

Non-Tariff Barriers, Integration and Export Growth in ASEAN

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Abstract

The objective of this paper is to study the impact of non-tariff barriers on the export growth and regional integration in ASEAN. In particular, the paper analyzes the effects of port efficiency, customs environment, regulatory environment and service sector infrastructure on the export performance of ASEAN countries using bilateral trade data from 2000 to 2001 for 69 ASEAN trading partners. Based on the gravity model analysis, the results of the paper highlight that reductions in the non-tariff barriers tend to have significant positive impact on the trade performance of ASEAN countries. Our examination of several key non-tariff barriers reveals that improvement in customs environment improves trade in the region. However, port efficiency tends to have a negative impact on export performance of the ASEAN countries indicating the importance of improvements in port efficiency to improve the export growth in the region. The paper also highlights several major challenges facing the ASEAN countries such as diminishing marginal returns to economic integration, importance of non-tariff barriers to trade, ASEAN members as rivals, and lack of leadership among signatories.

JEL Classification: F13; F15; F55

Key words: Association of Southeast Asian Nations (ASEAN), Non-Tariff Barriers

1. Introduction

Recent evidence highlight that tariff liberalization is necessary but insufficient for enhancing trade and economic integration (Helble et al., 2007). With the decline in tariff rates over the past decades across several countries, studies have shifted the focus to non-tariff barriers (NTBs) and behind border issues in terms of other non-traditional sources of trade costs to address the barriers to trade (Greenaway, McGowan and Milner, 2009). Increasingly policymakers are recognizing the importance of behind the borders issues such as institutional rigidities and infrastructure constraints that have direct impact on trade flows. Aside from tariffs, supply side constraints and other non-tariff barriers (NTBs) and non-traditional sources of trade costs have prevented firms in emerging economies from successfully exporting their goods to other economies.

Several recent studies have highlighted the importance of institutions in improving global trade. In their study, Anderson and Marcouiller (2002) concluded that weak institutions are significant barriers to international trade due to the risks generated by imperfect contract enforceability of import/export transactions. Employing the rule of law component of the World Bank's *World Governance Indicators* dataset and import share data for the USA in the analysis, Levchenko (2007) concluded that stronger trade flows in complex products is associated with higher institutional quality. In another study, de Groot et al. (2004) undertook a broader approach to examine institutions and trade by including all the *World Governance Indicators* (voice and accountability, political stability, government effectiveness, regulatory quality and control of corruption) as measures of institutional quality. Using a gravity model analysis, the study concluded that institutional quality and existence of similar institutions in trading partners are positively associated with bilateral trade. Lastly, Francois and Manchin (2007) found that strong institutions, measured by the degree of economic freedom, the size of government, freedom of trade, protection of property rights and business regulation, will generate higher trade at the intensive and extensive margins. This means that strong institutions will result in stronger bilateral trade flows and a higher probability that countries will trade with one another.

The impact of non-tariff barriers in terms of improvements of trade facilitation such as port efficiency, customs regulations, and services infrastructure is examined by a more recent study by Wilson, Mann and Ostuki (WMO) (2004). The study by WMO (2004) on the benefits of trade facilitation on global trade indicates that there are significant economic gains from improvements in trade facilitation of individual countries. The recent study by Shepherd and Wilson (2008) on the effects of trade facilitation on trade flows suggests that import and export costs vary considerably within the ASEAN countries. In particular, trade flows in ASEAN is sensitive to transport infrastructure and telecommunication and information technology. Their study also highlights that ASEAN countries will enjoy considerable economic gains in trade from reform in trade facilitation.

The Association of Southeast Asian Nations (ASEAN) was institutionalized in August 1967 by the five founding member countries, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. The regional grouping was subsequently extended to include the remaining Southeast Asian countries – Brunei Darussalam in January 1984, Laos and Myanmar in July 1997, and Cambodia in April 1999. As the ASEAN Declaration stated, ASEAN established itself as a regional cooperation with two fundamental objectives: (1) to accelerate economic growth, social progress, and cultural development in the region; and (2) to reduce historical conflicts and foster regional peace and stability without interventions in domestic affairs. The ultimate aim of AFTA is to “increase ASEAN’s competitive edge as a production base geared for the world market through trade liberalization and closer economic cooperation” (Cordenillo, 2005). The agreement on Common Effective Preferential Tariff Scheme for AFTA (CEPT-AFTA) is the main instrument through which ASEAN wishes to achieve trade liberalization. However, there are significant behind border constraints such as institutional barriers, custom regulations and lack of infrastructure impeding export growth in the ASEAN region. The progress on strengthening economic ties among the ASEAN member countries has been slow and rather patchy. The serious challenges facing the ASEAN countries include: diminishing marginal returns to economic integration; importance of non-tariff barriers to trade; ASEAN members as rivals; and lack of leadership among

signatories. These emerging hurdles call for the fine-tuned, more collaborative trade and investment policies that effectively address these difficulties.

The objective of this paper is to study the impact of non-tariff barriers on the export growth and regional integration in ASEAN.¹ In particular, the paper analyzes the effects of port efficiency, customs environment, regulatory environment and service sector infrastructure on the export performance of ASEAN countries using bilateral trade data from 2000 to 2001 for 69 ASEAN trading partners. As compared to Shepherd and Wilson (2004) that only considered trade among the ASEAN members, the current study extends the analysis to 69 key bilateral trading partners of ASEAN members. Based on the gravity model analysis, the results of the paper highlight that reductions in the non-tariff barriers tend to have significant positive impact on the trade performance of ASEAN countries.

The organization of this paper can be briefly outlined as follows: Section 2 enumerates the overall trade patterns characterizing and its impacts on ASEAN. Section 3 evaluates the non-tariff barriers and performance of economic integration in ASEAN. In section 4, we present the data and estimation results of a simple gravity model. Section 5 concludes by identifying the challenges facing the ASEAN countries.

2. Overview of Trade Patterns in ASEAN

The ASEAN economies have experienced a remarkable increase in both amount and volume of intra-regional trade flows since the last three decades. The evidence proves that the ASEAN region has proliferated since the establishment of AFTA in 1992. Table 1 tracks the intra- and extra- exports and imports trends over a period of 10 years (from 1996 to 2006) within the ASEAN region.

From Table 1, one can observe a rising trend in the value of merchandise trade from 1996 to 2006. The total value of exports to the region rose from US\$341 billion in 1996 to US\$770 billion in 2006, while the total value of imports rose from US\$376 billion to US\$685 billion - the rise in exports trade is more pronounced than that of imports trade with total exports being 125% higher in 2006 than in 1996, while total

¹ ASEAN consists of ten member countries of Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

imports rose only by 82.2%. Although there is a slight decline in trade variables during the Asian crisis, we do observe a general rising trend among the ASEAN countries. Intra-import trade rose more than extra-import trade over this period, while extra-export trade rose more than intra-export trade over the same period.

