ECONOMIC IMPACT OF REGIONAL TRADE AGREEMENTS: A STUDY OF ASEAN AND ITS IMPLICATIONS ON INDIA

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CERTIFICATE

This is to certify that Mr. **B.P. SARATH CHANDRAN** has worked on the thesis entitled **"ECONOMIC IMPACT OF REGIONAL TRADE AGREEMENTS: A STUDY OF ASEAN AND ITS IMPLICATIONS ON INDIA"** under my supervision and guidance. This thesis being submitted to Goa University, Taleigao Plateau, Goa, for award of the degree of Doctor of Philosophy in Economics is a record of an original work carried out by the candidate himself and has not been submitted for the award of any degree, diploma, a scholarship or fellowship of this or any other university.

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DECLARATION

I declare that the present thesis entitled **"Economic Impact of Regional Trade Agreements: A Study of ASEAN and Its Implications on India"** a consolidation of an original work which has been carried out by me under the guidance of **Dr. P.K.Sudarsan** at the Department of Economics, Goa University, and that the same has not been submitted to any other University or Institution for the award of any other degree, diploma or other such title.

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Table of Contents

CHAPTER – V **TRADE CREATION AND TRADE POTENTIAL BETWEEN ASEAN AND INDIA: A GRAVITY MODEL ANALYSIS**

CHAPTER – VI **IMPACT OF RTA ON FDI INFLOW: A CASE OF ASEAN-5 AND ITS IMPLICATIONS ON INDIA**

CHAPTER – VII **SUMMARY OF FINDINGS, CONCLUSION AND SUGGESTIONS**

List of Tables

List of Figures

CHAPTER – I

INTRODUCTION

CHAPTER – 1

INTRODUCTION

The theory of International Trade over the years unambiguously demonstrated that free trade among Nations enhances the welfare of the world in general and participating members in particular. Among the divergent approaches to liberalise trade, 'Multilateralism' was considered the 'first best method' as it is based on the principle of non discrimination and rule of law and do not inflict adverse impact on participating nations. The General Agreement on Tariffs and Trade (GATT) and its successor WTO were established to achieve this objective. Regionalism as an alternative to multilateralism emerged mainly from the failure of the world trading system to provide a quick and acceptable solution to the problems it encountered over a long period of time. Multilateral trade negotiations are protracted and behind schedule as it tries to evolve consensus on issues which are acceptable for large number of countries with diverse economic, political and social background and objectives resulting in high transaction costs. Even though regionalism had a historical presence, it could not thrive till nineties as it was considered a 'second best solution' to trade issues and by an indifferent attitude towards it by major trading nations (with the exception of European Union). The 1990s witnessed a tremendous spurt in the number of Regional Trade Agreements (RTAs) in the world trading system intended to circumvent the problems of multilateralism. The shift in United States' approach towards regionalism in the 90s and the success of EU and ASEAN has built the inertia in favour of Regional Trade Agreements (RTAs). This has generated scholarly debate among trade theorists on the mechanism through which further trade liberalisation should be carried out for achieving global free trade.

1.1 Regional Integration: Concepts

The literature of regional integration uses multitude of concepts intermittently and a deeper understanding of these concepts are vital for analytical clarity. Preferential Trade Agreement (PTA) is a basic form of integration where preferences are extended to few countries and the non-members of the agreement are discriminated against from this favour. According to Panagaria all forms of regional integration are Preferential Trade Agreements as countries hardly open all sectors for free trade with other members of the union (Panagaria, 2000). In a Free Trade Agreement (FTA) trade barriers among the members are removed and there is free movement of goods and services in the identified areas of cooperation. The Customs Union (CU) is an improvement over RTA in which member countries apply a common external tariff (CET) on a good imported from outside countries. The CET can differ across goods but not across union partners. In the Common Market (CM) in addition to CET there is free movement of factors of production such as labour, capital, enterprise and technology among the member states. As a result, there are chances of best allocation of resources in a common market leading to maximisation of benefits for member states. Economic Union (EU) is the highest form of economic integration in which the member states try to harmonize monetary, fiscal and other economic policies within the union. This may mean that the member states surrender at least to some extent their national sovereignty for the harmonization of economic policies. The EU after the Maastricht Treaty has come to be an economic union.

Sometime countries do not follow the above mentioned well structured form of regional integration and get in to bilateral or trilateral agreements. Also the content and coverage of the agreement widely varies among various integration schemes. In a Shallow Regional Integration scheme there is reduction or elimination of barriers to trade in commodities only (sometimes include non factor services). 'Shallow integration' range from a PTA, CU or FTA; but each member retains complete free hand concerning all other policies. On the contrary, 'Deep integration' involves additional elements of harmonization of national policies, and allowing or encouraging internal factor mobility. These include competition policy, technical standards, subsidies, monetary and fiscal policies, regulation and supervision of financial institutions, environmental issues, government procurement and more.

More recent evolution of RTAs include the 'Hub' and 'Spokes' model and the 'Spaghetti' Regionalism. Under the Hub and Spokes model a large country could be a member of several Free Trade Agreements, but that smaller countries might only belong to one of these arrangements each. The large country would then be the Hub, and the others would form the Spokes in a series of discriminatory bilateral trade agreements. Unlike in the case of Free Trade Area, where all parties negotiate as equals, under a hub- and-spokes arrangement the larger country generally sets the terms and conditions for membership. Spaghetti bowl regionalism (first used by Jagdish Bhagwati) described the complexity of trade rules resulting from a proliferation of Free Trade Areas resulting in different Rules of Origin (RoO) in each FTA. Countries that are members of more than one arrangement of this kind may have to administer different rules for each of them.

1.2 Growth of Regional Trade Agreements

World trading system after Second World War experienced progressive reduction of trade restrictions at the multilateral level along with bouts of regionalization initiatives. According to Bhagavati there were two waves of regionalism, one in the sixties and the second in the mid eighties. Getting inspired from the European integration efforts, the first wave of regionalism spread across Africa, Latin America and other parts of the Developing world. These efforts did not sustain long and Regionalism came to a halt mainly due to the stand taken by the United States which supported multilateralism. The second wave of regionalism started in the middle 1980s mainly due to two reasons. First, the GATT negotiations became extremely time-consuming and members were frustrated over the outcome and turned towards regional efforts. Secondly and more importantly, United States changed itself from devoted multilateralist to ardent regionalist. Because of this new integration agreements were initiated, existing ones were expanded and previously extinct ones were revived.

Another major explanation for the expansion in the number of RTAs in the 1990 was the collapse of the COMECON (old Soviet Union and Eastern Europe) and the alignment of the Central and Eastern European countries in to the European Union (WTO, 2003). Also the post WTO period witnessed sudden spurt in the number of bilateral agreements and economists call this as the third wave of regionalism. Bilateral agreements between members of various regional groupings makes the admininstering of Rules of Origin (RoO) difficult and delineating the impact of RTA difficult. In the period 1948-1994, the GATT received 124 notifications of RTAs (relating to trade in goods), and since the creation of the WTO in 1995, almost 300 additional arrangements covering trade in goods or services have been notified (WTO). There were 147 active RTAs existing as of May 2009 (WTO).

1.3 Reasons for countries entering RTAs

Even though the predominant objective of a RTA is to improve the trade performance between the participating countries, there could be multitude of other reasons also to enter in to an RTA. These motives can be broadly classified in to economic and non-economic reasons. In a comprehensive paper, Whalley (1996) analysed the motives behind forming Regional Trade Agreement and listed six major reasons for entering in to an RTA. They are achieving traditional gains of trade, lock in domestic reform measures, to increase multilateral bargaining power, guaranteed market access, strategic linkages and pushing domestic agenda in trade negotiations. Another reason for pursuing RTAs is to incorporate deep integration issues which were otherwise not possible in a multilateral agenda. Difficult non tariff border issues can be experimented in an RTA and if found successful can be extended to other broader negotiations. In addition to RTAs there are large numbers of bilateral agreements completed by Hubs for various purposes. The logic is more number of bilateral agreements is more trade reform and more market access. Other reasons for proliferating bilateral agreements could be due to fill the gap of multilaterlal process, improving net gain of global economy, consolidate regional economies, aid development, promote foreign policy, voice for small states and encourage human rights reform.

1.4 RTAs in the WTO Framework

WTO incorporated Most Favoured Nation (MFN) principle of GATT so that member countries do not discriminate other members in their tariff policy. PTAs/RTAs being discriminatory trade policy are not consistent with Article I of GATT, and had to be accommodated through a variety of additional provisions. Under the present GATT/WTO system, there are three different ways members can extend favours or discriminate other members namely Generalized System of Preferences (GSP), Enabling Clause and under Article XXIV of GATT. While under GSP developed countries can give developing countries 'one way' trade preferences, enabling Clause is intended to promote trade among developing countries. Developed countries receive trade preferences only under the provision of Article XXIV. A key requirement of article XXIV is that members of an FTA or CU eliminate duties and other restrictive regulations of trade with respect to 'substantially all trade' in products originating in union members. The reason behind the requirement for substantial inclusion is to prevent members from liberalizing those sectors in which they anticipate export growth. In the case of FTAs, external tariffs of member countries must not be raised. Since Free Trade Agreements allow members to retain different tariffs against the rest of the world, they must include detailed Rules of Origin (RoOs). RoOs prevent goods that enter a member country with a lower external tariff from being transshipped duty free to members with higher tariffs. In the case of CUs, the incidence of common external tariffs on outside countries' trade is not to exceed that of individual tariffs of union members prior to the formation of the union.

1.5 Statement of the Research Problem

The economic outcome of multilateralism and regionalism attracted huge interest among economists who carried out number of studies to identify the determinants of world trade. But these studies could not decisively resolve the regionalism versus multilateralism debate with their empirical findings and the economists are caught up between multilateralist and regionalist ideology. In this context an alternate view emerged known as 'open regionalism', which considered regionalism and multilateralism as complementarities and both can coexist and foster each other in their pursuit. The diversity of empirical results generated by these studies and numerous policy prescriptions helped the debate to continue for long time. In this context, the present study is an attempt to understand the economic impact of Regional Trade Agreement on members and non members and how it affects the multilateral negotiations and trade flow. It also investigates the role of ASEAN in the growth and composition of international trade, the trade creation/diversion effects if any, its role in attracting Foreign Direct Investment and how it improves the bargaining strength of the member countries at the multilateral trade negotiations. India after prolonged discussions and hectic negotiations signed a Free Trade Agreement with ASEAN in August 2009, the study looks in to the impact of India -ASEAN FTA on India's trade pattern and how this agreement affects various segments of the society in these countries.

In the context of India – ASEAN FTA a reality, it is important and meaningful to get answers to certain pertinent questions like: i) whether India – ASEAN FTA will result in trade creation or trade diversion? ii) What is the magnitude of trade creation or trade diversion? iii) What are the complementary sectors and products that would enhance the trade potential between India and ASEAN members? iv) Which are the ASEAN member nations with whom India can have better trade relations? v) Whether the FTA would result in increased FDI inflows between India and member nations? The present study is also an attempt to find answers to the above questions.

1.6 Objectives of the Study

The study focused on the development of Regionalism as a methodology to achieve trade liberalization and free trade as against the backdrop of the difficulties faced by Multilateralism. The broad objective of the study is to understand and analyse the economic impact of regional grouping on the trade flow of the members and nonmembers and its resultant impact on the welfare of the participating nations. The study systematically looked into the regional integration efforts in Association of South East Asian Nations (ASEAN), which is a prominent RTA in the emerging Asia for exploring the research problem and drawing general conclusions. This led to the following specific objectives of the study,

1. To study the developments of regional economic integration process across the world, particularly with reference to ASEAN and its impact on the multilateral trading environment.

2. To identify the complementary sectors and commodities for trade between India and ASEAN in the context of the India-ASEAN Free Trade Agreement.

3. To measure the extent of trade creation/diversion in the ASEAN Free Trade Agreement (AFTA)

4. To measure the Trade potential between India and ASEAN using the Gravity Model framework.

5. To study the impact of Free Trade Agreement (FTA) on the FDI inflows on members of ASEAN countries and lessons for India.

6. To study implications of rapidly increasing RTAs in the world, particularly with reference to ASEAN integration and the India – ASEAN FTA on world trade.

1.7 Significance of the study

The study is significant in the backdrop of proliferation of RTAs which is having a bearing on the multilateral trade liberalization. There is a cyclical cause and effect kind of relation with slow progress of Multilateral trade negotiations resulting in the rapid expansion of bilateral and regional RTAs which in turn slowing down the multilateral negotiations. The regionalism versus multilateral debate is continuing amidst the call from some to tread a complementary path where regionalism and multilateralism is reinforced to each other and pursued simultaneously. Understanding the exact nature of relationship and their impact on the trade flows is important to achieve the objectives of free trade.

The centre of gravity for the world economy is shifting towards Asia with China, India and resurgent East Asia propelling the engine of growth and producing goods and services for world consumption. Also emergence of regionalism as a powerful alternative to multilateralism makes countries to gang up under fiercely competing trade blocks namely EU, NAFTA and ASEAN plus. ASEAN is the vibrant regional grouping in Asia and envisioning itself to become an Asian Economic Community. It is important to study how ASEAN influences the trade flow between members and non members in the region.

As India removes its economic shackles in the post nineties liberalized environment, it is recording one of the highest economic growth in the world. It is also exploring the regional option with its traditional partners to double the trade in five year period. Realising the importance of the Asian region for sustaining high trade growth, it initiated the 'look east' policy in the early nineties. India signed FTAs with Singapore and Thailand and very recently (August, 2009) signed a Comprehensive Economic Cooperation Agreement with ASEAN. It is imperative to study the economic impact of India – ASEAN FTA for the successful Asian integration. Identification complementary and competing sectors are crucial to understand how this agreement will affect different sections of the society such as farming community, agro industries, small scale industries and labour intensive industries. Already questions are raised on the likely impact of the agreement on Indian Agriculture and the livelihood of the affected parties. The synergies between India and ASEAN need to be identified for further cementing the economic cooperation and deepening the relationship. More studies are required to answer these issues in a satisfactory manner.

1.8 Methodology

The study used both descriptive and analytical methods to examine the objectives. The literature for the study is drawn from multiple sources. These include journal articles, books, online journals, working papers, occasional papers, study reports, Annual Reports and downloads from the internet. Also web pages of important organizations such as

WTO, IMF, World Bank, UNCTAD, OECD, ADB, EU and ASEAN secretariat are extensively used for the literature and data.

Secondary data is used for the study and is collected from credible international organizations. The export import data is collected from Direction of Trade Statistics (DOTS) of the IMF (CD ROM) and data pertaining to GDP, per capita GDP, population and telephone connectivity is collected from World Development Indicators (WDI) of the World Bank. Bilateral distance between countries is taken from Jon Haveman's database and other gravity variables such as contiguous border, common language, and colony are taken from CEPII database. Data for ASEAN countries are collected from Annual Statistical yearbook of ASEAN, ASEAN database, ADB and UNCTAD. Secondary data is also collected from WTO statistical database, World Integrated Trade Solutions (WITS), Organization of Economic Cooperation and Development (OECD) and Ministry of Commerce, Government of India.

Bilateral FDI inflow between ASEAN countries are collected from ASEAN investment report 2006. Other FDI dependent variable such as Index of Economic Freedom is collected Heritage Foundation, Index of globalization from KOF, and international corporate tax from KPMG and Ross Business School database of Michigan University.

The intensity and complementarity in trade between India and ASEAN are analysed using Trade Intensity Index (TII) and Reveled Comparative Advantage Index (RCA). While TII looks how intensely the two are trading and the possible improvement in trade share, the RCA index unravels the complementary sectors and commodities in the trade basket of the partners.

Gravity model is used to measure the trade creation/diversion effect in ASEAN. "Gravity Model" is the workhorse used extensively in empirical studies on international trade. It has its origins with Tinbergen (1962). It provides robust statistical results and considered "Some of the clearest and most robust findings in empirical economics." (Leamer & Levinsohn, 1995).

Gravity theory has its roots in Newton's theory of gravity, which postulates that the gravitational force between two objects is directly proportional to each of their masses, and inversely proportional to the square of the distance between them.

Fij = G (MiMj / D2ij)

G here is a gravitational constant, supposed universal.

In Economics

$X_{ij} = c (Y_i Y_j) / D_{ij}$

Economic "mass" is proxied by a country's GDP. The distance between countries is taken as an indication of the level of trade costs they face.

A larger economy with higher GDP and per capita income can demand and supply large quantum of commodities to its trading partners. But this trade gravitation can be impeded by trade costs (e.g., transport, tariffs etc.). Standard proxies for trade costs in gravity equations are Distance, Adjacency, Common language, Colonial links, Common currency, Island, Landlocked and Institutions, infrastructures, migration flows, etc. Thus a familiar Gravity equation in log form is as follows,

$$Log(X_{ij}) = \beta_0 + \beta_1 \log(Y_i) + \beta_2 \log(Y_j) + \beta_3 \log(D_{ij}) + \varepsilon_{ij}$$

$$\beta_1 , \beta_2 > 0; \beta_3 < 0$$

Gravity models have been widely used to investigate the impact of preferential trading arrangements (PTAs) on trade among the members of the integration scheme due to its intuitive appealing and very strong explanatory power. The basic idea is to include an additional dummy variable in the standard gravity model that captures variations in the levels and direction of trade due to the formation of a preferential trading arrangement among a group of countries. It is assumed that the "normal volume of trade" between a pair of randomly selected countries can be explained by size (GDP, population, land area) and distance (broadly defined as trade costs) between two countries. If the preferential trade arrangement increases the trade among the members of the arrangement above its "normal" value, then the intra-bloc dummy variable (a variable that represents the existence of a preferential agreement between two countries) will get a positive and statistically significant coefficient.

Bilateral trade between 26 countries for 17 years are considered for the study This gave 650 bilateral country pairs and 11050 bilateral data points for the study which is analysed in a panel data framework. The 26 countries selected cover the different geographical regions and represent different stage of economic development. These include five original members of ASEAN namely Indonesia, Malaysia, Philippines, Singapore and Thailand; India, Bangladesh Pakistan Sri Lanka from South Asia; Saudi Arabia from middle east Asia; Australia from Oceania; China, Japan and Korea from east Asia; France, Germany, Italy, Spain and UK from Europe; Canada, Mexico and US from north America; Argentina, Brazil and Chile from South America and South Africa from Africa. Three gravity models, namely Basic Model, Augmented Model, and Extended Model were used for the study. The analysis is extended to fixed effect and random effect panel data analysis. Hausman test and LM Multiplier tests are used for model selection. A gravity model framework is also used to study the impact of RTA on bilateral FDI flows in ASEAN. The model is further augmented with some institutional, infrastructural and policy reform variables for analytical precision. Coefficients derived from the gravity model are used to calculate the potential trade flow between India and ASEAN in the context of the India-ASEAN FTA.

1.9 Outline of the Study

There are seven chapters in the study. The 'introduction' chapter provides the broad framework and design of the study. This chapter introduces the research topic and delineates the research problem to be investigated in the study. This followed by objectives of the study, significance of the research issue, methodology used in the study, chapter scheme and limitations of the study. The second chapter titled 'Regional Trade Agreements – Theoretical and empirical developments' systematically reviewed the theoretical evolution and empirical advancements in the area of regional economic integration in general and RTAs in particular. The objective of the chapter is to identify the research gap that exists in the literature and to refine methodological and measurement problems based on the experiences of previous studies. This also helps in identifying pertinent research problem in the area and define it in simple, clear and plausible manner for a systematic enquiry.

The third chapter of the study titled 'Economic and Trade profile of ASEAN and India' brought out the economic structure and trade performance of ASEAN and India. The objective of the chapter is to provide an overview of the economies of ASEAN and India and to understand the inherent strength and weaknesses, level of development and relative performance of the economy and trade and to see the compatibility of forming an economic cooperation agreement.

The fourth chapter titled as 'Trade Complementarity between India and ASEAN' form the analytical part of the study. The objective of the chapter is to construct trade indices for India and ASEAN to measure the intensity and comparative advantage between sectors and product groups between these economies. Three indices namely Intra Regional Trade Intensity index, Trade Intensity Index (Export Intensity Index and Import Intensity Index) and Revealed Comparative Advantage (RCA) Index were constructed for the analysis.

The fifth chapter is titled as 'Trade Creation and Trade Potential between ASEAN and India: A Gravity Model Analysis'. The Gravity Model framework was used to measure the trade creation/diversion in ASEAN and the trade potential between India and ASEAN. Four methods of analysis are used in the study namely Pooled OLS method (POLS), Fixed Effect Vector Decomposition' Method (FEVD), Random Effects Model (RE) and Hausman-Taylor Estimation technique (HT). The model selection between fixed effect an random effect is based on Hausman specification test.

The sixth chapter is titled as 'Impact of RTA on FDI inflow: A case of ASEAN-5 and its implications on India' studied the FDI implications of a RTA. Foreign Direct Investments flow in to an RTA to reap economies of scale, consolidation of existing industries through mergers and amalgamations for finer specialization and to create economic hub for larger coverage of the market. A gravity based model taking institutional and infrastructural variables together with time invariant specific factors are used to explain the FDI flow in to an RTA.

The seventh chapter namely 'Conclusion and Suggestions of the study' summarised major findings of the study with a conclusion. The policy implications emanating from the study and possible future course of action are discussed here.

1.10 Limitations

The study has its share of limitations which are beyond the control of the researcher. The study mainly relied on the gravity framework of analysis and the other prominent method namely Computable General Equilibrium method is not attempted for want of data and software. Also non linear regressions models are not attempted in the study. The study did not consider the new age provisions of RTAs which include imperfect market structure, scale economy and intra industry trade. The study considered only five original members of ASEAN and the new members who have joined at later periods are excluded from the analysis for lack of complete information. Also truncated models were not used to consider zero values in the FDI model. The effect of India's bilateral trade agreements with ASEAN members are not incorporated in the analysis.

CHAPTER – II

REGIONAL TRADE AGREEMENTS-THEORETICAL AND EMPIRICAL DEVELOPMENTS

CHAPTER - II

REGIONAL TRADE AGREEMENTS- THEORETICAL AND EMPIRICAL DEVELOPMENTS

Regional Trade Agreements (RTAs) have a long history and along with Multilateralism it occupied the centre place in the discourse of trade theory and commercial Policy for a long time. Even after numerous theoretical and empirical studies that were carriedout to resolve regionalism versus multilateralism debate, the issue remains unsettled as the results are divided between 'building block' versus 'stumbling block' argument of regionalism on international trade. Diverse nature of Preferential Trade Agreements (PTAs) from shallow integration to deep integration agreements necessitated designing appropriate methodologies and model building techniques for measuring the static and dynamic effects of trade liberalization. Complicating this phenomenon is the proliferation of large number of bilateral Trade Agreements between members of the RTAs creating a 'noodle bowl' effect on trade. The present chapter of the study systematically reviewed all the theoretical and empirical developments that have happened in the area of Regional Trade Agreements (RTAs) to identify the research gap and to delineate theoretic and methodological issues that need to to be considered to place the study on the research gap.

The chapter is divided in to seven sections. The first section reviewed the various theoretical developments that had happened in the area of regional economic integration over a period of time. The second section reviewed the empirical studies that were conducted in the area based on theoretical developments. The econometric and specification issues related to Gravity Model are discussed in the third section. The Gravity based studies are outlined in the fourth section. Empirical studies pertaining to ASEAN Free Trade Area are discussed in the fifth section. Studies pertaining to India –

ASEAN trade relationship are presented in the sixth section. This was followed by major findings of the review in the last section.

2.1 Theoretical Developments in Regionalism

There have been intense theoretical expositions by trade theorists on the likely impact of regionalism on the international trade flows of commodities. The two issues primarily addressed by them are how the formation of Regional Trading Blocks impacts the welfare of the members and world at large and whether regionalism help or hinder the process of multilateral trade liberalization. Economists failed resolve on this issue concretely and there is no unanimity amongst themselves on the magnitude and direction of the impact.

The earliest work on the theory regional integration was presented by Viner (1950) in his seminal work 'The customs union issue' in 1950. The traditional notion before this pioneering work was that any kind of preferential trade encourages specialisation of production in least cost countries and hence beneficial to international trade. Viner demonstrated that preferential trade need not necessary improve the welfare of the members and sometimes it reduces it by diverting trade from low cost country to high cost country. Viner used two concepts namely 'trade creation' and 'trade diversion' to explain the economic outcome of the regional integration. 'Trade creation' means high cost domestic producer is replaced by a low cost partner firm and the consumer can buy more at cheaper prices. In 'trade diversion' the low cost rest of the world partner is replaced by a high cost partner country and there is a welfare loss for the home country.Viner explained that since PTAs liberalise trade preferentially, on the one hand, they 'create' new trade between union members while on the other, they 'divert' trade from low –cost outside suppliers to high cost within union suppliers. The 'trade creation' is beneficial as the union partner replacing home country's less efficient industry and the consumers can avail the same commodity at a lower price. The 'trade diversion' effect arises from a union member displacing a more efficient outside supplier by taking advantage of the tariff preference it enjoys in a partner country and this is harmful. Unions which are primarily trade creating are beneficial and those that are primarily trade diverting are harmful to member countries taken together and to the world as a whole. However, it is possible for an individual member country to gain large benefits from a primarily trade diverting union by shifting the intra-union terms of trade in its favor. The Viner model had two major deficiencies. Firstly it is a partial equilibrium model which could not accommodate the modern neoclassical trade theory which is based on the general equilibrium theory. Secondly it could not explain the case of 'large' bloc countries of regionalism.

Meade (1955) outlined the modern static theory of regional integration arrangements in his book 'The Theory of Customs Union'. Meade's model is an improvement over Viners in many ways. Meade's analytical framework explicitly admitted trade by many countries in many commodities, abandoned the Vinerian assumption of constant costs of production in trading countries and recognized the necessity of ensuring equilibrium in international payments balances. These refinements to the static theory of regionalism admit the possibility of not only spillover effects of regional integration agreements on non-member countries but also feedback effects of international adjustments to the formation of regional integration arrangements on member countries. Meade focused his analysis on the economic welfare of the world economy, not simply the countries forming a regional integration arrangement.

Under a customs union or free trade area in which external tariffs and other trade restrictions are sufficiently high that the home country and the partner country trade exclusively with one another and the regional integration arrangement is completely trade diverting. This equilibrium determines the domestic and intra-block terms of trade for members of the regional integration arrangement. From the perspective of the partner country the equilibrium is superior under either protection or free trade. However from the perspective of the home country, the equilibrium is inferior to equilibrium under protection or free trade Thus in the small union Meade model the distribution of economic gains among member countries in a regional integration agreement is extremely important for the stability of the agreement.

Lipsy (1960) looked in to the welfare effect of customs union rather than merely looking the trade creation and trade diversion aspects and said welfare effects of customs union depend on the combination of its effect on the location, and hence cost of world production and on the location and hence the utility of world consumption. He delineated production and consumption effect of customs unions and said when consumption effect is allowed for, the simple conclusion that trade creation is 'good' and trade diversion is 'bad' are no longer valid. Lipsy in his model showed an increase in welfare may follow from the formation of a customs union which result solely in the diversion of trade from lower – to higher- cost sources of supply. Further more it will be shown that this welfare gain may be enjoyed by the country whose import trade is diverted, by the customs union area considered as a unit by the world as a whole.

The changes in intra-regional and extra-regional trade may have significant impacts on international prices for traded goods impinging on the economic welfare of both member countries and non-member countries. In this connection Ohyama (1972), Kemp and Wan (1976) and Vanek (1965) offer an interesting theoretical perspective. The logic behind the theorem is simple. Freezing the net trade vector of A and B with the rest of the world ensures that the rest of the world can be made neither better off nor worse off by the union. Then, taking the external trade vector as a constraint, the joint welfare of A and B is maximized by equating the marginal rate of transformation(MRT) and marginal rate of substitution(MRS) for each pair of goods across all agents in the union. This is, of course, accomplished by eliminating all intra-union trade barriers and setting the common external tariff (CET) vector at a level just right to hold the extra - union trade vector at the pre-union level.

When countries involved in a PTA are large enough to affect world market prices, there are *terms-of-trade effects* in addition to the trade creation and trade diversion effects. A PTA is likely to improve the terms-of-trade for its members and worsen them for non-members. Lower demand for non-member imports (because imports from member countries become cheaper due to tariff preference, despite a possible cost advantage of the non-member country) may lead to lower export prices of the non-member country. Furthermore, increased trade within the PTA may lead to a decline in the availability of goods to non-members, thereby raising the price of nonmember imports from the PTA (and may force the non-member to produce such goods themselves). So even if a PTA member loses tariff revenue in connection with a diversion of trade from non-members to members, these losses may be outweighed by improved terms-of-trade vis à vis non-members.

Baldwin (1993) developed the Domino theory of Regionalism to answer the question of why countries prefer regional integration than multilateral liberalization. Baldwin points out idiosyncratic shocks such as deeper integration of an existing regional block can trigger membership requests from countries that were previously happy to be non members. The stance taken by the Government regarding membership is the result of a political equilibrium that balances anti-membership and pro-membership forces. Among the pro integration forces are firms that export to the regional block. Since closer integration reduces the profits of non-member firms, the exporters in the non member country initiate greater pro-regional political activity. This extra activity may tilt the balance in favor of regional integration in a county which otherwise remained neutral to it. As the block enlarges, the cost to the non-members increases since they now face a cost disadvantage in an even greater number of markets. This will bring more pro-regional political activity in non-members countries resulting in further enlargement of the bloc. Hence Regionalism spreads fast and wide across the globe.

The Juggernaut theory of Baldwin (2005) suggests that liberalisation leads to liberalisation, and once the liberalisation process sets in, it is difficult or impossible to stop it. Announcement of multilateral tariff-cutting talks based on the principle of reciprocity make exporters lobby for domestic tariff cut to gain access to foreign markets. The tariff cuts at home and abroad alters the economic landscape and this generates a sort of political economy momentum and eventually liberalise the sector which is included in the tariff-cutting talks. Baldwin says the interaction between the domino theory and juggernaut theory suggests that regional trade blocs are building blocs toward free trade – at least in most cases. But he cautioned some limiting cases especially South-South FTAs which cannot generate domino and juggernaut effects. Baldwin (2008) critically evaluated theoretical literature in an attempt to identify the insights that are useful for thinking about regionalism's systemic impact in the new century. Baldwin observed regionalism is here to stay and there is need for deep multilateral integration. The paper suggested that there is a need to move the literature's focus from the high theory of shallow integration to a more policy-relevant issue – the theory and empirics of deep integration in regional versus multilateral contexts. There is also a need to advance the profession's thinking on how the liberalisation in RTAs can be made to be more supportive of multilateral liberalisation, i.e. on how one can promote convergence/harmonization of RTAs.

The success of the regional integration efforts in creating additional trade depends on numerous factors. Some of the factors which got profound influence on trade are the complementarities in trading Nations, level of initial protection, domestic trade liberalization measures, size of the economy and rule of origin. The risk of trade diversion is lower if the PTA being formed is between countries that are already major trading partners, indicating that trade flows are consistent with least-cost sourcing. Moreover, the greater complementarity in import demands between PTA members, the greater the potential gains from a PTA. Trade creation is more likely to dominate trade diversion if there is greater difference between unit production costs within the PTA and the smaller the difference in costs between the PTA and the rest of the world. The higher the initial level of protection, the greater the benefits, if the members reduce the protection after joining in a PTA. Inclusion of a highly protected sector in trade agreements brings out substantial gains for the members. Clearly, trade diversion is minimised when the PTA's have lower external trade barriers.

Trade liberalization measures can increase the welfare of a country by removing distortionary trade practices followed by it and in this sense joining in a PTA enables further welfare gains for PTAs members. Moreover, non-trade-related deep integration policies adopted in connection with a PTA may also enhance the welfare impact of the agreement. The economic size of the participating countries in a regional trade agreement can influence the trade flow and economic welfare. But this depends on the extent to which the world price and thereby the terms-of-trade of the countries involved will be affected due to integration efforts. Whether a trading country is small or large depends on the product in question and is therefore typically an empirical question. If the rules of origin are liberal, some of the benefits of liberalised trade within the PTA may be transmitted to non-members. If they are restrictive, on the other hand, such rules may pose an additional form of protection and thereby work against the liberalisation by making it more costly or more difficult.

There are excellent studies on the theoretical development and literature review on regionalism (Panagaria, 2000; DeRosa, 1998; Lloyd and Maclaren, 2004; Piermartini and Teh, 2005). Panagaria (2000) based on systematic economic analysis argued strongly in favour of multilateral trade liberalization than regional agreements as PTAs can divert trade and lower welfare for the participating nations. The paper suggested measures to minimize adverse effects of PTAs which include placing moratorium on the expansion of PTAs (except those in advanced stage of negotiation), modify the GATT Article XXIV to bind its tariffs to the pre FTA level, changes in Article XXIV relating to antidumping and safeguard measures and finally there be no rule of origin on a product in a member country with the lowest tariff in the Union on that product. DeRosa (1998) extensively reviewed the static theory of regional integration arrangements and considers the economic impact of such arrangements, based on recent quantitative studies of customs unions and free trade areas. The theoretical developments in the area of regional integration and the empirical substantiation of the theoretical developments are carefully analysed in the paper. Lloyd and Maclaren (2004) surveyed the theoretical and empirical aspects of regional integration and shown how member and nonmember countries gains and loses due to trade liberalization in goods by forging free trade area or a customs union.

Piermartini and Teh (2005) provided a non-technical explanation to two important trade polcy models namely CGE and gravity models and explained theoretical underpinning, model requirements and computational procedures required for these models. The paper surveyed large number of studies based on CGE, and gravity models and their analytical strengths and limitations also discussed. The survey is useful in conveying a sense of how results can vary depending on what goes into the models by way of their structure and data, emphasizing the importance of judicious, critical interpretation. De Groot, Liners, Rictveld and Subramanian (2004) explicitly investigated the effect of institutions and found that institutional quality has a significant positive and substantial impact on bilateral trade flows. Generally good governance lowers transaction costs for trade between high income countries, while trade between low-income countries suffers from high insecurity and transaction costs. This creates possibilities that countries with similar levels of institutional quality may be familiar with each other's business practices and trade more.

Zissimos (2002) argued that free trade agreements (FTAs) are regional because, in their absence, optimal tariffs are higher against (close) regional partners than (distant) countries outside the region. Optimal tariffs shift rents from foreign firms to domestic citizens. Lower transport costs imply higher rents and therefore higher tariffs. So regional FTAs have a higher payoff than non-regional FTAs and regional FTAs may yield positive gains when sponsoring a FTA is costly. Naive best response dynamics show that 'trade blocks can be stepping blocks' for free trade. Caldentey and Ali (2006) presented an alternative treatment to RTA using a two country model (leader-follower). The model shows that free trade can in fact accentuate differences and growth disparities among countries. More importantly it asserts, that the follower economy can catch-up to the leader economy only if the ratio of the income elasticity of demand for the follower country's exports by the rest of the world to its income elasticity of demand for imports is greater than the ratio of the induced productivity of the leader to that of the follower country. According to the paper, this golden rule is useful for policy design and determining the extent to which an RTA can be beneficial to its signatory member states.

The regionalism versus multilateralism debate has a long history and could not resolve decisively evenafter large number of theoretical and empirical studies on this issue. While some argue regionalism is stumbling block (Bhagwati and others; 1993, 1996) to the progress of multilateral trade liberalization which is a first best option for countries to improve their welfare others see it as a building block (Frankel, 1997, Summers, 1991 and et.al.) as it supplements and complements the multilateral process.

Multilateralists believe widespread regionalism may lead to a break-up of the World economy in to hostile blocks that divert political energies from multilateral initiatives. PTAs make it more difficult to negotiate at the multilateral level because agreements about positions need to be achieved within blocks before and during negotiations. PTAs are by definition discriminating, and large PTA blocks may exert market power to improve the terms-of-trade of its members. Closed membership clauses may block additional members in order to preserve trade gains, while open membership clause seduce members in to protectionist regional initiatives and diverts political energies from multilateral initiatives. Protectionism of countries not involved in PTAs may increase as regionalism spreads. Use of non-tariff barriers, such as antidumping and countervailing duty actions, against non-member countries increase as weaker industries struggle to survive regional free trade. Deeper integration of policies and institutions may create or strengthen interest groups that benefit from trade diversion and have incentives to lobby against free trade. Deeper integration may introduce protection in previously unprotected markets through the adoption of common, distorting internal policies.

Contrary to the above view those who favour regionalism argue that PTAs encourage others to come to the multilateral negotiating table, ie. the prospect of 'fortresses' may help motivate greater efforts to achieve successful multilateral negotiations. It may be easier to negotiate multilaterally between fewer and larger PTA- based blocks than large number of individual countries. Deeper integration within PTAs can help avoid destructive trade wars. Regionalists also believe that expansion of membership based on open membership clauses will eventually lead to global free trade. Adoption of 'open regionalism' is a slow and definite step that can eventually lead to global free trade. PTA-induced growth can induce increased demand for extra- PTA imports thereby benefiting non-members. PTAs may be able to tackle issues too deep or complex for multilateral negotiations, and may even serve as blueprints for such issues before coming to the global level. Deeper integration of policies and institutions may help lock-in complementary market oriented policies (competitive liberalism ie. increasing regionalism creates competition for reform and for membership of PTAs). Deeper integration among PTA members (Eg. Harmonisation of technical standards to international norms) may also promote trade both within the PTA and with third countries.

While regionalism versus Multilateralism debate hardens its stand, there is a group of analysts who believed that regional and global liberalization must proceed together to take advantage of the benefits of regional liberalization without undermining the continued vitality of multilateral system. In this context APEC initiated a new concept namely 'open- regionalism'; (Fred Bergsten, 1997) through which regionalism can be employed to accelerate the progress toward global liberalization and rule making. Bergsten gave five possible definitions of open regionalism which includes open membership, unconditional MFN, conditional MFN, global liberalization and trade facilitation. All five definitions can be implemented simultaneously as well as independently to achieve open regionalism. The complementarity between regionalism and multilateralism is also stressed by Ethier (1998) who argues that 'the new regionalism' is in good part a direct result of the success of multilateral liberalization, as well as being the means by which new countries trying to enter the multilateral system compete among themselves for direct investment.

The hypothesis of 'natural – trading partners' enunciated by [Wonnacott and Lutz (1989) and espoused by Summers (1991) and Krugman (1993)] envisage that the more two countries trade with each other relative to the outside world, the less likely that a union between them will be harmful. It has been suggested that neighbouring countries or countries whose relative resource endowments are highly complementary in both cases, giving rise to appreciable initial levels of trade should be expected to expand their trade

(Devos). Bhagavati and Panagaria (1996) and Shiff (1996) argues that under this case the tariff revenue loss will be substantial and the economic gains from forming a trade block are likely to be smaller.

Wonnacott and Wonnacot (1981, 1992) used the concepts of foreign trade barriers and transport costs to explain the formation of regional trade agreements. Foreign trade barriers and transport costs drive a wedge between the price that consumers in importing countries pay and price producers in exporting countries receive for the same traded goods. This wedge might be sufficiently large to offer neighbouring countries for expanding their mutual trade on a preferential basis. The home country and the partner country exchange trade preferences (giving up tariff revenues from one another) in order to capture the greater savings from the high costs of protection or transport of goods associated with the home country's exports to the non-member country. But Panagaria (1997) criticizes this argument by saying that transport costs are no different than any other costs and as such deserve no special attention in considering PTAs. Bhagavati and Panagaria (1996) show that in general even a limited proposition which makes a PTA between proximate partners ceteris paribus superior to that between distant partners is false. (India-Pakistan versus India-U.S. relationship).

The regionalism debate offers another explanation of non-traditional gains to the small partners. Economists and policy analysts expressed the view that the gains to a small developing country from a PTA with large developed economy go well beyond the traditional static welfare effects. These non-traditional gains include, guaranteed access to the large market, shield the developing country from administered protection of the rich country and credibility to their reform process (lock-in effects). Panagaria (1995 and 1996) reject these arguments taking the case of NAFTA.

