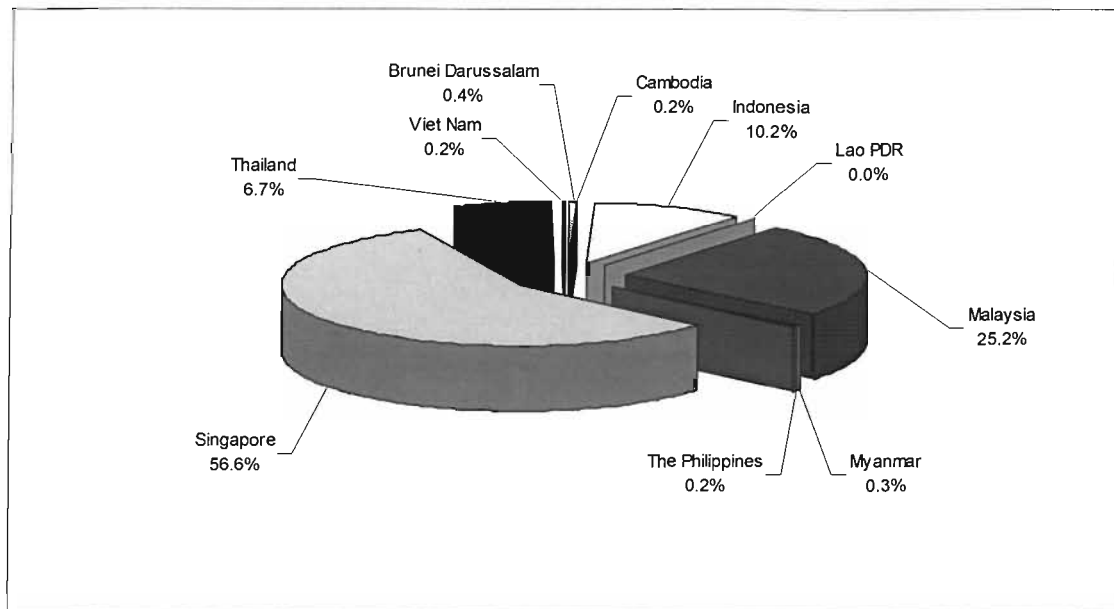
Source: ASEAN Secretariat - ASEAN FDI Database

Appendix 1.5: FDI inflows into ASEAN by Host Country, 2003
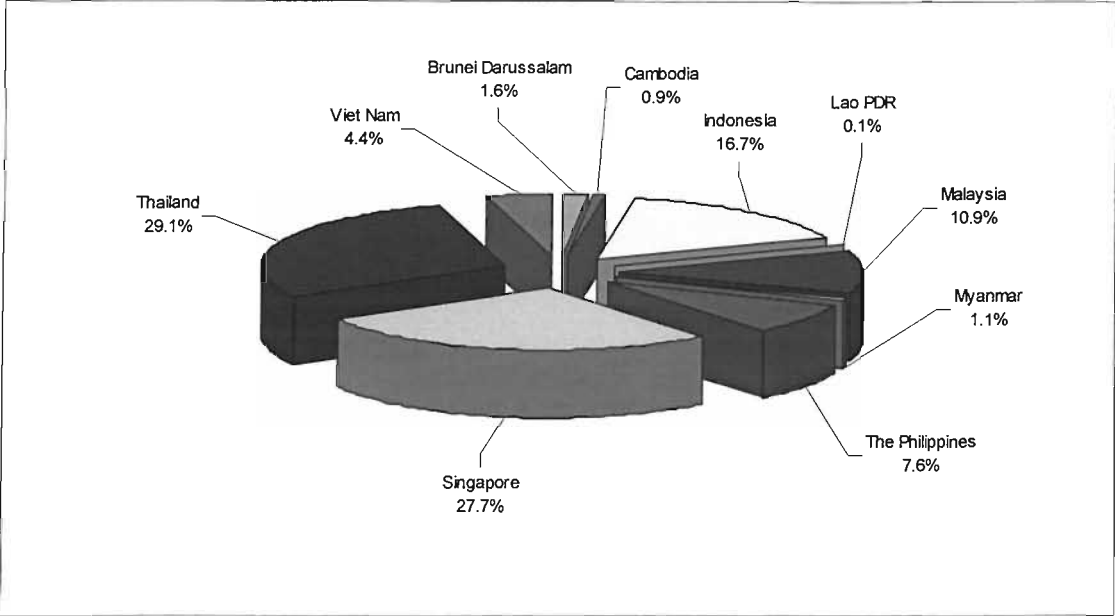
Source: ASEAN Secretariat - ASEAN FDI Database