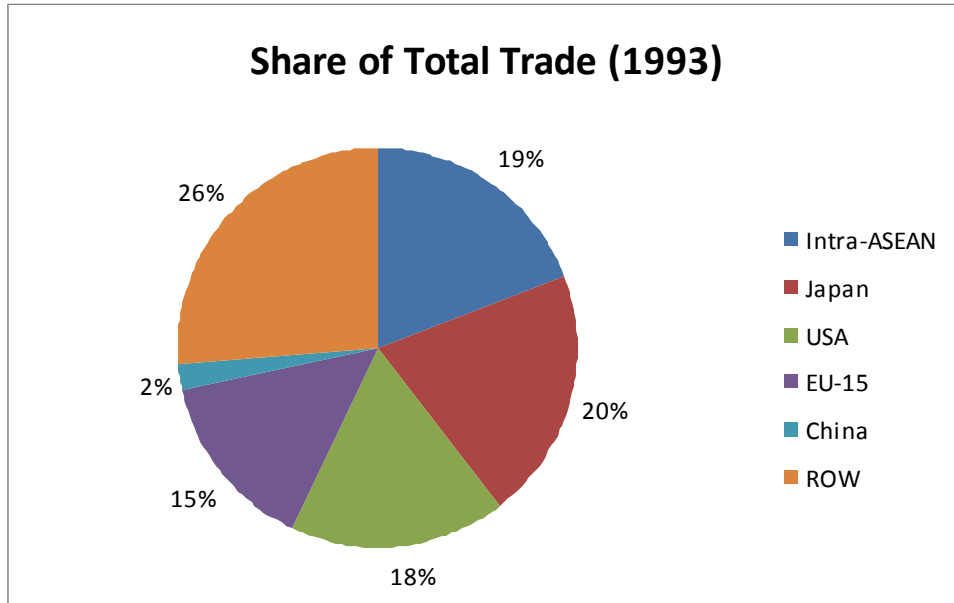
Table 1: Merchandise Trade within ASEAN (US\$ billion), 1996-2006.

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total exports	341	356	331	362	432	388	407	475	569	655	770
Intra-exports	87	88	73	81	104	91	95	116	145	167	193
Extra-exports	254	268	259	281	328	297	312	259	423	288	577
Total imports	376	382	287	310	381	347	365	410	511	601	685
Intra-imports	74	76	64	70	89	78	86	97	113	138	158
Extra-imports	302	306	223	250	291	269	279	313	298	463	527

Source: World Trade Organization (WTO) Website.

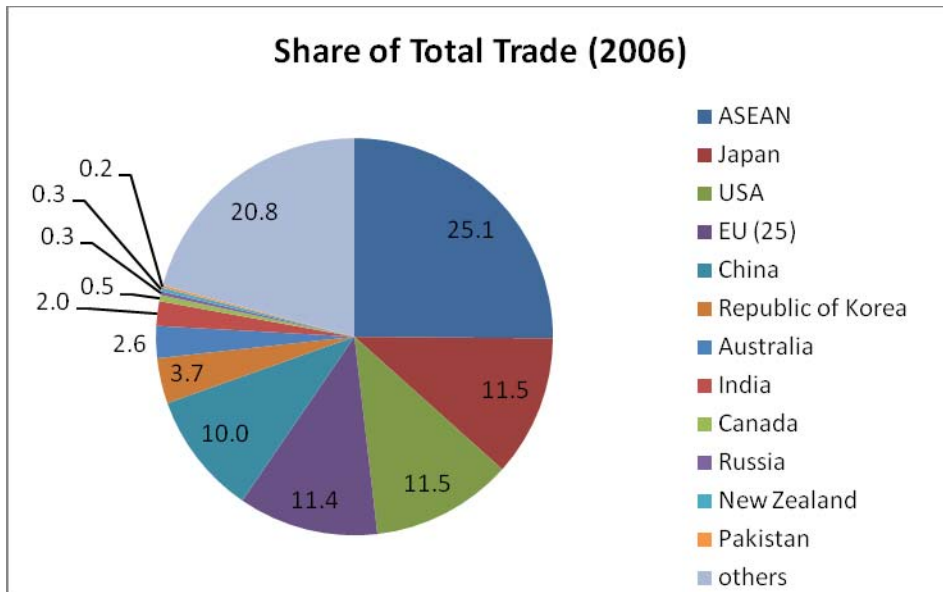
The growing strength of intra-regional trade transactions among the ASEAN economies is attributed mainly to considerable boosts in international and regional production networks through which production sharing enhances complementarities and degrees of specialisation among entrepreneurs in the region and ultimately augments intra-industry trade, particularly that in parts and components (Urata, 2004). As trade in intermediate inputs has become more important to business operating, regional economic integration has a crucial role to play in fortifying a nexus that vertically and horizontally links firms in ASEAN vis-à-vis production and procurement networks.

Figure 1: Share of Total Trade, 1993



Source: ASEAN Trade Database (ASEAN Secretariat)

Figure 2: Share of Total TRADE, 2006



Source: ASEAN Trade Database (ASEAN Secretariat)

Figures 1 and 2 demonstrate the relative importance of ASEAN trade as the shares of total trade. The past decade witnessed an exponential increase in ASEAN's share of total trade from approximately 19 percent in 1993 to 25.1 percent in 2006. A staggering boost in the share of world exports is accompanied the declining relative importance of the United States (US), the European Union (EU), and Japan. To date, the largest share of total trade in the world is taken by ASEAN.

Table 2: Proliferation of FTAs in East Asia.

Year	No. of FTAs	Status of FTAs		
		Concluded	Under Negotiation	Proposed
1976	1	1	0	0
1986	1	1	0	0
1996	4	3	0	1
2000	7	3	1	3
2001	10	5	2	3
2002	14	6	4	4
2003	23	9	5	9
2004	42	14	16	12
2005	67	21	30	16
2006	96	31	42	23
2007	102	36	41	25

Source: Kawai and Wignaraja (2007).

One of the key catalysts that substantiated ASEAN's increasingly important role in world exports as well as strengthening intra-ASEAN trade is an exploding amount of Free Trade Agreements (FTAs) involving ASEAN observed in the past few decades. The proliferation of FTAs in East Asia observed since 1990s has been unprecedented even though this region is a late comer of regional trade liberalisation compared to the United States (US) and EU. East Asian countries, particularly Singapore and Thailand, have been actively pursuing FTAs not only within the region, but also with those non-ASEAN

countries, especially Australia, China, India, Japan, Korea and New Zealand. Table 2 reports the numbers and status of FTAs pertinent to East Asia. As of 2007, 31 FTAs have been concluded; 41 are under negotiation; and 25 are being proposed. To date, East Asia is in the forefront of bilateral and regional trade negotiations, with a faster progress on trade and investment liberalisation than that of NAFTA and EU.

There are at least three driving forces of the FTAs proliferation in this region. First, to date, world trade is dominated by two mega-trade blocs, namely NAFTA and EU. This triggered the political concerns that ASEAN will become a laggard in the new era of globalization. This “Domino Effect” forced the ASEAN countries to hasten toward the establishment of FTAs in the region. Second, since the 1997 Asian Financial Crisis, there have been fears that ASEAN’s competitiveness in the global market was deteriorating. AFTA has by far been the only FTAs involving the ten ASEAN member countries. Its scope, however, was confined merely to trade in goods, and some of the members were not agreeable to fully comply with the AFTA guidelines. Last but not least, the emergence of the large developing countries, particularly China and India, has been a major threat to the region’s attractiveness as a hub of international trade and investment. In this sense, the ASEAN countries employed FTAs as a panacea for sustaining their competitiveness in the global market.