While 'old' trade theory focuses on the PTA-related changes in trade flows, prices, production structures, and the sectoral allocation of factors of production, 'new' trade theory considers a variety of other effects of preferential trade agreements such as imperfect competition, scale effects and increasing returns to scale. Moreover, some analysts argue that the efficiency gains estimated using techniques based on old trade theory, although significant, seem small relative to national income and also appear to be too small to explain the rapid economic growth that has accompanied trade expansion in many countries (Burfisher et al. 2003). The new trade theory tools include analysis of rent seeking behaviour, game theory, industrial organisation theory, and new growth theory. Features of new regionalism have the following characteristics.

i. Technology and knowledge transfers, and technology diffusion that increase productivity
ii. Dynamic comparative advantage and 'learning by doing' efficiency gains
iii. Elimination of wasteful rent seeking activities through trade liberalization
iv. Pro competitive gains from increasing import competition in an environment of imperfect competition allowing exploitation of potential economies of scale in production
v. Increased geographical dispersion of production through trade that supports 1.exploitation of different factor proportions for parts of the production process and/or 2. local economies of scale through finer specialization and division of labour in production

vi. Increased foreign direct investment that carries with it advanced technologies and hence increase in productivity.

vii. 'challenge –response increases in efficiency through increased competition due to expanded involvement in world markets

viii. Schumpeterian innovation and 'creative destruction' induced by increased competition arising from expanded trade.

If scale economies are achieved, it can offer greater international competitiveness to individual firms. For high technology firms in advanced countries, achieving scale economies in the production of new products can limit if not exclude entry by other firms in 'thin' or comparatively small-scale markets for new products (Krugman, 1980). For firms in less developed countries, achieving scale economies in the production of nontraditional products can contribute to the transformation of so-called infant industries, in to industries that are more likely to be internationally competitive (Pearson and Ingram, 1980). The scale economies offer additional source of economic gains for countries forming regional integration arrangement. In addition to achieving cost reduction effects related to increasing returns to scale, regional integration arrangements might successfully erode market power of dominant firms in member countries through encouraging market entry of competing firms from other member countries. This "pro-competitive" effect is widely cited in popular discussions of regionalism. Increased competitive conditions within the trading bloc could increase welfare substantially according to Smith and Venables (1988) through cost reduction effects and rationalisation of production location, increased sales by domestic firms in domestic markets and exit by some if not a substantial number of firms.

The geographic coverage and pattern of RTAs fundamentally changed recently. Up to the early 1990s most of the RTAs were non-intersecting areas which gave way for overlapping and criss crossing RTAs recently. Wonnacott (1996) introduced the terminology of hubs and spokes. A hub exists where one country (customs territory) is a member of two distinct RTAs. Single country hubs arise in several ways. Hubs may arise when one country is a member of one pre-existing RTA and then forms a new bilateral RTA with another single country outside the origin RTA. Or hubs may arise when one country almost simultaneously negotiates bilaterals with a number of countries or becomes a member of two multi-member RTAs.

A hub or a spoke may itself be a multi-country RTA. Such hubs and spokes may be called plurilateral hubs and plurilateral spokes respectively. As examples of plurilateral spokes, the US is a member of NAFTA and has a spoke agreement with the CACM countries, and Singapore is a member of ASEAN and has a spoke agreement with the EFTA States. Both the hub and one (or more) spokes may be RTAs. As an example, the EU has agreements with the EFTA states and MERCOSUR. There are hubs now in all geographic areas of the world economy.

2.2 Empirical Studies on Regionalism: An Overview

Empirical studies on regionalism are directed to answer some of the vexed issues that eluded consensus or answers in the domain of theoretical analysis. Quantitative studies based on appropriate methodologies helped in refining and restating some of the theoretical expositions. The trade flows can be validated with actual data and can be simulated to various situations using sophisticated econometric models.

Quantitative studies of regional integration arrangements may be classified as mainly empirical or analytical. Empirical studies are based on extensive contemporary or historical data, and parameters derived from these data through econometric estimation and hypothesis testing. Empirical studies involve *ex post* (explaining past trends) or *anti-monde* (what if regional integration was not established). In *ex post* studies, differences between actual data and the *anti-monde* are attributed to the effects of the regional integration arrangement, inclusive of unexplained residuals or error terms. Analytical studies, on the other hand, assume a theoretical structure and then rely predominantly on *a priori* estimates of key parameters compiled from empirical studies that are not necessarily related to issues raised by customs unions and free trade areas. In *ex ante* studies, the future course of variables, with and without a regional integration arrangement, must be judged on the basis of at least a minimum theoretic structure (De Rosa, 1998).

The changes in economic variables due to the implementation of trade policies are also studied in a static, comparative static and dynamic economic framework. The static analysis studies how the trade policy affects the initial equilibrium of the economy; the comparative static approach examines the difference in endogenous variables from the initial and final equilibrium of the economy. Dynamic approach is insightful as it examines the nature of final equilibrium and also the evolution from the initial to final stage. Dynamic models trace the adjustment cost and other dynamic effects such as economies of scale, competition etc. due to a change in trade policy.

The empirical studies pertaining to RTAs are studied in a partial or general equilibrium framework also. A partial equilibrium analysis typically focuses only on a specific market or product and ignores interactions with other markets. All other factors that can affect this market such as spill over effects, inter sectoral resource transfer or income effect of price changes are assumed constant. A partial equilibrium model is most suited for policy analysis when the policy-maker is only interested in sectoral policies, or when the sector under study represents only a small share of total income, or policy changes are likely to change the price in only one market, while prices in other markets will remain constant.

A general equilibrium analysis explicitly accounts for all the links between sectors of an economy - households, firms, governments and countries. It imposes a set of constraints on these sectors so that expenditures do not exceed income and income, in turn, is determined by what factors of production earn. These constraints establish a direct link between what factors of production earn and what households can spend. The two trade models which are extensively used in the empirical studies of Regional Trade Agreements are the Gravity Model for trade and the Computable General Equilibrium (CGE) model.

The relationship between trade and economic growth particularly regional integration and economic growth is subjected to lot of empirical investigations. Thirlwall (2000), Wacziarg and Welch (2003), and Frankel and Romer (1999) showed a positive relationship between trade liberalization and growth. There are skeptics like Rodriguez and Rodrik (1999) and Cruz (2008) on the role of trade or openness per se in stimulating growth. Lei and Netz (2001) extensively surveyed and empirically investigated the relationship between different forms of international integration and economic growth came to a conclusion that general openness, membership into a trade block and foreign direct investment into a country do lead to increased growth. The study also outlines the variation in income in the trade block also encourages more rapid growth among member countries. Dee (2007) empirically tested two presumptions on economic integration namely economic integration promote economic growth and preferential trade agreements promote economic integration. The study said even a broad-ranging PTA may do little to remove the important impediments to growth in the region and called for caution in pursuing East Asian economic integration.

There are number of studies that focused the reason behind rapid increase in bilateral and regional trade agreements in the arena of international trade. Whalley (2006) identifyed factors like customized bilateral agreements to suit the requirement of partners, coverage of non trade issues, limited yet dilatory success of multilateral process, demonstration effect of large players towards RTAs and use of RTAs by politicians and negotiators to advance their personal gains. The study contented that weakened multilateralism after a minimalist conclusion to the Doha Round may well accelerate this process. Fiorentino Verdeja and Toqueboeuf (2006) argued that the proliferation of RTAs is a challenge as well as opportunities for WTO members and RTAs should be designed and implemented to address this dichotomy so as to ensure RTAs complement the multileral process. Sager (1997) explored the effect of the proliferation of regional trading agreements on the multilateral trading system and said there is widespread disagreement regarding the effect of regional trade agreements on the multilateral trading system. While questioning the growth and importance of RTAs in the world trading system, Pomfret (2007) argued that the large number of RTAs are misleading as there is double counting of RTAs and inclusion of defunct and inconsequential RTAs and their trade share overstated. The author believed the design of the RTAs has inherent bias towards trade diversion and vehemently argued for multilateral trade liberalization for enhanced welfare.

There is a new trend emerging in the area of regionalism namely 'cross–border regionalism' where countries who are part of an existing RTA or from different geographical areas form bilateral agreements resulting in complex rule of origins (RoOs) and multiple enforcement norms. Baldwin (2006) while analyzing the global free trade observed regionalism and the 'Spaghtti Bowl' type of numerous trade agreements will regulate the world trade and a multilateralisation of the world's existing and emerging regionalism is required. Tovias (2008) observed that cross regionalism reduces overall economic welfare eventhough individual partner may gain independently from it. Lee, Park and Shin (2004) showed that RTAs on average increase global trade by raising intra-bloc trade without damaging extra-bloc trade. It is also shown that net trade creation effects of RTAs are substantially lower for countries participating in overlapping RTAs and there is less likely that the currently proliferating RTAs will completely merge and lead to global free trade. Freund (2000) observed free trade is the unique Nash equilibrium in which a country is always better off forming a bilateral trade agreement with every other country, irrespective of previous agreements. This suggests that each new preferential free trade agreement may be a step towards multilateral free trade.

There are number of studies that looked in to the determinants affecting the RTAs. Baier and Bergstrand (2005) found closeness of partners, remoteness, larger and similar economies, difference in capital-labour endowment ratios are important factors affecting RTAs. Holmes (2005) found countries from same continent have higher chances of signing an RTA irrespective of their importance in each others trade. Magee (2003) showed neighbouring countries are more likely to enter the PTAs but this cannot be attributed to 'natural trading hypothesis' since these agreements do not lead to more trade creation or less trade diversion. Harmsen and Leidy (1995) observed coverage of all sectors, shorter transition periods, transparent rules of origin, liberal rules of accession, no anti-dumping laws among members of PTAs and MFN liberalisation should either precede or accompany new PTAs are conditions that will lead to gains from an RTA. Venables (1999) while examining the way benefits and costs are distributed among the RTAs found that developing countries are likely to be better served by 'north south' than by 'south-south' free trade agreements.

It has been widely argued that, with the decline in trade costs (for example, transport and communication costs), the importance of distance has declined over time. Carrere and Schiff (2004) found though regional integration has a negative impact on the Distance of Trade (DOT), the countries forming trade blocs had a DOT that was growing faster or falling more slowly than that of excluded countries. Melitz .J, (2005) in the study concluded that distance does indeed increase trade along the north south dimension. Amjadi and Winters (1997) found that inter regional transportation costs are appreciably higher than intra-regional transportation costs but not sufficiently large to result in a net welfare gain for Mercosur countries.

There are studies that looked into the age of RTA and their economic outcome. Coulibalya (2004) found that for 'younger' developing RTAs (AFTA, CAN, MERCOSUR, NAFTA and SADC) first years of participation are rewarded by a positive trade and welfare effects while the 'older' ones (CACM, ECOWAS and EU) depicted a more volatile trade and welfare profiles as the number of years of participation of the members keep increasing. Magee (2007) observed the average regional agreement has significant anticipatory effects on trade flows and continues to affect trade for up to 11 years after the trade deal begins. Customs unions influence trade over a longer period of time than free trade areas. Fratianni and Oh (2007) tested the relationship between the size of regional trade agreements (RTA) and openness and found that regional trade bias declines with the size of the club. Freund and McLaren (1999) studied the dynamics of trade reorientation experienced when a country joins a regional trade bloc and stated that the joining country's trade orientation toward bloc countries typically rises along an 'S'-shaped path.

The regionalism versus multilateralism debate is central to the idea of trade liberalization and commercial policy and received lot of empirical research from academicians and policy analysts. Martin and Yanagishima, (1995) studied a 19 region global general equilibrium model with seven goods and found that non discriminatory trade liberalisation yields larger gains than discriminatory liberalisation. Farutain (1998) in his study observed that it is hard to believe that countries that are highly protectionist are willing to liberalise after joining a RTA unless they follow a more open import policy.

Vamvakidis (1999) studied regionalism versus broad liberalization in the context of member countries growth and showed that economies grew faster after broad liberalization, in both the short and the long run, but slower after participation in an RTA. Venables (2000) found that the effects of RIAs on the world trading system are not clear-cut. There is little evidence that regionalism has retarded multilateral liberalization, but neither is there support for the view that continuing expansion of regional agreements will obviate the need for multilateral liberalization efforts. Brown, Deardorff and Stern (2000) said welfare gains from multilateral trade liberalization are therefore considerably greater than the gains from preferential trading arrangements and more uniformly positive for all countries. Madani (2001) studied industrial growth of three Andean pact counties and showed that unilateral liberalization had a more positive impact on output growth, through the channel of greater imports of intermediate inputs than regional integration arrangements.

Andriamananjara (2003) showed that choosing the preferential route as the path of least resistance may lead the multilateral trading system into a vicious circle of competitive discrimination – rather that a competitive liberalization. The paper suggested "open membership" and low MFN tariffs facing the rest of the world (not necessarily to zero) among RTAs can lead to multilateral trade. Limao (2006) argued that to avoid the clash between preferential and multilateral liberalization a novel approach is required which accommodates the WTO member's desire for PTAs while simultaneously ensuring they do not slow down multilateral liberalization or at a minimum compensates non-members. Ornelas, (2003) studied whether creation Free Trade Areas undermine the progress of Multilateralism and said trade creation can reverse the support of the excluded countries to liberalization on a multilateral basis. Rose (2004) found little evidence that countries joining or belonging to the GATT/WTO have different trade patterns from outsiders, though the GSP seems to have a strong effect. Estevadeordal, Freund and Ornelas (2005) in their study found that regionalism helps the multilateral process and concern about a negative effect of regionalism on multilateralism in developing countries is overblown. It is also shown that greater the tariff preference that a country gives to its partners in a given product, the more the country tends to reduce its multilateral (MFN) tariff in that product. Nitsch and Sturm (2005) showed that RTA membership has, on average, no measurable effect on a country's trade policy.

Lee and Shin (2005) identified factors such as geographical distance, land borders, common language, and area, have significant impacts on trade creation and trade diversion and East Asian RTAs are more trade creating than trade diverting. Sally (2006) .argued hub-and-spoke pattern of FTAs that are emerging in Asia will not drive regional economic integration or further integration with the global economy as it lead to regional economic disintegration. Sulamaa and Widgrén (2005) using a computable general equilibrium model showed that global free trade is better for all regions in the investigation and the the biggest winners of global free trade are Asian countries, Brasilia and developing countries. Dee (2007) suggested greatest real income gains would come from comprehensive non-discriminatory trade reform as part of a unilateral domestic regulatory reform. The study observed for reform-weary governments PTAs are the best excuse to avoid reforms and for reform-ready governments it is a distraction from the main game. Schott (2004) in his study concluded regional blocs would provide only a 'third-best', and distinctly suboptimal, option for world trade. Plummer (2007) highlighted the difficulties of the multilateral trade negotiations and how efficient regional agreements are used to overcome it. The study has developed best practices of RTAs and verified how the existing RTAs confirm to the best practices of regionalsism in Asia.

The political economy dimention of regional trade agreements were subjected to number of empirical studies; Levy (1997) Krishna (1998) Bird and Rajan (2002) Albertin (2008) etc. Levy (1997) demonstrated that bilateral free trade agreements can undermine political support for further multilateral trade liberalization. Krishna (1998) found preferential arrangements that divert trade away from the rest of the world are more likely to be supported politically and preferential arrangements will reduce the incentives for multilateral liberalization. Bird and Rajan (2002) contended that trade-first approach to regional integration is essentially a political outcome as broadening and deepening of RTAs requires very strong political commitment and it is rarely exhibited as most RTAs are protectionist for strategic reasons. Albertin (2008) in his study showed that a country's decision to enter a regional trade agreement unambiguously undermines the incentives towards multilateral trade liberalization.

Gupta and Schiff (1997) studied the welfare implications for the excluded countries in a Regional Trade Agreements and contended that regional trade agreements among small countries may have negative welfare implications for outside countries. Yeats (1997) in his study demonstrated the potential pitfall of RTAs on members and on third countries as their trade patterns are different from current comparative advantage. Based on new trade theory, Winters (1997) analysed the welfare impacts of an RTA on non-members and argued that it depend on changes in the terms of trade, levels of output, number of firms, existing trade restrictions and induced investment effects. Winters and Chang (2000) studied Spain's accession to the EU and found that the preferred exporter will raise its pre-tariff price while the non member will reduce its pre-tariff price. Chang and Winters (2002) analysed Brazil's entry in to Mercusor and found that non-members' export prices to Brazil fell relative to their export prices of the same commodities to other markets. Borchert (2008) demonstrated empirically that different degrees of market access offered by European Union to developiong countries induces sizable trade diversion to the detriment of relatively less preferred beneficiary countries.

In addition to the trade benefits to regionalism there are studies highlighting the gains from non traditional areas in pursuing regional trade agreements. Schiff and Winters

(1999) content that regional trade agreements is part of diplomacy to reduce security tensions between neighbouring countries as trade between neighbouring countries increases trust between them and reduces the likelihood of conflict. Emphasizing the importance of non traditional gains of RTAs such as commitment, signaling and insurance mechanisms, Fernández (1997), opined RTAs can serve a useful economic purpose above and beyond the direct gains from trade liberalization by reducing such uncertainties and by enhancing credibility. Lobbying and Special interests often play a very important role on the outcome of Regional Trade Agreement. The broad framework to explain the role of special interest groups in shaping regionalism is developed by Grossman and Helpman (1995), which explains policy formations as the outcome of lobbying and contribution competition among industries. Kee, Olarreaga and P. Silva (2003) applied Grossman-Helpman (1994) model and showed very high returns (above 50 percent) to Latin American exporters' political contributions. Desker (2004) in his paper discussed the underlying security rationale for the conclusion of FTAs, highlighting the nexus between security interests and international economic policy in East Asia. Krueger (1993) worried that the establishment of regional FTAs might create beneficiaries (rent -seekers) who would form a political lobby against multilateralism. Krishna and Bhagavati (1997) showed that if two or more countries are pursuing certain non-economic objectives, they can still form a customs union between themselves and be jointly better off.

The economic size of countries joining the regional integration arrangement has been of considerable interest to economists recently (Bhagavathi and Panagaria 1996; Shiff 1996). The principal issue is whether a small country can expect to gain more from joining a large regional integration arrangement than a small regional integration arrangement. A related issue is whether trading countries that have a mutual affinity to trade with one another (natural trading partners) should expect to gain more substantially from forming a regional integration arrangement than other countries. Schiff (1999) in his study revealed that the smaller the volume (or share) of imports from the trading partner, the larger the impact of a preferential trade agreement on home country welfare. The study also suggested the home country is better off as a small member of a large bloc than as a large member of a small bloc. Schiff and Andriamananjara (1999) observed that a microstate's decision to form, expand, or join a regional organization is to reduce negotiating costs and increase bargaining power, rather than on the traditional costs and benefits of trade integration. Panagaria (1999) showed a union member loses more from a preferential liberalization if its external tariffs are higher and its import share is larger from the partner. Contrary to this, if a member exports more to the partner and the partners' tariff rates are higher, it gains more from the PTA. Scollay (2004) suggested for smallest and vulnerable countries it is critically important to continue MFN liberalization in parallel with the establishment of the FTA. Perroni and Whalley (1994) in their study explained that several of the newly negotiated Regional Trade Agreements contains significantly fewer concessions by the large countries to smaller countries than vice versa and without side payments large-small country regional agreements would not have occurred.

As regional integration gets deepened, it provides dynamic gains to participating nations. Hoekman and Konan (1999) emphasized that preferential trade agreements go beyond eliminating tariffs and quotas to eliminating regulatory and red tape costs and opening up service markets to foreign competition. Owen (1983) studied scale economies for some major EC industries and applied it to all EC manufacturing and showed cost reduction effects from achieving greater economies of scale under regional integration in Western Europe might have amounted to 3-to-6 percent of EC GDP in 1980. Brada and Mendez (1988) examined higher levels of investment and faster factor productivity growth in six integration areas and showed faster productivity effects are found only in LAFTA and CMEA while all schemes except the CMEA increased members' investment levels. But the cumulative impact of these dynamic effects over nearly twenty years is no more than 1% of members GNP. Hertel, Walmsley and Itakura (2001) found that the impacts of this new-age FTA on bilateral trade and investment flows are significant – with customs automization playing the most important role in driving increases in merchandise trade. Unlike preferential tariff cuts, the 'new age' components of this FTA promote imports from all sources, thereby eliminating the problem of trade diversion. Dee and Gali (2003) studied some of the traditional and 'new age' provisions of preferential trading arrangements (PTAs) on merchandise trade and investment using gravity models. Of the 18 PTAs studied it was found 12 have diverted more trade from non-members than they have created among members.

Schiff and Wang (2004) in a pioneering study analysed the dynamic effects of RIAs based on their impact on technology diffusion from partner and non-partner countries. It examined the impact of NAFTA on total factor productivity (TFP) in Mexico through its impact on trade-related technology transfers from OECD countries. The study found that Mexico's trade with its NAFTA partners (US + Canada) had a large and significant impact on Mexico's TFP while trade with the rest of the OECD did not. Simulation of the impact of NAFTA reveals a permanent increase in TFP in Mexico's manufacturing sector of between 5.5 percent and 7.5 percent and to some convergence to the economies of the US and Canada. There is a growing body of empirical literature that seeks to measure links between trade volumes and productivity. Coe, Helpman, and Hoffmaister (1997) estimated trade productivity links for 77 developing countries, found sizable spillover benefits of research and development in developing countries. They estimated that a one-percent increase in the import share of machinery and equipment to GDP results in a 0.3 percent increase in TFP. Frankel and Romer (1999) analysed a 98 country sample, controlling for capital inputs per worker and schooling. They found that a one-percentage point increase in the trade share of GDP increased the contribution of productivity to output by two-percentage points.

Krueger (1999) studied the trade creation and trade diversion effect of Mexican entry into NAFTA and found that fraction of Mexican trade with the U.S. and Canada has risen sharply and it is trade 'creating', and not diverting. A large number of studies in the area of regionalism were directed at examining the trade creation versus divertion effect of Regional Trade Agreements. Soloaga and Winters (2001) studied nine PTAs to compare bloc' patterns of trade before and after the second wave of regionalism and found trade diversion and export diversion in EU and EFTA. In a comprehensive review of trade flows, Crawford and Laird (2001) found that RTAs have been net trade creating for members and non members. Rose (2005) estimated the effect on international trade of three multilateral organizations intended to increase trade namely WTO (previously GATT), IMF and OECD and showed that OECD membership had a consistently large positive effect on trade, while accession to the GATT/WTO also increases trade.

Gilbert, Scollay and Bora (2001) found through gravity model and CGE approaches that there may be significant welfare gains associated with some of the new RTA proposals in the Asia-Pacific region, but they are likely to impose substantial costs on non-members.

In the context of forming South American Free Trade Area, Carrillo and Li, (2002) examined the effects of the Andean Community and Mercosur on both intra-regional and intra-industrial trade for the period 1980-1997. The gravity model showed that Andean Community preferential trade agreements had a significant effect on both the differentiated and reference products, while Mercosur preferential trade agreements only had a positive effect on the capital intensive subcategory of the reference products. Kari (2005) found that European trade is significantly influenced by various regional agreements and intensities of trade are strongly asymmetric between the regions. Bergstrand, Egger and McLaughlin (2008) examined the causes and consequences for the growth of regionalism particularly in the context of the 'latest wave' of regional trade agreements and concluded the economic benefits from EIAs are much larger than conventional ex ante economic analysis have previously suggested.

Kawai (1999) used simplified gravity model and showed that both trade creation and trade diversion dummies have statistically significant coefficients, but they were weakening during the 1990s. Urata and Okabe (2007) examined the same issue and found that FTAs bring about trade creation effect and that trade diversion effect is limited. Koo, Kennedy and Skripnitchenko (2006) examined the effects of RPTAs on agricultural trade and showed that RPTAs increase trade volume among member countries through both inter- and intraindustry trade and to a lesser degree, among non member countries thus increasing global welfare. Caporale, Rault, Sova and Sova (2008) studied FTAs between the European Union (EU-15) and the Central and Eastern European countries (CEEC-4) using gravity model with fixed effect vector decomposition (FEVD) technique to isolate and eliminate the potential endogeneity bias. The results of the study indicated a positive and significant impact of FTAs on trade flows. Liu (2004) used a gravity model to study the Trade Creation and Trade Diversion Effect on Trade between RTAs and revealed that Regional trade agreements like APEC, CER and MERCOSUR tend to promote member trade as well as trade with other trading partners from non-member countries. Cipollina and Salvatici (2006) in their study combines, explains, and summarizes a large number of results (1827 estimates included in 85 papers), using a meta-analysis (MA) approach. Despite high variability, studies consistently found a positive RTAs impact on bilateral trade and the hypothesis that there is no effect of trade agreements on trade is easily and robustly rejected at standard significance levels.

Kiyota (2006) used Michigan Model of World Production and Trade to compute potential economic effects of regional, bilateral and multilateral trade liberalization. The major findings of the study are; the effects of regional FTA are larger than those of bilateral FTA, among FTA member countries, small countries have larger benefits (in terms of the percentage of GDP) than large countries and finally, the effects of multilateral free trade are significantly larger than those of bilateral and regional FTAs. Clarete, Edmonds and Wallack (2003) used augmented gravity model to estimate the effect of various PTAs on trade flows within and across membership groupings as well as the effect of PTAs on members' trade with Asian countries and showed PTAs have augmented trade in Asia. Lee and Park (2005) showed East Asian FTA will likely be a building block for a global FTA if it takes the form of deeper integration in close consultation with existing multilateral institutional frameworks such as APEC and WTO.

Cabalu and Alfonso (2007) used variation in growth trends and the shift-and-share methodology on intra- and extra-regional commodity trade and shown that the ASEAN Free Trade Agreement for the ASEAN-6 was trade creating rather than trade diverting.

Ismail, Smith and Kugler (2007) studied the trade creation and diversion effect of AFTA and showed that trade creation among the ASEAN5 is enhanced after the establishment of AFTA. There is no evidence of trade diversion in pre-AFTA analysis but there is strong evidence of this during the post-AFTA period.

The large number of bilateral free trade agreements that came out recently also subjected to empirical testing. Klausing (2001) found establishment of Canada – US Free Trade Agreement had substantial trade creation effects, with little evidence of trade diversion. Roberts (2004) used the gravity model to study China-ASEAN Free Trade Area (CAFTA) and demonstrated that more developed CAFTA economies have a crucial role to play if integration is to benefit the less-developed economies. Tongzon (2005) looked the likely impact of the establishment of a FTA between China and Asean and showed there are economic opportunities for ASEAN from the FTA as China imports a significant portion of its input requirements, particularly raw materials and industrial components and agricultural products from ASEAN. Yihong and Weiwei (2006) applied Export Similarity Index to examine China's export potential to ASEAN market and found China ASEAN FTA had a significant positive effect on bilateral trade volume. Hertel, Walmsley and Itakura (2001) used a modified version of the dynamic GTAP model to evaluate the new age provisions of RTA between Japan and Singapore and found that they have significant impacts on bilateral trade and investment flows, with customs automization playing the most important role in driving increases in merchandise trade.

Bhattacharya (2006) studied the prospects of regional cooperation in trade, investment and finance between BIMSTEC countries and Japan and found that it will increase intraregional trade but Japan gains the most from it. Liu (2004) analysed the desirability of forming a bilateral free trade agreement between China and Australia and showed clear benefits for both Australia and China from a bilateral free trade agreement. Wang (2006) argued that regional economic integration in Asia should first realize sub-regional integration between East Asia and South Asia, among which the most important one should be a China-India FTA. Bhattacharya (2004) used a gravity model and simulation method to show the increase in India-Bangladesh bilateral trade under four hypothetical scenarios of tariff rate cuts. The results showed that in a free trade regime, the increase in India's exports will be more than the increase in its imports from Bangladesh. The trade potential between Brazil and India using Balassa's Revealed Comparative Advantage Index was done by Fonseca, Azevedo and Velloso (2005 for three-year period between 2000 and 2002. The results suggested low complementarity between the supply and demand of the two economies, which is one of the main reasons for low volume of bilateral trade. Pradhan, S.R (2006) used augmented gravity model to estimate the magnitude of India's export potential to the six-member Gulf Cooperation Council (GCC) countries who are currently negotiating a Free Trade Agreement (FTA). The result showed that the magnitude of India's export potential is highest with Oman, followed by Qatar, Bahrain, and Kuwait and there is no export potential with UAE, and Saudi Arabia.

Bhattacharya and Bhattacharyay (2007) studied the likely benefits of India - China FTA by identifying trade complementarities and potential using gravity model. Empirical results showed that in the short run India's potential gain is relatively less compared to China (because of its high tariffs) but in the long run, India's gains are higher than China (once tariffs are at par) . Free trade arrangement is a win-win situation for both countries and is consistent with their growing dominance in the international trade. The review of the studies showed most of the RTAs are creating trade for the participating countries.

2.3. Econometric and Specification Issues in Gravity Model

The econometric dimension of the Gravity model and specification issues attracted large number of studies ever since it was first used by Tinbergen. James Harrigan (1994) in his study highlighted specification issues related to gravity model such as use of zero observations, over prediction of trade volume, distance as proxy for trade costs, non unitary trade elasticity, difficulty in using CES model and prevalence of monopolistic competition and/or scale economies. Cardamone (2007) reviewed the empirical literature on gravity model and said the use of dummy variables to proxy PTAs can be misleading. Also there are bias in econometric estimation such as unobserved heterogeneity, endogeneity of some regressors and zero-trade flows affecting the reliability of results. Jensen (2000) asserted that Gravity models may not be appropriate to describe trade patterns for groups of countries of all income levels. The paper suggested two modifications namely disentangling the output and income share effects when considering the determination of trade flows and the use of disaggregated production data rather than GDP as a measure of production for the exporting countries. Ryrfeldt, Sundblad (2006) in their thesis evaluated the predictive ability of the gravity model and found that the gravity model results are poor in making predictions about future trade flows. This is due to specific and ad-hoc nature of the model and the inability to explain trade re-orientation.

Coulibaly (2007) used gravity model with kernel estimation techniques so as to capture the non-monotonic trade effects while imposing minimal structure on the model. Kandogan (2004) emphasized use of modified Gravity model for better model specifications by removing unnecessary constraints on the parameters of the model. Porojan (2000) revisited the popular gravity model of trade in the light of spatial econometrics and stated that when the inherent spatial effects are explicitly taken into account, the magnitude of the estimated parameters changes considerably and, with it, the measures on the predicted trade flows. Agostino, Aiello and Cardamone (2007) used an alternate methodology to overcome data aggregation and econometric specification bias faced by non-reciprocal preferential trade policies (NRPTPs). Data aggregation problem was tackled using evidence based on three levels of data aggregation (total exports, total agricultural exports and 2-digit) and specification problem with estimation methods that take into account the unobservable country heterogeneity, endogeneity of trade preferences and the potential selection bias which zero-trade values. Henderson and Millimet (2008) estimated gravity models in levels and logs to identify appropriate functional form between parametric and non parametric estimation. The study showed parametric models based on assumptions offer equally or more reliable in-sample forecasts (sometimes) and out-of-sample forecasts (always), particularly in the levels model and statistically significant. Thus, concerns in the gravity literature over functional form appear unwarranted, and estimation of the gravity model in levels is recommended.

Cheng and Wall (2005) compared various specifications of the gravity model and observed that unless heterogeneity is accounted for correctly, gravity models can greatly overestimate the effects of integration on the volume of trade.The study used bilateral country-pair fixed effects to control for heterogeneity. To overcome specification problems of standard gravity model, Cheng and Ying-Yi Tsai, (2005) constructed a heterogeneous trading-pair (HTP) model in which both the conventional gravity variables and price-effect variable are included. Harris and Matyas (1998) accounted for simultaneity bias in the gravity models and presented results of a random effects gravity model. It is important to properly specify the model, in terms of source, target and business cycle effects to get accurate results. Krishnakumar, (2002) postulated a gravity equation for each traded good rather than for the aggregate volume of bilateral trade and estimated a model incorporating correlated explanatory variables, presence of panel data effects and autocorrelated disturbances. Baier and Bergstrand (2005) addressed the endogeneity problem of FTAs using instrumental variable (IV) techniques, control-function (CF) techniques, and panel-data techniques. According to the study IV and CF approaches did not adjust for endogeneity well, but a panel-data approach corrected endogeneity problem and the empirical results showed the effect of FTAs on trade flows quintupled. Teresa L. (2002) used instrumental variables technique to overcome endogeneity of income in the gravity model.

In their paper, Sanso, Cuairan, and Sanz (1993) questions the loglinearity of the gravity model and concluded the optimal functional form is slightly, yet statistically, different from the loglinear form in every year of the sample and proposed a general functional form through Box-Cox transformations. Silva and Tenreyro (2003) explains estimating economic relationships in logarithms can lead to significant biases in the presence of heteroskedasticity and proposed an appropriate estimator. Loungani, Mody and Razin (2002) used 'transactional distance' to overcome distance puzzle and showed that trade and investment flows increase as 'transactional distance' falls. Cees van Beers (2000) showed specification of the distance-variable in the standard gravity model estimated on a widely dispersed sample affects the estimates of economic integration dummies. It results in a positive (negative) bias in the estimates obtained for the economic integration dummies for countries located at relatively large (small) distances from each other. Polak (1996) criticized the gravity model for misspecification and use of physical distance as a trade resistance term. The author suggested inclusion of a country dummy with a free coefficient, such as Linnemann's Location Index can overcome the problems associated with the use of physical distance.

In order to overcome zero flows Linders and De Groot (2006) employed various approaches and showed that the simplest solution of omitting zero flows from the sample often leads to acceptable results, although the sample selection model is preferred theoretically and econometrically. Westerlundy and Wilhelmssonz (2006) showed the usual log-linear estimation method can result in highly deceptive inference when some observations are zero. The study suggested Poisson fixed effects estimator which can perform well in small samples. Bun and Klaassen (2002) showed static models are misspecified and extended the static model by including lags of the regressors and lags of trade to get dynamics. They also showed that the simple Least Squares Dummy Variable (LSDV) estimator, which is typically used in static panels, yields accurate estimates for dynamic model and outperforms the popular Generalized Method of Moments (GMM) estimator of Arellano and Bond (1991). Benedictis and Vicarelli (2005) used gravity equation with a system GMM dynamic panel data approach and showed that gravity forces and "persistence effects" matter in the analysis. Egger (2000) specified three problems associated with the estimation of the gravity model such as i) misspecification ii) comparing estimation results between different economic concepts pertaining to different time horizons iii) trade potential of insample prediction approach. McPherson and Trumbull (2008) found Hausman-Taylor method is superior as it eliminates the heterogeneity bias that plagues OLS and the correlation between unobserved country-specific effects and the individual error term, which introduces bias in random-effects estimation. The study felt unlike fixed-effects estimation, the Hausman-Taylor method allows for the inclusion of time-variant explanatory variables and does not necessitate the ad hoc estimation of country-specific effects in out-of-sample projections.

Pleumper and Troeger (2006) used a three-stage fixed effects vector decomposition model for the estimation of time-invariant and rarely changing variables in panel data models with unit effects. The study juxtaposed vector decomposition technique against the random effects model, pooled OLS and the Hausman-Taylor procedure and demonstrated that it provided the most reliable estimates under a wide variety of specifications common to real world data. Lee (2008) used fixed effect estimators (FE) based on the Hausman test to overcome endogeneity bias in a panel data gravity model. To avoid unobservable omitted variables, the study experimented with country-pair fixed effect, country-pair fixed effect combined with time dummy, and time-varying country dummies. Baldwin and Taglioni (2006), generalized Anderson-Van Wincoop's multilateral trade resistance factor (which only works with cross section data) to allow for panel data and then showed that time-varying country dummies with omitted determinants of bilateral trade being dealt with by time-invariant pair dummies. Carrere (2003) used panel gravity model specification derived by Baier and Bergstrand (2002) with the addition a barrier-to-trade function and three dummy variables for each RTA considered (intra-trade, imports and exports dummies. Serlenga and Shin (2004) used extended panel data framework and highlighted the importance of allowing for a certain degree of cross section dependence through unobserved heterogeneous time specific common effects for better estimation.

2.4 Regional Integration Studies based on Gravity Model

Gravity model is the most widely used method to ascertain the impact of Regional Trade Agreements across the world. Rose (2004) using a gravity model estimated the impact of protectionism on trade performance and observed that Trade barriers have economically significant effect on trade, lowering trade by almost half in South Asia and the Caribbean, and almost a quarter in the other two regions. The results also indicated that Sub-Saharan Africa and (especially) East Asia trade disproportionately more than expected from the gravity model. Martinez Zarzoso, Lehmann D., and Horsewood (2005) investigated the impact of regionalism on intra or/and extra blocs international trade taking into account time and country heterogeneity and tested whether a dynamic model is preferred to the traditional static specification of the gravity model. The results indicated that the variables traditionally included in the gravity equation are statistically significant and highlight the role played by intra and extra-bloc effects.

Martinez Zarzoso and Lehmann (2003) through a panel data analysis identified factors such as infrastructure, income differences and exchange rates as important determinants of bilateral trade flows between Mercosur and European Union. The study also found that fixed effect model is to be preferred to the random effects gravity model. Zarzoso and Horsewood (2005) estimated trade potentials using a dynamic panel data approach with Blundell and Bond's (1999) system-GMM estimator and showed that the new wave of regionalism in the 1990s has had positive effects on intra-bloc trade, (EU and NAFTA) and also indicating some evidence of import diversion effects (CACM and CARICOM, MAGREB and MASHREK). Benedictis and Vicarelli (2004) used an in-sample trade method to estimate trade potential using panel data different specifications of the gravity model. The study found estimation of a gravity equation through a dynamic estimator instead of a static one, generally give fitted value close to historical values. Secondly, the choice of the estimator (static or dynamic) is very important in drawing policy guidelines from a gravity equation. Helmers and Pasteels (2005) used International Trade Center's (ITC) econometric gravity model, *TradeSim* (third version) and showed a high untapped trade potential for South Africa's overall exports to the US. Sohn (2005) based on the gravity model showed that South Korea's trade follows a Heckscher–Ohlin model more than an increasing returns or a product differentiation model. South Korea has large unrealized trade potentials with Japan and China, suggesting that they are desirable partners for an FTA.

Kien and Hashimoto (2005) used Hausman-Taylor (HT) estimation technique of panel data gravity model to study the economic impact of the ASEAN Free Trade area. The study revealed that AFTA produced only trade creation among its members and the trade facilitation policy is important to meet the targets of the FTA. Lee and Park (2007) measured the impact of trade facilitation on trade and showed RTAs with better trade facilitation measures are more likely to be trade-creating, less likely to be trade diverting, and are thus more likely to lead us toward global free trade. Cernat (2001) showed that a large number of African RTAs are not trade diverting but trade creating, both with regard to intra- and extra-RTA trade and regional trade agreements are fully justified if members acting together can reduce not only tariffs but also their overall trade barriers through trade facilitation measures. Rahman, Shadat and Das (2006) used panel data gravity model with country-pair specific as well as year specific fixed effects and shown that RTAs covered are net export creating. More than one third of the members of these RTAs are found to be positively affected by joining the RTAs.

Bhattacharyya and Banerjee (2006) applied the panel data gravity model to India's yearly bilateral trade data with all its trading partners in the second half of the twentieth century. The study came out with important conclusions: India's trade responds less than proportionally to size and more than proportionally to distance, Colonial heritage is still an important factor in determining India's direction of trade, India trades more with developed rather than underdeveloped countries and size has more determining influence on India's trade than the level of development of the trading partner. Batra (2006) estimated trade potential for India using the augmented gravity model approach and showed India's trade potential is highest with the Asia-Pacific region followed by Western Europe and North America. India's trade potential is revealed to be highest with Pakistan in SAARC and with Philippines and Cambodia in the ASEAN and with Oman, Qatar and Kuwait in the GCC. Nag and Nandi (2006) explored India's trade dynamics in the SAARC region using Gravity model and tested "natural trading partners" hypothesis on the success of South Asian trading bloc. The paper showed that in spite of an increasing trade complementarity between SAARC members, the members are moderate natural trading partners. Walsh (2008) used Gravity model with Hausman- Taylor estimation technique to find out the determinants of trade in services. The study showed standard gravity framework explains trade in services well and the results are similar to those found in trade in goods.