Appendix 1.6: Share of FDI inflows to ASEAN by Economic Sector, 2003 (%)
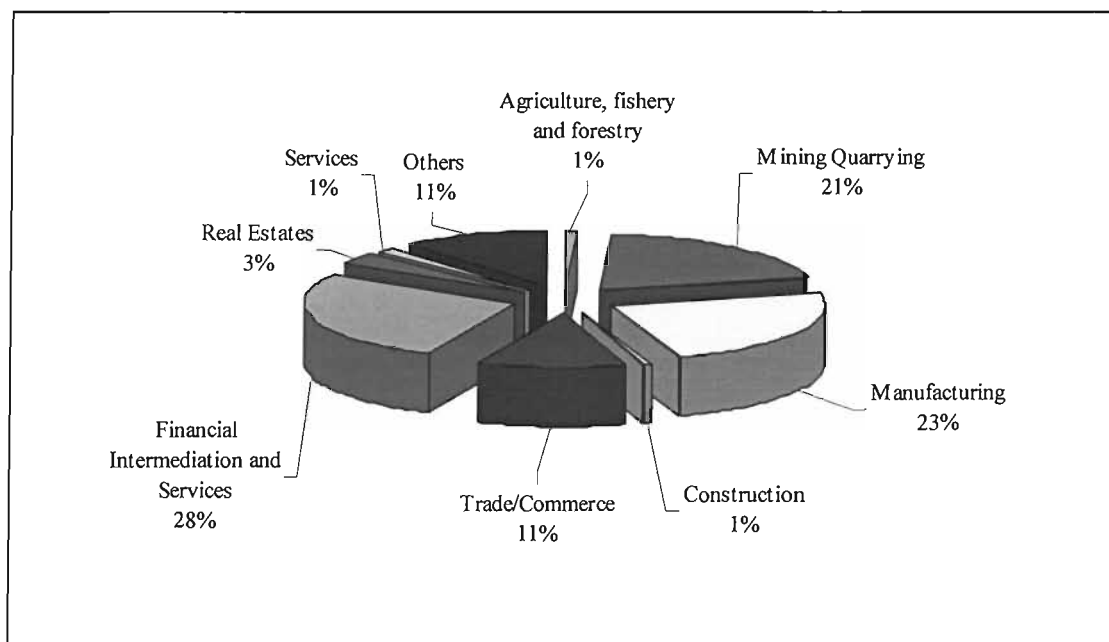
Source: ASEAN Secretariat - ASEAN FDI Database

Appendix 2.1 Variable and Data Source

Variable	Source
Bilateral export-import	IMF Direction of Trade Statistics Yearbook, ESDS database
Gross domestic Product	World Development Indicators, 2005, World Bank. ESDS database
Population	World Development Indicators, 2005, World Bank. ESDS
Gross Domestic Product per capita	World Development Indicators, 2005, World Bank. ESDS Database
Endowment	Proxy for relative endowment: absolute difference of GDP per capita between exporters and importers
Distance	Distance are calculated based on the great circle formula, which uses latitudes and longitudes of the most important city (in terms of population) or of its official capital Source :Centre D'etudes Prospectives Et D'informations Internationals (CEPII)
Common Border and Common Language	Centre D'etudes Prospectives Et D'informations Internationals (CEPII)

Appendix 2.2 Country Coverage

Groups	Countries
ASEAN5	Indonesia, Malaysia, Thailand, The Philippines and Singapore.
ASEAN10	ASEAN5 + Brunei, Cambodia, Laos, Myanmar and Vietnam.
East Asia	Japan, China, South Korea, Hong Kong
South Asia	Pakistan, India and Bangladesh
North America	United States of America and Canada
South America	Argentina, Brazil, Mexico, Paraguay, Uruguay and Venezuela
AUNZ	Australia and New Zealand
Europe	France, Germany, Denmark, Greece, Italy, Netherland, Norway, Poland, Portugal, Spain, United Kingdom, Sweden and Switzerland.