Apart from FTAs within the region, the ASEAN countries have also actively pursued FTAs with their neighbour countries. Since the 1997 Asian Financial crisis, several regional trade agreements (RTAs) have been put forward to take up intra- and extra-regional economic ties related to East Asia, including the ASEAN-China, ASEAN-India, ASEAN-Japan, ASEAN-Australia and New Zealand, and ASEAN-Korea groupings. Table 3 summarizes various stages of these trade negotiations.

Table 3: ASEAN's Ongoing RTA Initiatives

RTA	Status	Coverage Area	Timeframe
ASEAN-China Comprehensive Economic Co-operation Agreement	Early Harvest Program (EHP) in force; FTA under negotiation	Economic Partnership Agreement and FTA for trade in goods	Duty-free status to all commodities by 2010
ASEAN-India Comprehensive Economic Co-operation Agreement	FTA for trade in goods concluded	FTA for trade in goods	Implemented from January 1, 2009
ASEAN-Japan Comprehensive Economic Partnership Agreement	Framework Agreement Signed	FTA for trade in goods	In force from December 1, 2008
ASEAN-Australia and New Zealand Free Trade Area	Framework Agreement concluded	FTA for trade in goods and services, and investment in a single undertaking	Expected to be signed in December 2008
ASEAN-Korea Comprehensive Co-operation Partnership	Agreement in force	FTA for trade in goods and services, and investment, including "WTO-plus" issues	Eliminate tariffs for 80 percent of all products by 2010

Source: Authors' Compilation.

A key message drawn from Table 3 is that RTAs involving ASEAN follows the ASEAN+1 framework in which ASEAN serves as a "hub" of the regional economic cooperation. A closer examination of these arrangements reveal that their coverage goes beyond free flows of goods, services and investment capital, and thus they are more comprehensive than the multilateral negotiations under WTO; in this sense, these RTAs are "WTO-Plus" agreements. These RTAs are potentially beneficial to ASEAN as it will equip the region with a better access to the regional markets as a result of trimmed trade barriers, more cross-border investment opportunities and improved ease of doing business. However, the broader and deeper scope of RTAs pertaining to ASEAN poses serious challenges to the region in terms of limited resources, and much will be revealed as soon as the negotiations are completed.

The other major concern is the “noodle bowl” effect prompted by the proliferation of FTAs in this region (Baldwin, 2006). In principle, a FTA pertains to the Rules of Origin (RoO) – the ones determining whether goods are eligible to enjoy preferential tariffs under a particular FTA – which are of three categories: (i) a change in tariff classification (CTC) rule which defines a Harmonised System (HS) level; (ii) a local value content (VC) which specifies a minimum local value of goods, originated by the members of FTAs; and (iii) a specific process (SP) rule which determines a specific production process.

Kawai and Wignaraja (2007) documented that among 30 concluded FTAs involving ASEAN, most of them have employed a combination of RoOs depicted above, rather than a uniform rule. As the ASEAN countries paved the way toward economic integration through a series of bilateral and regional trade negotiations, the overlapping FTAs pertinent to East Asia could make RoO multiple. Inconsistency and complication of RoOs that emanated from a tariff structure of combined FTAs that is abstract from that of the other increased transaction costs, discouraged utilisation of FTA preferences, prevented the well-functioning production and procurement networks from being put in place, and ultimately transformed ASEAN economic partnership into a bane. The unsatisfactorily low utilisation of FTA preferences calls for consolidation of the noodle bowl into a single, region-wide FTA, perhaps through the East Asia Free Trade Area and/or Comprehensive partnership in East Asia.

3. Economic Integration in ASEAN

In the general sense of the term, economic integration is the abolition of the various restraints of trade between nations. The four main characteristics of this process include the establishment of Free Trade Areas (FTAs) wherein tariffs between member countries are abolished, the establishment of a customs union, the setting up of a common market (with no limitations on factor mobility) as well as complete economic integration through the unification of monetary, social and counter-cyclical policies.

In this paper, we consider a narrower definition of economic integration as suggested by ASEAN Vision 2020. In the ASEAN Vision 2020, ASEAN has set its goal as “a stable, prosperous and highly competitive ASEAN economic region in which there

is a free flow of goods, services and investment and a freer flow of capital”. In line with this objective, ASEAN implements a two-pronged strategy:

First, it accelerates the pace of economic integration through its four main pillars namely the Agreement on the Common Effective Preferential Tariff Scheme for the ASEAN Free Trade Area (CEPT-AFTA) signed in 1992, the ASEAN Framework on Services (AFAS) signed in 1995, the Basic Agreement on the ASEAN Industrial Cooperation Scheme (AICO) signed in 1996 and the Framework Agreement on the ASEAN Investment Area (AIA) which was signed in 1998.

Additionally, it also aims to initiate and deepen cooperative efforts, for instance the development of specific economic projects like ASEAN infrastructure and harmonizing regulations, customs and standards to further enhance trade in the region.

In November 2002, at the ASEAN Leaders’ Summit meeting in Phnom Penh, Cambodia, the initiative for ASEAN Economic Community (AEC) was first introduced, as it was believed to be a “logical extension” of ASEAN’s move towards integration. To facilitate the acceleration of the AEC, the ASEAN Economic Ministers (AEM), during their informal Meeting on 11 January 2007 in Cebu, Philippines, considered the Blueprint of the AEC which included the proposal of the AEC Structure, the strategic schedule for the AEC and reporting mechanism in realizing it. The result of this was the consensus on the general thrust of four foundations for the AEC Blueprint, “being a single market and production base, a highly competitive economic region, a region of equitable economic development and full integration into the global economy” (MDPWG, 2007).

The 1990s marked the stepping-stone economic integration initiatives the ASEAN countries have embarked on. With this in mind, the performance of these economic integration frameworks will be the focus of this study, including ASEAN Free Trade Area (AFTA), ASEAN Framework Agreement on Services (AFAS) and ASEAN Investment Area (AIA).