2.5 Studies relating to ASEAN

Ng and Yeats (2003) studied the intra industry trade and production sharing in the East Asian region and found that intra-trade has had a major positive influence on regional cooperation and growth in East Asia. Since the mid-1980s, East Asian intra-trade has been growing at a rate roughly double that of world trade, and at a rate far higher than the intra-trade of NAFTA or the European Union. Tran Van Hoa (2003) extended gravity model to time-series data and applied a new flexible modelling approach to construct a simultaneous-equation model of trade and growth for the ASEAN and the East Asia. The study showed that East Asia 3 plays an important part in improving ASEAN's growth; there is sufficient empirical basis to push for bilateral regional FTAs such as ASEAN+Japan, ASEAN+Korea and ASEAN+China. Sohn (2002) explained intra-regional trade and investment in East Asia has increased during the last few decades and accelerated since 1990s maily due to active and connecting roles of newly industrializing economies (NIEs) and concentrated FDI flows within the region. The concentrated FDI Flows have led to the internationalization of production networks, of which ethnic Chinese networks have been particularly significant. Gavin (2006) looked in to the effect of rapidly growing RTAs on regional integration and trade liberalisation and the prospects of trade creation in East Asia. The study observed that service sector can give more welfare gains to RTAs as applied tariff in manufactured products in East Asia is very low.

Tran Van Tho (2002) assessed the trade effect of AFTA and said while AFTA is contributing to the increasing confidence and stability of ASEAN countries, its effects on the development of these countries are not as important as the interdependence and dynamic division of labor between ASEAN and other economies in East Asia. Cabalu and Alfonso (2007) found that AFTA had trade creation effects, with little evidence of trade diversion. This is mainly because major import sources for ASEAN member countries are outside the region and ASEAN countries having similar production and trade structures and would source most of their diverse imports from the rest of the world. Lendle (2007) investigated empirically whether the ASEAN Free Trade Agreement had a building bloc or stumbling bloc effect on subsequent changes in MFN tariffs of four major ASEAN members. The study found significant building bloc effect for Indonesia, Philippines and Thailand as MFN tariffs of preferential products were reduced by more than for non-preferential products. For Malaysia the results emanated from the study are ambiguous. This suggests that overall the ASEAN Free Trade Agreement has rather helped than hindered nondiscriminatory trade liberalization.

Cheong (2008) used Fixed Effects Poisson Quasi-Maximum Likelihood estimator to study changes in trade patterns of ASEAN at the Harmonized System (HS) six-digit level in the period 2001 to 2003. The estimates from the study showed that ASEAN preferential margins had a trade-creating effect at the product level and majority of ASEAN countries benefited significantly from this trade creation. These results suggested ASEAN trade liberalization in the early 2000's had positive welfare effects. Hapsari and Mangunsong (2006) used an augmented gravity equation with two indices namely the 'complementarity index' and the 'similarity index' to study trade flows of AFTA on members and non-members and showed that gravity variables are consistent with many previous studies with some trade diversion. Damuri, Atje and Gaduh (2006) studied the regional integration process and the resultant Trade Specialization in East Asia. The study observed that there is no indication of a "low-productivity specialization trap" as all East Asian countries that were studied shown a trend towards specializing in products with higher sophistication and technological intensity. Sanidas (2009) calculated RCA for the 100 largest countries in the world, taking 14 different important industrial sectors and showed that for East and South East Asia, there is substantial competition for 2-3 industries such as IT and electronics and showed countries with particular RCAs are at a particular stage of development as proposed by Rostow and others.

Jayanthakumaran and Sanidas (2005) found ASEAN -5 emerged as a powerful integrated area due to unilateral, preferential and regional trade liberalisations. The ASEAN relied both outward orientation and positive aspects of regionalism as they are complementary with each other. Economist Intelligence Unit (2007) studied the export performance of ASEAN and Asia and contended that ASEAN's trade is becoming more globally integrated in the recent time with trade growing faster than GDP. The study highlighted China has had a profound effect on trade in ASEAN and Asia and visualized India is emerging as an important trading partner in Asia, but Japan's importance as a trading partner has declined in Asia. Menon (2007) in his study suggested that if members pursue open regionalism and offer their trade and other preferences to nonmembers on a nondiscriminatory basis, then this is consistent with the principles and objectives of multilateralism.

Sakakibara and Yamakawa (2003) in their paper looked at the future role of regional institutions, the prospects for a regional role in promoting trade and FDI, and the possibilities for financial and monetary cooperation for the growth and stability of its member economies. Yoshimatsu (2002) examined the development of regional economic integration in the ASEAN region and observed that foreign MNCs operating in small local markets seek larger markets to achieve an efficient production level, seek preferences for regional economic arrangements, and these preferences function as critical factors promoting regional economic integration. In the context of rising regionalism and tensions in multilateralism Low, (2003) observed that ASEAN regionalism became indecisive and ambivalent to the challenges of rising Asian regionalism after Asian crisis. The paper concluded that while improving multilateralism and the WTO remain the first best option, it is imperative to ensure that regional trading arrangements play a complementary and supplementary role. Panagariya (1994) examined whether East Asia pursue the regional route to sustain growth in the region argued that the costs of such sub-regional preferential trading schemes outweigh their benefits.

Thornton and Goglio (2002) asserted that South East Asia exhibits a regional bias towards intra-regional trade which is higher than EU and less than NAFTA. Gravity model result showed that apart from economic size, geographic distance and common language, re-exports and membership of ASEAN have been important factors promoting intra-regional trade in East Asia. Guangsheng (2006) discussed the performance of ASEAN Economic Integration and observed the performance of ASEAN economic integration is modest due to deep rooted concept of sovereignty and limited market scale of internal regional market. Unless these two issues are addressed progress of ASEAN economic cooperation will not change dramatically. Feridhanusetyawan (2005) in his paper described the proliferation of PTAs in Asia Pacific region, its characteristics and implementation and assesses their potential effects. Realizing the potential gains from Asia-Pacific PTAs required a commitment to liberalize sensitive sectors, maintain consistent provisions, and prompt enforcement of agreements and reducing administrative complications.

Llyod and Smith (2004), in their study explored the methods to achieve ASEAN Economic Community. It required elimination of both border and beyond – the –border measures that discriminate against foreign goods or persons, the harmonization across the boarders of standards, laws and regulations that inhibit trade. CEPII (2007) study used simulation methods to study East Asian integration between ASEAN and four main Asian countries namely Japan, Korea, China and India covering all goods and services. The simulation results showed that trade liberalisation produces significant effects for the parties involved and excluding the "sensitive" agricultural products from the liberalisation reduces the gains of integration for ASEAN by more than a third. Simulations showed that ASEAN would derive more from a hub and spokes agreement in which it would be the only one to have free access to the markets of the region's large economies. Bchir and Fouquin (2006) used CEPII'S CGE model (MIRAGE) and simulated for four different scenarios to get the welfare implications. The simulation results showed ASEAN can benefit most by forging separate bilateral negotiations within the region and to include agricultural products as it will give ASEAN easier access to its main natural partners. For India, a gradual involvement in a process of liberalization is recommended as there are higher levels of protection.

Mohanty and Pohit (2007) used simulation exercise based on a monopolistic version of Computable General Equilibrium (CGE) to identify ideal group formation and integration scheme that would benefit ASEAN the most. When India joins the ASEAN+3, the absolute level of welfare of the caucus rises between 30.5 per cent to more than 34 per cent depending upon the level of liberalization. Park (2008) quantitatively evaluated the likely impact of proposed East Asian RTA strategies on the East Asian economies and the world economy using a multi-country and multi-sector CGE model. The study found expansionary ASEAN+3 RTA can be a sustainable Pareto efficient policy option because the members' gains were significantly positive and evenly distributed, positive world welfare and the insignificant negative effect on nonmembers.

Kawai (2007) examined East Asia's economic architecture and suggested policy directions for greater regional economic cooperation in the region. These include consolidation of multiple, overlapping FTAs into a single East Asian agreement, achieve "deep, WTO-plus" integration and exchange rate policy coordination by financial authorities. Kawai and Wignaraja (2008) argued for the consolidation of multiple and overlapping FTAs into a single East Asian FTA as it can mitigate the harmful noodle bowl effects of different ROOs and standards. The paper suggested the consolidation at the ASEAN+6 level which would yield the largest gains to East Asia among plausible regional trade arrangements—while the losses to non-members are relatively small. For this to happen ASEAN must deepen economic integration, the plus-three countries (PRC, Japan, and Korea) need to collaborate more closely, and India needs to pursue further structural reforms. Lee and Park (2005) in their study tried to identify the appropriate form of a regional trading agreement in East Asia and concluded that ASEAN-3 would be the natural policy choice for the formation of a regional trading agreement in East Asia as it is based on the principles of open regionalism and multilateralism and called for a formal institutional framework to strengthen the relationships. Batra (2006) made a study to evaluate the most efficient approach to regional economic integration in Asia and emphasized there is efficiency of a prior alignment with ASEAN for all the plus four economies. Kumar (2005) called for a JACIK approach to East Asian integration as a preferred option over the ASEAN+3 approach. Financial and monetary policy cooperation in the region has the potential to augment production capacity, provide energy security, enhance infrastructure development and cooperation in core technologies such as ICT and biotechnologies.

The BOAO report (2007) called for the establishment of Pan-Asian FTA preferably from the ASEAN+3 FTA by including India and CER countries to maximize the potential benefits of FTAs in East Asia. The model simulations have confirmed that North Asia and ASEAN would gain most in an ASEAN+3 FTA, an ASEAN+6 FTA, and an Asia-wide FTA. Rana (2005) studied economic cooperation between south Asia and East Asia in the context of the Pan Asian Economic integration and observed that there exists significant complementaries between two regions. These include expansion of markets for goods and services and economies of scale, lower prices from increased competition, FDI, technology transfer and increased productivity, deeper integration among partners and cooperation on infrastructure and trade facilitation. Chew (2005) in his paper presented three strategic models for more intensified economic and monetary cooperation between ASEAN+3 and India. Either an intertwining web of free trade agreements consolidating an ASEAN+3 FTA, or a Japanese investment-led model, or a China/India inspired east Asian growth and consolidation model could be used to effectively integrate the region, though unlike Europe, the model would be more functional than institutional. Soesastro (2005) observed ASEAN Economic Community (AEC) can only be achieved if there is a clear blueprint, which identifies the end goal, the process to reach the end goal and a framework for proper assessment of the costs and benefits of an ASEAN Economic Community. AEC should not be based on the AFTA in which an agreement was reached first and the details negotiated afterwards earning it the nickname of Agree First Talk After.

Manchin and Pelkmans-Balaoing (2007) suggested that preferential tariffs favorably affect intra-regional imports only at very high margins (around 25 percentage points) and there will be high administrative costs attached to the exploitation of preferences, particularly with regard to the compliance with AFTA's rules of origin. Menon (2000) examined the impact of widening and deepening of the ASEAN Free Trade Area (AFTA). Widening of AFTA led to its membership grow from 6 to 10 and increased its diversity with the emergence of a two tier structutre of developed and underdeveloped segments. With regard to deepening of AFTA, apart from harmonizing customs procedures and tariff nomenclature and the fast tracking a common customs valuation method there has been limited progress achieved. Rana (2006) pointed out that increasing trade and financial integration in East Asian region is now starting to lead to a synchronization of business cycles in a selected group of countries, further enhancing the case for monetary integration among these countries. Plummer and Wignaraja (2007) in their study looked in to the desirability of having monetary union in East Asia or having expanded free-trade areas (FTAs) in the region. The study concluded that, at present, the postsequencing of economic integration in Asia is developing such that trade agreements will ultimately complement the movement toward financial and monetary integration. Kim and Lee (2008) examined the real and financial integration in East Asia and concluded that the degree of regional financial integration within Asia is far smaller than the degree of global financial integration and financial integration lags real integration.

Dennis and Yusof (2003) developed an overall index to measure ASEAN economic integration combining the intra-ASEAN trade and intra-ASEAN foreign direct investment indices. It showed a mixed record on ASEAN integration in the 1995-2000 period, mainly due to a sharp decline in intra-ASEAN investment following the 1997 financial crisis. Shepherd and Wilson (2008) found that trade flows in Southeast Asia are particularly sensitive to transport infrastructure and information and communications technology and the region stands to make significant economic gains from trade facilitation reform. Estimates suggested that improving port facilities in the region alone could expand trade by up to 7.5 percent or $22 billion showing larger gains for trade facilitation measures to comparable tariff reforms.

Sen (2007) analysed the implications of ASEAN's ongoing FTAs which range from limited to highly comprehensive and examined its role in fostering deeper economic integration in Asia. The study felt the emerging Noodle Bowl phenomenon in ASEAN result in potential trade diversion away from the spokes towards the emerging hubs and inefficient utilation of scarce negotiating resources. The paper concluded that ASEAN require institutional and legal infrastructure for economic integration and should pursue unilateral liberalization and simultaneously implement multilateral trade policy to get desired result.

Shresta and Hasebe (2006) studied the degree of economic integration in East Asia and observed their degree of dependence on Japan decreased over the period, but continue to depend heavily on rest of the world including USA and EU. Mahani (2002) observed that Asian crisis slowed the integration efforts in ASEAN and asserted that it needs to be strengthened and expanded through production network to attract investment and liberalizing its service sector. Presently more efforts are made on trade facilitiation whose impacts are felt in the long run only. Plummer (2006) surveyed the EU-ASEAN trade and Investment relationship and suggested how the EU Experience might assist ASEAN as it develops its financial system and new forms of financial and monetary cooperatrion in the wake of the Asian crisis. Fukase and Winters (2003) in their study examined the dynamic effects of regional integration when a new member country joins AFTA. The study showed that AFTA accession like to offer better access to foreign knowledge, while trade liberalization is likely to stimulate the returns to capital which in turn stimulates investment.

2.6 Studies related to India- ASEAN trade

Kumar (2002) in his paper suggested India and East Asian countries need to deepen their ongoing cooperation further and create an Asian Community which could emerge as the third pole of the world economy after NAFTA and the EU. By forming credible schemes of regional economic integration, Asia will be able to seek its due place in the global economic governance and contribute to building a more democratic and multipolar world economy. Asher and Sen (2005) argued that India's unilateral liberalization policies and its Look East Policy has resulted in greater integration with the rest of Asia than is commonly realized or acknowledged. If Asia is to increase its economic and political weight in the world affairs, India's involvement would have to be an integral part of the Asia-wide cooperation. Rajen (2003) outlined India's manufactured exports as a whole have stagnated when benchmarked against East Asia and India has largely been left out of the production-sharing process. If India is to become a manufacturing powerhouse it needs to take steps to integrate more effectively and intensively with the rest of East Asia and become an important participant in the regional and global division of labour. Saqib and Taneja (2005) attempted to study the non-tariff barriers that Indian exporters face while exporting to ASEAN countries and found that the incidence of non-tariff measures imposed by ASEAN has increased during 1997-98 to 2002-03.

Karmakar (2005) studied the India – ASEAN cooperation in services and suggested that at least in the medium term, there is a lot to be gained from a bilateral engagement between India and the Members of ASEAN in services. The areas where significant mutual interests seem to lie are: finance, education, health, IT & telecommunication, transport (including infrastructure), movement of professionals and other business services. Asher (2006) in his study suggested that while India and some of the other Asian countries are competitive in some areas, there are also considerable opportunities for cooperation between them. So it is important for the Indian establishment, including the media, contribute constructively and purposely to improving perceptions about India in the rest of Asia, and to promote India's strategic interests. Okamoto (2005) in his paper studied the economic impact of economic cooperation between ASEAN, China and India and said promotion of economic cooperation between ASEAN and India may make sense in the long run, but its immediate impact on both sides seems to be limited. This is because the success of India continues to depend on the services sector and there is still very little intra-industry specialization between ASEAN and India. Zhang (2006) examined the India's Look East Policy (LEP) by exploring its links with India's reforms, growth prospects and integration with East Asia. The paper called for some policy interventions such as opening its market wider to competition, revamping its rigid labour laws, and transforming the role of its government to provide better services to markets and society to accelerate the potential cooperation. India's reform would trigger a new round of economic reform and liberalisation in East Asia and both impacts would help economic integration between India and East Asia.

Mattoo and Subramanian (1999) argued that India should engage more actively in the multilateral trading system and listed four important reasons for this namely facilitating domestic reform, commitment to good policies, securing market access rights and as a bulwark against regionalism. The study said proliferation of regional agreements is having a serious impact on India's trade and suggested India should align itself with countries that press for sound open policies. Panagariya (2004) in his paper identified reasons for persuing RTAs by India, the pros and cons of following FTA policies and the pragmatic approach India can take given the circumstances. If India wishes to maximize the strategic advantage from FTAs, it must work towards the creation of an Asia wide FTA and keep non-trade issues outside of its FTA agreements. The potential risks for India from an FTA policy is its high external trade barriers, adverse effect on autonomous non- discriminatory liberalization and delay in multilateral liberalizations.

2.7 Major Findings

A careful review of the literature showed that the issue of trade creation and trade diversion is not resolved decisively yet. The issue of complementarity and substitutability between regionalism and multilateralism is also complicated. The magnitude of the impact of RTAs is not uniform. Certain methodological issues like nature of analysis, model specifications, and functional forms need further exploration. How regionalism influences multilateral liberalization, collective bargaining and trade negotiations are becoming increasingly important for developing countries. India's experience with regionalism is relatively limited and India cannot ignore the changing realities.There are large number of studies which have explored the trade creation and trade diversion effects of RTAs, but studies that look in to the impact of RTAs on a non member country like India is missing. India's changing trade with major trading blocks is not well explored. With the growing number of RTAs, what should be India's strategic response to avoid trade diversion needs more attention. Dynamic changes such as scale economies, FDI, and competition effects need more attention. In this context, the present study is directed to look in to the above mentioned issues.

CHAPTER- III

ECONOMIC AND TRADE PROFILE OF ASEAN AND INDIA

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Economic cooperation between nations can be developed, fostered and strengthened only if the underlying characteristics of the economy, trade structure and the inherent strengths of the economy are clearly identified and mutually beneficial actions are pursued actively. For this purpose the chapter systematically compiled profile of ASEAN and Indian economies, its economic characteristics, level of economic development, the composition and direction of trade so as to explore the possibility of economic cooperation between these important regional partners of Asia. For a methodical treatment and analytical clarity, the chapter is divided in to four parts. The chapter begins with a broad outline of the performance of the world economy in the 21st century with emerging trends and progress of major regions and products in international trade. The proliferation of large number of RTAs and the share of intra regional trade in World trade is also discussed here. The second section traces the evolution of ASEAN as regional trading group with its economic and trade performance over a period of time. Indian economy experienced structural transformation after initiating economic reform measures in the nineties and rapidly becoming a major driver of growth in the world economy. The economic and trade performance of India are discussed in the third section of the chapter. The last part deals with the trend, progress, extend and the potential areas of economic cooperation between India and ASEAN.

3.1 Performance of the World Economy

The world GDP grew at 3.4 percent in 2007 which is lower than the previous year growth of 3.7 percent. The GDP growth rate of developing countries and CIS are higher than the developed regions of the world with China and India leading the list with impressive growth rates. World merchandise trade had grown more than world output growth during the last three years. But the deceleration of demand in the developed countries slowed down expansion of international trade in 2007. As a result world merchandise exports grew in real terms by only 5.5 percent compared with 8.5 percent in 2006 (WTO, 2008). For the 2000-2007 period, exports on average increased by 2.7 percentage points faster than real gross domestic product.

Table: 3.1 GDP and Merchandise Trade by Region 2005-07

(Annual Percentage Change at constant prices)

Region	GDP			Exports			Imports		
	2005	2006	2007	2005	2006	2007	2005	2006	2007
World	3.3	3.7	3.4	6.5	8.5	5.5	6.5	8.0	5.5
North America	3.1	3.0	2.3	6.0	8.5	5.5	6.5	6.0	2.5
South and Central America	5.6	6.0	6.3	8.0	4.0	5.0	14.0	15.0	20.0
EU-27	1.8	3.0	2.7	4.5	7.5	3.0	4.0	7.0	3.0
CIS	6.7	7.5	8.4	3.5	6.0	6.0	18.0	21.5	18.0
Africa and Middle East	5.6	5.5	5.5	4.5	1.5	0.5	14.5	6.5	12.5
Asia	4.2	4.7	4.7	11.0	13.0	11.5	8.0	8.5	8.5
China	10.4	11.1	11.4	25.0	22.0	19.5	11.5	16.5	13.5
Japan	1.9	2.4	2.1	5.0	10.0	9.0	2.5	2.5	1.0
India	9.0	9.7	9.1	21.5	11.0	10.5	28.5	9.5	13.0
Newly Industrialised Economies	4.9	5.5	5.6	8.0	12.5	8.5	5.0	8.5	7.0

Source: World Trade Report, 2008

Exports of manufactured products expanded by 7.5 per cent in volume terms in 2007, maintaining its lead over both agriculture and fuels and mining products, which grew by 5 per cent and 3 per cent respectively. The deceleration in trade in manufactured products from the 10 percent level achieved in 2006 is partly due to the slowdown of activity in major importing economies. Asian exports of manufactured products expanded by 13.5 per cent in 2007, but North American and European exports increased by only 4.5 per cent and 4 per cent respectively, almost half their 2006 rates. Spurred by a 14 per cent growth in prices, agricultural exports expanded by 19.5 per cent in dollar terms in 2007, the highest growth rate since 2000.

The concept of intra- regional trade is useful to see how intensely trade is taking place within a geographical region and also an important indicator for studying the degree of regional integration. The three dominant regions of the world namely Europe, North America and Asia are having higher intra regional trade. The intra-regional trade is 71.2 percent in Europe, 37.8 percent in North America and 57.4 percent in Asia. Of the total world trade 42.4 percent in taking place in Europe, 27.4 percent in Asia and 13.6 percent in North America. The inter-regional trade is higher than the intra-regional trade for South and Central America, Africa and Middle East. The intra-regional trade for South and Central America is 27.1 percent whereas there trade share with North America is 29.0 percent. Similarly CIS have the intra-regional share of 26.0 percent which is lower than their trade with Europe (47.7 percent). Africa's intra-regional trade is 11.4 percent, but their trade share with Europe is 41.6 percent, North America, 7.7 percent and Asia, 25.7 percent. It is also revealed from table-2.3 that Asia is emerging as strong exporter across the regions of the world with large export share.

Intra regional trade account for a higher share of world trade compared to inter regional trade and since 2000, this share has fluctuated between 55 to 58 per cent. Relatively large differences have occurred in the growth of trade within regions: North America and Asia show a relative balanced growth between inter- and intra-regional trade; Europe's intra-trade is growing much faster than its external trade due to the deepening of its economic integration while South and Central America, Africa, the Middle East and the CIS have recorded higher growth in inter-regional exports than in intra-regional.

Table: 3.2 Percentage Shares of Regional Trade Flows in World Merchandise Exports, 2007

	World	North America	South and Central America	Europe	CIS	Africa	Middle East	Asia
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
North America	13.6	37.8	29.0	5.5	3.1	7.7	10.4	10.7
South and Central America	3.7	6.0	27.1	1.8	1.6	3.9	1.9	2.4
Europe	42.4	18.2	17.8	71.2	47.7	41.6	31.7	13.2
CIS	3.7	0.9	1.4	4.8	26.0	1.9	3.4	1.8
Africa	3.1	3.7	3.2	2.8	0.2	11.4	2.2	2.5
Middle East	5.6	3.3	1.0	1.8	1.2	7.8	19.3	12.1
Asia	27.9	30.1	20.5	12.0	20.1	25.7	31.2	57.4

Source: International Trade Statistics, 2008

3.1.1 Proliferation of RTAs

World trading system is experiencing rapid growth of Regional Trade Agreements particularly after the establishment of WTO in 1995. In the period 1948-1994, the GATT received 124 notifications of RTAs (relating to trade in goods), and since the creation of the WTO in 1995, almost 300 additional arrangements covering trade in goods or services have been notified (WTO). As of May, 2009 there were 247 RTAs established under various provisions of the WTO. These include 152 under article XXIV, 28 under enabling clause and remaining 67 under GATS article V. In the 247 RTAs, 232 are established as new ones and the 15 are accessions to the WTO.

Break up of regional agreements under various categories showed that Free Trade Agreement forms the bulk of the agreements (148) followed by Economic Integration Agreements (67), Customs Union (19) and Preferential Trade Agreements (13) respectively. 139 FTAs and 13 Customs Unions (CU) were established under GATT article XXIV.

Table: 3.3 Total Number of RTAs in the World (As on 5th May 2009)

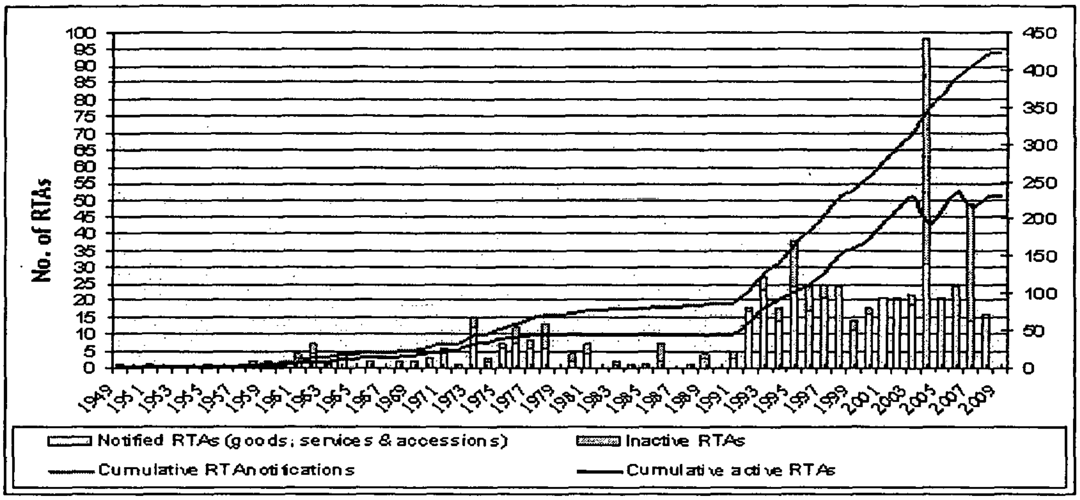
	Accessions	New RTAs	Grand total
GATT Art. XXIV (FTA)	2	137	139
GATT Art. XXIV (CU)	6	7	13
Enabling Clause	1	27	28
GATS Art. V	6	61	67
Grand total	15	232	247

Source: WTO

The growth of Regional Trade Agreements for the period 1949 to 2009 is depicted in Fig.3.1. In the graph it is explicitly visible that the spurt in the growth of RTAs happened at the time of establishment of WTO when the multilateral agreements faced stormy weather and the trend is continuing even now. This led to the conclusion that the proliferation of RTAs inversely related to the successful outcome of the multilateral trade negotiations.

Asia for a long period followed the multilateral approach to trade policy liberalisation and emergence of regionalism here is of relatively recent origin. ASEAN is the major regionalism initiative in south East Asia. The East Asian crisis and the slow pace of multilateral trade liberalization had resulted in large number of bilateral and regional agreements between different geographical regions and integrating areas of Asia. Table-2.6 gave the decomposition of regional agreements in Asia as of December 2007. There were a total of 134 regional agreements, of which 44 were negotiations were concluded and ready for signing or signed and 49 were under negotiations and remaining 41 were proposed for further negotiations.

Fig: 3.1 Total Number of RTAs as of May 2009 (WTO Secretariat)



104 of the 134 agreements are inter- regional in nature showing the trend of emerging 'cross regionalism'. Singapore is the one which inked maximum number of regional agreements, where India, Singapore and Thailand are involved in maximum number of regional agreements in Asia.

Table: 3.4 Number of Regional Trade Agreements in Asia

Negotiating Body	**Concluded**	**Under Negotiation**	**Proposed**	**Total**	**Inside IA**	**Outside IA**
ASEAN	2	4	0	6	4	2
Brunei	3	0	4	7	3	4
Cambodia	1	0	2	3	2	1
India	8	10	12	30	8	22
Indonesia	3	1	6	10	4	6
Lao PDR	3	0	2	5	3	2
Malaysia	4	5	4	13	5	8
Myanmar	1	1	2	4	2	2
Philippines	2	0	4	6	3	3
Singapore	11	10	5	26	6	20
Thailand	6	6	6	18	7	11
Vietnam	1	1	2	4	3	1
Total Asia	44	49	41	134	30	104
				Concluded	14	30
				Under Negotiation	8	41
				Proposed	8	33

Source: ADB, Emerging Asian Regionalism, 2008

3.1.2 Intra Regional Trade in RTAs

Intra regional trade is an important indicator explaining how well the region is getting integrated as a result of the regional agreement. Higher regional trade share shows members of the union trading more compared to countries outside the region and the low intra regional trade reveals the contrary. Table-2.7 showed the intra regional trade share of selected Regional Trade Agreements across the world. The highest intra regional trade is taking place in EU showing long, sustained and high degree of integration achieved by them over the years. The European Union is a highly integrated marketplace, with two-thirds of its trade transactions taking place within the region. NAFTA is also had a high share of intra regional trade, but marginally declined over the years. In 2007, intra-trade accounted for slightly more than half (51 per cent) of the exports of the NAFTA which was 56 percent in 2000. However, as trade with countries outside NAFTA's area has been growing at a somewhat faster pace than intra-NAFTA trade, intra regional trade share had been declining. Nearly one-forth of the ASEAN trade is occurring within the region and showing a rising trend. On the contrary, Mercosur is showing the declining trend in intra regional trade share where as Andean's share is fluctuating but remained low.

Table: 3.5 Intra Regional Trade Share of Major RTAs

Year	EU-27	NAFTA	ASEAN	MERCOSUR	ANDEAN
1997		43.97	22.22	22.83	7.14
2000	66.18	46.35	23.74	20.57	7.84
2005	66.48	42.88	24.88	15.47	10.31
2006	66.53	41.84	24.95	15.71	9.09
2007	66.50	40.93	24.79	16.18	8.90

Source: Computed from International Trade Statistics, 2008.

3.2 Evolution of ASEAN

The ASEAN declaration was signed on the 8th August 1967 at Bangkok, Thailand by the foreign ministers of five original member countries namely Indonesia, Malaysia, Philippines, Singapore and Thailand. The aims and purpose of ASEAN is to cooperate in the economic, social, cultural, technical, educational and other fields, and in the promotion of regional peace and stability through abiding respect for justice and the rule of law and adherence to the principles of the United Nations Charter. The ASEAN membership expanded and currently stands ten with Brunei Darussalam joined ASEAN on 8 January 1984, Vietnam on 28 July 1995, Lao PDR and Myanmar on 23 July 1997, and Cambodia on 30 April 1999. ASEAN is the major regionalism initiative in South East Asia designed mainly with political purpose for political stability and regional harmony. Economic dimension is added to the ASEAN to consolidate the market, efficient resource allocation within the region, regionalization of production networks and reap economies of scale. Even though the East Asian crisis questioned the validity of the miracle theory, it strengthened the resolve among ASEAN nations to increase regionalism efforts through innovative real and financial integration schemes.

ASEAN Free Trade Area (AFTA) is the essence of ASEAN economic integration. AFTA was launched in 1992 to promote the region's competitive advantage as a single production unit. It is a cooperative arrangement among the member countries whereby intra-regional tariffs will be brought down to within the 0-5 tariff bound over a period of time, ie 2002 for ASEAN -6 , 2006 for Vietnam, 2008 for Lao PDR and Myanmar and 2010 for Cambodia. Non-tariff barrier will also have to be eliminated under the CEPT scheme.

The initial decision by ASEAN leaders in 1992 was to complete AFTA within 15 years from 1993- 2008. But ASEAN agreed to accelerate the implementation and set 2003 as the completion date. In response to the 1997/98 financial crisis, ASEAN leaders agreed to bring the completion date forward to 1st January 2002 for the six original members of ASEAN. New members were given a larger time frame of 10 years to bring down most of their tariffs to 0-5 percent. More recently ASEAN also changed the end goal from 0-5 percent to Zero tariffs by 2010 for six original members and by 2018 (2015 for most products) by the newer members.

As of 1 January 2005, tariffs on almost 99 percent of the products in the Inclusion List of the ASEAN-6 (Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore, and Thailand) have been reduced to no more than 5 percent. More than 60 percent of these products have zero tariffs. The average tariff for ASEAN-6 has been brought down from more than 12 percent when AFTA started to 2 percent today. For the newer Member Countries, namely, Cambodia, Lao PDR, Myanmar, and Viet Nam (CLMV), tariffs on about 81 percent of their Inclusion List have been brought down to within the 0-5 percent range.

3.2.1 Brief Profile of ASEAN Countries

Indonesia is the biggest, most populated and multi religious country in ASEAN. The major Industries in Indonesia are pulp and paper, cement, basic metals and fertilizer, power generation, telecommunication, transportation. The major exports commodities of Indonesia are textile, electronic goods, footwear, oil & gas, plywood, sawn timber. The major imports are Chemical and pharmaceutical, fertilizer, cotton yarns, textile fabric, machines, motor vehicles. Malaysia is an important country and major exporter of the region. Major Industries of Malaysia include electronic & electrical goods, textiles, clothing and footwear, chemicals, petroleum, wood and metal products and rubber. Its exports include electronic & electric machinery, petroleum & LNG, textiles, clothing & footwear, palm oil, sawn timber to other nations. It imports products like manufacturing inputs, machinery & transport equipment, metal product from other countries. Philippines is an island nation exports commodities like Electronic products; garments; ignition wiring set and other wiring sets used in vehicles, aircrafts, and ships; coconut oil; woodcrafts and furniture; other products manufactured from materials imported on consignment basis; petroleum products; metal components; cathodes and sections of cathodes of refined copper; fresh bananas. Major imports are electronic products; mineral fuels, lubricants, and related materials; industrial machinery and equipment; transport equipment; iron and steel; cereal and cereal preparations; textile yarn, fabrics, made-up articles, and related products; telecommunications equipment and electrical machinery; plastics in primary and non-primary forms; organic and inorganic chemicals.

Singapore is the smallest country of the region with a land area of 704 sq.km and the population of 4.59 million in 2007 with a population density of 6518 per sq.km. and the most important trading partner in the region. Major Industries of Singapore include electronics, chemicals, banking and finance, real estate, tourism, trading and exports products like petroleum products, industrial machines, radio & television receivers & parts, electronic component & parts, clothing, beverages & tobacco. It imports products like crude petroleum, iron & steel, industrial machines, electric generators, electronic component and parts from other countries.

Thailand is second largest in terms of GDP (245.70 billion), third largest in terms of geographical area (513120 sq.km.) and fourth largest in terms of population (65.69 million) in ASEAN. The major industries in the country include electronics, gems and jewelry, footwear, textiles, clothing, mobiles and the export products are textiles, computer & components, integrated circuits and parts, gems & jewelry, footwear.

Thailand's main imports are industrial machinery, iron & steel electrical machinery & parts, chassis and body. Brunei is one of smaller countries in ASEAN with a land area of land area 5,765 sq.km and a total population of 396 thousand. Oil and gas, textiles, food and beverages, building materials are the industries developed in the country. The major exports are oil and gas, ready-made garments and imports include transport equipment and machinery, manufactured goods, food chemicals. The total land area of Vietnam is 329315 sq.km and the total population in 2007 was 85.21 million. Major industries are agriculture, forestry, fishery, industrial construction and export products like crude oil, coal, chromium, tin, cements, woolen carpet, jute carpet, rice cinnamon, marine products to other countries. The important import items include motors, petroleum products, diesel oil, fertilizers.

Cambodia has a land area of 181,035 sq.km with a population of 14.48 million in 2007. Cambodia is a Buddhist country and Khmer is the official language. Textiles and Garments, Beverages, Food Processing, Wood processing are the major industries in the country. Major exports include Garments, Textile Product Sawn, Wood Furniture and Rubber and imports products like transport equipment and machinery, manufactured goods, food chemicals. Myanmar is the second largest country in terms of geographical size (676,577 sq.km) with a population of 58.61 million. Agro-based industries, textiles industries, steel mills form the major industries in Myanmar. Major exports are rice, teak, beans & pulses, rubber, coffee, minerals, gems marine products and imports include power tillers, hand tractor, fertilizer, diesel oil, cement, dumper, loader and spare parts, water pumps, hydraulic excavator. Lao PDR achieved higher economic growth of 7.2 percent in 2008 based on continuing expansion of industry (especially mining and hydropower), and services.

Table: 3.6 Country Profile of ASEAN Countries

Country	Total land area	Total population	Population density	GDP at current prices	GDP Per capita at current prices	FDI inflow
	km^2	thousand	persons per km^2	US$ million	US$	US$ million
	2007	2007	2007	2007	2007	2006
Brunei Darussalam	5765 ***(0.13)***	396.35 ***(0.07)***	68.8	12316.99 ***(0.96)***	31076.09	433.5 ***(0.83)***
Cambodia	181035 ***(4.06)***	14474.64 ***(2.52)***	80	8662.32 ***(0.68)***	598.45	483.24 ***(0.92)***
Indonesia	1890754 ***(42.35)***	224904.9 ***(39.08)***	118.9	431717.67 ***(33.68)***	1919.56	5556.24 ***(10.61)***
Lao PDR	236800 ***(5.30)***	5607.78 ***(0.97)***	23.7	4128.11 ***(0.32)***	736.14	187.40 ***(0.36)***
Malaysia	330252 ***(7.40)***	27173.6 ***(4.72)***	82.3	186960.73 ***(14.59)***	6880.23	6059.73 ***(11.57)***
Myanmar	676577 ***(15.16)***	58605.21 ***(10.18)***	86.6	12632.69 ***(0.99)***	215.56	142.96 ***(0.27)***
The Philippines	300000 ***(6.72)***	88875.3 ***(15.44)***	296.3	146894.77 ***(11.46)***	1652.82	2345.01 ***(4.48)***
Singapore	704 ***(0.02)***	4588.6 ***(0.80)***	6517.9	161546.59 ***(12.60)***	35206.08	24055.4 ***(45.93)***
Thailand	513119.54 ***(11.49)***	65694 ***(11.41)***	128	245701.86 ***(19.17)***	3740.10	10756.06 ***(20.53)***
Viet Nam	329315 ***(7.38)***	85204.61 ***(14.80)***	258.7	71292.12 ***(5.56)***	836.72	2360 ***(4.51)***
ASEAN	**4464321.5**	**575525**	**128.9**	**1281853.87**	**2227.28**	**52379.54**

Source: ASEAN secretariat

Subsectors to grow included finance, wholesale and retail trade, government services, and transportation and communications. Agriculture, which employs over 70 percent of the labor force, was hit by severe floods in late August that damaged 10 percent of the arable area and curtailed production of rice and vegetables.

3.2.2 Economic Profile of ASEAN

In terms of GDP, Indonesia is the biggest country in ASEAN followed by Thailand, Malaysia, Singapore and Philippines. Four economies namely Cambodia, Laos, Myanmar and Brunei have less than one percent of the ASEAN's economic size. The per capita GDP is highest in Singapore and Brunei. The CLMV (Cambodia, Laos, Myanmar and Vietnam) countries have per capita income of less than 1000 dollars and dubbed as poor countries of ASEAN. Singapore received highest FDI flow for the year 2006 followed by Thailand, Malaysia and Indonesia. Cambodia, Laos, Myanmar and Brunei received paltry share of FDI inflows. The highest economic growth for the year 2007 was achieved by Cambodia (10.14 percent) followed by Singapore (9.27 percent), Vietnam (8.49 percent) and Philippines (7.45 percent).

Table: 3.7 Economic Indicators of ASEAN

	GDP growth rate	Inflation rate	Exchange rate at end of period	Unemployment rate	Year – on- year change in FDI net inflow		Trade/ GDP Ratio
	percent	percent	National currency per US$	percent	US$ million	percent	Percent
	2007	2007	2007	2005/06	2005-2006	2005-2006	2006
Brunei Darussalam	0.62	1.27	1.45	4	144.96	50.24	90.4
Cambodia	10.14	-	-	0.8	102.02	26.76	120.5
Indonesia	6.32	6.59	9419	10.5	-2779.75	-33.35	50.0
Lao PDR	6.01	-	0	1.3	159.68	575.84	60.8
Malaysia	6.33	2.39	3.3065	3.3	2094.94	52.84	195.7
Myanmar	5.56	0	5.6503	4	-92.89	-39.39	56.9
The Philippines	7.45	3.94	41.401	8.1	491.01	26.48	84.7
Singapore	9.27	4.41	1.4484	2.7	9053.5	60.35	386.2
Thailand	4.75	3.21	33.7044	1.3	1799.05	20.09	125.7
Viet Nam	8.49	-	16044	4.82	339.19	16.78	138.0
ASEAN	6.54	-	n.a.	n.a.	11311.71	27.54	-

Source: ASEAN secretariat & ADB

The overall GDP growth rate for ASEAN region as a whole for the year 2007 was 6.54 percent. The inflation rate calculated on the basis of year-on-year growth of CPI for the year 2007 was highest in Indonesia (6.59 percent) and lowest was in Brunei (1.27 percent) even though the official statistics of Myanmar claim zero percent. The unemployment rate was high in Indonesia and Philippines where Thailand, Cambodia and Laos recorded low unemployment rates. The year-on-year change in foreign direct investments net inflow for the year 2005 -2006 was highest in Singapore followed by Malaysia and Indonesia recorded huge net outflow. The trade to GDP ratio shows most of the countries in ASEAN got high trade openness. The trade openness is very high for Singapore and Malaysia and high for countries like Vietnam, Thailand and Cambodia.