Appendix 2.3   Descriptive statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
lEX	2.304414	1.03742	-2.791909	5.50395
lGDPi	10.87267	.2033818	10.46761	11.27416
lGDPj	11.16351	.8404071	8.859263	13.72919
lPOPi	7.532113	.5939286	6.436481	8.331428
lPOPj	7.433882	.7160653	5.33646	9.113943
lDISTij	9.005517	8.588443	6.225622	9.859886
ENDOW	.8330722	.5059389	.0005716	3.49269
Border	.0512821	.2206007	0	1
Language	.1230769	.3285676	0	1

Appendix 2.4   Correlation Matrix

	lEX_{ij}	$lGDP_i$	$lGDP_j$	$lPGDP_i$	$lPGDP_j$	$lPOP_i$	$lPOP_j$	$lDIST_{ij}$	BOR	LANG
lEX_{ij}	1.0000									
$lGDP_i$	0.0738	1.0000								
$lGDP_j$	0.5312	0.0393	1.0000							
$lPGDP_i$	0.3222	-0.2930	0.0136	1.0000						
$lPGDP_j$	0.2398	0.0248	0.5918	-0.0124	1.0000					
$lPOP_i$	-0.2468	0.5918	0.0020	-0.9441	0.0190	1.0000				
$lPOP_j$	0.3663	0.0193	0.5498	0.0284	-0.3251	-0.0173	1.0000			
$lDIST_{ij}$	-0.2477	0.0118	0.3340	-0.0162	0.4244	0.0177	-0.0485	1.0000		
BOR	0.1300	0.0035	-0.2107	0.0171	-0.1475	-0.0141	-0.1036	-0.3125	1.0000	
LANG	0.2174	-0.2008	0.0716	0.2132	0.0290	-0.2482	0.0572	-0.1453	0.1252	1.0000

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Appendix 2.5   The augmented gravity model with individual country dummy, various year, 1993 to 2003

	1993-1996		1997-1999		2000-2003	
lGDPi	2.261***	(.325)	1.942***	(.490)	3.079***	(.274)
lGDPj	.893***	(.034)	.845***	(.069)	1.02***	(.028)
lPOPi	-.320***	(.072)	-.278***	(.121)	-.321***	(.060)
lPOPj	-.0821**	(.035)	-.066**	(.074)	-.074***	(.029)
ENDOW	.176***	(.042)	.187	(.032)	.182***	(.037)
lDIST	-.00007***	(3.79e-06)	-.00002***	(6.18e-06)	-.00009***	(3.47e-06)
BOR	.254*	(.148)	.158	(.150)	.395***	(.096)
LANG	.271***	(.064)	.292***	(.096)	.273***	(.053)
const	29.60***	(3.32)	-26.85***	(5.13)	-39.96***	(2.86)
MAL_IT	.831***	(.092)	1.085***	(.114)	.766***	(.069)
IDN_IT	.352***	(.091)	.564***	(.158)	.135**	(.066)
PHL_IT	.358***	(.078)	.553***	(.115)	.373***	(.059)
SGP_IT	.849***	(.082)	1.153***	(.174)	.771***	(.070)
THA_IT	.588***	(.070)	.884***	(.118)	.497***	(.059)
No. Obs.	585		585		780	
R^2	0.7927		0.6630		0.8343	

Appendix 2.6   The augmented gravity model with individual country dummy during crisis, 1984 to 2003

	Full sample (1984-2003)		Post AFTA (1993-2003)	
lGDPi	2.532***	(.107)	1.027***	(.355)
lGDPj	.862***	(.019)	.476***	(.103)
lPOPi	-.901***	(.028)	-1.584**	(.743)
lPOPj	-.049***	(.017)	-1.23**	(.575)
ENDOW	.117***	(.025)	.202***	(.017)
lDIST	-.00008***	(2.55e-06)	-.00008***	(.00001)
BOR	.605***	(.069)	.522***	(.045)
LANG	.191***	(.027)	.029	(.031)
const	-26.84***	(1.035)	7.514***	(2.99)
MAL_IT crisis	.028	(.084)	-.183**	(.080)
IDN_IT crisis	.031	(.079)	-.111	(.078)
PHL_ITcrisis	.490***	(.088)	.364***	(.079)
SGP_ITcrisis	.304***	(.098)	.0028	(.079)
THA_IT crisis	.232***	(.063)	.008	(.078)
No. Obs.	3900		2145	
R^2	0.6412		0.8691	

Appendix 3.1   Variable and Data Source

Variable	Source
Bilateral FDI flows	Dependent Variable ASEAN Statistical Yearbook 2004. ASEAN Secretariat.
Real Gross domestic Product	Proxy for size market (constant US$, 2000) Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Population	Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Gross Domestic Product per capita	Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Endowment	Proxy for relative endowment: absolute difference of GDP per capita between exporters and importers. (If countries differ in factor endowment, Vertical FDI is expected to prevail otherwise Horizontal FDI becomes the prevalent mode of country)
Capital labor ratio	Alternative measure for factor endowments Gross fixed capital formation (constant 2000 US$)/ total labor force Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Distance	Distance are calculated based on the great circle formula, which uses latitudes and longitudes of the most important city (in terms of population) or of its official capital Source: Centre D'etudes Prospectives Et D'informations Internationals (CEPII)
Common Border and Common Language	An alternative proxy for distance costs- FDI are generally higher in neighbouring countries to which economic, political, cultural and personal relations are much intense. Source : Centre D'etudes Prospectives Et D'informations Internationals (CEPII)