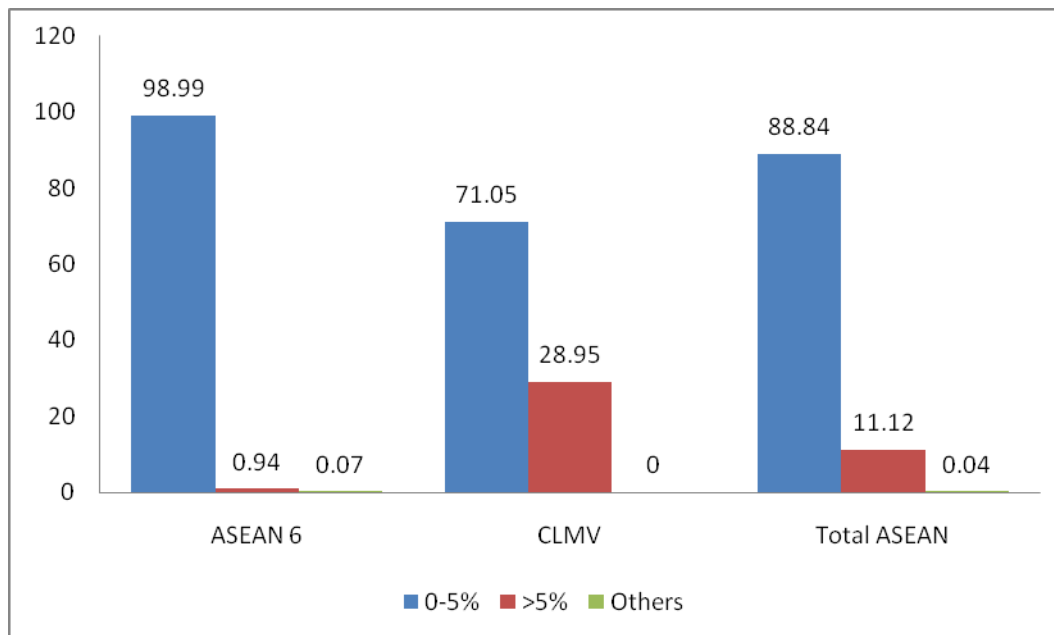
3.1 Regional Integration in Goods Sector

The momentum toward an integrated market in the region inaugurated with the establishment of the ASEAN Free Trade Agreement (AFTA) with the signing of a

Common Effective Preferential Tariff (CEPT) in 1992. Fully implemented in 2003 with respect to the ASEAN-6 countries (the five founding member countries plus Brunei Darussalam), AFTA contains four key measures for trade liberalization: (1) reducing tariff rates under CEPT; (2) eliminating non-tariff barriers (NTBs); (3) prohibiting quantitative restrictions; and (4) enhancing trade facilitations such as harmonization of standards and the reciprocal of tests and certification of products.

After several decades of development in trade liberalization, average tariff rate of ASEAN countries have been significantly lowered. The nominal average tariff rate of Indonesia in the 1950s and 1960s was as high as 85% and it fell to 17% at the start of the 1990s (Qing, 2005). The same pattern was also seen in other member countries. The construction of CEPT-AFTA in 1992 greatly accelerated this movement towards removing tariff barriers to a large extent.

Figure 3: Percentage of Tariff Lines in the 2005 CEPT Package.



Source: ASEAN Secretariat (2006)

Figure 3 shows the current level of tariffs under the CEPT-AFTA in 2005. As of 2005, tariffs on 98.99% (or 65,080 out of the total 65,743 tariff lines) of the products of

the ASEAN-6 have been reduced to the 0-5 percent tariff range. For Cambodia, Laos, Myanmar and Vietnam (CLMV), on the other hand, 71.05% of tariff lines are in the 0-5 percent tariff range (or 26,676 out of the 37,545). Overall, 88.84% of ASEAN tariffs are now in the 0-5 percent tariff range and notably, 46,600 of these tariffs are at 0% (Cordenillo, 2005).

Table 4: Trends in Average Applied Tariff Rates in ASEAN (unweighted %), 1996-2007.

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cambodia	35.0		18.0	18.0	17.0	16.7	16.3	16.3	15.6	14.1		12.5
Lao, PDR	9.5			9.5	9.3	9.5			8.7	7.0	6.5	5.8
Myanmar	4.5	4.8	4.5	4.7	4.7	4.6	4.7	4.7	4.5	4.5	4.4	4.1
Vietnam		13.0	13.0	15.6	15.1	15.2	14.2	13.7	13.9	13.0	13.1	11.7
Indonesia	10.8			9.9	7.8	6.1	6.4	6.0	6.1	6.0	6.0	6.6
Malaysia	8.4	8.9		8.2	8.0	7.5	7.5	7.4		7.4	6.2	5.8
Philippines	14.0	12.7	10.4	9.5	7.1	6.9	5.3	4.5	5.5	5.4	5.4	5.3
Thailand				16.9	16.4	14.7		13.6		10.5	10.8	10.0
Singapore	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brunei	3.1	3.1	3.1	3.1	3.1	3.1	3.0	2.9	2.9	3.0	2.9	2.9

Source: UNCTAD TRAINS database and WTO IDB database

In general, there has been a downward trend in the average tariff that has been applied within the ASEAN region as seen from Table 4. In fact, the decline became more pronounced beginning in the year 1999 (7 years after the implementation of AFTA). Coupled with other schemes like the Bali Accord II and CEPT-AFTA, average tariff rates have been brought down tremendously. The greatest decrease in tariffs can be seen in Cambodia and Philippines. Only Singapore reached the ideal level of tariffs in ASEAN, that being, zero tariffs. The ultimate goal of CEPT-AFTA is to remove all barriers to trade and attain zero level of tariff by 2010 for ASEAN-6 and by 2015 for CLMV. Judging from the current situation, there is much hope for the attainment of integration with regards to the total abolition of tariffs within the region.

3.2 Regional Integration in Services and Priority Sectors

Signed during the Fifth ASEAN Summit in December 1995, the ASEAN Framework Agreement on Services (AFAS) – a regional agreement on services trade cooperation among the ASEAN member countries – aimed to eliminate services trade restrictions and enlarge the scope of liberalization of trade in services beyond what already implemented under the General Agreement on Trade in Services (GATS). In September 2003, AFAS roped in the “ASEAN minus X” principle to expedite the progressive liberalization progress. Under this approach, those countries that are ready are eligible to conclude the respective agreements while others could abide by the agreements at a later time.

Nevertheless, an assessment of commitments on liberalization of services trade by the individual ASEAN countries reveals that the progress made by AFAS is at best unsatisfactory since little has been done in terms of substance. The evidence shows that the barriers to services trade continue to undermine efficiency and competitiveness of the services sector in the region. The weak AFAS commitments are attributable mainly to the fact that the restrictions the governments impose in the services sector essentially serves as a policy instrument to secure and accommodate the domestic business interests. The challenges facing the ASEAN member countries are how to taper a gap in readiness to open up the services sector among the signatories and how to ensure a robust momentum of services trade liberalization in the region. To achieve this, the technical and legal expertise as well as a multi-track approach – one that allows the member countries who are more ready and less affected by the trimmed restrictions, to take initiatives of liberalization in the services sector – must be put in place.

According to ASEAN Vision 2020, ASEAN has vouched to improve its steps towards regional integration in priority sectors by 2010. According to the 30th Meeting of the ASEAN Consultative Committee for Standards and Conformance (ACCSQ) in August 2007, much development was made in the discussion of integration in priority sectors. The ASEAN Framework (Amendment) Agreement for the Integration of Priority Sectors and the ASEAN Sectoral Integration (Amendment) Protocol for the Integration of Priority Sectors were signed by the AEM in December 2006 in Cebu.

The effects of this form of integration in the priority sectors leaves to be determined when the full ratification of the effort takes place in 2010. These measures are in sync with the targets set by ASEAN in its Vision, suggesting that integration is well underway.

3.3 Financial Market Integration

The Framework Agreement on the ASEAN Investment Area (AIA) was initiated in October 1998. Its main objective is to attain the greater and more sustainable levels of foreign direct investment (FDI) into the region and substantially realize a surge in FDI flows from both ASEAN and non-ASEAN sources by transforming ASEAN into an attractive, competitive, and liberal investment area.