3.2.3 Trade Profile of ASEAN

East Asian countries adopted export orientation as the core of their trade policy and initiated unilateral and multilateral trade liberalization resulting in high productivity, efficiency and competitiveness. This export led high economic growth achieved by these new enterprising tiger economies of Asia is acclaimed as 'East Asian miracle'. According to the 2007 (MFN tariff only) Overall Trade Restrictiveness Index (OTRI), tariff barriers are highest in Thailand and lowest in Singapore. As judged by the 2007 Market Access OTRI (tariff only but including preferential rates), Thailand exports faced highest tariff barrier in their destination and Brunei faces lowest tariff barrier in the destination market among the ASEAN countries. Of the 175 countries ranked on the basis of ease of doing business by the World Bank, Singapore topped the list while Thailand (17) and Malaysia (21) got high ranks. But other members of ASEAN such as Lao PDR (166), Cambodia (146), Indonesia (133) and Philippines (130) got very low rank on this criterion. Singapore topped in the Logistics Performance Index among the ASEAN countries followed by Malaysia, Thailand and Indonesia. The LPI is very low for Myanmar showing the big difference in the infrastructural development among ASEAN countries. In 2005-06, the real growth in total trade of goods and services were highest in Vietnam followed by Singapore (20.16 percent), Lao PDR (16.02 percent) and Cambodia (14.67percent). With regard to trade share in the world and trade per capita, Singapore is well ahead of other ASEAN countries, followed by Malaysia and Thailand.

Table: 3.8 Trade indicators of ASEAN countries 2005-06

Country	Overall TRI-tariff (all goods)	Market Access-Overall TRI-tariff (all goods)	Ease of Doing Business Rank (1-175)	Logistics Performance Index (1 to 5)	RG in Total trade of goods and services (in %)	Trade Share in the World	Trade (G+S) Per Capita (Dollar)
Singapore	0.04	3.05	1	4.19	20.16	2.54	123,396
Philippines	2.94	3.14	130	2.69	8.5	0.44	1,176
Brunei	3.53	2.07	66	..	..	-	-
Indonesia	3.61	5.34	133	3.01	8.48	0.87	800
Malaysia	3.95	3.08	21	3.48	6.72	1.28	11,518
Thailand	6.29	8.22	17	3.31	7.18	1.19	4, 092
Cambodia	..	..	146	2.5	14.67		
Lao PDR	..	..	166	2.25	16.02	0.01	537
Myanmar	..	..	..	1.86	..	-	-
Vietnam	..	..	94	2.89	22.05	0.37	1,446

Source: World Trade Indicators, 2007 database [TRI = Trade Restrictiveness Index]

The ASEAN countries are experiencing impressive export performances with significant annual growth rates since 1990s. The merchandise exports of ASEAN-6 which was 206,637.2 million US dollars rose to 706,242.4 million US dollars in 2006. This highly impressive export led growth which was dubbed as 'East Asian Miracle' continued till 1995 and after that the exports growth decelerated due to the east Asian crisis. The East Asian crisis shaken the confidence of the international community resulting into flight of capital from ASEAN region affecting the Macro economic balance of the member countries. In 1998, ASEAN exports witnessed a negative growth of -7.59 doubting the suitability of the East Asian economic model. But in 1999, the exports bounced back to the pre crisis level and since then it is showing steady growth rate. Since 2002, the export performance of the region is very impressive and acting as one of the growth centers of the world pushing up the international trade.

Table: 3.9 ASEAN Trade Performance for the period 1993 – 2006

(Million US Dollars)

Year	Total ASEAN Exports	ASEAN-6 Exports	ASEAN Total Imports	ASEAN-6 Total Imports	ASEAN Total Trade	ASEAN-6 Total Trade
1993	206637.2	206637.2	223310.8	223310.8	429948	429948
1995	296696.7	296696.7	318554.8	318554.8	615251.5	615251.5
2000	410140.6	407579.3	348960.2	345336.2	759100.8	752915.4
2005	648147	613181.1	576742.4	538989	1224889	1152170
2006	750707.8	706242.4	654097.8	608235	1404806	1314477

Source: ASEAN Secretariat

Along with exports, imports also witnessing steady growth in the region increasing from 223,310.8 million US dollars in 1993 to 608,235 million US dollars in 2006. But during the crisis years the imports declined as the economy and trade shrunk in this period. The import of commodities picked up in the post 2002 period with higher export performance and impressive world production.

ASEAN-6 is the dominant players in ASEAN trade. In 2006, ASEAN-6 account 94.08 percent of total ASEAN export and 92.99 per cent of total ASEAN imports and their share in total trade is 93.57 percent.

Fig: 3.2 Export, Import and Total Trade of ASEAN-6

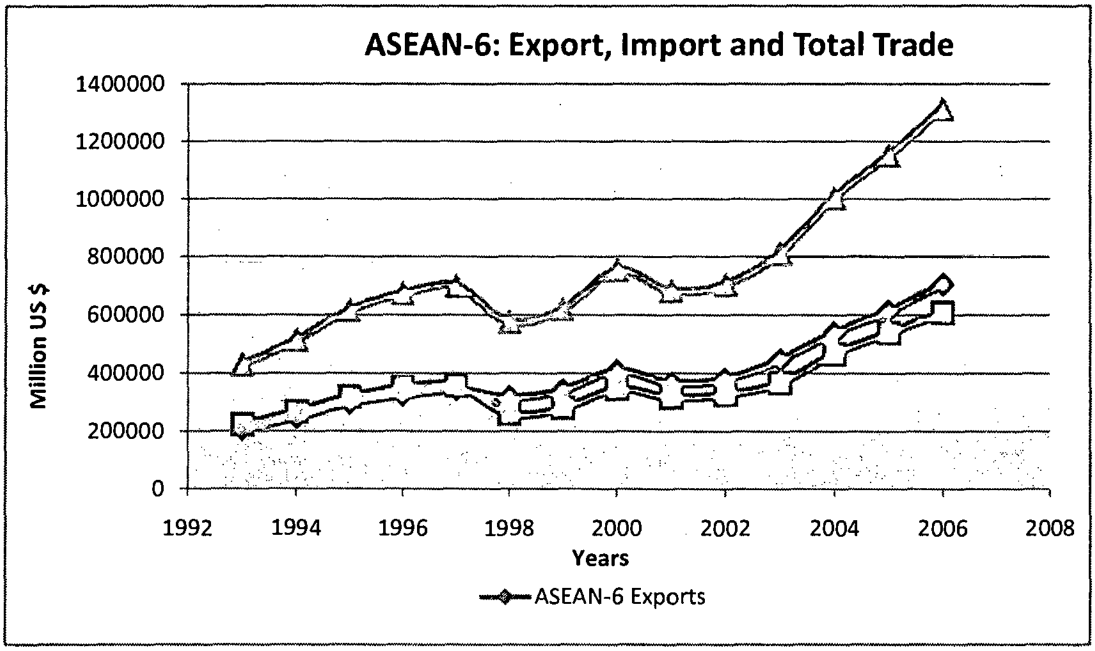


Table-3.10 provided the Annual percent change in exports, imports and total trade for ASEAN -6 and ASEAN block as a whole. Export and import achieved impressive double digit growth except the crisis years.

Table: 3.10 Annual percentage change of ASEAN Trade

Year	ASEAN-10 Export GR	ASEAN-6 Export GR	Total ASEAN Import GR	ASEAN-6 Import GR	ASEAN Total Trade GR	ASEAN-6 Total Trade GR
2001	-9.70	-10.04	-8.12	-8.40	-8.97	-9.29
2002	3.64	3.50	2.91	3.12	3.30	3.32
2003	17.90	17.48	12.73	12.48	15.51	15.17
2004	25.81	20.84	35.08	27.07	29.99	23.65
2005	13.84	13.81	14.78	15.61	14.28	14.65
2006	15.82	15.18	13.41	12.85	14.69	14.09

Source: Computed from ASEAN Statistical Yearbook, 2006

The highest growth was achieved in 2004 with exports and imports growing above 20 percent.

3.2.4 Intra and Inter Regional Trade of ASEAN

Extra and Intra- regional trade are the fundamental concepts used in evaluating a Regional Trade Agreements. If the intra regional trade increases at the expense of efficient extra regional trade, there will be trade diversion and welfare reduction for the world at large. The intra regional trade as a percent of total trade for ASEAN steadily increased from 19.18 percent in 1993 to 25.01 percent in 2006. For the same period intra regional import increased from 17.6 to 24.41 percent while intra regional export rose to 21.14 to 25.53 percent.

Table: 3.11 Intra Regional Trade Share of ASEAN-6 for 1993 to 2006

Year	Intra trade as % of Total Trade	Intra import as a % of total import	Intra export as a % of total export
1993	19.18	17.36	21.14
1995	20.12	16.83	23.65
2000	21.88	20.79	22.80
2005	24.89	24.08	25.60
2006	25.01	24.41	25.53

Source: Computed from ASEAN Statistical Yearbook, 2006

A comparison of intra regional trade among various regional groupings helps us to understand the intensity with which they trade among themselves. The intra regional trade is highest in EU followed by NAFTA, ASEAN, MERCUSOR, and ANDEAN. The intra regional export for EU is 67.32 percent, NAFTA 53.75 percent compared to ASEAN's 25.06 percent. This is markedly higher than Mercosur and Andean.

Table: 3.12 Comparison of ASEAN intraregional trade with Other Regional Groupings

	EU		NAFTA		ASEAN		MERCOSUR		ANDEAN	
Year	IE	II	IE	II	IE	II	IE	II	IE	II
1996			46.91	39.00	25.51	19.68	22.67	20.69	8.70	7.14
2000	67.50	64.06	55.67	39.55	24.07	23.36	21.18	20.00	7.69	8.00
2005	66.87	64.63	55.71	34.43	25.50	22.96	12.80	19.30	9.80	10.87
2006	67.32	64.25	53.75	33.86	25.06	23.07	13.68	18.44	7.81	10.71
2007	68.08	64.98	51.38	33.72	25.0	24.55	14.29	18.48	7.89	10.00

Source: International Trade Statistics, 2008

(IE-Intraregional Export, II-Intraregional Import)

3.2.5 Composition and Direction of ASEAN Trade

The three major commodity groups traded in ASEAAN are HS-85(Electric machinery, equipment and parts; sound equipment; television equipment), HS-84(Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof) and HS 27 (Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax). The trade share of major commodities is listed in table-2.15. The top ten commodity group account 72.7 percent of the ASEAN import and 76 percent ASEAN import.

Diversification Index (DI) and Concentration Index (CI) show the structure of trade of a country and useful in analyzing the pattern of trade. Diversification index is computed by measuring absolute deviation of the country share from world structure. Diversification index that ranges from 0 to 1, reveals the extent of the differences between the structure of trade of the country or country group and the world average. The index value closer to 1 indicates a bigger difference from the world average.

Table: 3.13 Top ten ASEAN trade commodity groups, 2006

2-digit HS code	Description	Exports Share (%)	Imports Share (%)	Total trade Share (%)
85	Electric machinery, equipment and parts; sound equipment; television equipment	27.6	27.6	27.6
27	Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax	14.3	17.9	16.0
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	15.7	14.4	15.1
39	Plastics and articles thereof	2.7	2.7	2.7
29	Organic chemicals	2.8	2.3	2.6
87	Vehicles, (not railway, tramway, rolling stock); parts and accessories	2.3	2.5	2.4
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus; parts & accessories	1.9	2.4	2.1
72	Iron and steel	0.8	3.1	1.9
40	Rubber and articles thereof	2.8	0.8	1.9
71	Natural or cultured pearls, precious or semiprecious stones, precious metals and metals clad therewith and articles thereof; imitation jewelry; coin	1.3	1.6	1.4
Total top ten commodity groups		72.1	75.3	73.6
Others		27.9	24.7	26.4
Total		100.0	100.0	100.0

Source: ASEAN Trade Database

The Herfindahl-Hirschmann index is a measure of the degree of market concentration. It has been normalized to obtain values ranging from 0 to 1 (maximum concentration).

Table: 3.14. Export Diversification and Concentration Index for ASEAN and India

Country	1995			2005		
	No. of Products Exported	DI	CI	No. of Products Exported	DI	CI
Brunei	87	0.821	0.606	-	-	-
Cambodia	-	-	-	78	0.813	0.416
Indonesia	230	0.605	0.144	247	0.521	0.130
Lao PDR	59	0.750	0.259	-	-	-
Malaysia	257	0.517	0.180	258	0.469	0.187
Myanmar	88	0.820	0.308	-	-	-
Philippines	233	0.620	0.363	227	0.615	0.358
Singapore	259	0.489	0.213	257	0.477	0.246
Thailand	256	0.481	0.090	259	0.377	0.087
Vietnam	198	0.690	0.211	235	0.692	0.229
India	**250**	**0.832**	**0.139**	**259**	**0.541**	**0.134**

Source: UNCTAD Handbook of Statistics, 2006

Export diversification and export concentration for ASEAN countries and India are given for 1995 and 2005 in the following table. The export diversification index is high for Brunei and Cambodia and low for Thailand, Singapore and Malaysia. That means export of Brunei and Cambodia are confined to few select products and very much different from the world export structure. On the other hand exports of Thailand, Singapore and Malaysia are spread over large number of commodities and more similar to world export structure. India's export diversification index was very high in 1995 (0.832) declined to 0.541 in 2005. This shows India which was exporting some select traditional commodities is widening its export basket by adding different commodities and moving towards the world export structure. Concentration index for most of the ASEAN countries and India are low showing the export markets are well spread out across the globe.

The Import Diversification Index is low for most of the ASEAN countries showing that it is not significantly different from the world import structure. Cambodia and Lao PDR are having higher diversification index showing their limited number of import commodities.

Table: 3.15 Import Diversification and Concentration Index for ASEAN and India

Country	1995			2005		
	No. Products Exported	DI	CI	No. of Products Exported	DI	CI
Brunei	212	0.464	0.083	-	-	-
Cambodia	128	0.600	0.170	190	0.643	0.220
Indonesia	255	0.433	0.062	250	0.439	0.181
Lao PDR	168	0.552	0.117	-	-	-
Malaysia	258	0.385	0.178	259	0.372	0.221
Myanmar	201	0.492	0.078	-	-	-
Philippines	254	0.367	0.174	250	0.456	0.292
Singapore	259	0.368	0.161	257	0.379	0.217
Thailand	258	0.311	0.079	257	0.320	0.135
Vietnam	234	0.479	0.096	251	0.421	0.091
India	**252**	**0.481**	**0.137**	**255**	**0.475**	**0.244**

Source: UNCTAD Handbook of Statistics, 2006

India's import diversification index is slightly higher than the ASEAN-5, mainly because of the large share of petroleum products in India's import basket. The import concentration index showed that ASEAN countries and India have less market concentration of its imports.

USA, Japan, European Union (25) and China are the major trade partners of ASEAN and their share in total ASEAN trade are 12.6, 12.6, 11.5 and 9.3 percent respectively. Top ten destinations account 82.3 percent of the ASEAN trade. Fig. 3.3 gives the direction of ASEAN trade for the year 2006. The major trade partners are Japan USA, EU-27, China apart from intra regional trade among ASEAN members.

Table: 3.16 Top ten ASEAN trade partner countries/regions, 2005 (share in percent)

Trade partner country	2005			2006		
	Exports	Imports	Total trade	Exports	Imports	Total trade
ASEAN	25.3	24.5	24.9	25.2	25.0	25.1
USA	14.3	10.6	12.6	12.9	9.8	11.5
Japan	11.2	14.1	12.6	10.8	12.3	11.5
EU-25	12.5	10.3	11.5	12.6	10.1	11.4
China	8.1	10.6	9.3	8.7	11.5	10.0
Republic of Korea	3.8	4.1	3.9	3.4	4.1	3.7
Australia	3	2	2.6	3.1	2.0	2.6
India	**2.3**	**1.4**	**1.9**	**2.5**	**1.5**	**2.0**
Taiwan	1.3	2	1.6	1.2	2.0	1.6
Hong Kong, SAR	2.1	1	1.6	1.8	1.0	1.4
Total top ten trade partner countries	83.9	80.5	82.3	82.2	79.3	80.9
Others	16.1	19.5	17.7	17.8	20.7	19.1
Total	100	100	100	100	100	100

Source: ASEAN Trade Database

Table 3.17 provides the ad valorem tariffs for south East Asian countries and compared with India. A cursory look at the table shows the tariff levels in India are much higher compared to the south East Asian region. The tariff rates for Beverages and Tobacco (83.7 percent), Animal and vegetable oil (82.3 percent) and Food and animals (46 percent) are exceedingly high compared to the south East Asian nations and any free trade agreement between the two partners will affect this high tariff sector. On the other hand Singapore is having near zero tariffs for all commodities and will not experience any trade diversion from any free trade agreements.

Fig: 3.3 ASEAN Trade by Selected Partner/Country, 2006

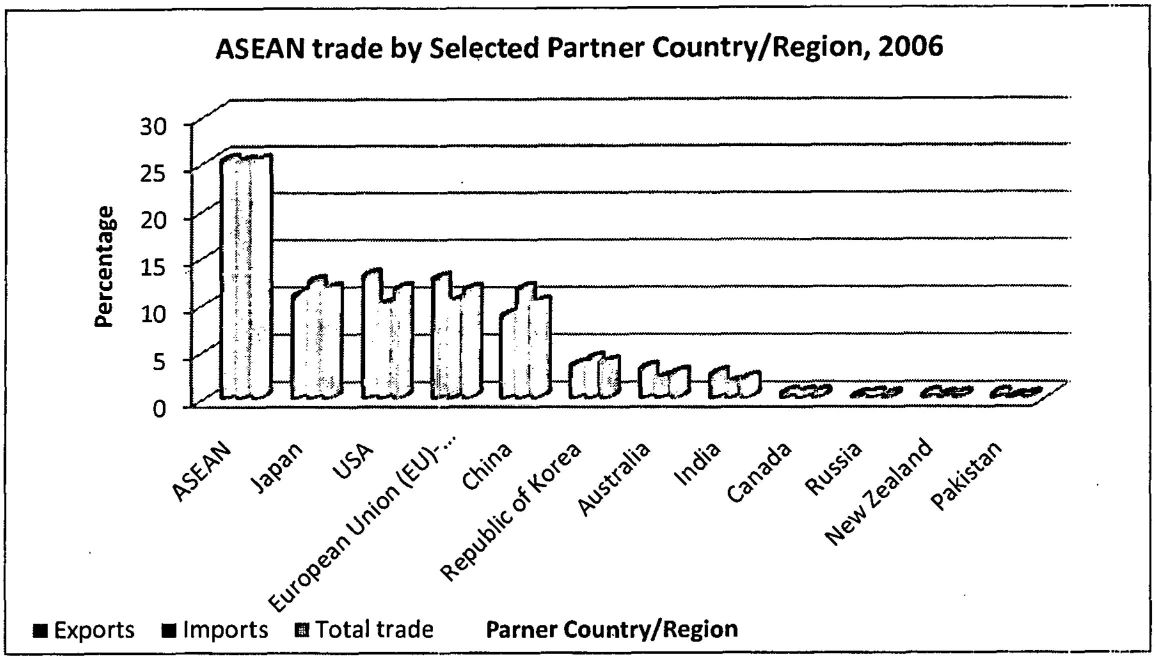


Table: 3.17 Ad Valorem Applied Tariffs in South East Asia and India

Economy	Year	Food & Animals	Beverages & Tobacco	Crude Materials	Mineral Fuel, Lubricants etc.	Animal & Vegetable oil	Chemical Products	Manufactured goods	Mach & Trans Equip	Mic. Comm	Other Comm
BRUi	1992	0.0	24.2	3.8	0.0	0.0	2.3	1.6	6.2	4.3	0.0
	1995	0.1	0.0	0.6	0.0	0.0	1.1	1.6	11.4	3.7	0.0
CAM	2001	9.7	9.8	7.9	22.4	7.0	6.8	16.9	18.9	20.8	0.3
	2003	12.2	9.0	7.6	21.6	7.0	5.9	16.8	18.8	21.0	0.4
IND	1990	40.7	284.3	66.5	4.0	116.8	93.5	71.7	74.0	66.5	93.7
	2005	**46.0**	**83.7**	**12.4**	**11.0**	**82.3**	**14.7**	**16.1**	**9.8**	**11.3**	**15.0**
INDO	1990	9.3	18.5	4.3	3.6	18.6	7.1	13.3	19.5	16.0	18.8
	2005	5.8	31.5	1.8	3.8	3.8	5.7	8.6	5.6	9.3	0.5
MAL	1991	4.4	44.1	3.0	3.6	1.9	9.9	13.4	10.3	12.4	2.5
	2005	3.0	19.8	1.1	1.2	2.1	4.9	15.5	2.8	4.8	0.1
PHI	1990	19.5	27.1	11.8	10.3	24.6	12.7	19.8	13.4	21.2	28.7
	2005	7.7	9.6	3.2	4.8	10.5	5.0	6.0	1.8	5.7	3.8
SING	1989	0.1	0.0	0.0	4.3	0.0	0.0	0.0	0.9	0.8	0.0
	2005	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THAI	1991	47.4	19.0	14.5	24.9	20.0	31.3	18.3	37.4	42.8	35.1
	2005	10.0	59.3	4.4	0.4	15.7	6.8	5.5	6.1	11.2	0.2
VIET	1994	17.5	119.8	0.6	36.6	15.4	2.5	18.6	12.0	20.3	0.6
	2005	17.7	77.0	1.8	14.8	33.9	3.9	18.0	13.2	21.7	6.6

Source: ADB, Asian Regionalism, 2008

3.3 Economic Profile of India

India the second most populous country in the world is growing rapidly in recent years and acting as one of the growth centres along with China pushing world economic growth. The Indian economy is the second fastest growing economy among the large economies of the world today. In terms of purchasing power parity (PPP) GDP, India is the fourth largest economy after the US, China and Japan (WDI). Indian economy has grown at 6.11 percent for the period 1992-2000 and in recent years it is growing over 8 percent. India's share in world GDP (PPP) basis has increased from 4.3 percent in 1991 to almost 6 percent in 2005. The World Bank has reported that India has been in the top 10% of all countries in growth performance since the 1980s. (WB, 2006). There are various positive factors influencing the growth rates in India. Indian economy is more open now, middle class is growing rapidly, demographic dividend, strong and competitive corporate sector, increase in savings and investment and growth in gross fixed capital formation.

India became trillion dollar economy in 2007 and the growth rate exceeded 7 percent since 2004. The per capita GDP exceeded 1000 US dollars and growing at a healthy rate. Inflation which touched double digit in late 2008 due to high agricultural and oil prices mellowed down in the early part of 2009 and came down below one percent in mid 2009. Merchandise exports and imports grown at a healthy rate with a deficit in the current account in the balance of payment. Even though external debt outstanding was high, India had a huge foreign exchange reserve of 309.72 billion US dollars in 2008.

Table: 3.18 Economic Indicators of India, 2004-08

Economic Indicators	2004	2005	2006	2007	2008
GDP US$ billion (Current prices)	669.442	783.141	877.793	1100.70	1237.45
Growth rate of GDP (% per year)	7.5	9.5	9.7	9.0	7.1
GDP Per capita US $ (Current prices)	599.33	690.355	762.137	941.557	1043.21
Growth rate of per capita GDP (%per year)	5.8	7.9	8.2	7.5	5.6
Inflation (% per)	6.4	4.4	5.4	4.7	8.7
Growth rate of merchandise exports (% per year)	28.5	23.4	21.8	23.7	-
Growth rate of merchandise imports (% per year)	48.6	32.1	21.8	29.9	-
Trade Balance (US $ million)	-33702	-51904	-63171	-90060	-
Current Account balance (% of GDP)	-0.4	-1.2	-1.1	-1.5	-3.0
FDI (US $ million)	5987	8901	21991	32327	20700
External Debt outstanding (US$ million)	132973	138133	169669	221212	-
Exchange rate against US $ (Annual Average)	44.9	44.3	45.3	40.3	46.0
Gross international Reserves (US $ million)	141514	151622	199179	309723	-
Fiscal Balance (% of GDP)	-7.5	-6.7	-6.4	-5.4	-6.0

Source: ADB, Asian Development Outlook, 2009

3.3.1 Trade Profile of India

India's merchandise trade which was 23.26 billion dollars grew to 41.80 billion dollars in 1990. The macro economic crisis of 1991 resulted in decline of merchandise trade in 1991 prompting government to initiate reform measures in the economic structure in general and external sector in particular. The trade liberalization initiated in 1991 improves the trade openness of the country leading to higher exports and import growth. The external sector grew reasonably well since 1992 and the total merchandise trade stood at 109.41 billion in 2002 with export contributing 50.50 billion and import constituting 58.91 billion. The post 2002 period, riding on a favourable external environment, India's trade rapidly grew and the total trade stood at 399.99 billion US dollars with export contributing 151.93 billion and import 248 billion.

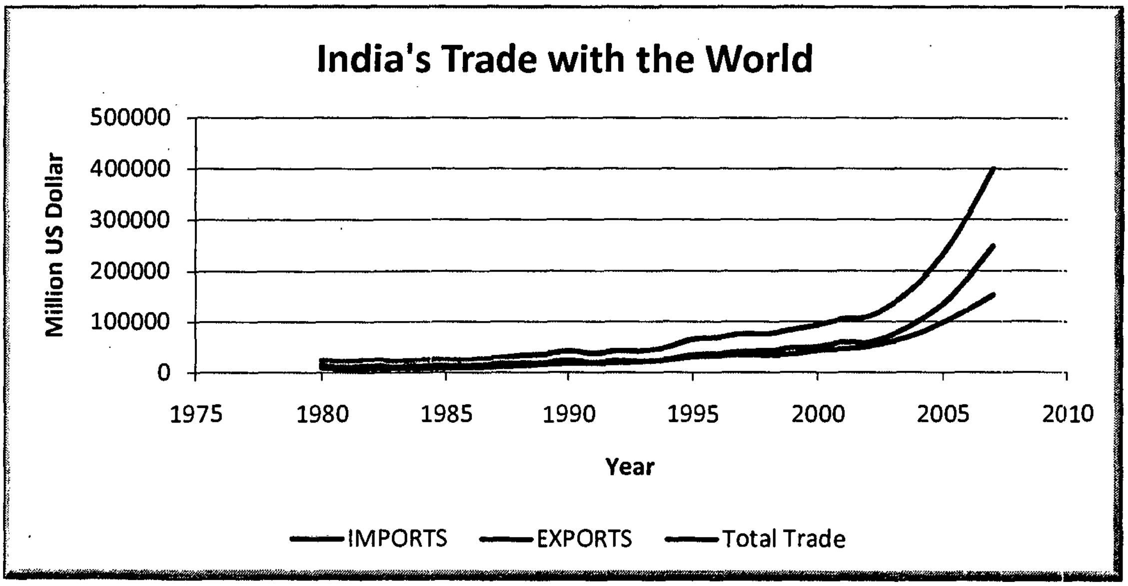
Table: 3.19 Table: India's Trade with the world (Million US Dollars)

Year	IMPORTS	EXPORTS	Total Trade
1980	14822.2	8440.83	23263.03
1990	23991.4	17813	41804.4
2000	50336.1	42625.8	92961.9
2005	134690	97918.1	232608.1
2006	186002	123032	309034
2007	248062	151932	399994

Source: DOTS, IMF CD ROM

Fig.3.4 showed the growth of imports, exports and total trade in India. The graph showed the rapid growth in India's trade happened after 2002 with sharp upward shift in the curves.

Graph: 3.4 India's Trade with World



Trade policies of India

The growth and evolution of the external sector after independence depicts three phases of development. The first phase is for the period 1950 to 1975 with autarky in trade policy and experiencing Hindu rate of growth of 3.5 percent. The second phase is for the period 1976-1991 with moderate trade reform. The third phase started with 1990 onwards with systemic trade reforms. India had experienced trade dynamism after 2002 where both imports and exports witnessed rapid growth. This trade dynamism is mainly due to progressive reduction in tariffs, reduction in transaction costs, expansion in port infrastructure, de-reservation of certain sectors, stronger growth in exports to neighboring markets, diversification of export product basket, new initiatives towards establishing SEZs and progress in conclusion of FTAs. The Government is committed to bring down import duties to ASEAN levels.

3.3.2 Composition and Direction of India's Trade

Table: 3.20 Commodity Composition of exports 1990-91 2007-08 (percent)

Commodity	**1990-91**	**2000-01**	**2004-05**	**2005-06**	**2006-07 ®**	**2007-08(P)**
Agriculture and allied products	18.49	13.40	10.14	9.91	10.04	11.36
Ores and minerals	5.34	2.59	6.08	5.98	5.54	5.66
Leather and manufactures	7.99	4.36	2.90	2.62	2.39	2.16
Chemicals and related products	9.52	13.21	14.90	14.33	13.72	12.86
Engineering goods	12.40	15.30	20.77	21.07	23.40	23.09
Textile and textile products	23.93	25.33	16.23	15.91	13.75	11.96
Gems and jewellery	16.12	16.57	16.47	15.06	12.64	12.36
Handicrafts	1.23	1.48	0.45	0.45	0.35	0.29
Other manufactured goods	0.43	0.80	0.98	0.95	0.96	0.85
Petroleum products	2.88	4.20	8.37	11.29	14.78	15.64
Others	1.67	2.76	2.71	2.44	2.43	3.76

Source: DGCI&S taken from RBI Statistical handbook [R=Revised P=Provisional]

In the year 2007-08, the manufactured products constitute the majority of the exports (63.58 percent) and the primary products contribute 17.02 percent followed by petroleum products 15.64 percent and others (3.76 percent). The share of primary products and the manufacturing sector declined from export basket from the time of liberalization (from 23.83 percent and 71.61 percent respectively) primarily because of the strong export performance of the petroleum products.

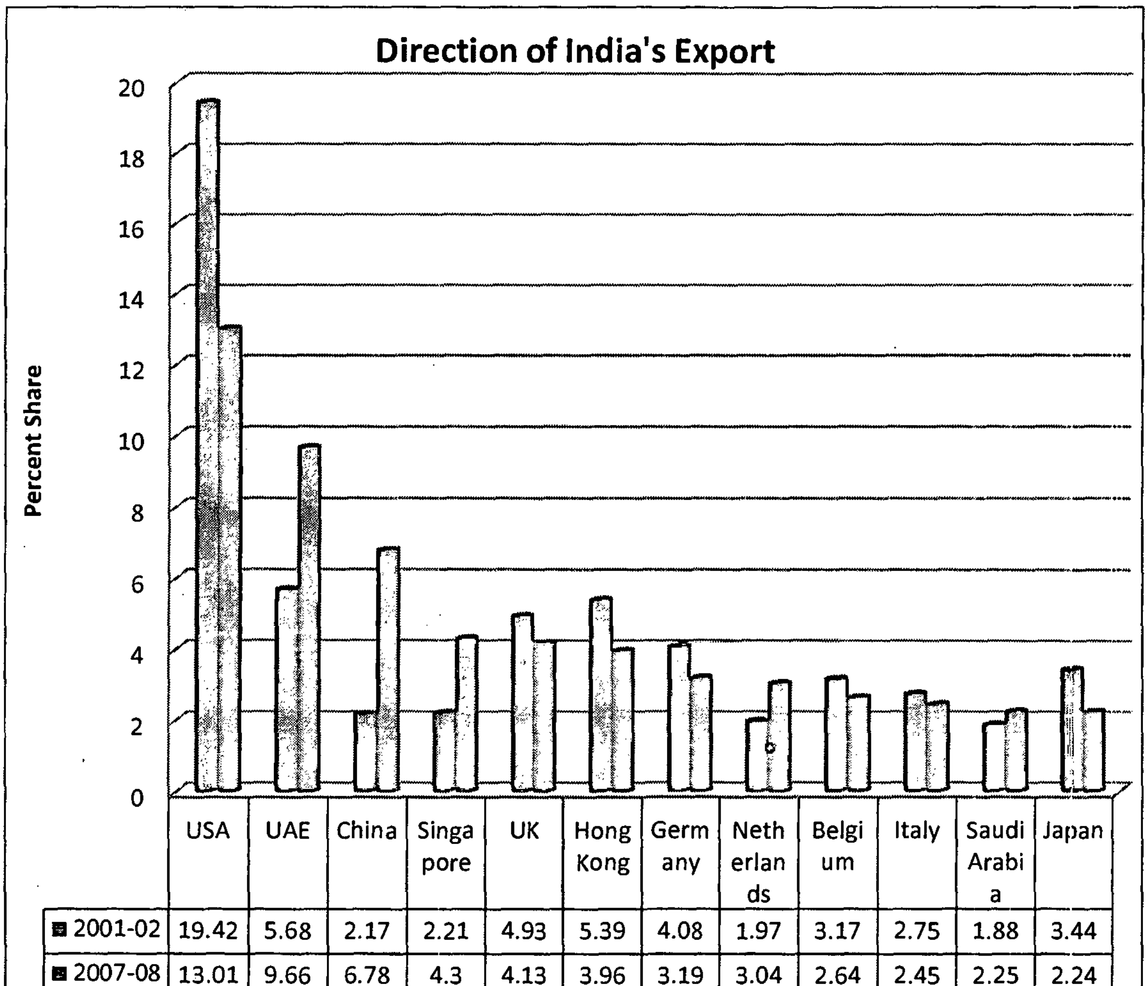
Within the manufacturing sector, the four product categories which are contributing bulk of the exports are Engineering Goods, Chemicals and related products, Gems and Jewellery and textiles and readymade garments. In the year 2007-08, their shares were respectively, Engineering Goods 23.09 percent, Chemical and related products 12.86 percent, Gems and Jewellery 12.36 percent and Textiles &RMG 11.96 percent. From 1991 to 2007-08 during liberalization period, engineering goods and chemicals increased their share (12.40 to 23.09 percent for engineering goods and 9.52 to 12.86 percent for chemicals) while share of textiles and gems & jewelery declined (23.93 to 11.96 percent for textiles and 16.12 to 12.36 percent for gems and jewelery). Petroleum products is the sector which shown remarkable export growth during the period.

USA is India's important export partner even though its share is coming down in recent years. UAE, China, Singapore and UK are the other important countries India export its products. India's export to UAE, China and Singapore increased from 2001-02, export share to traditional partners such as Hong Kong, Germany, Belgium and Japan experienced a decline.

Fig. 3.5 showed India's export share to various Regional Trade Agreements between 1997-98 and 2005-06. It is clear from the diagram that exports to CIS, EU, NAFTA, OECD has declined during the period while export share to ASEAN, LAIA, OPEC and

SAARC showed improvement. The biggest decline is with OECD where India is facing difficulty in penetrating those highly protected markets for agricultural and other traditional items for which India got competitive advantage. India is consolidating and exporting more to Asian countries taking advantage of the high growth exhibited by these countries.

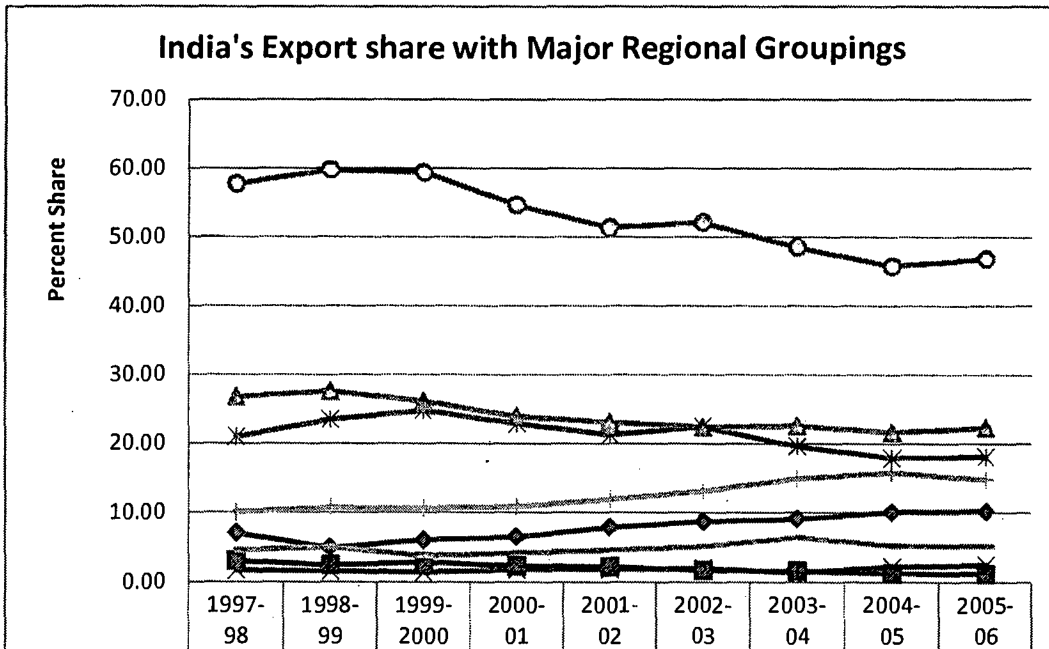
Fig. 3.5 Direction of India's Export



	USA	UAE	China	Singapore	UK	Hong Kong	Germany	Netherlands	Belgium	Italy	Saudi Arabia	Japan
2001-02	19.42	5.68	2.17	2.21	4.93	5.39	4.08	1.97	3.17	2.75	1.88	3.44
2007-08	13.01	9.66	6.78	4.3	4.13	3.96	3.19	3.04	2.64	2.45	2.25	2.24

In terms of absolute value, India exported goods worth 48.1 billion to OECD, 18.64 billion to NAFTA, 15.23 billion to OPEC and 10.51 billion to ASEAN in 2005-06.

Graph: 3.6 India's Export Share with Major Regional Groupings



	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
ASEAN	7.06	4.91	6.08	6.52	7.89	8.76	9.12	10.09	10.23
CIS	3.06	2.45	2.89	2.35	2.22	1.75	1.62	1.31	1.20
EU	26.76	27.63	26.15	23.98	23.13	22.47	22.62	21.69	22.34
LAIA	1.68	1.59	1.43	1.83	1.81	2.02	1.43	2.25	2.50
NAFTA	20.98	23.49	24.79	22.90	21.30	22.49	19.61	17.96	18.15
OECD	57.74	59.80	59.42	54.65	51.40	52.16	48.51	45.82	46.84
OPEC	10.09	10.70	10.61	10.90	11.93	13.09	14.97	15.82	14.84
SAARC	4.60	5.05	3.80	4.21	4.62	5.17	6.50	5.32	5.22

Source: CMIE

In the year 2007-08, bulk imports constituted 47.02 percent and the non-bulk imports form the remaining 52.98 percent. Petroleum, crude and products is the single largest item of import with 33.23 percent which has increased from 25.04 in the year 1990-91. This is partly due to high oil price experienced in the international crude market in the year 2008. Among the non-bulk items, capital goods import is important with 24.37 percent of the total import followed by capital export related items (8.66 percent). Among the capital goods industries, machinery (except electrical) and electronic goods form important items of import with 8.20 and 8.48 percent respectively.