Extended market host country	Alternative measure of market size which takes the value of the regional market size for countries belonging to a RTA -calculated as the sum of the domestic market size of all countries sharing RTA
Extended market relative to distance host country	Alternative measure for extended market size calculated by the sum of GDPs the host country that access at a zero tariff-calculating a weighted sum of the partners's GDPs with weights equal to the inverse of the distance between the host and each partner $(Xi = \ln (1+ \Sigma \, GDPj/Dij))$
Real interest rate	end of period: minimum lending rate (%), proxy for macro stability Source: ASEAN Statistical Yearbook 2004
Real exchange rate	Proxy for macro stability International Monetary Fund, IMF Balance of Payment Statistics, ESDS International, University of Manchester
Inflation rate	Proxy for macro stability Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Government budget	-proxy for stabilization Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Openness	Proxy for trade liberalization. -The sum of export and import, US dollars Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Trade Policy Index	Trade policy Index, which measures the score from 1 to 5 based on country's weighted average tariff rate, the lowest means very low level of protection. Source: The Heritage Foundation (http://www.heritage.org/index/)
Phone lines	Proxy for infrastructures, Fixed line and mobile phone subscribers (per 1,000 people) Source: World Bank, World Development Indicators, ESDS International, University of Manchester

Economic Freedom Index	The Index of Economic Freedom is grading based on the score from 1 to 5 which the lowest represent the more conducive economic freedom inclusive ten factors that covers trade policy, fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property right, regulation and informal market activity. Source: The Heritage Foundation (http://www.heritage.org/index/)
Transparency Corruption Perception Index	Transparency Corruption Perception Index compiled transparency International available at http://www.transparency.org/policy_research/surveys_indices/cpi

Appendix 3.1	Variable and Data Source

Variable	Source
Bilateral FDI flows	Dependent Variable ASEAN Statistical Yearbook 2004. ASEAN Secretariat.
Real Gross domestic Product	Proxy for size market (constant US$, 2000) Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Population	Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Gross Domestic Product per capita	Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Endowment	Proxy for relative endowment: absolute difference of GDP per capita between exporters and importers. (If countries differ in factor endowment, Vertical FDI is expected to prevail otherwise Horizontal FDI becomes the prevalent mode of country)
Capital labor ratio	Alternative measure for factor endowments Gross fixed capital formation (constant 2000 US$)/ total labor force Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Distance	Distance are calculated based on the great circle formula, which uses latitudes and longitudes of the most important city (in terms of population) or of its official capital Source: Centre D'etudes Prospectives Et D'informations Internationals (CEPII)
Common Border and Common Language	An alternative proxy for distance costs- FDI are generally higher in neighbouring countries to which economic, political, cultural and personal relations are much intense. Source : Centre D'etudes Prospectives Et D'informations Internationals (CEPII)

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Extended market host country	Alternative measure of market size which takes the value of the regional market size for countries belonging to a RTA -calculated as the sum of the domestic market size of all countries sharing RTA
Extended market relative to distance host country	Alternative measure for extended market size calculated by the sum of GDPs the host country that access at a zero tariff-calculating a weighted sum of the partners's GDPs with weights equal to the inverse of the distance between the host and each partner $(Xi = \ln (1+ \Sigma \ GDPj/Dij))$
Real interest rate	end of period: minimum lending rate (%), proxy for macro stability Source: ASEAN Statistical Yearbook 2004
Real exchange rate	Proxy for macro stability International Monetary Fund, IMF Balance of Payment Statistics, ESDS International, University of Manchester
Inflation rate	Proxy for macro stability Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Government budget	-proxy for stabilization Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Openness	Proxy for trade liberalization. -The sum of export and import, US dollars Source: World Bank, World Development Indicators, ESDS International, University of Manchester
Trade Policy Index	Trade policy Index, which measures the score from 1 to 5 based on country's weighted average tariff rate, the lowest means very low level of protection. Source: The Heritage Foundation (http://www.heritage.org/index/)
Phone lines	Proxy for infrastructures, Fixed line and mobile phone subscribers (per 1,000 people) Source: World Bank, World Development Indicators, ESDS International, University of Manchester