Table 5: Net FDI Inflows by Host Regions/Economies, 1990-2002 (US\$ million).

Region/Economi	1990-95	1996	1997	1998	1999	2000	2001	2002
World	225,321	386,140	481,911	686,028	1,079,083	1,392,957	823,825	651,188
Developed Economies	145,019	219,908	269,654	472,265	824,642	1,120,528	589,379	460,334
Developing Economies	74,288	152,685	193,224	191,284	229,295	246,057	209,431	162,145
China	19,360	40,180	44,237	43,751	40,319	40,772	46,846	52,700
ASEAN	16,932	29,370	30,369	18,504	19,691	11,056	13,241	13,957
Brunei Darussalam	102	654	702	573	748	549	526	1,035
Cambodia	80	586	168	243	230	149	148	54
Indonesia	2,135	6,194	4,678	-356	-2,745	-4,550	-3,279	-1,523
Laos	33	128	86	45	52	34	24	25
Malaysia	4,655	7,296	6,324	2,714	3,895	3,788	554	3,203
Myanmar	180	310	879	684	304	208	192	129
Philippines	1,028	1,520	1,261	1,718	1,725	1,345	982	1,111
Singapore	5,782	8,608	13,533	7,594	13,245	12,464	10,949	7,655
Thailand	1,990	2,271	3,882	7,419	6,091	3,350	3,813	1,068
Vietnam	947	1,803	2,587	1,700	1,484	1,289	1,300	1,200

Source: UNCTAD (2003).

Recent developments unveiled that the ASEAN countries are now facing serious challenges of sustaining their attractiveness as the host economies. Table 5 shows the net FDI inflows across the ASEAN countries and regions. The ASEAN countries experienced a substantial influx of FDI flows in the late 1980s and 1990s, achieving its peak of US\$ 30,369 million in 1997. A number of internal and external factors account for the substantially increasing trends of FDI in the region, including the subsequent appreciation of the YEN and the East Asian currencies following the Plaza Accord, an increasingly important role of ASEAN as a hub of labor-intensive production, on top of the strikingly progressive pace of trade and investment liberalization (Tham, 1998). However, intensive competition from China after its accession to the World Trade Organization, together with a backdrop of the 1997 Asian Financial Crisis, the prolonged stagnation of the Japanese economy, and rising labor costs within the region, reversed the mounting trend of FDI flows in the region. As shown in Table 4, the net FDI inflows in ASEAN exhibited a sharp plummet to US\$ 18,504 million in 1998, and the declining trend persisted until 2002.

3.4 Regional Infrastructure Cooperation

The establishment of regional production network relates to the work undertaken by private sector and multinationals at improving trade facilitation and investment. With regards to ASEAN, to date, it has made major efforts in financial and monetary integration, transportation network production and communication network production which have contributed greatly towards the reduction of trade and transportation costs.

One example wherein ASEAN has made efforts in improving trade facilitation among its member states is the establishment of the ASEAN Trade Facilitation Work Program (ATFWP) which is responsible for implementing the work program with financial assistance from ASEAN-US Technical Assistance and Training Facility (ASEAN-US TATF) (MDPWG, 2007). In addition, major inter-state highway and railway networks were built to improve the infrastructure among the members. Some examples are the Singapore to Kunming Rail-Link, principal ports and sea lanes for maritime traffic and major civil aviation links.

In view of the measures undertaken by ASEAN in achieving economic integration, it thus appears that ASEAN is moving towards its objectives as outlined by ASEAN Vision 2020.

4. SIMPLE GRAVITY MODEL

4.1 Overview of Gravity Model

The gravity model is a useful framework in modeling the development of trade between countries. Gravity models are derived from various international trade theories. In a nutshell, these trade theories tried to determine the equilibrium trade flows between the two trading countries. The demand for merchandise goods comes from the importing country with the supplier being the exporting country.

The first model used Cobb-Douglas and CES utility functions to derive the demand side of the model (Anderson, 1979). Anderson assumed that consumers differentiated goods by the country of production. A second model based on the model by Armington (1969) used CES function as well as price levels to derive the demand side of trade flows.

Aitken (1973) initially used the gravity model as a platform to assess the effects of European Economic Community because the model could be used to isolate the effects of a RTA in terms of trade creation and trade diversion effects through the introduction of dummy variables. Carrère (2006) introduced further model specifications such as the use of time and country specific effects to the model to account for unobserved factors attributing to increased (or decreased) bilateral trade flows. In this paper, we adopted the basic model used by Bergstrand (2002) wherein Dixit-Stiglitz preferences were used in a monopolistic setting. Bergstrand assumed that goods are differentiated according to the firms in which they were produced and not the countries.

4.2 Overview of Datasets

There is generally a lack of data on NBTs and trade cost for ASEAN countries. The recent study by WMO (2004) provides ideal dataset to study the impact of NBTs on ASEAN. However, the WMO (2004) dataset only covers two years (2000 and 2001) but does provide bilateral trade data for more than 80 countries. In this paper, we used the dataset from WMO (2004) that provides bilateral trade data matched to trade facilitation variables. The study covers the ASEAN trade with 75 countries for the years, 2000 and 2001. WMO (2004) trade facilitation dataset present four distinct areas to derive the NBTs: (1) port efficiency, (2) customs environment, (3) own regulatory environment, and (4) service sector infrastructure. Port efficiency is designed to measure the quality of infrastructure of maritime and air ports. Customs environment is derived to measure direct customs costs as well as administrative transparency of customs and border crossings. Regulatory environment measures the economy's approach to regulations. Service sector infrastructure measure highlights the extent to which an economy has the necessary domestic infrastructure (such as telecommunications, financial intermediaries, and logistics firms) and is using networked information to improve efficiency and to transform activities to enhance economic activity. In addition to NBTs, we also account for the effects of FTAs of AFTA, ASEAN plus 3 and ASEAN plus six. In this study we only considered Indonesia, Malaysia, Singapore, Philippines, Thailand and Vietnam as ASEAN member countries due to the lack of data from the other member countries.

In assessing the intra-ASEAN trade inflows, we only focused on the manufactures export trade. The data is organized wherein each unit of observation corresponds to a pair of importing and exporting countries. The major sources of data are the Commodity and Trade Database (COMTRADE) of the United Nations Statistics Division for trade data, the Trade Analysis and Information System (TRAINS) of the United Nations Conference on Trade and Development

(UNCTAD) for tariff data, the World Development Indicators published by the World Bank for the data of gross national product (GNP) and per capita GNP, and 3 country surveys for trade facilitation indicator used for the calculation of the level of infrastructure index.

Among the 75 countries in the sample over the 2 years, the 6 ASEAN members, termed 'home countries', are paired with the 69 other countries (partner countries) in terms of trade flows. Table A1 provides the list consisting of the 'home countries' and the 'partner countries'. We have also considered a two-way trade flow when i is the importer and j is the exporter and when the two countries reverse their roles. This is in a bid to account for the lack of 'symmetry' in trade flows between the home and partner countries.