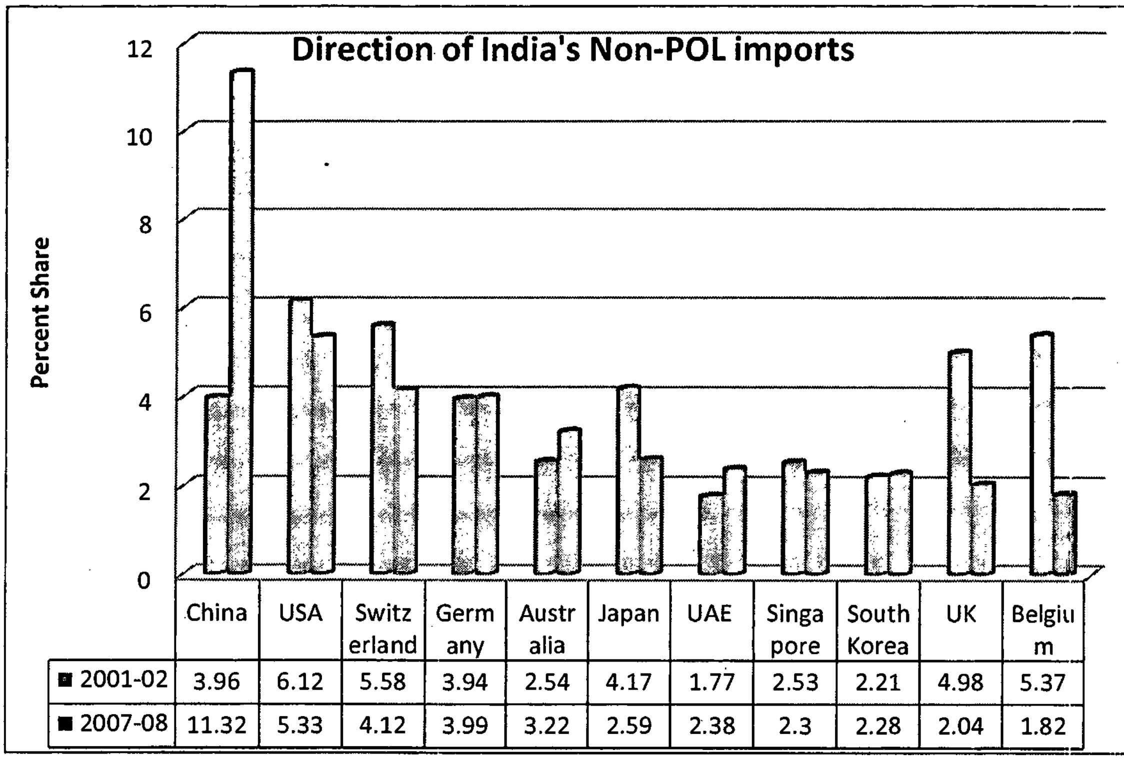
Table: 3.21 Commodity Composition of India's Imports (Percent)

Commodity	1990-91	2000-01	2005-06 p	2006-07 ®	2007-08(P)
Petroleum, crude and products	25.04	30.97	29.47	30.76	33.23
Fertilisers	4.09	1.49	1.43	1.69	2.26
Metalliferrous ores, metal scrap, etc.	3.54	1.53	2.60	4.49	3.30
Iron and steel	4.89	1.54	3.07	3.46	3.62
Machinery except electrical	8.72	5.36	6.71	7.46	8.20
Electronic goods	0.00	6.94	8.88	8.60	8.48
Transport equipment	3.87	1.39	5.93	5.08	3.44
Pearls, precious and	8.65	9.51	6.12	4.03	3.33
Organic and inorganic chemicals	5.30	4.84	4.68	4.22	4.12
Textile yarn, fabrics, made-ups, etc.	1.02	1.18	1.37	1.16	1.03
Gold and silver	0.00	9.18	7.59	7.88	7.45
Artificial resins and plastic	2.53	1.10	1.52	1.39	1.54
Coal, coke and briquittes, etc.	1.83	2.18	2.59	2.46	2.68
Others	6.38	18.41	6.46	4.75	5.21

Source: RBI

Fig. 3.7 showed the direction of India's non petroleum import for the period 2001-02 to 2007-08. In this period China has emerged as the most important source of import for India, increasing its share from 3.96 to 11.32 percent. The import share of India's traditional trade partners such as Belgium, UK, Japan and USA declined during this period. Asian countries like UAE, Australia, South Korea and Singapore are becoming important trade partners to India.

Fig: 3.7 Direction of India's Imports (Non POL)

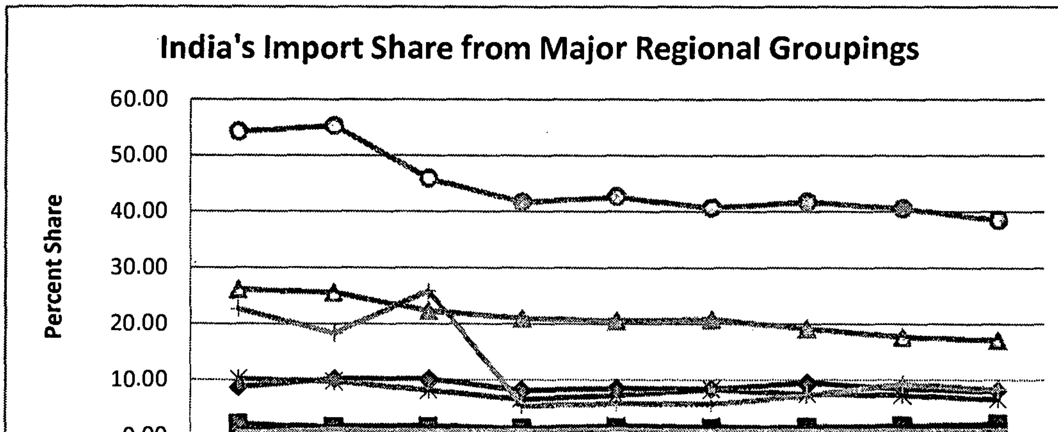


Source: RBI

India's increasing import share with China is reflected in terms of declining trade share with many regional trade agreements. For the period 1997-8 to 2005-06, India's import share declined with OECD, OPEC, NAFTA, EU and the share got stabilized with ASEAN and CIS countries.

In terms of absolute value, India imports 51.43 billion from OECD, 22.84 billion from EU, 11.05 billion from OPEC, 10.61 billion from ASEAN and 8.77 billion from NAFTA in the year 2005-06. India for long period engaged in multilateral trade liberalization giving scant attention to regional trade engagement. But the lack of progress in multilateral trade negotiations and the global phenomenon of bilateralism and regionalism forced India to relook its trade liberalization policy. Consequently India started negotiations for bilateral and regional agreements with number of its partners. Following are some of the regional trade initiatives of India.

Fig: 3.8 India's Import Share from Major Regional Groupings



	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
ASEAN	8.69	10.19	10.22	8.12	8.53	8.39	9.51	8.44	7.95
CIS	2.16	1.65	1.61	1.36	1.43	1.37	1.61	1.81	2.16
EU	26.16	25.57	22.32	21.00	20.59	20.81	19.18	17.69	17.12
LAIA	1.26	1.66	1.86	1.38	1.88	1.62	1.45	1.71	1.62
NAFTA	10.17	9.71	8.12	6.58	7.28	8.26	7.47	7.27	6.57
OECD	54.25	55.28	45.91	41.70	42.67	40.76	41.80	40.61	38.55
OPEC	22.69	18.34	25.85	5.37	5.79	5.70	7.21	9.32	8.28
SAARC	0.56	1.10	0.80	0.87	1.11	0.83	0.86	0.88	1.00

Source: CMIE

India-Sri Lanka FTA became operational from March 2000 and negotiations are in progress for a CEPA (Comprehensive Economic Partnership Agreement). India-Singapore Economic Cooperation Agreement (CECA) became operational from June 2005. India- Thailand FTA became operational from September 2004 and an early harvest of 82 items is under implementation. India signed a FTA with South Korea and a Comprehensive Economic Cooperation Agreement with ASEAN in August 2009. South

Asian Free Trade Agreement (SAFTA) came into force on 1, January 2006 and fully operational by 2016.

Also India is a member of regional groupings such as BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical & Economic Cooperation) and Bangkok Agreement. Also India is involved in negotiations for India-MERCOSUR PTA, India-Chile PTA and India-Brazil-South Africa Cooperation

3.4 India ASEAN Trade

India's trade with ASEAN remained moderate compared with its potential. The total trade which was 2.9 billion in 1993 rose to 28.7 billion in 2006. This was achieved mainly by the concerted efforts and renewed focus given by the Indian Government to the East Asian region. In the year 2006, ASEAN's export to India was 18.9 billion and Import was 9.7 Billion US Dollars.

Table: 3.22 ASEAN's Exports, Imports and Total Trade with India (Million US Dollar)

Year	ASEAN Total Trade	ASEAN-6 Total Trade	ASEAN Export	ASEAN-6 Export	ASEAN Import	ASEAN-6 Import	ASEAN Trade balance	ASEAN-6 Trade Balance
1993	2913.6	2913.6	1484	1484	1429.6	1429.6	54.3	54.4
1995	4659.5	4659.5	2821.1	2821.1	1838.4	1838.4	982.6	982.7
2000	9656.3	9329	6446.8	6198.8	3209.6	3130.2	3237.2	3068.6
2005	23000.6	22359.8	15048.3	14503.7	7952.3	7856.1	7095.9	6647.6
2006	28702.7		18928.1		9774.6		9153.5	

Source: ASEAN Secretariat

ASEAN India trade was growing steadily in the nineties except during East Asian crisis period. The trade between ASEAN and India grew at double digit rate in the recent years. Total trade between India and ASEAN was 28.7 billion US dollars of which ASEAN's export is 18.92 billion and import was 9.77 billion. ASEAN had a trade surplus of 9.15 billion in the year 2006. ASEAN-6 account bulk of India's trade with ASEAN countries. The In the year 2005 export grown at 24.79 percent while import grown at 22.92 percent. Fig. 3.9 presents India's trade with ASEAN countries.

Graph: 3.9 India's Trade with ASEAN and ASEAN-6

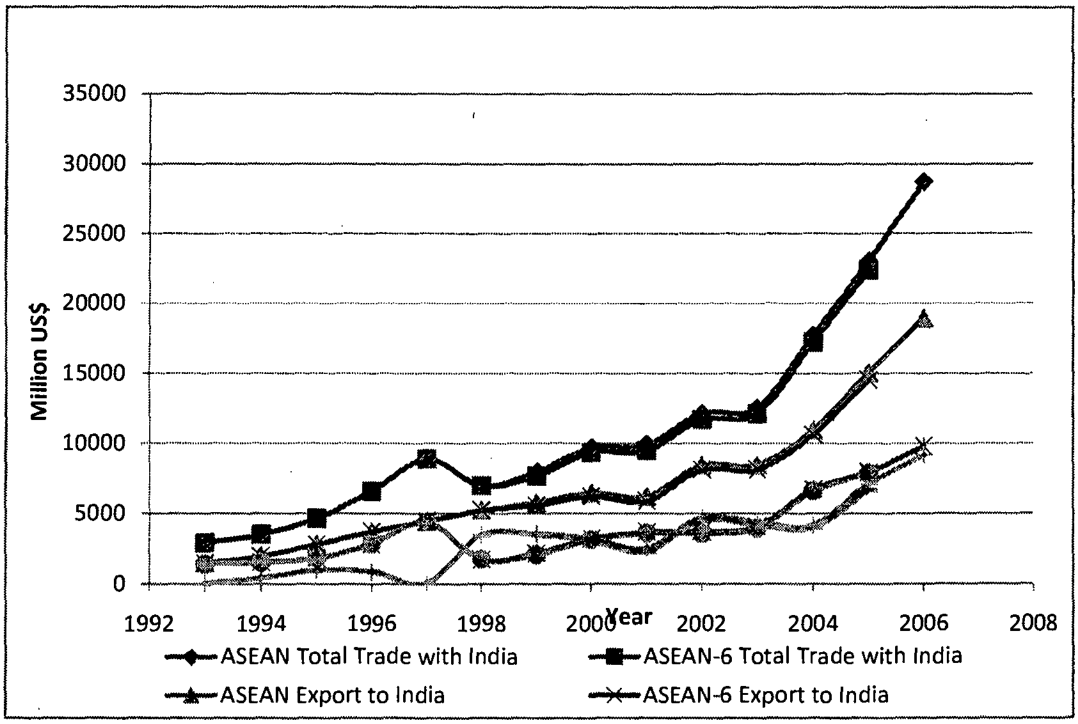


Table: 3.23 Annual Percentage Change in India ASEAN trade for the period 1994-2006

Year	Percent Change					
	ASEAN Total Trade	ASEAN - 6 Total Trade	ASEAN Exports	ASEAN -6 Exports	ASEAN Imports	ASEAN - 6 Imports
2000	21.40	21.79	11.92	11.15	46.30	50.32
2001	2.35	1.31	-3.66	-5.44	14.41	14.69
2002	22.58	23.62	35.54	38.18	0.66	-0.14
2003	3.28	3.59	0.41	0.43	9.83	10.73
2004	41.21	42.14	29.42	30.43	65.77	66.12
2005	30.17	29.97	37.56	36.71	18.17	19.14
2006	24.79		25.78		22.92	

Source: ASEAN Secretariat

3.4.1 Composition and Direction of India – ASEAN Trade

The major export commodities of ASEAN to India are HS-27(Min. fuels, min oils & products of distillation; bitium substances; mineral wax), HS-84(Nuclear reactors, boilers, machinery & mechanical appliances/parts) and HS-85(Electrical machinery, equipments & parts; sound equipment, t.v. equipments). The top 10 export commodities account 80 percent of the ASEAN export. The major import categories of ASEAN from India HS-71(Natural or cultred pearls; precious/semi precious stone/metal; imitation jewelry; coin), HS-27(Min. fuels, min oils & product of distillation; bitum substances; min wax), HS-29(Organic chemicals) and HS-72(Iron & Steel). The top ten import item account 75.8 percent of the ASEAN import.

Table: 3.24 Percent Share of top Ten Export Commodities of ASEAN-6 to India by HS-2 classification

HS -2 Code	Commodities	2003 share	2004 share	2005 Share
15	Anml./veg fats & oils; preprd edible fats; anml or veg waxes	20.4	14.3.	8.0
84	Nuclear reactors, boilers, mechernry & mechan applns/parts	16.6	17.8	17.6
27	Min. fuels, min oils & prd of distillation; bitum substances;min wax	14.4	16.0	22.3
85	El.mechnrt, equpmnts & parts; sound equpmt, tv equpmts	13.1	14.9	12.0
29	Organic chemicals	5.7	5.4	5.3
39	Plastics and articles thereof	2.7	2.8	3.4
90	Optcl,photo/cinematgraphic,measuring,precision,medical equipmt	2.5	2.1	2.0
26	Ores,slags and ash	2.4	2.0	4.4
44	Wood and articles of wood; wood charcoal	2.0	2.9	3.4
54	Manmade filaments,including yarns&worn fabres	1.5	-	
38	Miscellaneous chemical products	-	1.6	
72	Iron and Steel			1.6
	Ten major commoditites	81.2	79.8	80.0
	Others	18.8	20.2	20.0
	Total	100.0	100.0	100.0

Source: ASEAN Secretariat

Table: 3.25 Percent Share of top Ten Import Commodities of ASEAN-5 from India by HS-2 classification

HS-2 Code	Commodities	2003 Share	2004 Share	2005 Share
27	Min. fuels, min oils & prd of distillation; bitum substances;min wax	13.4	20.4	16.1
71	Nat. or cultred pearls; prec/semi prec ston/metal;imitation jewelry;coin	12.5	12.2	27.0
29	Organic chemicals	8.4	8.3	8.4
72	Iron & Steel	7.6	6.7	6.8
84	Nuclear reactors, boilers, mechernry & mechan applns/parts	6.1	5.5	4.6
10	Cereals	5.8	3.5	
02	Meat and edible offal	3.3	2.4	2.6
23	Food industry residues; prepared animal feed	3.0	6.4	2.7
85	El.mechnrt, equpmnts & parts; sound equpmt, tv equpmts	2.9	3.0	2.7
76	Aluminium and articles thereof	2.6	3.0	2.6
74	Copper and articles thereof			2.5
	Ten Major Commodities	65.6	71.4	75.8
	Others	34.4	28.6	24.2
	Total	100.0	100.0	100.0

Source: ASEAN Secretariat

3.5 Major Findings

A careful study on the flow of international trade and the composition and direction of trade across regions and grouping revealed that world trade is entering to the difficult stage of recession after growing impressively for six years. Even though world trade is growing more than world output rate, the growth is not uniform across the regions. As the number of Regional Trade Agreements increased, intra regional trade account for a higher share of world trade compared to inter regional trade resulting in formation of fiercely competing trade blocks. ASEAN is a vibrant trade block in Asia with lower tariffs, export orientation and trade facilitation. But there is diversity in size, population, level of development, trade liberalistion, and economic and financial stability among ASEAN members. ASEAN-6 countries are dominant players of ASEAN trade by contributing majority of exports and imports. Intra regional trade share in ASEAN is increasing steadily but much smaller than EU and NAFTA and higher than Mercosur and ANDEAN. The top ten commodity group account 72.7 percent of the ASEAN import and 76 percent ASEAN import. Brunei and Cambodia export structure is less diversified and exports of Thailand, Singapore and Malaysia are more diversified. Cambodia and Lao PDR import smaller variety of products. USA, Japan, European Union-25 and China are the major trade partners of ASEAN. Tariff levels are much lower in ASEAN compared to India. India is experiencing trade dynamism in the post 2002 period. Manufacturing sector provides maximum export and within the manufacturing sector, Engineering Goods, Chemicals and related products, Gems and Jewellery and textiles and readymade garments are the major items of export. USA is India's important export partner even though its share is coming down in recent years. UAE, China, Singapore and UK are the other important countries India export its products. Petroleum, crude and products is the single largest item of import. China has emerged as the most important source of import for India in recent times. ASEAN India trade was growing steadily since the nineties except during East Asian crisis period. The trade between ASEAN and India grew at double digit rate in the recent years.

CHAPTER – IV

TRADE COMPLEMENTARITY BETWEEN INDIA AND ASEAN

CHAPTER – IV

TRADE COMPLEMENTARITY BETWEEN INDIA AND ASEAN

It is generally understood that complementarity in the trade structure of the countries facilitates more export and import between them and there is scope for mutual benefit from this increased trade. Hence identifying and measuring trade complementarity is an important task in realizing trade potential and for forging trade cooperation among countries. Regional Trade Agreements are effective and successful only if they are carefully designed by identifying and collating complementary products and sectors. There are different indices developed to examine the trade pattern and to see whether increased cooperation is possible between nations. These include Trade Intensity Index, Intra Regional Trade Intensity Index and Revealed Comparative Advantage Index. In this chapter an attempt is made to construct these indices for India and ASEAN and to see whether increased trade cooperation between these two trading partners is possible or not.

4.1 Trade Intensity Index (TII)

The trade intensity index (TII) is used to determine whether the value of trade between two countries is greater or smaller than would be expected on the basis of their importance in world trade. It is defined as the share of one country's exports going to a partner divided by the share of world exports going to the partner. It is calculated as,

$$T_{ij} = \frac{(x_{ij}/X_{it})}{(x_{wj}/X_{wt})}$$

Where x_{ij} and x_{wj} are the values of country i's exports and of world exports to country j and where X_{it} and X_{wt} are country i's total exports and total world exports respectively. An index of more (less) than one indicates a bilateral trade flow that is larger (smaller) than expected, given the partner country's importance in world trade.

Trade Intensity Index is further divided in to Export Intensity Index (EII) and Import Intensity Index (III) for looking the pattern of exports and Imports. Following Kojima (1964) and Drysdale (1969), the index of trade intensity is restated as follows

$$EII\ between\ India\ and\ ASEAN = \frac{X_{IA}/X_I}{M_A/(M_W - M_I)}$$

X_{IA} = India's Export to ASEAN; XI= India's total Export

M_A= Total Import of ASEAN; M_w= Total World imports

M_I = Total Imports of India

$$III\ between\ India\ and\ ASEAN = \frac{M_{IA}/M_I}{X_A/(X_W - X_I)}$$

M_{IA} = Import of India from ASEAN; M_I = Total Import of India

X_A = Total Export of ASEAN; X_W = Total World Export

X_I = Total Export of India

4.1.1 Trade Intensity Index between ASEAN and India

Trade Intensity Index is calculated for India and ASEAN countries for the period 1990 to 2007 taking data from Direction of Trade Statistics (DOTS), IMF and accessed through World Integrated Trade Solutions (WITS). Both Export Intensity Index and Import Intensity Index are calculated for India and ASEAN taking partners' position in world trade. An index value of one indicates bilateral trade is following the pattern of rest of the world and the value above one shows there is trade intensity between partners. Table 4.1 provided the Trade Intensity Index between India and ASEAN.

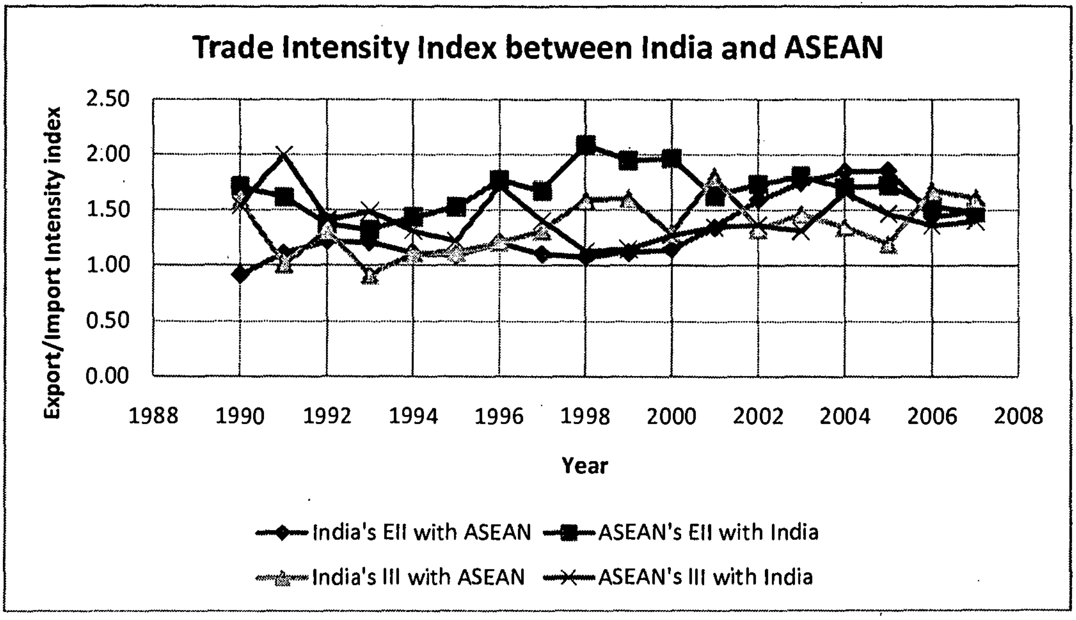
Table: 4.1 Trade Intensity Index between ASEAN and India

Year	India's EII with ASEAN	ASEAN's EII with India	India's III with ASEAN	ASEAN's III with India
1990	0.9127	1.7143	1.5770	1.5372
1995	1.0903	1.5260	1.1218	1.2206
2000	1.1437	1.9671	1.2942	1.2737
2001	1.3445	1.6275	1.8053	1.3462
2002	1.5903	1.7326	1.3280	1.3660
2003	1.7452	1.8052	1.4628	1.3125
2004	1.8477	1.7049	1.3480	1.6552
2005	1.8592	1.7215	1.1954	1.4685
2006	1.4429	1.5353	1.6801	1.3635
2007	1.4872	1.4775	1.6059	1.3997

Source: Computed from DOTS, IMF

It is revealed from Table 4.1 that India's export intensity as well as import intensity is above one for most of the years. This means India's exports and imports are intense with ASEAN countries compared with its trading pattern with rest of the world. The natural trading partner theory reveals countries tend to trade more with neighbors and close proximate partners. Both the index will come down once it is adjusted for the geographical distance. ASEAN's Export Intensity Index is higher than Import Intensity Index as it exports more to India compared to its imports. Fig 4.1 gives the diagrammatic representation of the Trade Intensity Index between India and ASEAN.

Fig: 4.1 Trade Intensity Index between ASEAN and India



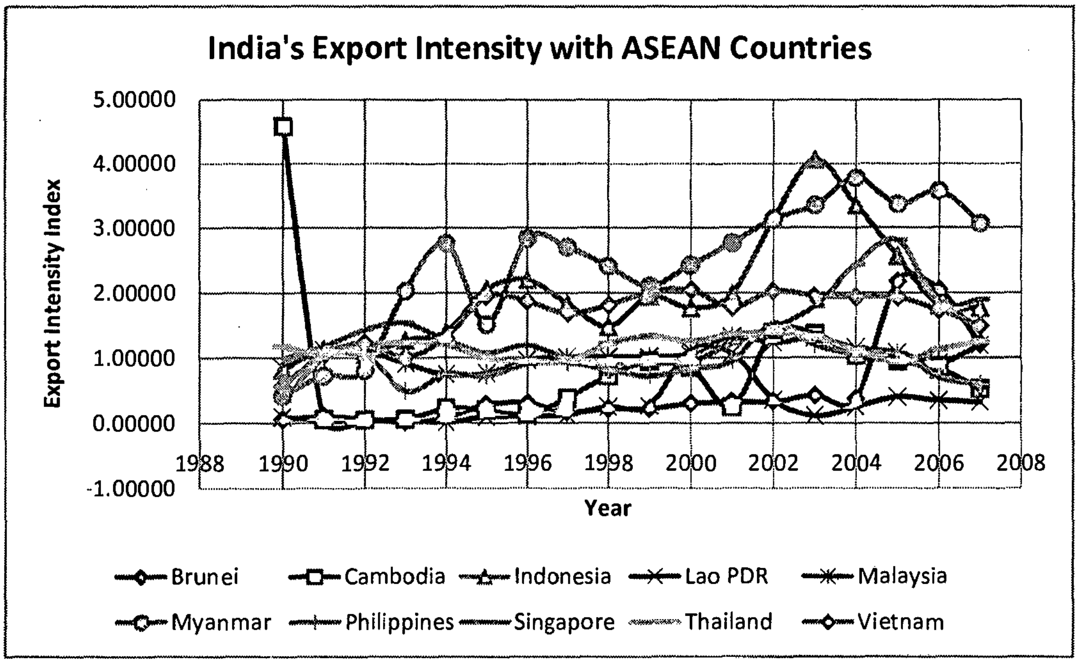
Country wise look at the trade intensity shows, India's export Intensity is above one for Indonesia, Malaysia, Myanmar, Singapore, Thailand and Vietnam. For others (Brunei, Laos, Cambodia and Philippines) the export intensity is fluctuating over the years. Myanmar, Singapore and Vietnam are the three countries with whom India got high export intensity. For the year 2007, except Cambodia, Laos and Philippines, India got high trade intensity with all ASEAN countries. Table 4.2 and following Fig.4.2 give the country wise export intensity of ASEAN countries.

Table: 4.2 India's Export Intensity Index with ASEAN Countries

Year	BRU	CAM	INDO	LAO	MAL	MYA	PHI	SING	THAI	VIET
1990	0.05	4.58	0.82	0.10	0.84	0.42	0.32	0.99	1.18	0.57
1995	0.28	0.20	2.06	0.09	0.77	1.52	0.72	1.08	1.00	1.95
2000	0.30	0.85	1.77	1.11	1.06	2.43	0.84	0.94	1.26	2.04
2001	0.33	0.25	1.98	1.07	1.33	2.77	0.95	1.22	1.37	1.78
2002	0.32	1.38	3.13	0.36	1.24	3.13	1.53	1.46	1.39	2.03
2003	0.43	1.37	4.06	0.11	1.30	3.35	1.20	1.80	1.33	1.95
2004	0.36	1.04	3.35	0.24	1.16	3.78	1.06	2.44	1.12	1.94
2005	2.17	0.95	2.56	0.40	1.08	3.37	1.08	2.80	0.94	1.93
2006	2.05	0.83	1.80	0.35	0.92	3.58	0.70	1.84	1.13	1.74
2007	1.21	0.53	1.77	0.32	1.19	3.07	0.59	1.90	1.25	1.49

Source: Computed from DOTS, IMF

Fig. 4.2 India's Export Intensity with ASEAN Countries



India's Import intensity is very low with Brunei, Cambodia, Lao PDR, Philippines, and Vietnam reflecting the small quantum of imports it is having with these countries. India's import intensity was small with Thailand for many years but improved strongly after signing the bilateral trade agreement. India's imports with ASEAN countries traditionally confined to Singapore and Malaysia. India's import intensity is high with Myanmar as it is sharing border with India and in close proximate to the north eastern states of India. Table 4.3 gives the Import Intensity of India with ASEAN countries.

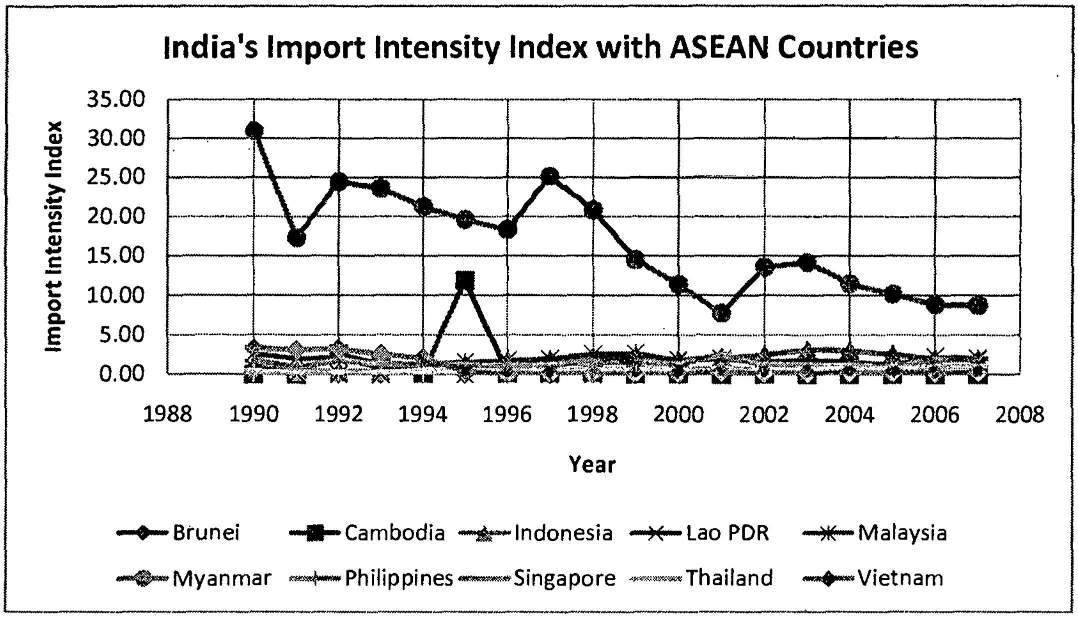
Table: 4. 3 India's Import Intensity Index with ASEAN Countries

Year	BRU	CAM	INDO	LAO	MAL	MYA	PHI	SIN	THA	VIET
1990	0.00	0.00	0.94	0.82	2.60	30.93	0.07	1.83	0.38	3.30
1995	0.00	11.84	1.24	0.00	1.53	19.62	0.12	1.20	0.36	0.40
2000	0.01	0.12	1.87	0.00	1.78	11.40	0.20	1.35	0.61	0.11
2001	0.01	0.01	2.12	0.00	2.03	7.76	0.25	2.55	0.84	0.34
2002	0.01	0.05	2.45	0.03	1.60	13.60	0.36	1.21	0.61	0.17
2003	0.01	0.02	3.19	0.03	1.82	14.21	0.34	1.21	0.69	0.18
2004	0.01	0.01	3.06	0.01	1.56	11.49	0.38	1.12	0.73	0.24
2005	0.01	0.02	2.54	0.01	1.28	10.17	0.37	1.03	0.77	0.28
2006	0.01	0.01	2.01	0.01	2.23	8.86	0.18	1.97	0.98	0.24
2007	0.01	0.01	1.85	0.01	2.03	8.75	0.13	2.03	1.06	0.22

Source: Computed from DOTS, IMF

The Import Intensity of India is diagrammatically showed in Fig.4.3. India is having exceptionally high import intensity with Myanmar mainly because Myanmar is having very less imports with the rest of the world. For all other countries, the index follows a range except for Cambodia in the year 1995.

Fig: 4. 3 India's Import Intensity Index with ASEAN Countries



4.2 Intra Regional Trade Intensity Index:

Kawai (2004) developed a new index namely Intra Regional Trade Intensity Index to explain the importance of intra regional trade of a RTA to the world trade. Intra Regional Trade Intensity is calculated with the following formulae.

Intra-ASEAN Trade Intensity = (Intra ASEAN Exports/Total World Exports) / {(Total ASEAN Exports/Total World Exports) X (World Exports to ASEAN/Total World Exports)}

Table 4.4 provided the Intra ASEAN trade intensity index for the period 1990 to 2006.

Table: 4. 4 Intra ASEAN Trade Intensity Index

Year	Intra ASEAN Trade Intensity Index
1990	4.2677
1995	3.7021
2000	4.0636
2001	4.1690
2002	4.1625
2003	4.5285
2004	4.6028
2005	4.4399
2006	4.4311

Source: Computed

The intra ASEAN Trade Intensity Index is high for all the years. This means ASEAN intra regional trade is significantly higher compared with ASEAN's share in world trade. From 1998 Intra Regional Trade Intensity (IRTI) index is above four and stood at 4.4311 in 2006.

4.3 Revealed Comparative Advantage (RCA) Index

Revealed Comparative Advantage Index shows how comparative is a product in countries export compared to the products share in world trade. A product with high RCA is competitive and can be exported to countries with low RCA. Measures of revealed comparative advantage (RCA) have been used to help assess a country's export potential. The RCA indicates whether a country is in the process of extending the products in which it has a trade potential, as opposed to situations in which the number of products that can be competitively exported is static. It can also provide useful information about potential trade prospects with new partners. Countries with similar RCA profiles are unlikely to have high bilateral trade intensities unless intraindustry trade is involved. RCA measures, if estimated at high levels of product disaggregation, can focus attention on other nontraditional products that might be successfully exported. The RCA index of country 'i' for product j is often measured by the product's share in the country's exports in relation to its share in world trade:

$$RCA_{ij} = \frac{(x_{ij}/X_{it})}{(x_{wj}/X_{wt})}$$

Where x_{ij} and x_{wj} are the values of country i's exports of product j and world exports of product j and where X_{it} and X_{wt} refer to the country's total exports and world total exports. A value of less than unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product.

Revealed Comparative Advantage (RCA) for ASEAN countries is calculated at three levels namely Commodity Groups, HS-2 and HS-4 levels and compared against India's RCA to see trade complementarity between these trading partners. At the aggregate level, RCA is calculated for eight ASEAN countries across 16 major commodity groups for 17 years to identify specific advantage in trade. The commodities for which RCA are calculated include Agricultural Products, Food, Fuels and Mining, Fuels, Manufactures, Iron and Steel, Machinery and Transport Equipment, Office and Telecom equipments, EDP and OE, IC and EC, Pharmaceuticals, Chemicals, Automotive, Textiles and Clothing. Data for calculating RCA is collected from IMF, WTO and ASEAN Secretariat.

RCA for ASEAN countries taken together at HS-2 classification for the year 2008 is calculated and compared against India for getting a picture on latest India - ASEAN trade complementarity. Data pertaining to Brunei, Laos, Indonesia, Myanmar and Vietnam is not included for non availability of data. RCA for HS-4 digits commodities for India, Malaysia, Philippines, Singapore and Thailand is also computed to see the trade complementarity at a more disaggregated level. The following section provides the analysis of RCA for various commodities between India and ASEAN countries.

4.3.1 Agricultural Products

India's RCA for agricultural products for the year 2006 is 1.53 which illustrated that India's agricultural exports are higher than share of agricultural exports in world trade. The RCA for agricultural products among ASEAN countries are high for Indonesia, Malaysia, Thailand and Vietnam. That means India can have higher agricultural exports with other ASEAN countries such as Brunei, Cambodia, Philippines and Singapore.

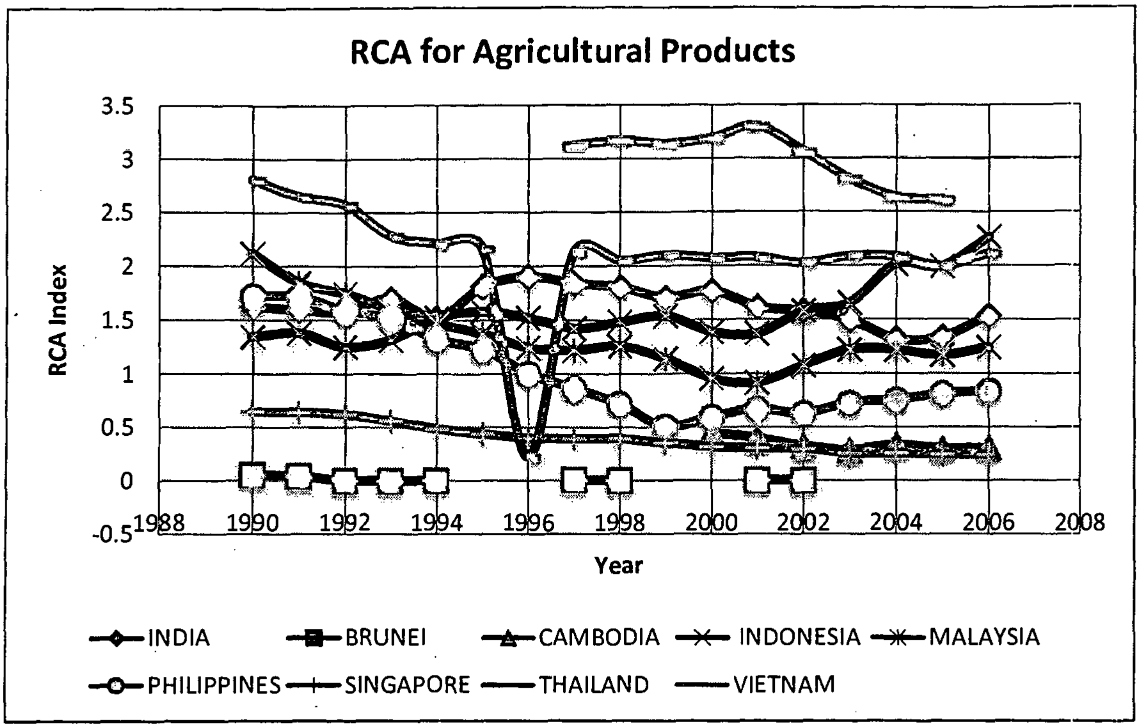
Table: 4.5 RCA for Agricultural Products in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	1.6224	0.0571		1.3455	2.1177	1.7242	0.6458	2.8070	
1995	1.8084			1.5813	1.3717	1.2300	0.4407	2.1597	
2000	1.7649		0.4485	1.3871	0.9534	0.5951	0.3157	2.0677	3.1900
2001	1.6164	0.0061	0.3966	1.3698	0.9139	0.6707	0.3034	2.0756	3.3025
2002	1.5754	0.0030	0.3249	1.5757	1.0727	0.6274	0.2966	2.0201	3.0619
2003	1.4925		0.2846	1.6530	1.2193	0.7270	0.2534	2.0823	2.8072
2004	1.3166		0.3343	2.0105	1.2158	0.7539	0.2532	2.0784	2.6359
2005	1.3353		0.2979	1.9899	1.1680	0.8143	0.2435	1.9904	2.6154
2006	1.5331		0.3070	2.2647	1.2399	0.8363	0.2395	2.1111	

Source: Computed from WTO database

The RCA for the period 1990 to 2006 (seventeen years) provide the long term trend for each product. The mean RCA for agricultural commodity is above one for India, Indonesia, Malaysia, Philippines, Thailand and Vietnam and below one for Brunei, Cambodia and Singapore. This means there is a scope to trade agricultural Commodities between India and low RCA countries of ASEAN such as Brunei, Cambodia and Singapore. Fig. 4.4 diagrammatically represents the RCA for ASEAN countries and India for the period 1990 to 2006.