Economic Freedom Index	The Index of Economic Freedom is grading based on the score from 1 to 5 which the lowest represent the more conducive economic freedom inclusive ten factors that covers trade policy, fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property right, regulation and informal market activity. Source: The Heritage Foundation (http://www.heritage.org/index/)
Transparency Corruption Perception Index	Transparency Corruption Perception Index compiled transparency International available at http://www.transparency.org/policy_research/surveys_indices/cpi

Appendix 3.2   Country Coverage

Groups	Countries
ASEAN5_host country	Indonesia, Malaysia, Thailand, The Philippines and Singapore.
ASEAN10_host country	ASEAN5 + Brunei, Cambodia, Laos, Myanmar and Vietnam.
SOURCE Country	Japan, China, Hong Kong, Taiwan, South Korea, Singapore, Malaysia, Indonesia, The Philippines, Thailand, Unites States of America, Canada, Australia, New Zealand, France, Germany, United Kingdom and Netherlands.
East Asia	Japan, China, South Korea, Hong Kong, Taiwan
North America	United States of America and Canada
AUNZ	Australia and New Zealand
Europe	France, Germany, United Kingdom and Netherlands.

Appendix 3.3   Descriptive statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
IFDI	1.198624	.9986708	-1	3.593696
IGDPi	11.6391	.6259829	10.66224	13.01465
IGDPj	10.52513	.6559111	9.106177	11.27416
IPOPi	7.640405	.6283301	6.547282	9.113943
IPOPj	7.289994	.8280479	5.472756	8.331428
IPGDPi	4.008038	.5522924	2.780519	4.582314
IPGDPj	3.203785	.6580297	2.197859	4.357298
IDISTij	3.644077	.3770101	2.703753	4.191336
Border	.0764331	.2657839	0	1
Language	.0700637	.2553447	0	1
ENDOW	1.002761	.6228856	.0008791	2.384455
Capital labor ratio	7.7962291	8.303849	4.837080	9.610445
Extended market	11.76227	.0453022	11.60992	11.81959
Extended market relative to distance	8.112238	.3463787	7.585748	8.740296
Real exchange rate	8.014637	8.508065	0.3364722	9.657906
Real interest rate	3.399646	10.19827	-41.86	16.89
Inflation rate	2.398866	3.0297336	0	4.8553
Openness	10.41423	.8481888	8.862727	11.80284
Phonelines	5.51359	5.758688	1.289236	7.1722327
Government budget balance	-1.287603	4.070968	-7.61	17.39
Trade policy index	3.527569	1.373297	1	5
Economic freedom Index	3.314896	.9858356	1.54	4.8
Transparency Index	4.033534	2.331334	1.7	9.4

Appendix 3.4   Correlation Matrix

	IFDI	IGDPi	IGDPj	IPOPi	IPOPj	IDist	Bor	Lang	Endow	Extmktd	Extmkt	K-L	Exchrt	inflat	open	phone	intrat	Govt	EFI	TCPI
IFDI	1.00																			
IGDPi	0.36	1.00																		
IGDPj	0.30	-0.02	1.00																	
IPOPi	0.01	0.57	-0.19	1.00																
IPOPj	-0.21	-0.05	0.31	-0.06	1.00															
Ldist	0.04	0.57	0.05	0.12	-0.001	1.00														
Bor	0.01	-0.2	-0.003	0.05	-0.07	-0.44	1.00													
Lang	0.27	0.06	0.07	-0.02	0.23	-0.23	0.1	1.00												
Endow	-0.05	0.23	-0.35	-0.19	0.34	0.17	-0.21	-0.07	1.00											
Extmktd	-0.04	-0.61	-0.02	-0.17	0.02	-0.93	0.35	0.00	-0.23	1.00										
Extmkt	0.07	0.45	-0.05	-0.07	-0.02	0.54	-0.29	-0.04	0.26	-0.52	1.00									
K-L	0.39	0.03	0.17	0.04	-0.78	0.02	0.04	0.31	-0.46	-0.03	-0.03	1.00								
Exchrt	-0.21	-0.03	-0.59	-0.02	0.26	-0.07	-0.06	-0.19	0.46	0.03	0.02	-0.35	1.00							
intlat	-0.08	0.20	-0.03	-0.06	-0.28	0.15	-0.19	-0.05	-0.16	-0.07	0.22	0.04	0.013	1.00						
open	0.16	-0.48	-0.03	-0.05	0.48	-0.65	-0.35	0.42	0.01	0.91	0.013	-0.05	0.04	0.02	1.00					
Phone	0.26	-0.48	-0.00	0.06	0.84	-0.44	-0.35	0.34	0.04	0.26	0.05	-0.73	0.014	0.05	0.55	1.00				