4.1 Variables affecting the gravity model

The initial idea of the gravity model is to quantify the reasons for trade flows between countries, the most common factors being income of importer and exporter countries, population of both countries and the geographic distance between the two countries.

Income and Population variables

Typically, incomes and population of the trading countries are positively correlated with trade. Higher incomes and higher population in a country will raise its demand for consumption of both domestic as well as foreign goods whilst increasing the market for foreign goods, thereby increasing trade. Therefore in the case of ASEAN regional trade, we expect the coefficient estimates to have similar predicted signs.

Geographic distance variable

Geographic distance between countries is an important factor in contributing to trade through changes in the transportation costs to trade. Geographic distance is a proxy for transportation costs. If the distance between two trading partners is closer, then the transportation costs of

merchandise trade can be greatly reduced. This can account for the reason for AFTA's success since its member countries are in close proximity as a region as compared to the rest of the world. So we expect to obtain a negative coefficient for the distance variable.

Non-Tariff Barriers (NTBs)

The NTBs in the economy is given by the variable IN_{ijt} . While tariffs are significantly lowered, most countries within ASEAN are simultaneously increasing NTBs which may undermine the success of AFTA. IN_{ijt} variable is computed as the mean index using the indices of port efficiency, customs environment, regulatory environment and service sector infrastructure based on WMO (2004). It is estimated that IN_{ijt} should be positively correlated with trade. Hence, as non-tariff barriers go down, the trade facilitating infrastructure improves bringing about greater regional trade.

Common border and Common language dummy

The dummy variables are used for countries sharing a common border and common language respectively that takes on the value of 1 if both trading partners share these common features and of 0 if otherwise. The dummy variables are expected to be positively correlated with trade.

Free Trade Agreement Dummy

FTA_{ij} reflects the significance of individual FTAs between bilateral partners. This dummy variable takes on the value of 1 if the two countries have established a FTA when one country is a home country and the other is a partner country. Its coefficient could be positive or negative.

Regional dummies

The regional dummies are inserted with the intention to isolate TC and TD effects. According to the trade theory by Viner (1937), TC and TD effects are defined as follows:

- (1) TC effect means that trade is created between the members of the RTA as high-cost production of goods in one member country is moved to a low-cost producer within the RTA but imports from the rest of the world remain unchanged, and
- (2) TD effect means that trade is diverted from a low-cost producer in a non-member country to a high-cost producer in the member country

It is estimated that should AFTA be successful, the coefficient of *DASEAN* be positive, suggesting that trade is enhanced within the region. *DASEAN(imp)* captures bloc imports from the rest of the partner countries and the negative coefficient suggests that trade is diverted away from the region. Alternatively, a positive coefficient means more trade is created in the region. Likewise, *DASEAN(exp)* captures bloc exports to the rest of the partner countries. If its coefficient is negative, there is TD in terms of exports and if it is positive there is TC. It has been noted that gravity models are limited in the sense that they capture mostly TC as opposed to TD effects.

The complete gravity equation is as follows:

$$\begin{aligned} \ln M_{ijt} = & \alpha_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln N_{it} + \beta_4 \ln N_{jt} + \beta_5 \ln D_{ijt} + \beta_6 L_{ij} \\ & + \beta_7 L_{antj} + \beta_8 FTA_{ijt} + \beta_9 D2000 + \beta_{10} \ln IN_{it} + \beta_{11} \ln IN_{jt} \\ & + \beta_{12} D(ASEAN_{imp}) + \beta_{13} D(ASEAN_{exp}) + \beta_{14} D(ASEAN) \\ & + \beta_{15} D(+3_{imp}) + \beta_{16} D(+3_{exp}) + \beta_{17} D(+6_{imp}) + \beta_{18} D(+6_{exp}) \\ & + v_{ijt} \end{aligned}$$

Several combinations of the models are regressed to analyze the individual effects of these variables on regional trade. A summary of all the variables is put in the Appendix.

4.2 Results of the Gravity Model

The results of the gravity model are given in Table 6.

Table 6: Results of Gravity Model for ASEAN: 2000-2001

<i>Variables</i>	(1)	(2)	(3)	(4)
<i>Constant</i>	-18.968*** (-15.304)	-19.638*** (-16.069)	-19.162*** (-15.248)	-19.807*** (-15.977)
<i>In Y_i</i>	1.509*** (21.450)	1.157*** (17.441)	1.492*** (20.260)	1.1568*** (17.347)
<i>In Y_j</i>	0.924*** (11.169)	1.228*** (13.578)	0.902*** (10.415)	1.203*** (12.589)
<i>In N_i</i>	0.912*** (28.216)	1.005*** (34.313)	0.892*** (26.893)	1.015*** (33.253)
<i>In N_j</i>	1.506*** (33.517)	1.410*** (34.589)	0.892*** (26.893)	1.378*** (31.41)
<i>In IN_i</i>	-0.125 (-0.262)	1.564*** (3.605)	1.502*** (31.411)	1.615*** (3.676)
<i>In IN_j</i>	5.296*** (9.415)	1.766*** (6.709)	-0.158 (-0.320)	3.800*** (6.448)
<i>In D_{ij}</i>	-1.392*** (-15.311)	-1.442*** (-17.567)	-1.318*** (-12.481)	-1.393*** (-14.503)
<i>DASEAN</i>	1.381*** (5.629)		1.539*** (5.494)	
<i>DASEAN (exp)</i>		1.946*** (8.653)		2.121*** (8.473)
<i>DASEAN (imp)</i>		0.667*** (2.918)		0.770*** (3.065)
<i>D+3(exp)</i>			0.252 (1.068)	0.766*** (3.784)
<i>D+3(imp)</i>			0.523* (2.413)	-0.123 (-0.721)
<i>D+6(exp)</i>			-0.415* (-2.026)	0.212 (1.291)
<i>D+6(imp)</i>			0.689*** (3.974)	-0.024 (-0.122)
<i>FTA_{ij}</i>	-0.461 (-1.629)	-0.455 (-1.567)	-0.451 (-1.385)	-0.445 (-1.507)
<i>Lan_{ij}</i>	0.018 (0.108)	0.119 (0.818)	0.024 (0.136)	0.121 (0.796)
<i>L_{ij}</i>	-0.376* (-1.647)	-0.377* (-1.815)	-0.365 (-1.017)	-0.417* (-1.993)
<i>D2000</i>	0.193** (2.150)	0.189** (2.215)	0.199* (2.217)	0.188* (2.209)
<i>R²</i>	0.775	0.795	0.776	0.796
<i>Standard error</i>	1.532	1.459	1.528	1.458
<i>Obs.</i>	1267	1267	1267	1267

Note: *, **, *** refers to significance testing under 10%, 5% and 1% significance level
: (..) refers to t-statistic, the above analysis includes country specific dummies

We want to consider the impact NBTs on trade flows in ASEAN. In addition, we are also interested to consider how much of trade is a result of bloc free trade agreements with ASEAN plus 3 and plus 6 countries.