Fig: 4.4 RCA for Agricultural Products in India and ASEAN



4.3.2 Food

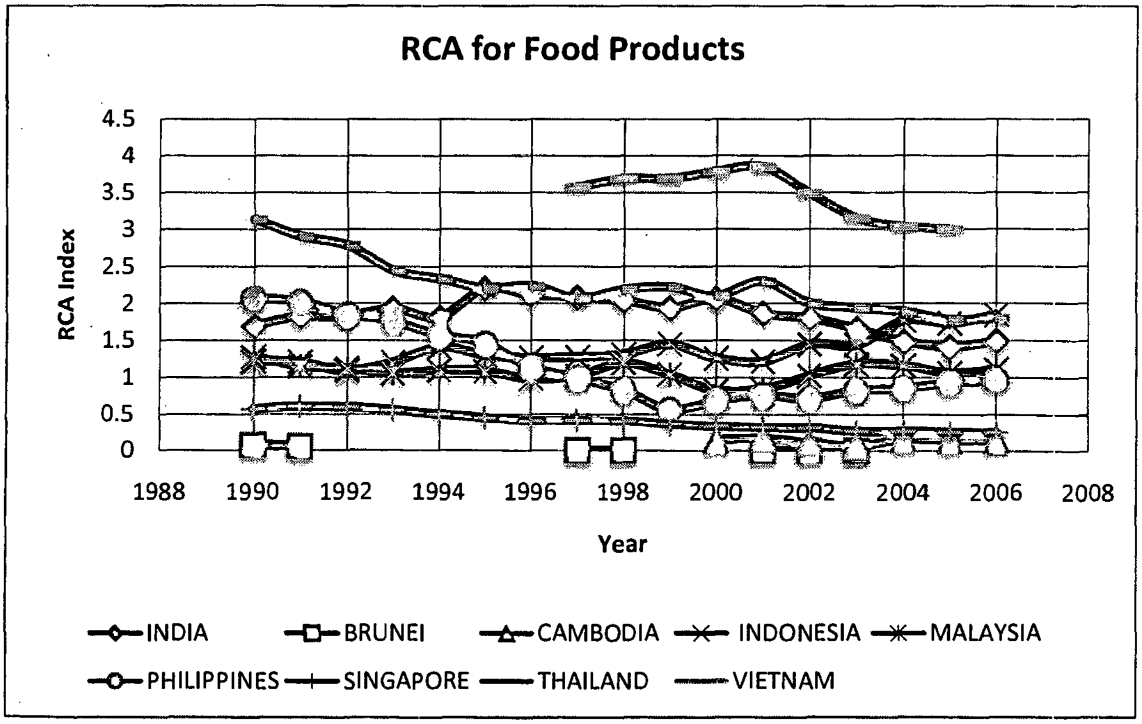
Food items form part of agricultural products and resemble the same pattern of RCA that of agricultural products. RCA for food is high for India, Indonesia, Malaysia, Thailand and Vietnam and low for Brunei, Cambodia, Philippines and Singapore. The average RCA showed that the two ASEAN countries namely Vietnam and Thailand are having a strong RCA of above two. But Brunei, Cambodia and Singapore got a very low RCA in food and India which got a mean RCA of 1.8374 can export food articles to these nations. It is also revealed from the table 4.6 that Philippines and Thailand which had high RCA for food items in the early nineties weakened its RCA over the period time. Table 4.6 and Fig. 4.5 provide the RCA for food items for India and ASEAN.

Table: 4.6 RCA for Food in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	1.6922	0.0741		1.2146	1.2743	2.0625	0.5694	3.1323	
1995	2.2018			1.2994	1.0817	1.4593	0.4505	2.1973	
2000	2.062		0.1442	1.2631	0.8278	0.6818	0.3353	2.0985	3.7839
2001	1.864	0.0054	0.1674	1.2172	0.8451	0.7656	0.3182	2.2969	3.8486
2002	1.8012	0.0053	0.1079	1.4514	1.0273	0.7134	0.3134	2.0040	3.4874
2003	1.6585	0.0060	0.0632	1.4431	1.1815	0.8243	0.2659	1.9374	3.1470
2004	1.488		0.1590	1.7704	1.1622	0.8553	0.2654	1.8903	3.0291
2005	1.416		0.1413	1.7379	1.0646	0.9298	0.2531	1.7821	2.9978
2006	1.4928		0.1464	1.8487	1.1133	0.9639	0.2489	1.8010	

Source: Computed from WTO database

Fig: 4.5 RCA for Food in India and ASEAN



4.3.3 Fuels and Mining Product

Fuel and Mining are resource based products depending on the natural endowments of the country. But industries can be established to process and refine these products. For Mining and Fuels, RCA is high in Brunei, India, Indonesia, and Vietnam and low in Cambodia, Malaysia, Singapore and Thailand. The three oil rich countries of ASEAN are Brunei, Indonesia and Vietnam and they export petroleum related products to other parts of the world. India has a rich deposit of mineral ores and export them to the mineral scarce countries of ASEAN and rest of the world. India is a huge importer of petroleum crude and its requirements are surging ahead every year and they can look forward to ASEAN oil exporters to meet the demand. Table 4.7 gives the RCA for fuels and Mining products taken together for India and ASEAN countries.

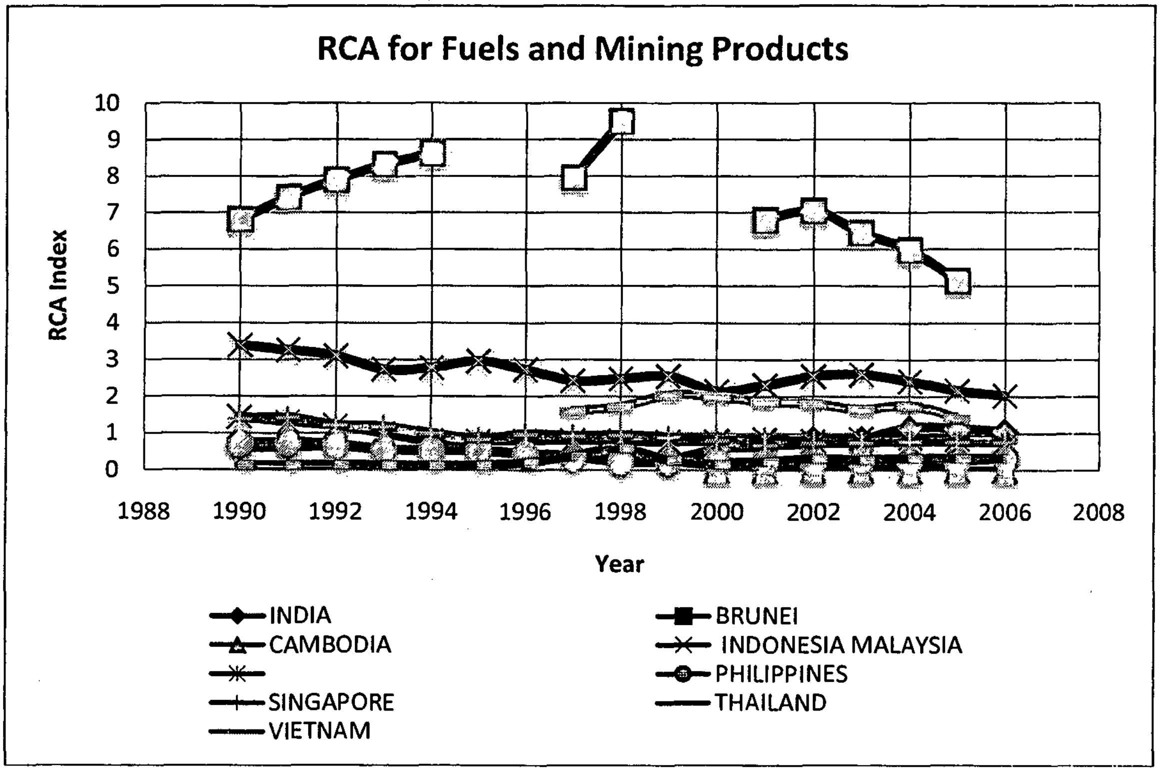
Table: 4.7 RCA for Fuels and Mining Products in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.6106	6.8225		3.3997	1.4410	0.7339	1.3900	0.1323	
1995	0.5136			2.9650	0.7881	0.5456	0.8347	0.1267	
2000	0.5727		0.0005	2.1471	0.7942	0.2102	0.8080	0.1498	2.0004
2001	0.6609	6.8003	0.0004	2.3121	0.8481	0.2111	0.6887	0.2342	1.8595
2002	0.8381	7.0537	0.0001	2.5573	0.7896	0.2190	0.7373	0.3150	1.8086
2003	0.8507	6.4454	0.0016	2.6073	0.8607	0.2574	0.7492	0.2850	1.6552
2004	1.1596	5.9856	0.0006	2.4236	0.8962	0.2585	0.7901	0.3322	1.7611
2005	1.14	5.1412	0.0002	2.1663	0.8426	0.2424	0.7748	0.3254	1.4371
2006	1.0606		0.0003	2.0348	0.7994	0.3483	0.7688	0.3419	

Source: Computed from WTO database

The mean RCA shows, Brunei and Indonesia got strong RCA for fuel and mining products while Vietnam got high RCA and they can export fuel products to Cambodia, Philippines and Thailand who have weak RCA and India, Malaysia and Singapore who have low RCA. This showed there is complementarity in trading fuel products in the ASEAN region. With regard to the mining products alone, India got the comparative advantage in many product categories and can export them to most of the ASEAN countries.

Fig: 4.6 RCA for Fuels and Mining Products in India and ASEAN



4.3.4 Fuels

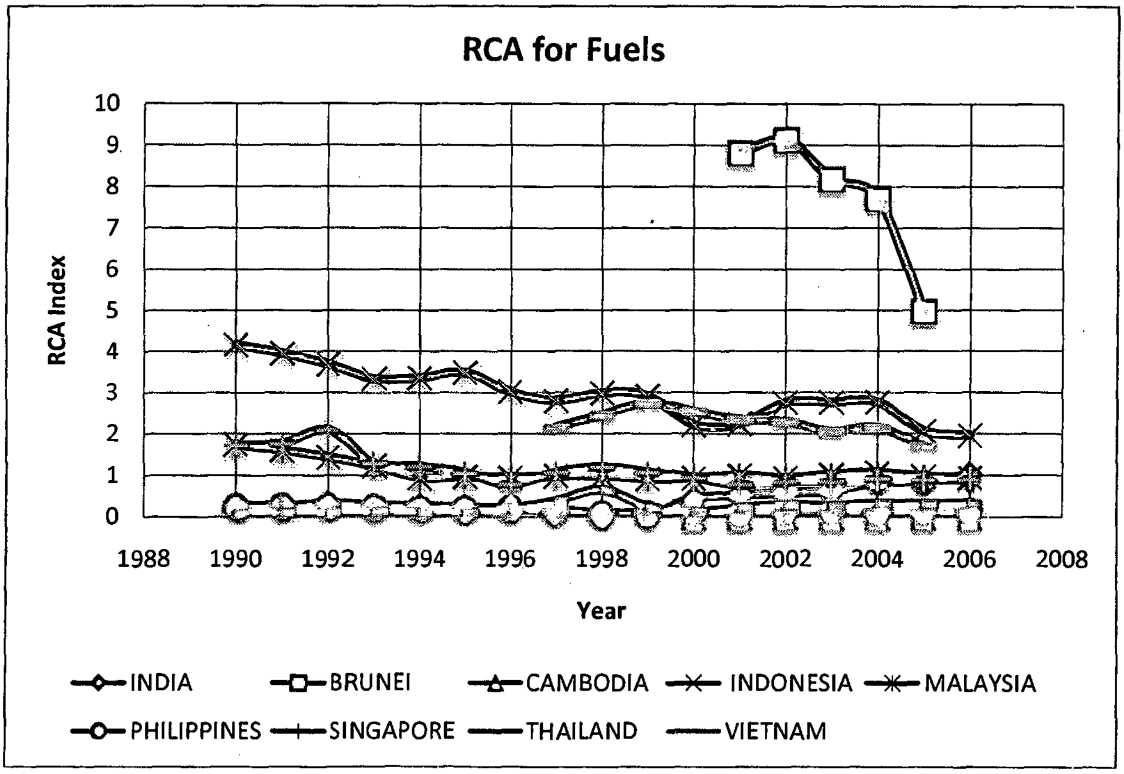
If we consider fuel separately; Brunei, Indonesia and Vietnam got a high comparative advantage. Brunei's single most item of export is petroleum and enjoys the mean RCA of 7.7632. Indonesia is a member of OPEC and Vietnam is exploring new wells to increase petroleum export. Singapore and Malaysia got high RCA in fuels for refining and exporting the products to other countries. India, Cambodia, Philippines and Thailand got weak RCA and import large quantity of fuel from other countries.

Table: 4.8 RCA for Fuels in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.2766			4.1639	1.7431	0.2639	1.7256	0.0792	
1995	0.2353			3.4809	0.9586	0.2062	1.0513	0.0988	
2000	0.4448		0.0001	2.2144	0.9246	0.1221	0.9350	0.1157	2.5388
2001	0.5203	8.8049	0.0003	2.2390	0.9939	0.0850	0.7745	0.2156	2.3419
2002	0.589	9.1306	0.0001	2.7467	0.9233	0.1276	0.8383	0.2876	2.2870
2003	0.6228	8.1856	0.0001	2.7555	1.0072	0.1553	0.8451	0.2636	2.0520
2004	0.8229	7.7207	0.0001	2.7599	1.0554	0.1152	0.9128	0.3238	2.1480
2005	0.871	4.9744	0.0000	2.0658	0.9670	0.1364	0.8863	0.3145	1.6958
2006	1.0095		0.0000	1.9545	0.9371	0.1495	0.8954	0.3396	

Source: Computed from WTO database

Fig: 4.7 RCA for Fuels in India and ASEAN



4.3.5 Manufacture

Manufactured commodities are value added products and export of these products depend on the industrial development of the country. The computation of RCA for manufacture products showed India, Cambodia, Malaysia, Philippines, Singapore and Thailand had

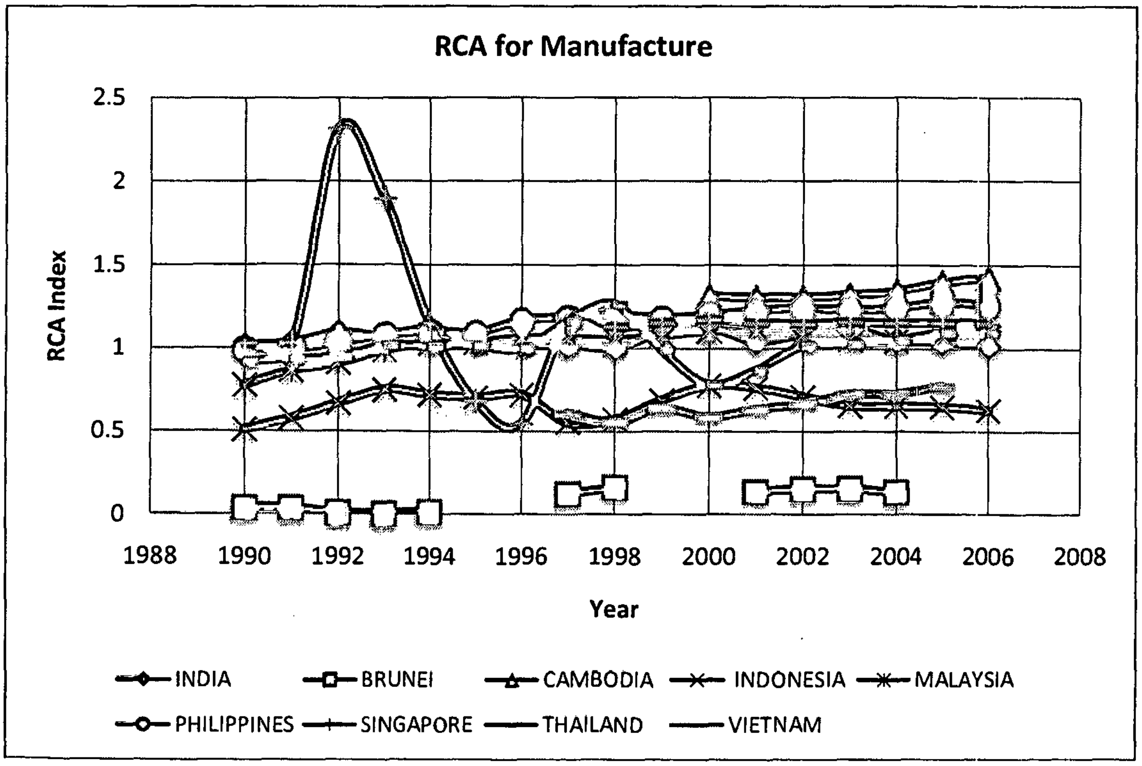
RCA above one where as Brunei, Indonesia and Vietnam got RCA below one. But the disaggregation of Manufacture products in to different categories showed that countries enjoy clear RCA in specific product categories.

Table: 4.9 RCA for Manufacture Products in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	1.0053	0.0390		0.5079	0.7750	0.9935	1.0255	0.9114	
1995	1.052			0.7019	1.0349	1.0935	0.6799	1.0143	
2000	1.1215		1.3144	0.7760	1.1039	1.2007	1.1732	0.7825	0.5859
2001	1.0451	0.1378	1.3069	0.7627	1.0949	1.2249	1.1530	0.8686	0.6317
2002	1.0846	0.1538	1.3084	0.7092	1.0828	1.2442	1.1485	1.0147	0.6643
2003	1.1182	0.1551	1.3223	0.6556	1.0542	1.2331	1.1601	1.0274	0.7274
2004	1.0494	0.1346	1.3454	0.6531	1.0457	1.2435	1.1536	1.0498	0.7290
2005	1.042		1.3976	0.6497	1.0668	1.2776	1.1569	1.0974	0.7768
2006	1.0195		1.4275	0.6284	1.0739	1.2621	1.1528	1.1016	

Source: Computed from WTO database

Fig: 4.8 RCA for Manufacture Products in India and ASEAN



4.3.6 Iron and Steel

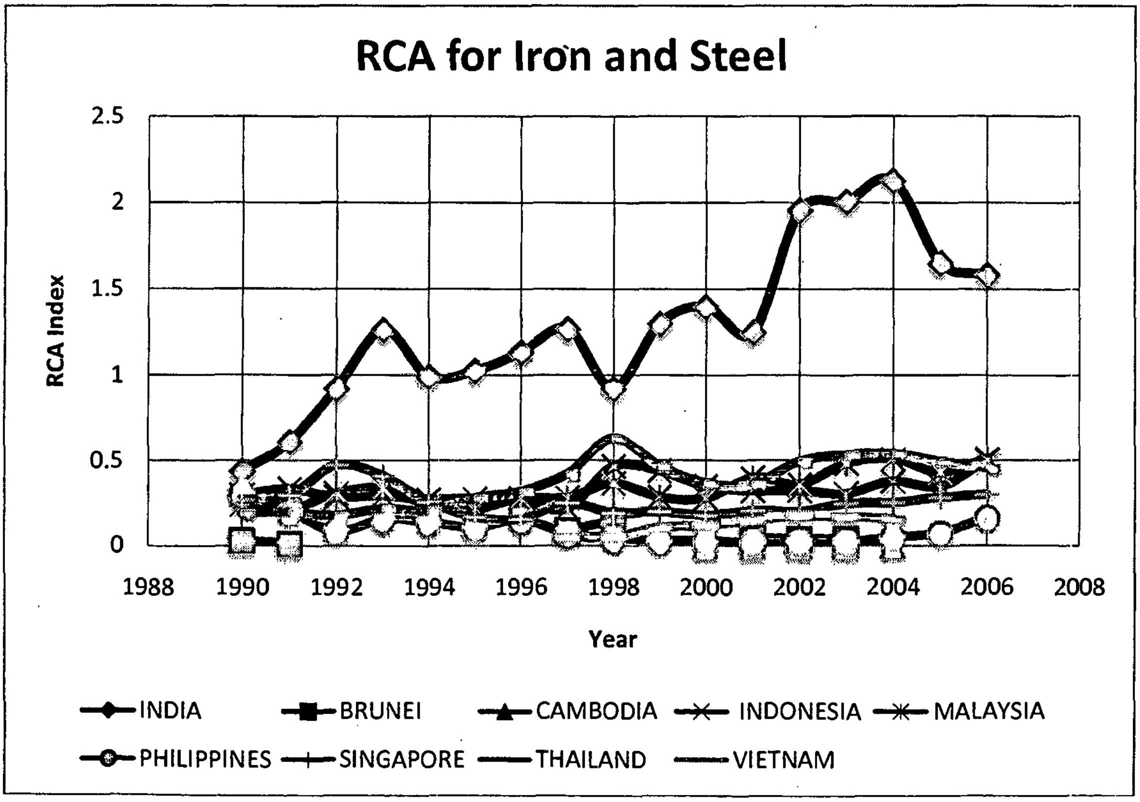
In the case of Iron and Steel industry, all the ASEAN countries got comparative disadvantage where as India enjoy a high RCA in the product. This industry depends on the availability of natural resource in a country and India got huge iron ore reserve in the country. India can export iron and steel to most of the ASEAN countries.

Tab: 4.10 RCA for Iron and Steel in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.439	0.0329		0.3003	0.2430	0.3086	0.2708	0.1922	
1995	1.0249			0.2770	0.2157	0.1067	0.1706	0.2812	
2000	1.398		0.0010	0.3531	0.2824	0.0294	0.1812	0.3707	0.1218
2001	1.2486	0.0515	0.0003	0.3245	0.4014	0.0226	0.2073	0.3618	0.1493
2002	1.9549	0.0413	0.0015	0.3264	0.3612	0.0237	0.2029	0.4945	0.1767
2003	2.0064	0.0442	0.0001	0.3078	0.4817	0.0217	0.2493	0.5334	0.1705
2004	2.1263		0.0004	0.3798	0.5095	0.0496	0.2541	0.5414	0.1605
2005	1.6502			0.3492	0.4316	0.0766	0.2850	0.4932	
2006	1.5819			0.5039	0.5104	0.1652	0.3006	0.4562	

Source: Computed from WTO database

Fig: 4.9 RCA for Iron and Steel in India and ASEAN



4.3.7 Chemicals

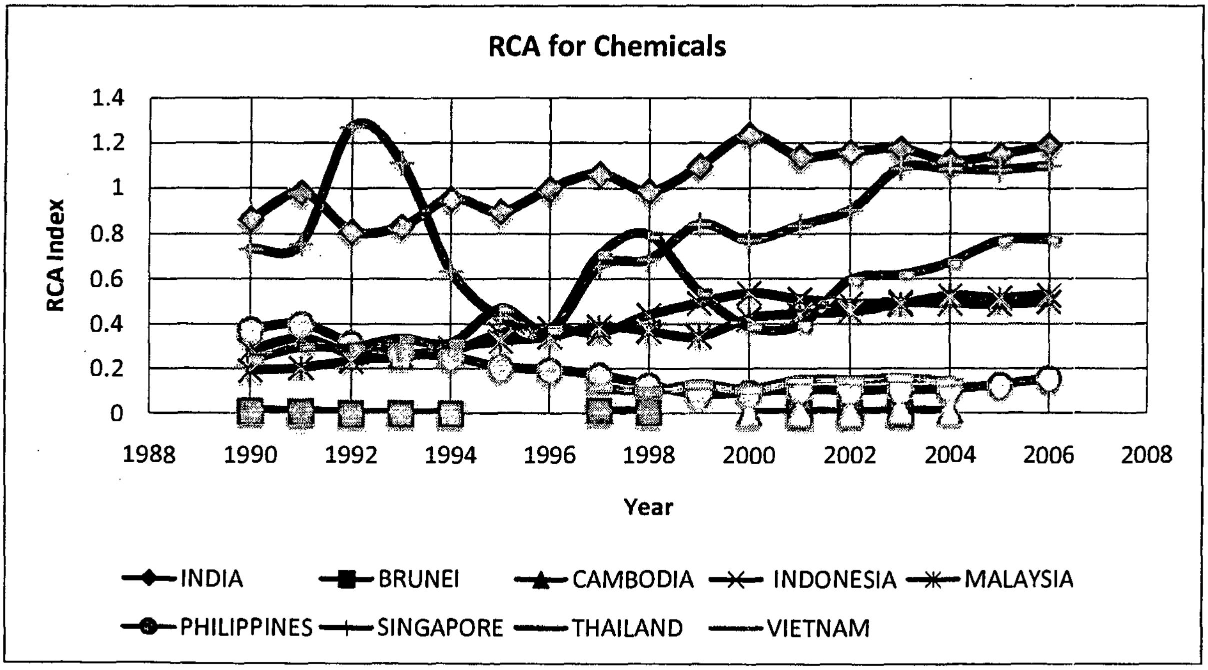
The computation of RCA for Chemicals showed that India developed comparative advantage in the product category over the period of time. Currently India is exporting different chemical products and increasing the export share in its export basket. India got a high RCA in Chemicals where as all the other ASEAN countries have either weak or low RCA. This showed India can improve trade in Chemical products with the ASEAN countries.

Table: 4.11 RCA for Chemicals in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.8625	0.0091		0.2818	0.1907	0.3749	0.7315	0.2384	
1995	0.8961			0.3572	0.3231	0.2084	0.4286	0.4685	
2000	1.2354		0.0015	0.5356	0.4231	0.0945	0.7702	0.3888	0.1062
2001	1.1392	0.0053	0.0013	0.5102	0.4438	0.1066	0.8374	0.3946	0.1511
2002	1.16	0.0036	0.0036	0.4890	0.4535	0.1032	0.9048	0.5948	0.1490
2003	1.1735	0.0054	0.0104	0.4959	0.4872	0.1058	1.0886	0.6173	0.1582
2004	1.1195		0.0109	0.4912	0.5252	0.1089	1.0853	0.6722	0.1435
2005	1.1484			0.4860	0.5139	0.1274	1.0815	0.7687	
2006	1.191			0.4975	0.5277	0.1563	1.0988	0.7743	

Source: Computed from WTO database

Fig: 4.10 RCA for Chemicals in India and ASEAN



4.3.8 Pharmaceuticals

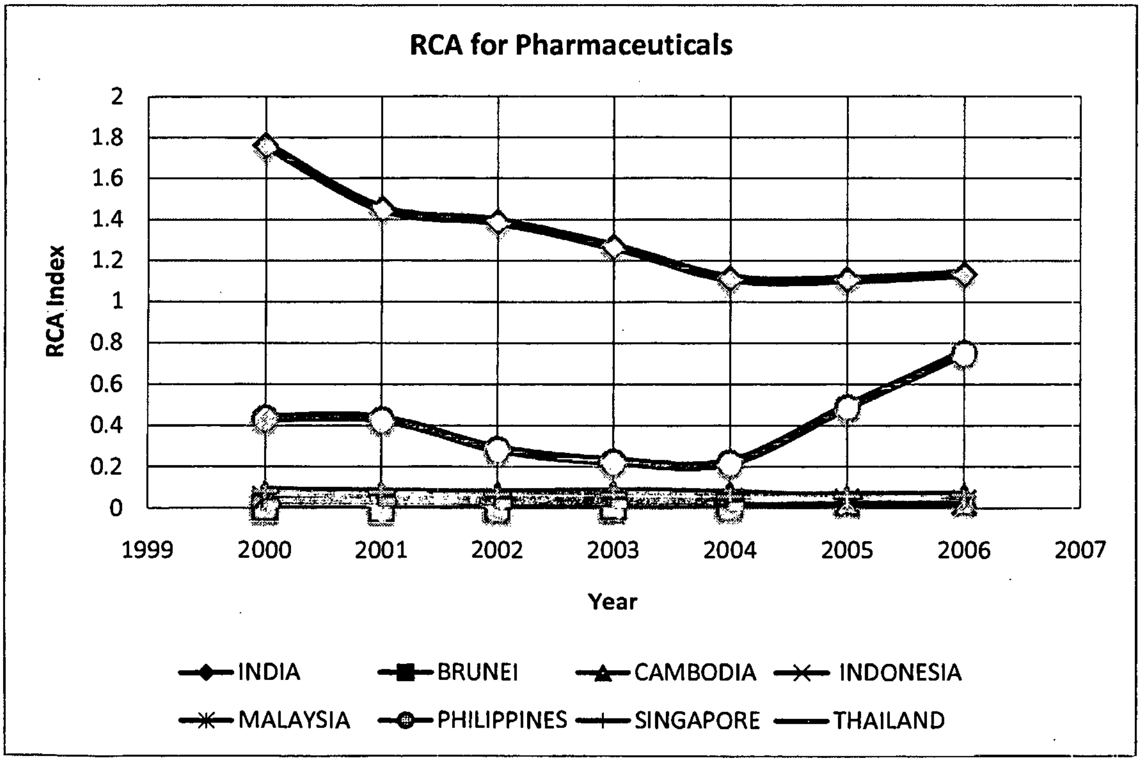
India is having high RCA in this knowledge based industry showing the capacity developed over the period of time. All the ASEAN countries have weak RCA in this category even though Philippines is slowly increasing its share over time. There is prospect higher trade between India and ASEAN countries in Pharmaceutical Products.

Table: 4.12 RCA for Pharmaceuticals Products in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI
2000	1.7619	0.0038	0.0709	0.0482	0.0302	0.4364	0.0827	0.0205
2001	1.4517	0.0006	0.0705	0.0416	0.0376	0.4314	0.0769	0.0311
2002	1.3894	0.0091	0.0709	0.0377	0.0252	0.2870	0.0674	0.0233
2003	1.2684	0.0095	0.0777	0.0358	0.0220	0.2261	0.0636	0.0220
2004	1.1149	0.0211	0.0705	0.0385	0.0268	0.2217	0.0560	0.0098
2005	1.1088		0.0495	0.0366	0.0250	0.4902	0.0597	
2006	1.136		0.0609	0.0327	0.0257	0.7529	0.0621	

Source: Computed from WTO database

Fig: 4.11 RCA for Pharmaceuticals Products in India and ASEAN



4.3.9 Machinery and Transport Equipment

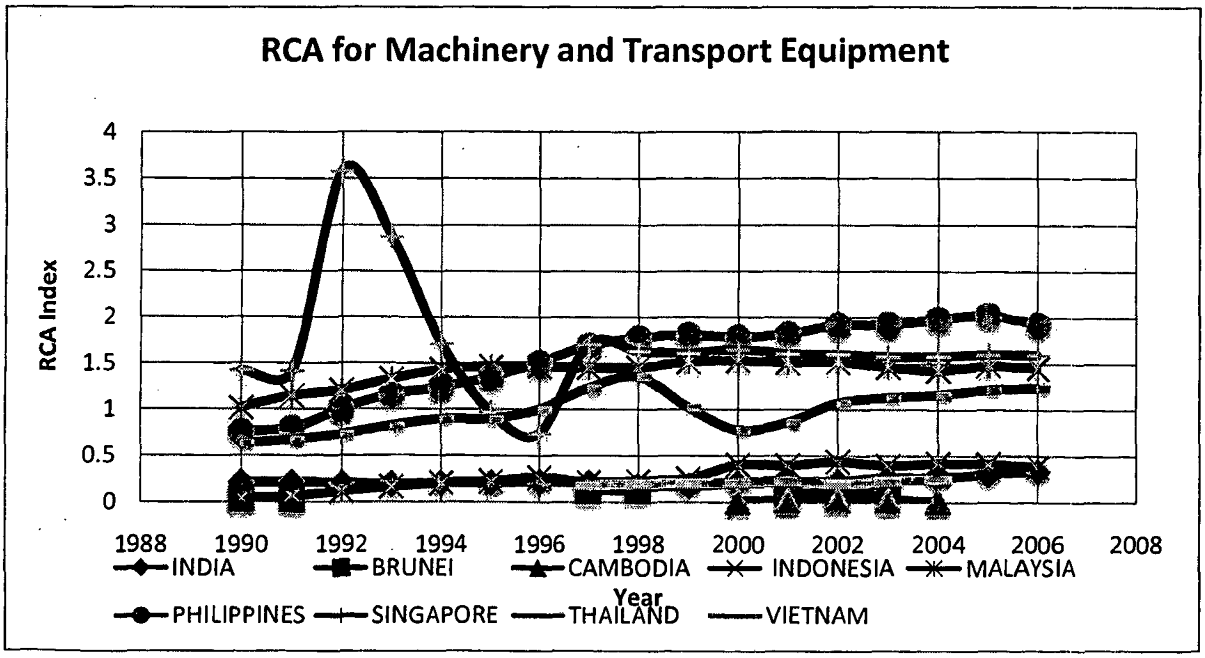
Singapore, Malaysia, Philippines and recently Thailand have been exporting more Machinery and Transport Equipment and showing high RCA. The low RCA countries in the product group include India, Brunei, Cambodia, Indonesia and Vietnam. This reveals there is scope for trading Machinery and Transport Equipment within ASEAN countries and ASEAN and India.

Table: 4.13 RCA for Machinery and Transport Equipments in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.2107	0.0387		0.0406	1.0148	0.7565	1.4227	0.6248	
1995	0.2072			0.2244	1.4646	1.3535	0.9699	0.8957	
2000	0.2074		0.0172	0.4037	1.5331	1.7868	1.6530	0.7768	0.2126
2001	0.2191	0.0961	0.0221	0.3959	1.5120	1.8227	1.6075	0.8578	0.2305
2002	0.2266	0.1122	0.0369	0.4390	1.5206	1.9220	1.6027	1.0716	0.1993
2003	0.2679	0.1291	0.0256	0.3950	1.4647	1.9283	1.5775	1.1293	0.2293
2004	0.2657		0.0125	0.4207	1.4261	1.9860	1.5826	1.1613	0.2518
2005	0.3083			0.4142	1.4800	2.0279	1.6012	1.2170	
2006	0.3396			0.3830	1.4552	1.9303	1.5973	1.2373	

Source: Computed from WTO database

Fig: 4.12 RCA for Machinery and Transport Equipments in India and ASEAN



4.3.10 Office and Telecom Equipment

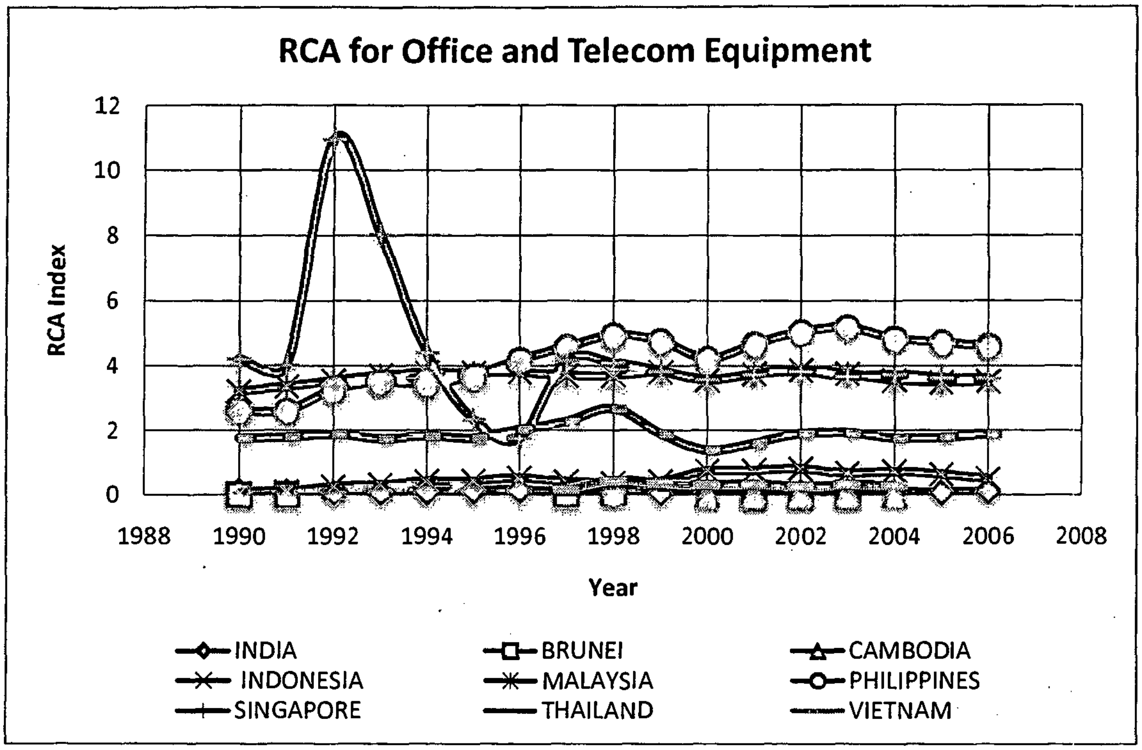
In this high technology industry; Singapore, Malaysia, Philippines and Thailand developed competencies and exporting large share of products to other countries. The mean RCA is strong for Singapore, Philippines and Malaysia where it is high for Thailand. On the other hand countries like India, Brunei, Cambodia, Indonesia and Vietnam have to go a long way in developing comparative advantage and exporting these products to other countries. This gives scope for higher intra regional trade for Office and Telecom Equipment and between Singapore, Malaysia, Thailand and India.

Table: 4.14 RCA for Office and Telecom Equipment in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.1169	0.0112		0.0559	3.2192	2.6117	4.2141	1.7628	
1995	0.1296			0.4289	3.7803	3.6905	2.3297	1.7642	
2000	0.0756		0.0011	0.7430	3.5598	4.2180	3.5760	1.3826	0.3005
2001	0.1021	0.0177	0.0030	0.7615	3.7507	4.6735	3.7321	1.6024	0.3211
2002	0.0907	0.0095	0.0058	0.8114	3.8690	5.0491	3.8230	1.8964	0.2532
2003	0.1114	0.0217	0.0091	0.6763	3.7487	5.1849	3.6720	1.9162	0.3039
2004	0.0891		0.0052	0.7299	3.5535	4.8384	3.7255	1.7641	0.2886
2005	0.0811			0.6408	3.4892	4.7208	3.6250	1.7765	
2006	0.095			0.4970	3.5168	4.6119	3.6154	1.8708	

Source: Computed from WTO database

Fig: 4.13 RCA for Office and Telecom Equipment in India and ASEAN



4.3.11 Electronic Data Processing and Office Equipment

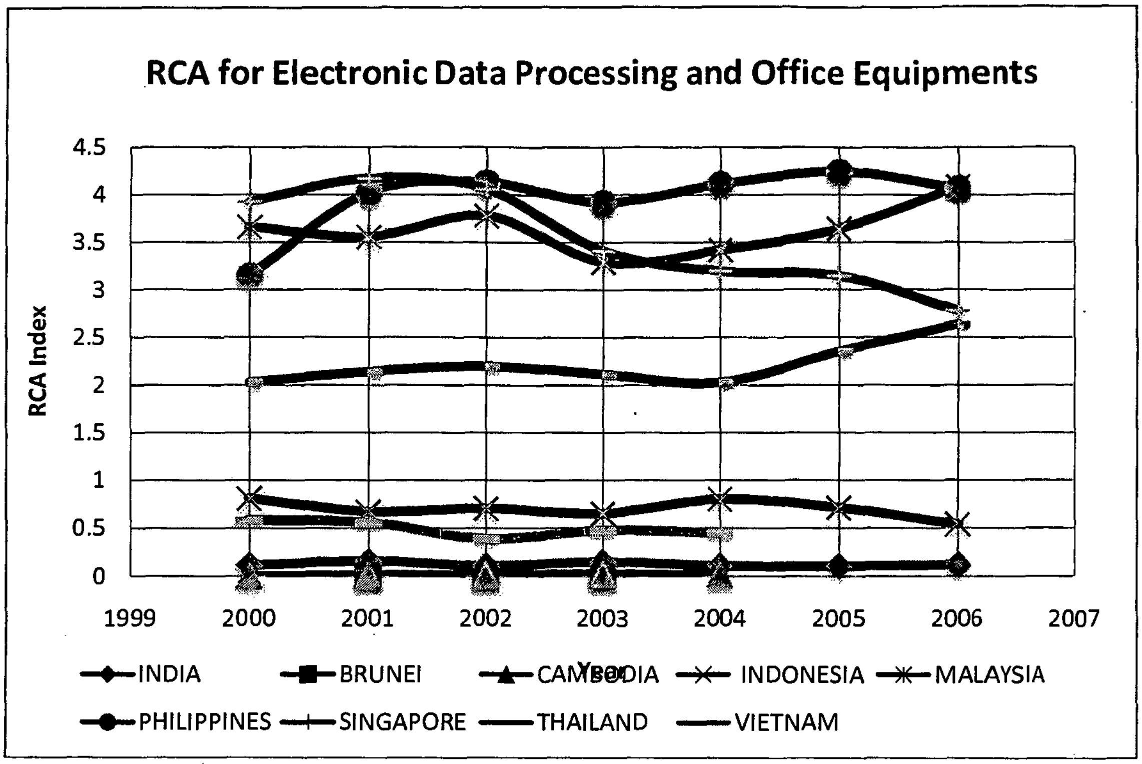
If we take the Electronic Data Processing and Office Equipment separately it follows the same pattern. Singapore, Malaysia, Philippines and Thailand had strong mean RCA and rest of ASEAN and India got weak RCA.