Intrate	-0.09	0.2	-0.4	0.02	-0.22	-0.03	-0.03	-0.04	0.06	0.03	0.03	-0.02	0.07	-0.33	-0.39	-0.12	1.00			
Govt	0.26	0.02	-0.07	0.03	-0.60	-0.02	0.003	0.20	-0.26	-0.01	-0.05	0.68	-0.12	-0.25	0.17	0.39	0.18	1.00		
EFI	-0.39	-0.02	-0.67	-0.02	0.43	-0.56	-0.02	-0.26	0.56	0.03	0.05	-0.72	0.82	0.22	-0.82	-0.70	0.16	-0.41	1.00	
TCPII	0.40	0.04	0.19	0.05	-0.84	0.02	0.06	0.29	-0.50	-0.03	-0.03	0.96	-0.45	-0.34	0.53	0.91	-0.02	0.60	-0.74	1.00

Appendix 4.1 Variable and Data Source

Variable	Source
Income	Penn World Table 6.1
Population growth	World Development Indicators, 2005, World Bank. ESDS database
Share of capital	Penn World Table 6.1
Share of Government expenditure	Penn World Table 6.1
Share of trade	Penn World Table 6.1
FDI	World Development Indicators, 2005, World Bank. ESDS database
Inflation rate	World Development Indicators, 2005, World Bank. ESDS database

Appendix 4.2 Descriptive statistics : ASEAN5 from 1960-2004

Variable	Mean	Standard Deviation	Minimum	Maximum
Income	3.573134	.3725052	2.929466	4.468846
Population growth	2.208667	.7509452	-.11	4.81
Share of capital	3.167412	2.54415	1.67719	3.961395
Share of Government expenditure	2.765625	1.582953	1.49674	3.348293
Share of trade	4.74741	4.427204	3.626643	6.13756
Inflation rate	2.75859	4.392405	0.06097	7.03548

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Appendix 4.3   Correlation Matrix : ASEAN5 from 1960-2004

	Y	ngd	Sk	Gov	Open	inf
Y	1.0000					
ngd	-0.1306	1.0000				
Sk	0.5338	-0.1336	1.0000			
Gov	-0.4899	-0.0815	-0.6022	1.0000		
Open	0.9054	-0.0249	0.5196	-0.5674	1.0000	
inf	-0.1955	-0.0012	-0.1871	0.0264	-0.1149	1.0000

Appendix 4.4   Descriptive statistics : ASEAN8 from 1993-2004

Variable	Mean	Standard Deviation	Minimum	Maximum
Income	3.832885	.3475417	3.483825	4.468846
Population growth	1.808	.8081005	.58	4
Share of capital	3.157350	2.38340	2.28558	3.79886
Share of Government expenditure	2.73473	1.40144	1.88995	3.04113
Share of trade	5.173715	4.710400	4.185211	6.13756
FDI to GDP	4.353455	5.120279	5.664237	7.652472
Inflation rate	5.415763	7.93777	-.39	58.39

Appendix 4.5   Correlation Matrix : ASEAN8 from 1993-2004

	y	ngd	sk	gov	open	inf	Fdi/gdp
Y	1.0000						
ngd	0.4890	1.0000					
sk	0.4292	0.0635	1.0000				
Gov	-0.7166	-0.4615	-0.1748	1.0000			
Open	0.9660	0.5040	0.4697	-0.7437	1.0000		
Inf	-0.6224	-0.2036	-0.3701	0.3635	-0.6252	1.0000	
Fdi/gdp	0.8257	0.5927	0.5153	-0.7361	0.8874	-0.5201	1.0000

Appendix 4.6   Conditional convergence with and without ASEAN dummy from 1960 to 2004 as reported in Table 4.2