Impact of NBTs

The coefficients of IN_{ij} are also highly statistically significant and positive for most of the models, with the exception of IN_i which is negative and insignificant. On the whole, the results confirm the prediction that with improvements in the levels of infrastructure and reduction of NBTs, trade within the region improves. The effect of improvement is more pronounced when the level of infrastructure and NBTs of the exporting country improves as opposed to that of the importing country. This is in line with the finding of WMO (2004) in their assessment on the potential benefit of trade facilitation. In ASEAN's context, some policies and agreements on harmonization were effectively implemented in 2000, namely the Framework Agreement on the Facilitation of Goods in Transit came into action on 2nd October 2000 and the ASEAN Telecommunication Regulators Council adopted a mutual recognition agreement for telecommunication equipment in the same month. Thus, the positive impact on trade is expected and well supported.

Impact of AFTA

The regression (1) confirms our empirical observation that AFTA is responsible for increasing regional trade flows. In the regression (1), the coefficient of the ASEAN dummy is statistically significant and positive, implying that AFTA plays a crucial role in increasing trade flows within the ASEAN region. The positive and statistically significant coefficient of this dummy corresponds to the findings of Thornton and Goglio (2002) which confirmed the importance of AFTA in promoting intra regional trade.

To analyze how much of this increase in trade within the region is a result of TC and TD effects, the regressions are run substituting the ASEAN dummy with two dummies specifying the

role of an ASEAN member country as the importer and as the exporter through $DASEAN(imp)$ and $DASEAN(exp)$ respectively (see regression (2)).

There is a clear TC effect when ASEAN acts as the exporter and a clear TD effect when ASEAN is the importer. The increase in regional trade together with the positive sign of $DASEAN(exp)$ suggests a higher propensity of ASEAN to export to the rest of the world and thus indicates a TC effect. The negative sign of $DASEAN(imp)$ reflects a lower propensity on the part of the ASEAN members to import from the rest of the world and indicates a TD effect. ASEAN members seem to focus more on import substitution for the region. The coefficients are highly significant, which imply trade within the region is largely a result of Viner's TC and TD effects. In fact, the TC effect is stronger when the ASEAN countries are the exporters than when they are the importers as shown by the larger coefficient estimates for $DASEAN(exp)$ in comparison to $DASEAN(imp)$. So, even though the ASEAN countries may be moving towards a policy of import substitution, the extent of this policy is still limited. Thus members continue to rely on imports from other countries outside the ASEAN circle. Nevertheless, more trade is still created within the region.

Impact of trade flows with ASEAN plus 3 and plus 6 countries

The next four regressions are used to analyze the importance of FTAs between ASEAN member countries and ASEAN plus 3 and plus 6 countries.

When extending the analysis to include ASEAN plus 3 and plus 6 countries as exporters, the role of the coefficient signifies different results. Both coefficients of $DASEAN(imp)$ and $DASEAN(exp)$ are highly positively significant, implying that ASEAN imports and exports more to the rest of the world. The coefficients of the $D+3$ and $D+6$ can help explain how much of this increase in extra-regional trade is attributed to the plus 3 and plus 6 countries. In terms of importing from the rest of the world, the positive coefficients for $D+3(exp)$ and $D+6(exp)$ imply that ASEAN imports come mainly from the plus three and plus six countries, more so from plus

three since the coefficients are much bigger. Therefore, free trade agreements to import freely from these countries are beneficial to ASEAN regional trade.

On the other hand, the coefficients of $D+3(imp)$ and $D+6(imp)$ are negative although $DASEAN(exp)$ is positive. This suggests that ASEAN exports more to the countries with whom they have no free trade agreements as opposed to exporting to the plus three and plus six countries. However, these results are not statistically significant.

The positively significant coefficient of $DASEAN$ supports the descriptive data that intra-ASEAN trade is a major component of regional trade and as such attests to the benefits of AFTA and integration. We also observe $D+3(imp)$ and $D+6(imp)$ are highly positively significant, overthrowing our previous contention that free trade agreements with these countries are insignificant in contributing to greater regional trade. The positive signs here show that ASEAN members do indeed export more to plus three and plus six countries as supported by the study by Kim (2002). In addition, ASEAN imports more from plus 3 countries, as shown by the positive coefficient of $D+3(exp)$. However, the coefficient of $D+3(exp)$ is insignificant so it might indicate that importing from plus 3 countries is not as significant as importing from its member countries through TD effects. Also, the coefficient of $D+6(exp)$ is significantly negative, suggesting that ASEAN imports less from these countries since the links between plus 6 and AFTA were still not solidified during 2001. The significance of this AFTA only emerges in the later years, which is beyond the scope of my data.

Common variables of regional trade

In considering the coefficients of the common variables in all the regressions, the signs of these coefficients namely $In Y_{ij}$, $In N_{ij}$ and $In D_{ij}$ are the same under cross-sectional and panel analysis. These coefficients display predicted signs and are all highly statistically significant, further affirming the universal contention that these factors still continue to dominate in accounting for greater regional trade. As expected, incomes are positively correlated with trade flows. In particular, the GNP per capita of the exporter is higher than that of the importer

(Grunfeld and Moxnes, 2003). Likewise, distance has a negative coefficient value with respect to trade. Thus, these results tally with conventional trade theory.

The common language dummy, in general, has the expected sign implying that if countries shared a common language, trade is higher for these partners. However, in most instances, the coefficients are insignificant. Integration within ASEAN ties up these members with common language as well as other common characteristics like history and culture. As such, integration is advantageous for these countries since it enhances trade flows within the region. However, it is not a major factor in leading to greater regional trade.

On the other hand, the common border dummy does not correspond with our predictions. The estimate is largely negative in most cases though insignificant, implying that common borders do not lead to greater ASEAN trade. ASEAN itself is characterized by sharing a common region and most member countries share common borders with one another like Thailand and Malaysia. However, this variable does not contribute to greater regional trade in ASEAN context. Its relevance is more pronounced in EU and in Latin America.

The coefficient of FTA_{ij} is, in general, negative and statistically insignificant. Thus, it implies that benefits accruing from the individual FTAs with member countries are not extended to the region as a whole in increasing regional trade. Initially, only some members of ASEAN like Singapore established FTAs with ASEAN plus six countries. So only these countries benefitted from trading with them. In fact, trade was diverted from the intra-regional arena to trade outside this region due to the preferential treatment offered by these countries under the free trade agreement. The result of extending this agreement to the whole of ASEAN is positive since bloc trading agreements between ASEAN and ASEAN plus 3 and plus 6 countries do increase intra-regional trade. Since the coefficient of the FTA dummy is insignificant, it does not play a major role in impeding regional trade.

The constant term in the panel regressions represents both the observed and unobserved country-specific effects, coined as “multilateral resistance” by Anderson and von Wincoop (2003)

whilst the constant in the cross-sectional regressions only represents the observed effects. The multilateral resistance term is negatively correlated to trade flows. When the multilateral resistance of an exporter increases relative to that of the importer, the price of exports becomes relatively higher so trade falls. Thus, the panel analysis accounts for the differences in price indices of the trading countries through the constant under the fixed effects specification. Also, the panel analysis accounts for the temporal and the dynamic aspect of trade through the inclusion of the time dummy. Regional trade in ASEAN has been on a rising trend over the years since the formation of AFTA in 1992. Other factors kept constant, the role of time might also be responsible for this rise. As time goes by, relations between countries improve and trade between them also increases.