Table: 4.15 RCA for EDP and Office Equipment in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
2000	0.1124		0.0030	0.8084	3.6621	3.1503	3.9263	2.0248	0.5835
2001	0.1572	0.0090	0.0075	0.6709	3.5547	4.0209	4.1720	2.1371	0.5536
2002	0.1103	0.0046	0.0150	0.7047	3.7802	4.1288	4.0594	2.1941	0.3881
2003	0.1471	0.0057	0.0236	0.6507	3.2919	3.9188	3.4102	2.1110	0.4750
2004	0.1088		0.0138	0.7994	3.4171	4.1120	3.1953	2.0257	0.4479
2005	0.1058			0.7099	3.6401	4.2421	3.1430	2.3494	
2006	0.1182			0.5374	4.0874	4.0728	2.7803	2.6350	

Source: Computed from WTO database

Fig: 4.14 RCA for Electronic Data Processing and Office Equipment in India and ASEAN



4.3.12 Telecom Equipment

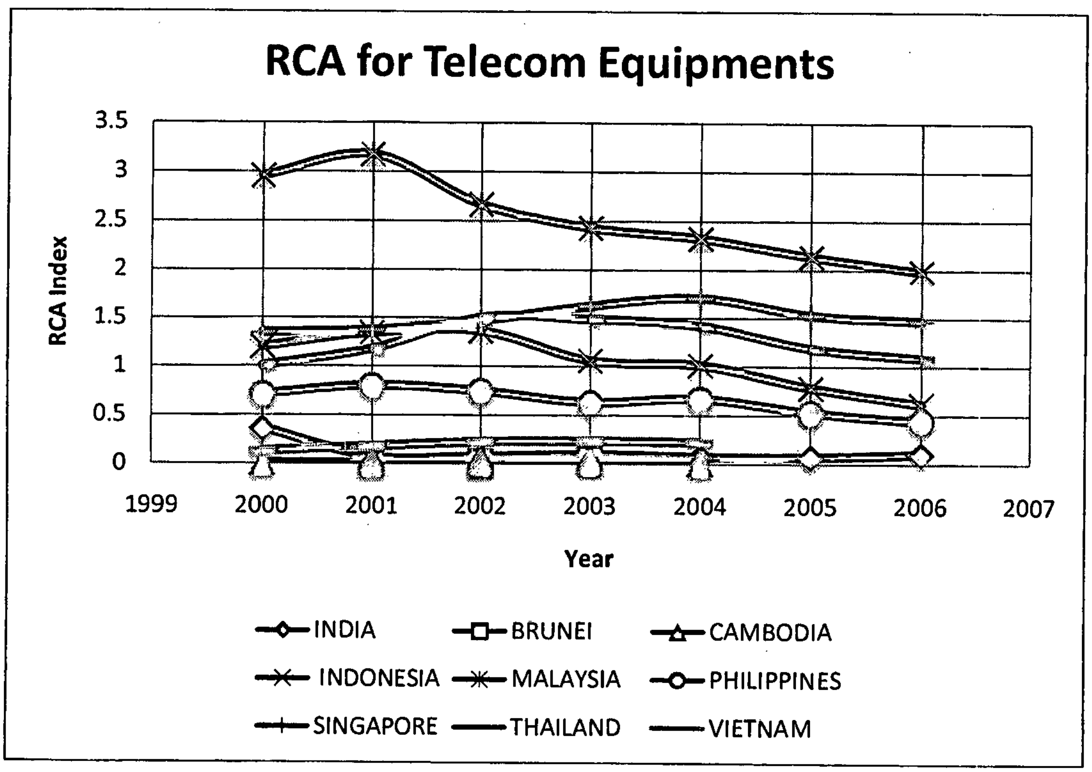
In the case of Telecom equipment, Malaysia enjoys strong comparative advantage whereas Singapore and Thailand got high RCA. Indonesia whose RCA was above one during early 2000, slipped its position after 2005 when RCA fell below one. The less developed countries of ASEAN, Philippines and India got low comparative advantage and facilitate higher intra regional trade among these countries.

Table: 4.16 RCA for Telecom Equipment in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
2000	0.3634		0.0036	1.1989	2.9567	0.7134	1.3438	1.0027	0.1253
2001	0.0744	0.0439	0.0074	1.3430	3.1763	0.8015	1.3697	1.1763	0.1788
2002	0.0767	0.0236	0.0145	1.3617	2.6675	0.7461	1.4670	1.4986	0.2246
2003	0.0964	0.0603	0.0263	1.0597	2.4336	0.6300	1.6231	1.4866	0.2343
2004	0.0727		0.0083	1.0115	2.3251	0.6682	1.7042	1.4169	0.2224
2005	0.0719			0.7823	2.1395	0.5288	1.5263	1.1861	
2006	0.1033			0.6145	1.9875	0.4371	1.4679	1.0858	

Source: Computed from WTO database

Fig: 4.15 RCA for Telecom Equipment in India and ASEAN



4.3.13 Integrated Circuits and Electronic Components

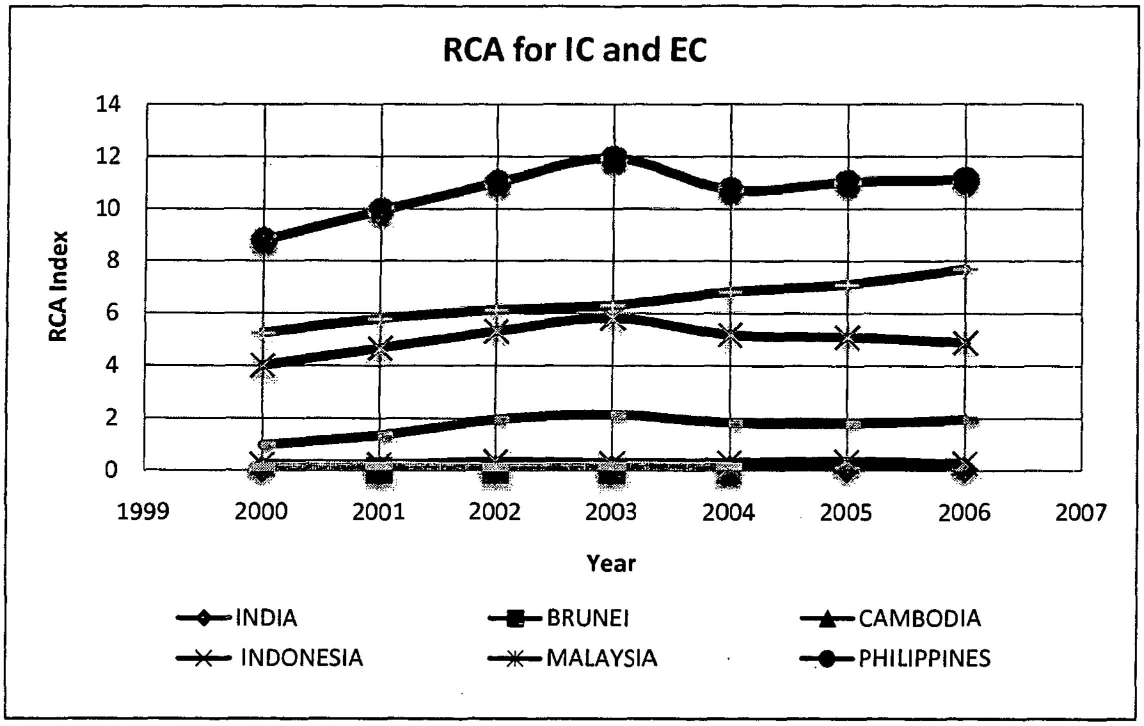
Integrated Circuits and Electronic Components are an important input for the development of electronics and communication industry and growing fast in the information age. East Asian Countries like Singapore, Malaysia, Philippines and Thailand developed competencies in this sector and have a strong RCA. The average RCA for Philippines is 10.6418, Singapore 6.4328, Malaysia 4.9963 and Thailand 1.7101. On the other hand the remaining East Asian countries like Brunei, Cambodia, Indonesia, Vietnam and India got a weak RCA for this category. This showed that large potential for bilateral trade for this important input component and increased trade among ASEAN countries and between India and ASEAN.

Table: 4.17 RCA for I C and Electronic Components in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
2000	0.0427			0.2371	4.0012	8.7896	5.2441	0.9630	0.1232
2001	0.0571	0.0004		0.2340	4.6664	9.9212	5.7756	1.3417	0.1578
2002	0.0804	0.0003		0.3455	5.3097	11.0003	6.1075	1.9431	0.1074
2003	0.0805	0.0002		0.2842	5.8181	11.9316	6.2979	2.1348	0.1538
2004	0.0828		0.0004	0.3055	5.1872	10.7282	6.8127	1.8343	0.1592
2005	0.0601			0.3568	5.1021	11.0116	7.1021	1.7965	
2006	0.0532			0.2809	4.8894	11.1099	7.6899	1.9572	

Source: Computed from WTO database

Fig: 4.16 RCA for Integrated Circuits and Electronic Components in India and ASEAN



4.3.14 Automotive

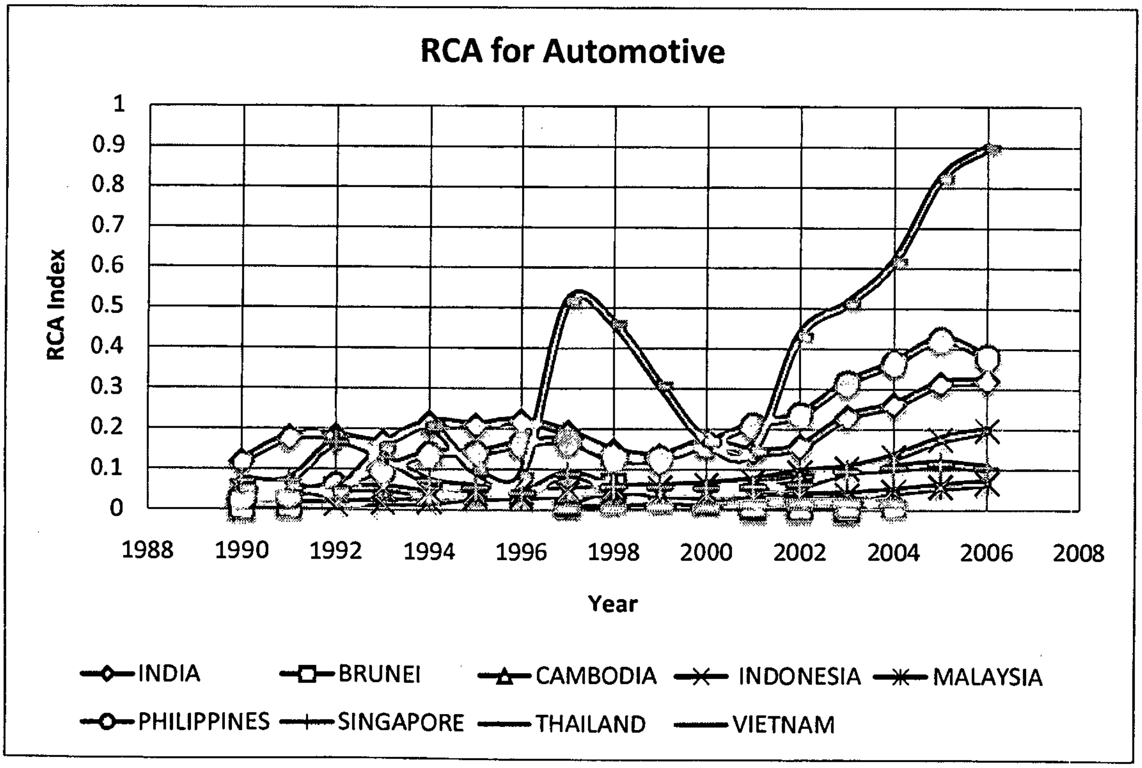
This is an important component in the manufacturing sector with strong backward linkage and employment potential. But ASEAN countries as well as India do not have comparative advantage in this sector. This is because of the dominance and Japanese companies for long and Korea recently. India has been attracting foreign entry and investment in this sector and exporting cars manufactured by Multinational (Maruthi Suzuki, Hyundai) particularly to European nations but yet to develop RCA for sizable export share and market dominance.

Table: 4.18 RCA for Automotive in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	0.1189	0.0108		0.0093	0.0443	0.0311	0.0714	0.0506	
1995	0.2084			0.0321	0.0424	0.1401	0.0546	0.0968	
2000	0.1689		0.0328	0.0630	0.0350	0.1640	0.0550	0.1686	0.0062
2001	0.1451	0.0094	0.0190	0.0725	0.0313	0.2106	0.0578	0.1468	0.0159
2002	0.1575	0.0097	0.0335	0.0942	0.0359	0.2366	0.0635	0.4329	0.0191
2003	0.2315	0.0038	0.0198	0.1036	0.0388	0.3161	0.0960	0.5124	0.0190
2004	0.261		0.0164	0.1324	0.0469	0.3645	0.1052	0.6171	0.0190
2005	0.3128			0.1752	0.0585	0.4242	0.1145	0.8244	
2006	0.3207			0.1982	0.0681	0.3808	0.1049	0.9003	

Source: Computed from WTO database

Fig: 4.17 RCA for Automotive in India and ASEAN



4.3.15 Textiles

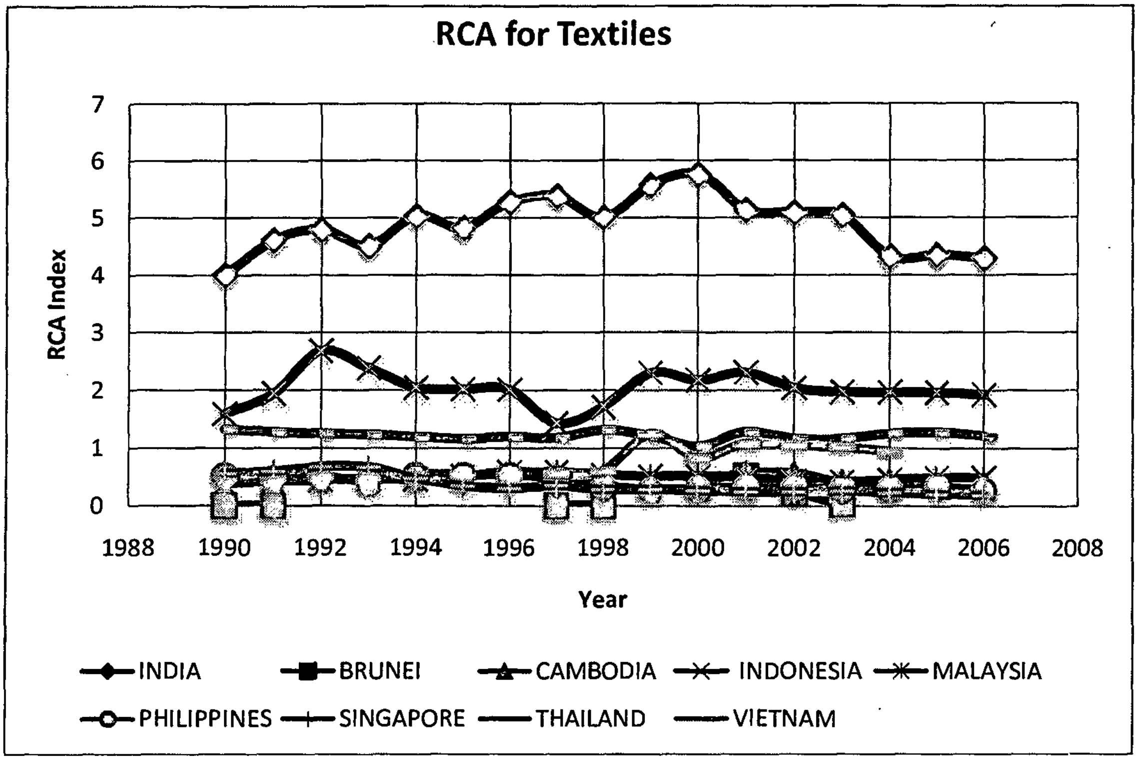
This is the labour intensive sector with high employment potential and most of the developing countries of Asia depend on their export to earn their foreign exchange. India traditionally exported large quantity of Textile products and enjoyed strong RCA. Indonesia and Thailand also have high RCA as their export shares are above the world share. The mean RCA computed in the study is 4.8810 for India, 2.0316 for Indonesia and 1.2226 for Thailand. Most of the ASEAN countries have low RCA showing the complementarity existing in the sector and they can trade more with India for their requirement. But the dismantling of MFA (Multi Fibre Agreement) bring in strong players like China dominating the market and India need to equip itself to take care of this advantage.

Table: 4.19 RCA for Textiles in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	4.009	0.0096		1.5979	0.3851	0.5375	0.5660	1.3296	
1995	4.8234			2.0255	0.5177	0.5424	0.3517	1.1635	
2000	5.7605		0.3833	2.1811	0.5260	0.3036	0.2679	1.0373	0.8402
2001	5.1362	0.5265	0.5757	2.3128	0.4970	0.3231	0.2484	1.2882	1.0834
2002	5.0948	0.2512	0.5706	2.0467	0.4398	0.3236	0.2454	1.1716	1.0565
2003	5.0402	0.0296	0.4213	1.9781	0.4216	0.3232	0.2615	1.1680	1.0191
2004	4.3197		0.4300	1.9706	0.4570	0.3055	0.2317	1.2542	0.9496
2005	4.347			1.9675	0.4909	0.3325	0.2036	1.2807	
2006	4.2885			1.9256	0.4945	0.2801	0.1853	1.2159	

Source: Computed from WTO database

Fig: 4.18 RCA for Textiles in India and ASEAN



4.3.16 Clothing

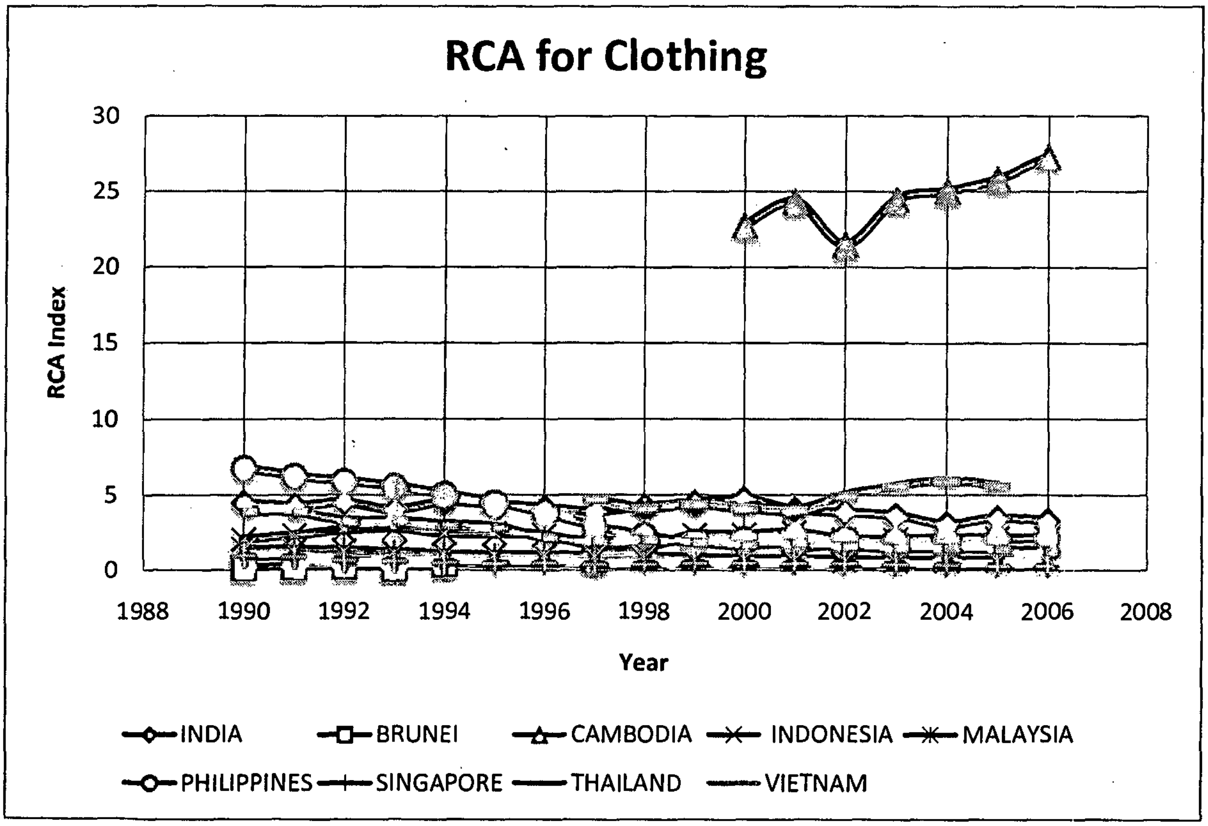
There is increased competition in the clothing sector in the East Asian region as most of the developing countries having strong comparative advantage along with India. The mean RCA for Cambodia (24.4563), Vietnam (4.8141), Philippines (3.5168), Thailand (2.2949), and Indonesia (2.2332) are high and these countries are major exporters of clothing to the rest of the world. India is also a major exporter of clothing to the world and there is limited complementarity between India and ASEAN countries for increased trade in this sector.

Table: 4.20 RCA for Clothing in India and ASEAN

Year	INDIA	BRU	CAM	INDO	MALA	PHIL	SING	THAI	VIET
1990	4.4905	0.1456		2.0455	1.4243	6.8101	0.9606	3.8952	
1995	4.376			2.4243	0.9998	4.5091	0.4268	2.8936	
2000	4.7499		22.7513	2.3583	0.7484	2.0773	0.4315	1.6701	4.0965
2001	4.0372	1.3556	24.3302	2.5215	0.7511	2.3303	0.4279	1.8113	3.9659
2002	3.857	1.7599	21.4898	2.0607	0.6689	2.1220	0.4155	1.5897	4.9591
2003	3.638	1.5989	24.4667	2.0467	0.6360	2.0108	0.3902	1.4564	5.5714
2004	3.0671	1.5656	25.0304	2.1405	0.6499	1.9216	0.3509	1.4634	5.9121
2005	3.4923		25.8125	2.1474	0.6624	2.0885	0.2783	1.3968	5.6181
2006	3.2884		27.3129	2.1369	0.6864	2.1478	0.2834	1.2629	

Source: Computed from WTO database

Fig: 4.19 RCA for Clothing in India and ASEAN



The following table gives the mean Revealed Comparative Advantage (RCA) of ASEAN countries and India for the period 1990 and 2006 for 16 product categories along with Coefficient of Variation. For simplicity and easy comparison, an average of RCA is calculated along with Standard Deviation and Coefficient of Variation. From the mean RCA, countries are classified in to four categories based on their export performance. The categories are RCA 0 to 0.5, low comparative Advantage; RCA 0.5 to 1 weak comparative advantage; RCA 1 to 2 high comparative advantage and RCA above 2 means strong comparative advantage. This facilitates easy comparison of comparative advantage across countries and product groups. RCA above one in the table is given in bold showing comparative advantage enjoyed by the country.

Based on the mean RCA, countries are classified in to four categories namely Weak, Low, High and Strong RCA. Weak and Low RCA countries cannot trade as they do not have comparative advantage. High and strong RCA countries have comparative advantage and face similar export structure. But finer specialization in production can lead intra industry trade among countries with strong comparative advantage. But trade is possible between complementary trade structure with Weak -Strong, Weak-High, Low-Strong and Low-High comparative advantage.

Table: 4.21 Mean RCA for India and ASEAN in Major Commodity Groups

Commodity Categories	Mean & CV	INDIA	BRU	CAM	INDO	MALA	PHI	SING	THA	VIET
Agriculture	Mean	**1.6295**	0.0137	0.3420	**1.5650**	**1.3406**	**1.0130**	0.4019	**2.0942**	**3.0054**
	CV	10.1926	155.0694	17.3557	17.6534	23.9709	40.8866	35.3441	25.6310	8.4281
Food	Mean	**1.8374**	0.0224	0.1328	**1.3800**	**1.0727**	**1.1753**	0.4043	**2.2536**	**3.4715**
	CV	12.5786	131.2727	27.0339	15.8384	10.7237	42.6308	30.6301	16.8695	9.4989
Fuel & Mining	Mean	0.6582	**7.3307**	0.0005	**2.6299**	0.9143	0.4002	0.9455	0.2480	**1.7665**
	CV	40.9484	16.5032	99.6738	14.7089	22.2892	49.2196	23.9234	51.8235	10.7217
Fuels	Mean	0.4071	**7.7632**	0.0001	**2.9645**	**1.0882**	0.1716	**1.1343**	0.2312	**2.2655**
	CV	71.1653	21.2761	88.9572	21.6273	23.6266	38.2580	33.7435	62.9596	13.2842
Manufacture	Mean	**1.0577**	0.0886	**1.3461**	0.6639	**1.0213**	**1.1594**	**1.1869**	**1.0107**	0.6572
	CV	3.7372	74.1311	3.5637	11.5446	8.8286	8.0749	33.3611	11.0425	11.2533
Iron & Steel	Mean	**1.2845**	0.0606	0.0007	0.3352	0.3389	0.0999	0.2568	0.3748	0.1236
	CV	36.5482	75.1560	85.8527	22.5052	29.0279	80.0645	32.2819	38.2335	40.7492
Chemicals	Mean	**1.0379**	0.0051	0.0056	0.4099	0.3714	0.1889	0.8440	0.5044	0.1317
	CV	12.9416	82.5334	85.6556	23.9589	30.1619	53.4105	30.0790	37.8649	17.0208
Pharmaceuticals	Mean	**1.3187**	0.0088	0.0673	0.0387	0.0275	0.4065	0.0669	0.0213	
	CV	18.0676	88.6274	13.7232	12.8371	18.4054	45.9637	14.3601	35.6685	
Machinery & TranspEqup	Mean	0.2257	0.0961	0.0229	0.2719	**1.4043**	**1.5581**	**1.6992**	0.9816	0.2136
	CV	19.8971	43.5268	40.5658	48.2533	10.4075	27.3830	37.8094	22.4252	10.4442
Office & Tel Eqipments	Mean	0.0945	0.0270	0.0048	0.4804	**3.6405**	**4.1706**	**4.3260**	**1.8722**	0.3037
	CV	24.8896	79.1837	62.5690	46.9930	4.8552	19.9335	48.8590	14.7184	26.8335
EDP & Office Equipments	Mean	0.1228	0.0064	0.0126	0.6974	**3.6334**	**3.9494**	**3.5267**	**2.2110**	0.4896
	CV	16.7656	35.0143	62.5016	13.2740	7.0900	9.2693	15.0383	9.8341	16.1975
Tel. Equipments	Mean	0.1227	0.043	0.0120	**1.0531**	**2.5266**	0.6464	**1.5003**	**1.2647**	0.1971
	CV	87.1131	43.085	73.8877	26.5210	17.0756	19.6559	8.6495	15.8722	23.0729
IC & EC Products	Mean	0.0653	0.0003	0.0004	0.2920	**4.9963**	**10.6418**	**6.4328**	**1.7101**	0.1403
	CV	24.3642	37.1358	0	16.4267	11.3560	9.4789	12.9153	24.0219	16.8104
Automotive	Mean	0.1974	0.0184	0.0243	0.0658	0.0457	0.1878	0.0827	0.3285	0.0119
	CV	29.5041	104.3874	33.6734	87.2249	20.0447	63.5945	39.6978	83.4420	59.7181
Textiles	Mean	**4.8810**	0.1219	0.4762	**2.0316**	0.4873	0.4058	0.3667	**1.2226**	0.9219
	CV	9.9251	163.3059	18.9545	14.5292	11.6383	25.8790	45.3314	5.7967	25.7729
Clothing	Mean	**4.0654**	0.8553	**24.4563**	**2.2332**	0.9324	**3.5168**	0.4828	**2.2949**	**4.8141**
	CV	11.6523	80.3460	7.8391	14.5102	28.2444	50.3871	38.9831	39.1023	15.3942

Source: Computed from WTO database

Table: 4.22 Country Classification Based on Mean RCA of Commodities

Commodity Classification	**Weak RCA RCA<0.5**	**Low RCA RCA<0.5 to 1**	**High RCA RCA 1 to 2**	**Strong RCA RCA Above 2**
Agricultural Products	Brunei, Cambodia, Singapore	-	**India**, Indonesia, Malaysia, Philippines	Thailand, Vietnam
Food	Brunei, Cambodia, Singapore	-	**India**, Indonesia, Malaysia, Philippines	Thailand, Vietnam
Fuels & MP	Cambodia, Philippines, Thailand	**India,** Malaysia, Singapore	Vietnam	Brunei, Indonesia
Fuels	**India**, Cambodia, Philippines, Thailand	-	Malaysia, Singapore	Brunei, Indonesia, Vietnam
Manufacture	Brunei	Indonesia, Vietnam	**India**, Cambodia, Malaysia, Philippines, Singapore, Thailand	-
Iron & Steel	Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam	-	**India,**	-
Chemicals	Brunei, Cambodia, Indonesia, Malaysia, Philippines, Vietnam	Singapore, Thailand	**India**	-
Pharmaceuticals	Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand	-	**India**	-
Machinery & Transport Equipments	**India,** Brunei, Cambodia, Indonesia, Vietnam	Thailand	Malaysia, Philippines, Singapore	-
Office & Telecom Equipments	**India**, Brunei, Cambodia, Indonesia, Vietnam	-	Thailand	Malaysia, Philippines, Singapore
EDP & OE	**India**, Brunei, Cambodia, Vietnam	Indonesia	-	Malaysia, Philippines, Singapore, Thailand

Telecom	**India**, Brunei, Cambodia, Vietnam	Philippines	Indonesia, Singapore, Thailand	Malaysia
IC & EC	**India**, Brunei, Cambodia, Indonesia, Vietnam	-	Thailand	Malaysia, Philippines, Singapore
Automotive	**India**, Brunei, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam	-	-	-
Textiles	Brunei, Cambodia, Malaysia, Philippines, Singapore	Vietnam	Thailand	**India**, Indonesia
Clothing	Singapore	Brunei, Malaysia	-	**India**, Cambodia, Indonesia, Philippines, Thailand, Vietnam

Source: Computed from WTO database

4.4. India's Comparative Advantage with ASEAN Countries – Product Category wise

Table 4.23 gave comparison of RCA between India and ASEAN countries across product categories for easy comparison. For Agricultural Commodities India got a high RCA and can export to Brunei, Cambodia and Singapore who have disadvantage in this product category. Food products are part of agricultural products and follow the same pattern as that of agricultural products. For Fuel and Mining products Brunei, Indonesia and Vietnam have comparative advantage and can trade with India. India's RCA for fuel is weak and can import petroleum products from Brunei, Indonesia and Vietnam who are the oil exporters of ASEAN or from Malaysia and Singapore who refine crude oil and export.

Table: 4.23 India- ASEAN Trade Complementarity from computed RCA

INDIA- Product Groups	BRU	CAM	INDO	MAL	PHI	SIN	THA	VIE
Agricultural Products	**H-W**	**H-W**	H-H	H-H	H-H	**H-W**	H-S	H-S
Food	**H-W**	**H-W**	H-H	H-H	H-H	**H-W**	H-S	H-S
Fuels & MP	**L-S**	L-W	**L-S**	L-L	L-W	L-L	L-W	**L-H**
Fuels	**W-S**	W-W	**W-S**	**W-H**	W-W	**W-H**	W-W	**W-S**
Manufacture	**H-W**	H-H	**H-L**	H-H	H-H	H-H	H-H	**H-L**
Iron & Steel	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**
Chemicals	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**	**H-L**	**H-L**	**H-W**
Pharmaceuticals	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**	**H-W**	
Machinery & Transport Equipments	W-W	W-W	W-W	**W-H**	**W-H**	**W-H**	W-L	W-W
Office & Telecom Equipments	W-W	W-W	W-W	**W-S**	**W-S**	**W-S**	**W-H**	W-W
EDP & OE	W-W	W-W	W-L	**W-S**	**W-S**	**W-S**	**W-S**	W-W
Telecom	W-W	W-W	**W-H**	**W-S**	W-L	**W-H**	**W-H**	W-W
IC & EC	W-W	W-W	W-W	**W-S**	**W-S**	**W-S**	**W-H**	W-W
Automotive	W-W	W-W	W-W	W-W	W-W	W-W	W-W	W-W
Textiles	**S-W**	**S-W**	S-S	**S-W**	**S-W**	**S-W**	S-H	**S-L**
Clothing	**S-L**	S-S	S-S	**S-L**	S-S	**S-W**	S-S	S-S

Source: Computed from WTO database

India's RCA for Manufacture is high and there is a possibility in trade with Indonesia and Vietnam who got low comparative advantage. India has large deposit of Iron ore and major exporter of Iron and Steel to other countries. All the ASEAN countries having weak comparative advantage in Iron and Steel and there is a trade complementarity between them and India. India's export of Chemical products are increasing and reveals a high comparative advantage. RCA for Chemicals is weak for Brunei, Cambodia, Indonesia, Malaysia, Philippines and Vietnam and low for Singapore and Thailand. This complementarity in trade structure gives opportunity for India to export more Chemical products to ASEAN countries. Similarly India got high RCA in Pharmaceutical products and export them to weak RCA ASEAN countries.

With regard to Machinery and Transport equipment, India's RCA is weak and can import them from high RCA ASEAN countries such as Malaysia, Philippines and Singapore. The core competence of East Asian countries is in Office and Telecom Equipments in which the newly industrializing ASEAN countries such as Malaysia, Singapore, Philippines and Thailand have a strong comparative advantage and export large quantities to different parts of the world. For Electronic Data Processing and Office Equipment the same pattern continues with Malaysia, Philippines, Singapore and Thailand exhibiting strong comparative advantage. For Telecom, Malaysia has a strong comparative advantage whereas Indonesia, Singapore and Thailand got low RCA. For Integrated Circuits and Electronic Components, Malaysia, Philippines, Singapore and Thailand are having strong comparative advantage.

With regard to the Automotive sector, none of the ASEAN countries enjoy comparative advantage. The same is true with India and there is limited possibility of trade between India and ASEAN with regard to Automotive sector. India has a strong comparative advantage in Textiles and got a favorable trading environment with ASEAN as most of the countries got weak comparative advantage. But with regard to clothing there is similarity in trade structure as most of the ASEAN counties have strong comparative advantage similar to India.

4.5 Revealed Comparative Advantage for HS-2 Classification

In order to get product level comparative advantage, Revealed Comparative Advantage (RCA) for HS-2 digit classification of commodities are calculated for India and ASEAN countries for the period 2003 to 2006. The Data pertaining to HS2 classification of commodity exports and imports are extracted from DOTS of WITS (World Integrated Trade Solutions). RCA for the period 2003-2006 is calculated for India and combined

ASEAN countries and a mean RCA is obtained for comparison. The HS-2 data is not available for some ASEAN countries and only available data is taken for calculating RCA for ASEAN group. The absolute difference in RCA between India and ASEAN is obtained to understand the extend of complementarity in commodities. This is supplemented with trade performance under HS-4 digits classification to know finer specialization of products by India and ASEAN countries. The results of RCA for HS-2 products for India and ASEAN are discussed below.

Table 4.24 showed the mean RCA, RCA category and absolute difference in RCA between India and combined ASEAN for agricultural commodities in HS-2 digit classification. Of the 24 HS-2digits commodities, 9 categories showed trade complementarity between India and ASEAN. These include Edible vegetables and certain roots(HS-07),Edible fruit and nuts; peel of citr (HS-08), Prod.mill.indust; malt; starches (HS-11); Oil seed, oleagi fruits; miscellgr(HS-12), Animal/veg fats & oils & their clea (HS-15), Prep of meat, fish or crustaceans(HS-16),Residues & waste from the food indu (HS-23) and Tobacco and manufactured tobacco su (HS-24). The highest RCA for India in agricultural products is in Vegetable plaiting materials; veget (HS14) and Coffee, tea, matï and spices (HS-09) and for ASEAN is Animal/veg fats & oils & their clea (HS15) and Prep of meat, fish or crustaceans (HS-16). The highest absolute difference in RCA is for Vegetable plaiting materials; veget (HS-14) and Coffee, tea, matï and spices (HS-09).

Table: 4.24 RCA for Agricultural Products in HS2 classification

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
01	Live animals	0.0514	0.2266	weak	weak	0.1752
02	Meat and edible meat offal	0.8696	0.0751	low	weak	0.7946
03	Fish & crustacean, mollusc& other	2.4041	1.6525	strong	high	0.7516
04	Dairy prod; birds' eggs; natural ho	0.3893	0.2745	weak	weak	0.1148
05	Products of animal origin, nes or	0.7329	0.2131	low	weak	0.5197
06	Live tree & other plant; bulb, root	0.5906	0.2919	low	weak	0.2987
07	Edible vegetables and certain roots	**1.4093**	**0.4803**	**high**	**weak**	**0.9290**
08	Edible fruit and nuts; peel of citr	**1.6377**	**0.4496**	**high**	**weak**	**1.1881**
09	Coffee, tea, matī and spices.	5.3282	1.1762	strong	high	4.1520
10	Cereals	3.5873	1.3762	strong	high	2.2112
11	Prod.mill.indust; malt; starches;	**0.5891**	**1.0784**	**low**	**high**	**0.4892**
12	Oil seed, oleagi fruits; miscellgr	**1.4195**	**0.1055**	**high**	**weak**	**1.3140**
13	Lac; gums, resins & other vegetable	**9.9841**	**0.4704**	**strong**	**weak**	**9.5137**
14	Vegetable plaiting materials; veget	5.7112	1.2402	strong	high	4.4710
15	Animal/veg fats & oils & their clea	**0.8091**	**4.4486**	**low**	**strong**	**3.6395**
16	Prep of meat, fish or crustaceans,	**0.5465**	**3.0308**	**low**	**strong**	**2.4844**
17	Sugars and sugar confectionery.	2.0349	1.1313	strong	high	0.9037
18	Cocoa and cocoa preparations.	0.0352	0.8690	weak	low	0.8338
19	Prep.of cereal, flour, starch/milk;	0.3507	0.7988	weak	low	0.4481
20	Prep of vegetable, fruit, nuts or o	0.4113	0.8604	weak	low	0.4491
21	Miscellaneous edible preparations.	0.5320	0.8521	low	low	0.3201
22	Beverages, spirits and vinegar.	0.0784	0.3768	weak	weak	0.2984
23	Residues & waste from the food indu	**3.3460**	**0.5091**	**strong**	**low**	**2.8370**
24	Tobacco and manufactured tobacco su	**1.3953**	**0.6878**	**high**	**low**	**0.7075**

Source: Calculated from data extracted from WITS

For Chemical products the trade complementarity is present in Salt; sulphur; earth &ston; plaste (HS-25), Ores, slag and ash (HS-26), Mineral fuels, oils & product of th (HS-27), Tanning/dyeing extract; tannins & (HS-32) and Explosives; pyrotechnic prod; match (HS-36). Interestingly India has a higher RCA than ASEAN for all product categories. India's highest RCA is for Ores, slag and ash (5.6552) and Salt; sulphur; earth &ston; plaste(HS-25) and these two products have highest absolute difference in RCA.