	(1)				(2)				(3)				(4)			
Long run coefficients			H-T(p-value)				H-T(p-value)				H-T(p-value)				H-T(p-value)	
Ln(n+g+d)	-0.055***	(-2.93)	2.60	(0.11)	-0.163***	(-4.99)	0.04	(0.84)	-0.283***	(-3.30)	1.99	(0.16)	-0.538***	(-2.11)	1.14	(0.29)
Ln(sk)	0.004***	(3.20)	0.17	(0.68)	0.012***	(3.80)	0.49	(0.49)	-0.009	(-1.26)	0.66	(0.42)	-0.050	(-1.53)	1.29	(0.26)
ASEAN									0.880**	(2.50)	0.45	(0.50)	1.413***	(2.109)	1.67	(0.20)
AFTA					0.126	(1.116)	0.03	(0.87)	-0.050	(-0.33)	0.20	(0.66)	-0.131	(0.798)	1.81	(0.18)
AFTA97/98													-1.407*	(-1.772)	1.54	(0.21)
AFTA 00-04													-0.773	(-1.478)	1.08	(0.30)
Convergence coefficient	-0.166***	(-3.22)			-0.067	(-1.08)			-0.022**	(-2.14)			-0.016**	(-1.906)		
Short Run Coefficients																
Ln(n+g+d)	-0.009***	(-3.22)			-0.011	(-1.08)			-0.06**	(2.14)			-0.009**	(-1.906)		
Ln(sk)	0.001***	(3.22)			0.001	1.084							-0.001**	(-1.906)		
ASEAN									0.019**	(2.14)			0.022**	(-1.906)		
AFTA					0.002	1.084			-0.001**	(-2.14)			0.002**	(-1.906)		
AFTA97/98													-0.22**	(-1.906)		
AFTA 00-04													-0.12**	(-1.906)		
Δ Ln(n+g+d)	0.002	(0.12)											0.005	(1.000)		
ΔLn(sk)	0.002**	(2.38)											0.001	(0.555)		
ΔASEAN													-0.020	(-1.533)		
ΔAFTA					0.001	0.058							0.012	(1.198)		
ΔAFTA97/98													0.020	(1.603)		
ΔAFTA 00-04																
Trend	0.003**	(2.48)														
constant	0.563***	(3.20)			0.263	1.164			0.091**	(2.645)			0.087**	(2.555)		
No of observations	208				213				218				218			
Log likelihood	601.448				573.473				591.226				626.581			

Note: ***, **, * denote 1%, 5% and 10% level of significance respectively. The numbers in parentheses are the t-statistics. H-T stands for the Hausman Test and the values in parentheses are the p-value.

Appendix 4.7 Conditional convergence with and without ASEAN dummy from 1960 to 2004 as reported in Table 4.3

	(1)		(2)		(3)		(4)		(5)		(6)	
Long Run coefficient		HT		HT		HT		HT		HT		HT
Ln(n+g+d)	-0.504***	1.06	-0.062***	0.00	-0.020**	0.23	-0.025	3.47	-0.017	3.10	-0.143***	3.24
	(-7.039)	(0.30)	(-2.665)	(1.96)	(-1.833)	(0.63)	(-1.368)	(0.06)	(-0.809)	(0.08)	(-5.244)	(0.07)
Ln(sk)	-0.005	1.09	0.006***	0.37	0.008***	3.82	0.019***	3.47	0.017***	0.07	0.009***	1.03
	(-0.827)	(0.30)	(2.861)	(0.54)	(5.409)	(0.06)	(4.902)	(0.06)	(4.618)	(0.79)	(4.162)	(0.31)
OPEN	0.004***	1.00					0.003***	1.29	0.003***	0.36	0.005***	3.47
	(3.037)	(0.32)					(12.413)	(0.26)	(12.062)	(0.55)	(6.528)	(0.06)
INF			-0.001	0.84			-0.002	1.74	-0.001	2.98	-0.0001	0.91
			(-1.415)	(0.36)			(-0.909)	(0.19)	(-0.609)	(0.08)	(-0.118)	(0.34)
GOV					-0.006	0.63			0.016	1.61	0.009	0.94
					(-1.655)	(0.43)			(1.377)	(0.20)	(1.235)	(0.37)
AFTA											-0.115**	0.38
											(-2.749)	(0.54)
											0.306***	2.47
											(4.482)	(0.12)
Convergence coefficient	0.015		-0.147***		-0.0165***		-0.043*		-0.049*		-0.096**	
	(0.539)		(-3.315)		(-3.562)		(-1.693)		(1.645)		(-1.920)	
Short Run coefficient												
Ln(n+g+d)	0.008		-0.009***		-0.003***		-0.001*		-0.001*		-0.014**	
	(0.539)		(-3.315)		(-3.562)		(-1.693)		(-1.644)		(-1.920)	
Ln(sk)	0.000		0.001***		0.001		0.001*		0.001		0.001**	
	(0.539)		(3.315)		(3.562)		(1.693)		(1.644)		(1.920)	
OPEN	0.000						0.0001*		0.001*		0.0001**	
	(-0.539)						(1.693)		(1.644)		(-1.920)	
INF			-0.001***				-0.0001*		-0.001*		-0.0001**	
			(-3.315)				(1.693)		(-1.644)		(-1.920)	
GOV					-0.001***				0.001*		0.001**	
					(3.562)				(1.644)		(-1.920)	
AFTA											-0.011**	
											(-1.920)	