The results and the study can, undoubtedly, be further improved. The data collated is limited in the sense that it only considers a two-year period and it excluded many of the recent members of ASEAN, namely Cambodia, Laos, Myanmar and Brunei Darussalam. The data set could have been better if it included all the ASEAN countries and considered a wider time frame preferably from 1980s to 2007.

5. Policy Conclusion: Key Challenges to ASEAN Integration

5.1 Diminishing Marginal Returns to Economic Integration

Table 6 gives a measurement of the share of ASEAN exports compared to other blocs and to the rest of the world. It seems to suggest a limited scope in increasing intra-ASEAN trade through integration. The evidence drawn from this table shows that although intra-ASEAN trade increased largely over the years from 2.3 percent of world exports in 1970 to 6.1 percent in 2003, this increase has been less than significant in the later years. In fact, it seems that benefits to integration might undergo “diminishing marginal returns”. This can be attributed largely to the small size of the ASEAN market. In comparing the percentage of intra-regional trade with other blocs, the extent to which ASEAN can raise its intra-ASEAN trade is very limited, hitting the maximum cap of around 23-24%. Mohammed (1997) also mentioned this exhaustive nature of ASEAN

integration, “it is highly unlikely to reach a very high intra-region trade rate in AFTA. Even if the rate increases to 30 percent, it will stagnate after that (though the amount may continue to grow)”.

Table 6: ASEAN Export Values (US\$ million), Percentage of Total Bloc Exports and Percentage of World Exports, 1980-2003.

	1980	1990	1995	1998	1999	2000	2001	2002	2003
Total export	13,350	28,648	81,911	72,352	80,415	101,848	89,478	95,864	104,872
% of total bloc exports	18.7	19.8	25.4	21.9	22.4	23.9	23.2	23.7	23.0
% of world exports	3.9	4.3	6.4	6.1	6.3	6.7	6.3	6.3	6.1

Source: The World Bank, World Development Indicators 2005

5.2 ASEAN Members as Rivals

ASEAN unlike other regions is very outward looking. This can be attributed to the fact that it has a small market size and constantly looks towards extra-ASEAN trade for economic growth. If this continues, ASEAN integration will soon exhaust its potential benefits. Thus, ASEAN should consider extending its ties with external relations as a whole rather than as individual member countries since individual FTAs have been proven to undermine integration.

5.3 Importance of Non-tariff Barriers to Trade

Whilst AFTA has effectively brought down the tariff rates of ASEAN members, it seems that this measure has limited impact on increasing trade flows within the region. This is largely attributed to the presence of non-tariff barriers to trade. As seen from Table 7, for large decreases in tariff rates, both income and trade rise by very insignificant amounts in countries in Southeast Asia. Thus, this is further evidence to show that integration in the form of reducing tariff barriers is soon being exhausted.

Table 7: Agreement on the CEPT.

Tariff Cuts	50%	80%	100%	50%	80%	100%
Trade increase	Sum (million dollars)			% of total		
Indonesia	411	685	882	1.5	2.3	2.9
Malaysia	574	919	1,490	2.0	3.2	4.0
Philippine	110	176	220	1.4	2.3	2.8
Singapore	554	887	1,080	1.0	1.6	2.0
Thailand	380	608	761	1.8	2.9	3.6
Total	2,030	3,248	4,060	1.4	2.3	2.9
Income increase						
Indonesia	1,258	2,013	2,517	1.2	1.9	2.3
Malaysia	1,087	1,739	2,173	2.6	4.0	5.1
Philippine	397	635	793	0.9	1.4	1.8
Singapore	946	1,514	1,892	2.7	4.4	5.5
Thailand	1,069	1,711	2,136	1.3	2.1	2.7
Total	4,757	7,612	9,515	1.5	2.5	3.1

Source: Institute of Southeast Asian Studies, Regional outlook: Southeast Asia 1993-4.

5.4 Lack of Leadership

ASEAN, unlike its other regional counterparts, lacks a strong leader who is capable of coordinating the integration efforts of the region and in further promoting the region. If there were such a leader in ASEAN in as much the same way as America is in North America and France and Germany are in the EU, ASEAN would be able to reduce the above-mentioned limitations to a large extent. ASEAN member countries, despite sharing common cultural and historical background, are essentially very different in terms of their levels of development. Countries like Singapore and Malaysia have been accepted as developed countries, while the CLMV countries are ranked along with the third world countries. This disparity within ASEAN is quite large. Furthermore, the regression analysis does attribute a significant role of income per capita in increasing trade. Thus, with different levels of income and development, these countries will differ in their

motivations and interests which might even diverge from each other, as clearly seen by the willingness of some members like Singapore and Malaysia to open up their markets to external relations and the reluctance of others like Laos. This divergence of interests can only be reconciled under strong leadership, which will in turn promote greater integration within the region.

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Table A1: LIST OF HOME AND PARTNER COUNTRIES

Home Countries	Partner Countries					
Indonesia	Argentina	Czech Republic	Honduras	Mauritius	Russia	United States
Malaysia	Australia	Denmark	Hong Kong	Mexico	Slovak Republic	Uruguay
Philippines	Austria	Dominican Republic	Iceland	Netherlands	Slovenia	Venezuela
Singapore	Bangladesh	Estonia	India	New Zealand	South Africa	Zimbabwe
Thailand	Belgium	Ecuador	Ireland	Nicaragua	Spain	
Vietnam	Bolivia	Egypt	Israel	Nigeria	Sri Lanka	
	Brazil	El Salvador	Italy	Norway	Sweden	
	Bulgaria	Finland	Jamaica	Panama	Switzerland	
	Canada	France	Japan	Paraguay	Taiwan	
	Chile	Germany	Jordan	Peru	Trinidad & Tobago	
	China	Greece	Korea	Poland	Turkey	
	Colombia	Guatemala	Latvia	Portugal	Ukraine	
	Costa Rica	Hungary	Lithuania	Romania	United kingdom	

A2: EXPLANATORY VARIABLES

Year	2000 and 2001
Importer, i	Importing country
Exporter, j	Exporting country
Trade, M_{ij}	The value of manufactures export from country j to i
Y_i	Importing country's GNP per capita in 1995 U.S. dollars
Y_j	Exporting country's GNP per capita in 1995 U.S. dollars
N_i	Importing country's population
N_j	Exporting country's population
D_{ij}	Geographic distance between country i and j
$IN_i(j)$	Level of infrastructure in i(j)
D2000	A dummy for year 2000
L_{ij}	A dummy for countries sharing the same border
Lan_{ij}	A dummy for countries sharing a common language
FTA_{ij}	A dummy for countries with FTA between member and non-member
DASEAN	A dummy for trade between ASEAN members
DASEAN(imp)	A dummy for trade when ASEAN imports to a non-member
DASEAN(exp)	A dummy for trade when ASEAN exports to a non-member
D(+3imp)	A dummy for trade when ASEAN(+3) imports to a member
D(+3exp)	A dummy for trade when ASEAN(+3) exports to a member
D(+6imp)	A dummy for trade when ASEAN(+6) imports to a member
D(+6exp)	A dummy for trade when ASEAN(+6) exports to a member