ASEAN						0.029** (-1.920)
Δ Ln(n+g+d)	0.008 (0.500)	0.002 (0.146)	-0.003 (-0.829)		-0.009 (-0.990)	0.012 (0.679)
ΔLn(sk)	0.002** (2.057)	0.002*** (2.005)	0.002* (1.884)			0.003** (2.632)
Δ OPEN	0.000 (1.195)					-0.0001 (-1.390)
Δ INF		0.000+* (1.703)		0.001** (2.197)		0.0001** (2.454)
Δ GOV			-0.004*** (-2.055)			-0.005** (-2.969)
Δ AFTA						0.007 (1.583)
Trend		0.002*** (2.536)	0.003*** (2.433)			-0.0001 (-0.478)
constant	-0.046 (0.391)	0.507*** (3.382)	0.543*** (3.663)	0.135** (2.071)	0.146** (1.929)	0.317** (2.051)
No of observations	213	204	208	214	214	209
Log likelihood	604.546	601.280	612.491	579.649	575.073	643.593

Note: ***, **, * denote 1%, 5% and 10% level of significance respectively. The numbers in parentheses are the t-statistics. H-T stands for the Hausman Test and the values in parentheses are the p-value.

	(1)	HT	(2)	HT	(3)	HT	(4)	HT	(5)	HT	(6)	HT	(7)	HT
(n+g+d)	-0.005 (-0.417)	0.32 (0.57)	- 0.019*** (-6.553)	0.23 (0.63)	- 0.037*** (-3.130)	0.80 (0.37)	- 0.042*** (-3.092)	1.40 (0.24)	-0.009 (-0.658)	1.15 (0.28)	-0.013*** (-2.791)	0.00 (0.98)	- 0.049*** (-4.086)	0.00 (0.97)
sk	0.028*** (14.108)	1.51 (0.22)	0.007*** (0.007)	0.02 (0.90)	0.006*** (6.520)	0.91 (0.34)	0.014*** (4.563)	3.31 (0.07)	0.003*** (3.805)	0.51 (0.48)	0.008*** (6.574)	0.19 (0.66)	0.003*** (2.842)	0.01 (0.94)
OPEN			0.001*** (18.790)	0.12 (0.72)							0.001*** (11.744)	0.52 (0.47)		0.77 (0.38)
GOV					0.002 (1.080)	0.00 (0.97)								
INF							-0.002 (-1.448)	0.73 (0.39)						
FDI									0.006*** (5.844)	0.92 (0.34)	0.0001 (0.174)	1.33 (0.25)		
CRISIS													- 0.032*** (-2.783)	
Convergence coefficient	-0.303** (-1.768)		- 0.382*** (-2.822)		- 0.401*** (-2.387)		-0.537* (-1.650)		-0.355** (-2.101)		-0.198* (1.652)		-0.291 (1.545)	
(n+g+d)	-0.001** (-1.768)		- 0.007*** (-2.828)		- 0.015*** (-2.387)		-0.002* (-1.650)		-0.003** (-2.101)		-0.002* (-1.652)		-0.014 (-1.545)	
sk	0.008** (1.768)		0.003*** (2.828)		0.002*** (2.387)		0.007* (1.650)		0.001** (2.101)		0.001* (1.652)		0.001 (1.545)	
OPEN			0.001*** (2.828)								0.000+* (1.652)			
GOV					0.001*** (2.387)									
INF							-0.001*							

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				(-1.650)			
FDI					0.002**	0.000+*	
					(2.101)	(1.652)	
CRISIS							-0.009
							(-1.545)
Δ(n+g+d)	0.274					0.020	0.180
	(1.000)					(0.328)	(1.495)
Δ(s_k)							0.007
							(1.448)
ΔOPEN						0.000+	
						(-0.114)	
Trend	0.003***	0.003	0.003	0.003**	0.004**		
	(2.135)	(1.387)	(1.580)	(2.170)	(2.259)		
constant	0.858***	1.267**	1.386***	1.546**	1.267**	0.469	0.924**
	(1.938)	(2.852)	(2.417)	(1.736)	(-2.101)	(1.220)	(1.724)
No of observations	85	83	84	80	80	80	85
Log likelihood	253.721	286.587	254.960	225.592	263.714	274.298	258.389

Note: ***, **, * denote 1%, 5% and 10% level of significance respectively. The numbers in parentheses are the t-statistics. H-T stands for the Hausman Test and the values in parentheses are the p-value.

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