Table: 4.25 RCA for Chemical Products in HS2 classification

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
25	Salt; sulphur; earth &ston; plaste	3.3358	0.6419	**strong**	**low**	**2.6940**
26	Ores, slag and ash.	5.6552	0.0870	**strong**	**weak**	**5.5683**
27	Mineral fuels, oils & product of th	1.0652	0.9918	**high**	**low**	**0.0733**
28	Inorgnchem; compds of precmtl, r	0.9534	0.2458	low	weak	0.7076
29	Organic chemicals.	1.6482	1.1846	high	high	0.4636
30	Pharmaceutical products.	0.9249	0.1934	low	weak	0.7315
31	Fertilisers.	0.0450	0.2567	weak	weak	0.2117
32	Tanning/dyeing extract; tannins &	1.5994	0.6254	**high**	**low**	**0.9740**
33	Essential oils &resinoids; perf,	0.6848	0.6822	low	low	0.0026
34	Soap, organic surface-active agents	0.3487	0.7308	weak	low	0.3821
35	Albuminoidal subs; modified starche	0.7641	0.6621	low	low	0.1020
36	Explosives; pyrotechnic prod; match	1.2044	0.3187	**high**	**weak**	**0.8856**
37	Photographic or cinematographic goo	0.1356	0.7483	weak	low	0.6127
38	Miscellaneous chemical products.	0.9589	0.8673	low	low	0.0916

Source: Calculated from data extracted from WITS

For other manufactured products, the complementarity is present in Rubber and articles thereof (HS-40), Raw hides and skins (HS-43) and Articles of leather; saddlery/harne (HS-43). India has strong comparative advantage in Articles of leather; saddlery/harne and Raw hides and skins (other than fu) where ASEAN got high comparative advantage in Rubber and articles thereof.

Table: 4.26 RCA for Other Manufactured Products in HS2 classification

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
39	Plastics and articles thereof.	0.6162	0.9653	low	low	0.3491
40	Rubber and articles thereof.	**0.9436**	**2.4883**	**low**	**strong**	**1.5447**
41	Raw hides and skins (other than fu	**2.6104**	**0.4486**	**strong**	**weak**	**2.1618**
42	Articles of leather; saddlery/harne	**3.5765**	**0.5024**	**strong**	**low**	**3.0742**
43	Furskins and artificial fur; manuf	0.0052	0.0289	weak	weak	0.0237
44	Wood and articles of wood; wood	0.1039	1.1347	weak	high	1.0308
45	Cork and articles of cork.	0.0944	0.0247	weak	weak	0.0696
46	Manufactures of straw, esparto/othe	0.2058	1.3314	weak	high	1.1255
47	Pulp of wood/of other fibrous cellu	0.0045	0.1584	weak	weak	0.1539
48	Paper & paperboard; art of paper pu	0.2600	0.3245	weak	weak	0.0645
49	Printed books, newspapers, pictures	0.4227	0.7972	weak	low	0.3745

Source: Calculated from data extracted from WITS

India's strong comparative advantage in Textiles and related products include Silk (HS-50), Cotton (HS-52), Other vegetable textile fibres; pap (HS-53), Man-made filaments (HS-54), Carpets and other textile floor co (HS-57)Art of apparel & clothing access(HS-61), Art of apparel & clothing access (HS-62)Other made up textile articles (HS-63) and these products have export markets in ASEAN countries. The mean RCA for ASEAN countries taken together do not reveal comparative advantage in textiles and related products even though individual countries show high revealed comparative advantage.

Table: 4.27 RCA for Textile and Related Products in HS2 classification

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
50	Silk.	**11.8276**	**0.4601**	**strong**	**weak**	**11.3675**
51	Wool, fine/coarse animal hair, hors	0.5912	0.1816	low	weak	0.4096
52	Cotton.	**7.3260**	**0.3674**	**strong**	**weak**	**6.9586**
53	Other vegetable textile fibres; pap	**4.6547**	**0.1906**	**strong**	**weak**	**4.4640**
54	Man-made filaments.	**2.8839**	**0.8337**	**strong**	**low**	**2.0502**
55	Man-made staple fibres.	3.4723	1.0799	strong	high	2.3924
56	Wadding, felt & nonwoven; yarns; tw	0.5510	0.5760	low	low	0.0251
57	Carpets and other textile floor co	**8.0420**	**0.2666**	**strong**	**weak**	**7.7754**
58	Special woven fab; tufted texfab;	**1.2873**	**0.4611**	**high**	**weak**	**0.8262**
59	Impregnated, coated, cover/laminate	0.4599	0.3206	weak	weak	0.1393
60	Knitted or crocheted fabrics.	0.3393	0.4498	weak	weak	0.1104
61	Art of apparel & clothing access,	**2.5943**	**0.9227**	**strong**	**low**	**1.6716**
62	Art of apparel & clothing access, n	**3.2977**	**0.6748**	**strong**	**low**	**2.6229**
63	Other made up textile articles; set	**5.9216**	**0.3821**	**strong**	**weak**	**5.5395**

Source: Calculated from data extracted from WITS

In this category of commodities the complementarity is present in Prepared feathers & down; artificial flower (HS-67) and Natural/cultured pearls, precious stone (HS-71) in which India got very strong comparative advantage. Pearls and precious stones are important items of export as these are used in jewellery and artifacts.

Table: 4.28 RCA for Material specific manufactured goods in HS2 classification

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
64	Footwear, gaiters and the like; par	1.6627	1.0504	high	high	0.6123
65	Headgear and parts thereof.	0.2447	0.6424	weak	low	0.3977
66	Umbrellas, walking-sticks, seat-sti	0.0875	0.0889	weak	weak	0.0013
67	Prepr feathers & down; arti flower;	**5.0116**	**0.6190**	**strong**	**low**	**4.3926**
68	Art of stone, plaster, cement, asbe		0.2974			
69	Ceramic products.	0.4180	0.6872	weak	low	0.2692
70	Glass and glassware.	0.5343	0.5631	low	low	0.02877
71	Natural/cultured pearls, prec stone	**7.8262**	**0.8420**	**strong**	**low**	**6.9842**

Source: Calculated from data extracted from WITS

India enjoys comparative advantage in many mineral products compared to ASEAN countries. These include Iron and steel (HS-72) Articles of iron or steel (HS-73), Copper and articles thereof (HS-74) and Zinc and articles thereof (HS-79) in which India got high RCA against ASEAN. ASEAN's comparative advantage lies in Tin and articles thereof (HS-80) and India can import this from ASEAN as the absolute difference is highest in this category.

Table: 4.29 RCA for Mineral Products in HS2 classification

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category -India	RCA Category -ASEAN	Absolute difference in RCA
72	Iron and steel.	**1.5293**	**0.3017**	**high**	**weak**	**1.2275**
73	Articles of iron or steel.	**1.5586**	**0.5872**	**high**	**low**	**0.9714**
74	Copper and articles thereof.	**1.7848**	**0.6129**	**high**	**low**	**1.1719**
75	Nickel and articles thereof.	0.0746	0.1882	weak	weak	0.1136
76	Aluminium and articles thereof.	0.5731	0.3871	low	weak	0.1861
78	Lead and articles thereof.	0.4707	0.7170	weak	low	0.2463
79	Zinc and articles thereof.	**1.6277**	**0.4693**	**high**	**weak**	**1.1585**
80	Tin and articles thereof.	**0.6575**	**7.1447**	**low**	**strong**	**6.4872**
81	Other base metals; cermets; article	0.1696	0.2006	weak	weak	0.0310
82	Tool, implement, cutlery, spoon & f	**1.0636**	**0.5422**	**high**	**low**	**0.5214**
83	Miscellaneous articles of base meta	0.5790	0.4598	low	weak	0.1192

Source: Calculated from data extracted from WITS

ASEAN has strong RCA for Electrical machinery, equipments, parts thereof (HS-85) and high RCA for Nuclear reactors, boilers, machinery (HS-84) against India and export lot of items to India. On the other hand India's RCA include Ships, boats and floating structure (HS-89), Clocks and watches and parts thereof (HS-91) and Works of art, collectors' pieces etc. (HS-97).

Table: 4.30 RCA for Electric, Electronic and Related Products in HS2 classification

HS Code	Commodity Name	Mean RCA of India	Mean RCA of ASEAN	RCA category-India	RCA Category-ASEAN	Absolute difference in RCA
84	Nuclear reactors, boilers, mchy& m	**0.2969**	**1.2864**	**weak**	**high**	**0.9895**
85	Electrical mchy equip parts thereof	**0.2509**	**2.3171**	**weak**	**strong**	**2.0662**
86	Railw/tramwlocom, rolling-stock &	0.1578	0.0767	weak	weak	0.0811
87	Vehicles o/t railw/tramw roll-stock	0.3301	0.2771	weak	weak	0.0530
88	Aircraft, spacecraft, and parts the	0.1437	0.4156	weak	weak	0.2720
89	Ships, boats and floating structure	**1.0734**	**0.4139**	**high**	**weak**	**0.6595**
90	Optical, photo, cine, meas, checkin	0.2129	0.7050	weak	low	0.4921
91	Clocks and watches and parts thereo	**0.2614**	**1.0391**	**weak**	**high**	**0.7777**
92	Musical instruments; parts and acce	0.2008	0.4206	weak	weak	0.2198
93	Arms and ammunition; parts and acc	0.0511	0.0867	weak	weak	0.0356
94	Furniture; bedding, mattress, matt	0.2420	0.7353	weak	low	0.4933
95	Toys, games & sports requisites; pa	0.2085	0.5008	weak	low	0.2924
96	Miscellaneous manufactured articles	0.9015	0.6525	low	low	0.2490
97	Works of art, collectors' pieces an	**3.3009**	**0.1315**	**strong**	**weak**	**3.1693**

Source: Calculated from data extracted from WITS

4.6 Revealed Comparative Advantage (RCA) of HS -4 digits Classification

Revealed Comparative Advantage is calculated for four ASEAN countries namely Malaysia, Philippines, Singapore and Thailand for the year 2008 and compared against India to see the trade complementarity at the more disaggregated level. The exercise could not be done for other ASEAN countries due to non availability of data at the HS four digits level. The following section gives the analysis of RCA of ASEAN and India in HS-4 digits commodity classification. The results of RCA between India and ASEAN for HS-4 digits are presented in appendix tables 4.A-1, 4.A-2, 4.A-3, 4.A-5 and 4.A-5.

The top five highest RCA for India in the HS-4 digits are Glass inners for vacuum flasks or f (58.92), Cooking or heating apparatus of a k (54.91), Oil-cake and other solid residues,(49.89), Keyboard pipe organs; harmoniums an (46.82) and Other organic compounds(46.30). The top five HS-4 commodities in terms of export share for India are Petroleum oils and oils obtained fr,(17.35 percent with a RCA of 3.84), Diamonds, whether or not worked, bu, (8.19 percent with a RCA of 15.13), Iron ores and concentrates, include(3.10 percent with a RCA of46.30), Rice (1.56 percent with a RCA of 10.05), and Other organic compounds (1.31 percent with a RCA of 46.30). Among agricultural commodities India got comparative advantage in Coconuts, Pepper, Vanilla, Seeds of anise, badian, fennel, Rice, Groundnut, Copra and Oil cakes and other residues.

The top five highest RCA for Malaysia in the HS-4 digits are Accordions and similar instruments; (53.4038), Felt hats and other felt headgear, (48.1461), Palm oil and its fractions, whether (47.1762), Vegetable materials of a kind used (29.2936) and Articles of apparel and clothing ac (28.7228). The top five HS-4 commodities in terms export share for Malaysia are Automatic data processing machines (7.20 percent with a RCA of 3.37), Petroleum gases and other gaseous h (7.07 percent with a RCA of 3.56), Petroleum oils and oils obtained fr (6.65 percent with a RCA of 1.21), Palm oil and its fractions, whether (6.41 percent with a RCA of 47.18) and Parts and accessories (other than c) (5.47 percent with a RCA of 6.30).

The top five highest RCA for Philippines in the HS-4 digits are Natural sponges of animal origin (184.74), Photocopying apparatus incorporatin (126.82), Coconut (copra), palm kernel or bab (99.75), Dolls representing only human being (90.44) and Tin plates, sheets and strip, of a (79.66). The top five HS-4 commodities in terms export share for

Philippines are Electronic integrated circuits and (9.73 percent with a RCA of 6.28), Automatic data processing machines (7.65 percent with a RCA of 3.58), Parts and accessories of the motor (4.19 percent with a RCA of 2.24), Diodes, transistors and similar sem (3.67 percent with a RCA of 6.75) and Parts and accessories (other than c (3.35 percent with a RCA of 3.85)

The top five highest RCA for Singapore in the HS-4 digits are Oxygen-function amino-compounds (14.9909), Glands and other organs for organo (12.1184), Light-vessels, fire-floats, dredger (11.3108), Prepared unrecorded media for sound (9.6141) and Bituminous mixtures based on natura (8.7370). The top five HS-4 commodities in terms export share for Singapore are Petroleum oils and oils obtained fr (24.16 percent with a RCA of 5.35), Electronic integrated circuits and (11.26 percent with a RCA of 7.28), Parts and accessories (other than c (4.28 percent with a RCA of 4.92), Automatic data processing machines (3.77 percent with a RCA of 1.77) and Prepared unrecorded media for sound (1.72 with a RCA of9.61).

The top five highest RCA for Thailand in the HS-4 digits are Natural rubber, balata, gutta-perch (37.09), Manioc, arrowroot, salep, Jerusalem (34.80), Vulcanised rubber thread and cord (24.51), Rice (22.31) and Unused postage, revenue or similar (22.01). The top five HS-4 commodities in terms export share for Thailand are Automatic data processing machines (7.62 percent with a RCA of 3.5704), Petroleum oils and oils obtained fr (5.05 percent with a RCA of 1.1180), Electronic integrated circuits and (4.07 percent with a RCA of 2.6289), Natural rubber, balata, gutta-perch (3.82 percent with a RCA of 37.0878) and Rice (3.47 percent with a RCA of 22.3080).

4.7 Major Findings

Inferences from the trade indices computed for understanding the trade structure between India and ASEAN revealed that there are complemetanry sectors and products available for enhancing trade cooperation between the trading partners. ASEAN countries are in different stages of economic development and India can have trade cooperation with some of them in all product categories. While India can export food grains to small and developed countries of ASEAN, it can import edible and other agricultural products from other ASEAN countries. India enjoy advantage in minerals whereas they can import crude oil from ASEAN. India had advantage in some manufactured items like chemicals, Iron and Steel, Jems and Jewellery and can export them to many ASEAN countries. ASEAN has comparative advantage in Electrical and Electronic components and India can import them from ASEAN. With regard to Textiles and Clothing there is intense competition between ASEAN and India to increase market share. Reduction of tariffs will have a short term impact on India exports but can consolidate in the medium term through productivity gains and efficiency.

CHAPTER- V

TRADE CREATION AND TRADE POTENTIAL BETWEEN ASEAN AND INDIA:

A GRAVITY MODEL ANALYSIS

CHAPTER- V

TRADE CREATION AND TRADE POTENTIAL BETWEEN ASEAN AND INDIA: A GRAVITY MODEL ANALYSIS

The chapter forms the core of the analysis in which a systematic attempt is made to ascertain the trade impact of ASEAN and its implications on India at a time when India signed a FTA with ASEAN countries which will come in to effect from 1st January 2010. A gravity model with appropriate variables is used to measure the bilateral trade flows. Based on the parameters of Gravity model, the possible trade potential between India and ASEAN countries are calculated. The results are corroborated with a partial equilibrium simulation exercise based on World Integrated Trade Solutions (WITS). The chapter is divided in to five parts, each part focusing important dimensions of the research problem. The first part deals with the application of Gravity Model in explaining trade flows between countries, its specifications, advantages and difficulties in using it. The second part deals with different methods of estimation of panel data regression and how these can be extended to Gravity Model framework. Different estimation techniques were applied to the database to select the appropriate model which is efficient and reflects the characteristics of bilateral trade. The third part discussed the empirical results arrived at from various models and its implications on India-ASEAN trade. The trade potential existing between India and ASEAN countries is computed in the forth section. The trade, revenue and welfare effect of India-ASEAN FTA is simulated through a partial equilibrium framework using WITS and presented in the sixth section. This follows the major findings of the study.

5.1 The Gravity Model of trade

Gravity models utilize the gravitational force concept as an analogy to explain the volume of trade, capital flows, and migration among the countries of the world. Gravity models establish a baseline for trade-flow volumes as determined by Gross Domestic Product (GDP), Population, and Distance. The effect of policies on trade flows (such as RTA) can then be assessed by adding policy variables to the equation and estimating deviations from the baseline flows. The gravity model of bilateral trade, in its most basic form says that trade between country 'i' and country 'j' is proportional to the product of GDPi and GDPj and inversely related to the distance between them.

5.1.1 Gravity Model Specifications

Gravity models begin with Newton's Law for the gravitational force (GFij) between two objects *i* and *j*. In equation form, this is expressed as:

$$GF_{ij} = \frac{M_i M_j}{D_{ij}^2} \qquad i \neq j \qquad (1)$$

In this equation, the gravitational force is directly proportional to the masses of the objects (Mi and Mj) and inversely proportional to the distance between them (Dij).

Gravity models are estimated in terms of natural logarithms, denoted "ln." In this form, what is multiplied in Equation 1 becomes added, and what is divided becomes subtracted, translating Equation 1 into a linear equation:

$$lnGF_{ij} = ln\, M_i + ln\, M_j - lnD_{ij} \qquad i \neq j \qquad (2)$$

Gravity models of international trade implement Equation 2 by using trade flows or exports from county *i* to country *j* (Eij) in place of gravitational force, with arbitrarily small numbers sometimes being used in place of any zero values. Distance is often measured using "great circle" calculations. The economic mass in equation (2) can be represented in four alternate methods. In the first method, mass in Equation 2 is associated with the Gross Domestic Product (*GDP*) of the countries. In this case, Equation 2 becomes:

$$lnE_{ij} = \alpha + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 lnD_{ij} \quad (3)$$

In general, the expected signs here are $\beta 1$, $\beta 2 > 0$. However, when applied to agricultural goods, Engels' Law allows for *GDP* in the destination country to have a negative influence on demand for imports. Hence it is also possible that $\beta 2<0$.

In the second Method, mass in Equation 2 is associated with both GDP and Population (*POP*). In this case, Equation 2 becomes:

$$lnE_{ij} = \phi + \gamma_1 lnGDP_i + \gamma_2 lnPOP_i + \gamma_3 lnGDP_j + \gamma_4 lnPOP_j + \gamma_5 lnD_{ij} (4)$$

With regard to the expected signs on the population variables, these are typically interpreted in terms of market size and are therefore positive ($\gamma 2$, $\gamma 4 >0$). However, there is the possibility of import substitution effects as well as market size effects. If the import substitutions effects dominate, the expect sign is $\gamma 4 <0$.

In the third and fourth Methods, mass in Equation 2 is associated with *GDP* per capita and with both Gross Domestic Product and GDP per capita, respectively. In these cases, Equation (2) becomes one of the following:

$$lnE_{ij} = \tau + \delta_1 ln\, GDP_i/POP_i + \delta_2 ln\, GDP_j/POP_j + \delta_3 ln\, D_{ij} \quad (5)$$

$$lnE_{ij} = \mu + v_1 lnGDP_i + v_2 ln\, GDP_i/POP_i + v_3 lnGDP_j + v_4\, GDP_j/POP_j + lnD_{ij} \quad (6)$$

Since they involve the same variables, the parameters of Equations 4, 5, and 6 are transformations on one another: $\gamma_1 = \delta_1 = v_1+v_2$; $\gamma_2 = -\delta_1 = -v_2$; $\gamma_3 = \delta_2 = v_3+v_4$; $\gamma_4 = -\delta_4 = -v_4$.

5.1.2 Augmented Gravity Models

Gravity model is augmented with large number of other variables to account for large number of factors that are influencing trade. These include cultural factors, geographical factors, historical factors and other factors. Cultural factors explain whether countries share common language, customs, practices and similar ethnic groups. The geographical factors explain whether countries share common borders or they are landlocked countries or island nations. Historical nature of the relationship between countries shows whether one colonized the other, or they have common colonizer. When all possible factors influencing trade between nations are taken in to consideration the remaining unaccounted part is the result of artificial barriers to trade.

In some gravity equations Per Capita Income enters in two forms, as the product of bilateral per capita GDPs, and as the absolute value of the difference. The product of bilateral Per Capita GDPs captures importance of wealth (as opposed to size) as a determinant of trade where as absolute difference in per capita GDP captures the importance of differences between economies as emphasized in the Heckscher-Ohlin type models. The absolute per capita GDP difference (PC*GDPdiff*$_{ij}$) between countries *i* and *j* is also useful to test Linder Hypothesis. According to Linder hypothesis, countries with similar levels of income per capita will exhibit similar tastes, produce similar but differentiated products and trade more amongst themselves. A negative sign on the per capita GDP difference variable will support the hypothesis.

5.1.3 Theoretical basis of Gravity model

Gravity model was first used by Tinbergen (1962) to explain international trade flows between nations when other models like Heckscher-Ohlin theorem proved faulty due to the presence of "border effects." Despite its huge empirical success, gravity model was devoid of strong theoretical background as the existing theories could not explain this phenomenon.

The first important attempt to provide a theoretical basis for gravity models was done by Anderson (1979) using a linear expenditure system employing product differentiation by country of origin assumption, commonly known as the "Armington assumption" (Armington, 1969). Bergstrand (1985) used a generalised gravity model which assumed a more flexible utility function that allowed him to find evidence that imports were closer substitutes for each other than for domestic goods. The role of distance is also incorporated in Bergstand's (1985) imperfect substitutes theory, which incorporated role for shipping costs, proxied in practice by distance. Distance is also included in the second of the two HO based models developed by Deardorff. Price effects have also been captured using real exchange rates (e.g., Brun et al., 2005).

The monopolistic competition model of new trade theory has been another approach to providing theoretical foundations to the gravity model (Helpman, 1987 and Bergstrand, 1989). The gravity model is considered to be supportive of the monopolistic competition explanation of intra-industry trade and product differentiation. Grossman (1998) argued that the assumption of perfect product specialisation that generates the empirical success of the equation. Evenett and Keller (1998) argued that the perfect specialisation version of the H-O model is an unlikely candidate to explain the success of the gravity equation, while the increasing return to scale model was more likely to be a successful candidate. Feenstra, Markusen and Rose (2001) extended this analysis using the Rauch (1999) trade classification, found strong evidence that monopolistic competition models of international trade account for the success of the equation when tested within the differentiated product category.

Recent work has shown that the gravity equation can be derived from both the traditional and the 'new' theory of international trade and not only from the latter as Helpman and Krugman (1985) and Helpman (1987) suggested. Deardorff (1998) showed that a gravity model can arise from a traditional factor-proportions explanation of trade and derived a gravity-type relationship from it. Eaton and Kortum (2001) derived a gravity-type equation from a Ricardian type of model. Anderson and van Wincoop (2003) drew it from a model of monopolistic competition in differentiated products and Helpman et al. (2004) obtained it from a theoretical model of international trade in differentiated goods with firm heterogeneity. Though the model was developed in the early 1960s its application to the study of RTAs became popular following Krugman's (1991) study in which he posits that geography (proximity) plays a role in the decision to forming RTAs. He shows how proximity can lead to agglomeration of production to a given region and in the process biasing trade to that region by promoting a regional integrating area (RIA).

5.1.4 Merits and Problems using Gravity models

Gravity Model is widely used in determining trade flows between nations due to its inherent simplicity and high explanatory power. Frankel (1997) identified three important reasons namely empirical success, improved theoretical foundations and new interest among economists in the subject of geography and trade for its popularity in trade analysis. Gravity models are intensively used to study the impact of Regional Trade Agreements as it provides strong theoretical basis and empirical results.

But gravity model is also subjected to criticism both theoretically and econometrically. A major criticism of the model regards to mis-specification of the functional form (Hamilton and Winters, 1992; Polak, 1996). The importance of this concern has waned over the years because variables of economic size, trade distance, and GDP have become widely recognized as explanatory variables for trade flows. The model's log-linear specification, though highly restrictive as pointed out by Fik and Mulligan (1998), is only a problem under non-asymptotic conditions, especially in the least developing countries' context where trade data are hardly available. Helpman, et al.(2004) argued that disregarding zero trade observations has important consequences for the empirical analysis, as it generates biased estimates. They also argued that the standard specification of a gravity model, by imposing symmetry of trade flows (that is, that the volume of imports from A to B equal imports from B to A), is inconsistent with the data, and also biases the results. Issues of spatial dependence (caused by spatial aggregation and externalities) and heteroskedasticity (Anselin, 1998) are also of concern. Porojan (2000) pointed out that Spatial Econometrics technique can resolve the spatial dependence problem. The asymptotic nature of the sample along with the underlying provisions of the Central Limit Theorem makes the issue of spatial dependence and heteroskedasticity less of a concern (Gujarati, 1995). Other criticisms relates to the argument by some, for example, Evenett and Keller (1998), that the success of the model depended on its assumption of increasing returns to scale production techniques outside of which the model becomes less robust. The application of the model by Carillo and Li (2002) under a differentiated and homogeneous product classification has proved otherwise.

5.1.5 Application of Gravity Model in Regional Trade

Gravity models have been widely used to investigate the impact of preferential trading arrangements (PTAs) on trade among the members of the integration scheme. The basic idea is to include an additional dummy variable in the standard gravity model that captures variations in the levels and direction of trade due to the formation of a preferential trading arrangement among a group of countries. The dummy variable is equal to one when both countries in a given pair belong to the same regional group and 0 otherwise. The estimated coefficient will then tell us how much of the trade within each region can be attributed to a special regional effect. It is assumed that the "normal volume of trade" between a pair of randomly selected countries can be explained by size (GDP, population, land area) and distance (broadly defined as trade costs) between two countries. If the preferential trade arrangement increases the trade among the members of the arrangement above its "normal" value, then the intra-bloc dummy variable (a variable that represents the existence of a preferential agreement between two countries) will get a positive and statistically significant coefficient.

Gravity models are also used to capture the trade diverting effects that the creation of a regional block can have on non-members. For this purpose, a second dummy variable (extra-bloc dummy) is added to the basic gravity equation to indicate when trade occurs between countries where only one of the two is party to a regional agreement. If countries outside a certain regional trade agreement trade relatively less than normal with countries that belong to a regional block, then the dummy variable will take a negative and significant coefficient. Most of the gravity models use one extra-block dummy variable to capture trade diversion. However, some applications add two extra bloc dummies to the standard gravity equation (like in the paper by Soloaga and Winters, 2001): one capturing diversion of imports of RTA member countries from non-members and the other one capturing diversion of RTAs member countries' exports. This alternative specification allows for imports and exports being affected differently by the creation of a regional trade agreement and may prove to be a better specification of the model

Economic theory suggests that the overall welfare effects of a PTA depend on the balance between trade creation and trade diversion. Trade creation takes place when, as a result of the preferential rate established by a PTA, domestic production of a product is displaced by the imports from a member country, where the good is produced at a lower cost or additional demand for imports is created. Trade diversion occurs when as a result of preferences, imports from a low cost country outside the regional trade agreement are displaced by imports from a higher cost partner country.

Trade creation and trade diversion have opposite effects on welfare. Trade creation generates welfare gains for member countries without imposing any losses on non-members. Consumers resident in the preferential area will pay less to purchase the same product, so they enjoy a welfare gain. And these gains outweigh the loss in producer surplus and tariff revenues which occur as a result of the elimination of protection from competition from PTA partners. In contrast trade diversion generates a welfare loss. Trade diversion not only represents a cost for the exporting country outside the preferential agreement (that will see its exports reduced), but it also represents a cost for the importing country in the preferential trading arrangement. Consumers pay a lower price than before the preference was introduced, but the government loses tariff revenue. This generates a loss for the country as a whole.

5.1.6 Panel Data Gravity Models

Although early empirical studies used cross-section data to estimate gravity models (Aitken, 1973; Bergstrand, 1985), most researchers nowadays use panel data (Mátyás, 1997; De Grauwe and Skudelny, 2000; Wall, 2000; Glick and Rose, 2001). One reason is that the extra time series observations result in more accurate estimates. Moreover, in a cross-section analysis unobserved trade determinants that are country-pair specific and invariant over time are necessarily captured by the disturbance term. As these variables are likely correlated with observed regressors, the usual least squares estimator is inconsistent. In contrast, with panel data the effects of such unobserved determinants can be modeled by including country-pair specific constant terms, so that the source of inconsistency just mentioned is avoided. Mátyás (1997) and Wall (2000) stress the importance of including country-pair "individual" effects.

5.2 Econometric Estimation Using Panel Data

The term "panel data" refers to the pooling of observations on a cross-section of households, countries, firms, etc. over several time periods (Baltagi, 2005). Panel data regression differs from a regular time series or cross section regression in a sense that it has a double subscript on its variable, i.e.

$$y_{it} = \alpha + X'_{it}\beta + u_{it} \qquad i= 1, \ldots, N; \qquad t = 1, \ldots T$$

With i denoting households, individuals, firms, countries etc. and t denoting time. The i subscript, therefore, denotes the cross section dimension whereas t denotes the time-series dimension. α is a scalar, β is K x 1 and X_{it} is the ith observation on K explanatory variables. Most of the panel applications use one-way error component model for the disturbances, with

$u_{it} = \gamma_i + \epsilon_{it}$

Where γ_i denotes the unobservable individual-specific effect and ϵ_{it} denotes remainder disturbance.

5.2.1 Benefits and limitations of Panel Data

Panel data analysis presents numerous advantages and efficient econometric estimates to the data analysis (Baltagi, 2005). These include controlling individual heterogeneity, more data points thus less collinearity and more degrees of freedom and efficient estimation, traces dynamic adjustment and more useful in studying more complicated behavioural models. Micro panel data measures data more accurately whereas macro panel data have longer time series and overcomes the problem of unit roots tests in time-series analysis.

The panel data however subjected some limitations. These include design and data collection problems, distortions of measurement errors, selectivity problems such as self selectivity, Non response and attrition, short time-series dimension and cross section dependence.

5.2.2 Omitted Variable Problem in Panel data

Unobserved individual heterogeneity is the serious problem faced by panel data estimation.

Consider a true model

$y_{it} = \alpha + X'_{it}\beta + \gamma_i + \epsilon_{it}$ $\quad\quad i = 1, \ldots, N; \quad\quad t = 1, \ldots T$

In the above equation γ is unobserved and x and γ are correlated. This gives the β of the OLS-estimate biased. But having a panel data structure with many data points help to transform the data to "get rid of γ_{it}". When omitted variables are time invariant, we can get reliable estimates by taking first differences. This can be done following two ways,

If $\gamma_{it} = \gamma_i$ for all t, use e.g. first differences and if $\gamma_{it} = \gamma_t$ for all i, include e.g. time dummies

Consider the true model

$$y_{it} = a + X'_{it}b + \gamma_i g + \epsilon_{it}$$

$$y *_{it} = y_{it} - y_{i,t-1} = (a + X'_{it}b + \gamma'_i g + \epsilon_{it}) - (a + X'_{it-1}b + \gamma'_i g + \epsilon_{it-1})$$

$$= (X_{it} - X_{it-1})'b + (\epsilon_{it} - \epsilon_{it-1}) = X^{*\prime}_{it}b + \epsilon^*_{it}$$

We need not worry about the bias that ordinarily arises from the latent variable, γ_i. By introducing the subject-specific variable a_i, accounts for the presence of many types of latent variables.

5.2.3 Pooled Ordinary Least Squares Method (POLS)

Pooled OLS means combining both dimensions in one data set and neglecting time and cross-sectional structure of the data.

General Cross section model: $Y_i = \alpha + \beta X_i + u_i$

General Time series model: $Y_t = \alpha + \beta X_t + u_t$

Using Matrix Notation: $y = x\beta + u$ (This equation is for one country)

Before pooling the data, we have to test the hypothesis known as the stability of the regression across country/time.

Chow Test:

Null Hypothesis: β is the same for all firms

$H_0: \beta_1 = \beta_2 = \beta_3 \ldots. . . = \beta_N$

Alternate Hypothesis: β is different for some cases.

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \ldots\ldots \neq \beta_N$

Run the regression: **y** = **x** β + **u** for each sample country separately (OLS);

Then run a pooled regression (OLS)

Chow Test Statistics:

$$F = \frac{e'e - e'_1 e_1 - e'_2 e_2 \ldots\ldots\ldots e'_n e_n/(N-1)K'}{e'_1 e_1 + e'_2 e_2 + \ldots\ldots\ldots e'_N e_N/N(T-K')}$$

This is distributed as F [(N-1)K, N(T-K)]

Similarly one can test the stability of regression across time: in this case the d.f = [(T-1)K, N(T-K)].

If we suspect only LSDV model, then the intercepts are allowed to vary but the slopes remain the same in all cases.

This estimate is still heavily biased because of unobserved heterogeneity (u_{it} and x_{it} are correlated). This is due to the fact that pooled-OLS also relies on a between comparison. Compared with the cross-sectional OLS, the bias is lower because pooled-OLS also takes regard of the within variation. Panel data lets us eliminate omitted variable bias when the omitted variables are constant over time within a given panel. But panel data alone do not remedy the problem of unobserved heterogeneity; one has to apply special regression models for that.

Panel data analysis uses either one way model or a two way model. In the case of one way model only time invariant individual effects are taken in to consideration. On the other hand in a two way model, both individual and time effects are taken in to consideration. In a one way model, there are two options for treatment of individual effects. These include

Fixed effects – γ_i are assumed constants

Random effects – assumed γ_i are drawn independently from some probability distribution

5.2.4 Three Panel Data Models

The panel data models are directed to eliminate the unobserved unit heterogeneity. Three types of panel data models are used for this purpose.

FD (First difference) Method

$\Delta Y_{it} = (\alpha_i - \alpha_i) + \beta \Delta X_{it} + \Delta u_{it}$

FE (Fixed Effects) Model

$Y_{it} = \alpha_i + \beta X_{it} + u_{it}$ (Replace with dummy variable)

RE (Random Effects) Model

$Y_{it} = \beta X_{it} + u_{it}$ where $u_{it} = \alpha_i + \epsilon_{it}$ (put it in the error term)

Then, find a way to eliminate αi for each.

The main questions asked in deciding on what estimation method to use are: i) Are there an unobserved unit specific component correlated with the explanatory variables? and ii) Are the idiosyncratic errors strictly exogenous? First difference estimators and fixed effects *allow* the unobserved unit specific effect to be correlated with the explanatory variables. Random effects (and pooled OLS) *do not allow* the unobserved unit specific effect to be correlated with the explanatory variables. Strict exogeneity is needed for all basic panel estimators to be consistent

5.2.5 The first difference estimator

Let us consider a model

$Y_{it} = X_{it}\beta + \gamma_i + \epsilon_{it}$ *i= 1 . . . . . . N,* *t= 1 . . . . . T*

The composite error is $u_{it} = (\gamma_i + \epsilon_{it})\ with\ \epsilon_{it} \sim iid$

And $E(X'_{it}\epsilon_{it}) = 0$

Hence, there is a time invariant unit specific component 'γ_i' in the error term

In many settings, such an effect will be correlated with one or more of the explanatory variables in x_{it}

Then $E(X'_{it}\gamma_i) \neq 0$ and pooled OLS is not valid.

But the advantage of panel data is that we have repeated observations in the time dimension and this allow the mechanism to solve out the time invariant unobserved effect by transforming the variables. The simple solution is the first difference transformation wherein we subtract y_{it-1} on each side of the original model, substitute and simplify. We get a new model with the same β-coefficients, but without the unit specific error component.

$$\Delta Y_{it} = \Delta X_{it}\beta + \Delta\epsilon_{it}$$

$$\Delta Y_{it} = Y_{it} - Y_{it-1} \quad \text{etc.}$$

The time invariant unit specific error component disappear as

$$\Delta u_{it} = u_{it} - u_{it-1} = (\gamma_i + \epsilon_{it}) - (\gamma_i + \epsilon_{it-1}) = \epsilon_{it} - \epsilon_{it-1} = \Delta u_{it}$$

β can be estimated consistently by OLS, if ϵ_{it} is uncorrelated with x_{it} using first differenced model. Here we simply regress growth in y on growth in x. Note that in general, also the constant term will disappear. The model should, however, include time dummies. Usually we will drop one time dummy and estimate a model with a constant term.

The big advantage of this method is that the fixed-effects have been cancelled out and the assumption of γ_i uncorrelated with x_{it} is no longer required. This estimator, however, is not efficient, because one could also subtract period 1 from 3 (this information is not used). In addition, with more than two time-periods the problem of serially correlated $\Delta\varepsilon_i$ arises. OLS assumes that error terms across observations are uncorrelated (no autocorrelation). This assumption can easily be violated with multi-period panel data. Then standard errors (SEs) will be biased. To remedy this one can use GLS or Huber-White sandwich estimators.

5.2.6 Fixed Effect Model

Taking first differences is a simple and intuitive way to solve the endogeneity problem when an unobserved "fixed effect" is correlated with the explanatory variables. The most commonly used panel data estimator uses "within transformation" to solve out the unobserved effect. The result is the fixed effects or FE-estimator.

(a) Within Transformation

Consider again a model

$Y_{it} = X_{it}\beta + \gamma_i + \epsilon_{it}$ $\quad\quad$ *i= 1 . . . . . . .N;* $\quad\quad$ *t= 1 . . . . K*

Start out taking averages over the time dimension to obtain

$$\bar{Y}_{i\cdot} = \bar{x}_{i\cdot}\beta + \gamma_i + \bar{\varepsilon}_{j\cdot}$$

Subtract the equation from the original model

$$Y_{it} - \bar{Y}_{i\cdot} = x_{it} - \bar{x}_{i\cdot}\beta + \varepsilon_{it} - \bar{\varepsilon}_{i\cdot}$$

γ_i disappears as it is its own time average

Writing the model using transformed variables we can consistently estimate the β-vector using OLS

$\ddot{Y}_i = \ddot{x}_{it}\beta + \ddot{\varepsilon}_{it}$ $\quad$ i= 1 . . . . . .N; t = 1 . . . . . .T

Fixed effect: $Y_{it} = \alpha + \beta X_{it} + \delta_1 D_1 + \delta_2 D_2 + \delta_3 D_3 + \cdots \ldots \ldots + \delta_n D_n + \epsilon_{it}$ (assumption is that group effect does not vary over time).

There is a specification problem in the above equation with dummy variable Trap.

So drop α or one of the dummies to estimate the equation. Basically we include n dummies.

Modified Equation: $Y_{it} = \alpha_i[\mathrm{i}] + \beta X_{it} + \epsilon_{it}$

Here, we assume no time-specific effects.

α_i – the individual effect-it is taken to be constant over time but specific to individual cross sectional unit (shifting just the intercepts)

Simple LSDV Model: OLS can be used

$y = D_\alpha + X\beta + \epsilon$ (OR)

$$Y = [d_1 d_2 d_3 \ldots\ldots X] \begin{vmatrix} \alpha \\ \beta \end{vmatrix} + \epsilon$$

OLS will provide unbiased estimates of parameters

5.2.7 The Between Estimator

The fixed effects estimator exploits only "within unit" variation over time. The "extreme opposite" would be to use only cross sectional variation *between* the units, i.e. to discard the time dimension. This is done using the so-called "between-estimator". Simply stated, the between estimator reduces the panel to a cross section of averages over time, and uses OLS on this cross section

Consider a model

$$Y_{it} = x_{it}\beta + \gamma_i + \varphi_i + \varepsilon_{it} \qquad \mathrm{i}= 1 \ldots\ldots\ldots \mathrm{N}; \quad \mathrm{t}= 1 \ldots\ldots\ldots \mathrm{T}$$

Remember that the first stage of the within transformation was to compute averages over time for each variable

$$\bar{Y}_{i\cdot} = \bar{x}_{i\cdot}\beta + \gamma_{\cdot} + \varphi_i + \bar{\varepsilon}_{i\cdot}$$

Using OLS on this transformed equation will give the between estimates for **β**

Generally, BE is not very useful in the econometric analysis. If φ_i is correlated with x_{it}, the between estimator is *inconsistent* just like pooled OLS and the random effects estimator. One should use FE or FD instead. If φ_i is not present or not correlated with x_{it}, the between estimator is *inefficient* and pooled OLS or the random effects model (RE) should be used instead.

5.2.8 The Random Effects Model

Fixed effects regression is not an effective tool if the variable of interest is time invariant in nature as such variables cannot be included in the model. Random effects regression model subject to two conditions, provide a solution to this problem. The first condition is that it is possible to treat each of the unobserved γ_i variables as being drawn randomly from a given distribution. It represents individual observations constitute a random sample from a given population and the γ_i may be treated as random variables (hence the name of this approach).

$$Y_{it} = \beta_0 + \beta_{it}X_{it} + \gamma_i + \epsilon_{it}$$

$$Y_{it} = \beta_0 + \beta_{it}X_{it} + u_{it}$$
$$u_{it} = \gamma_i + \epsilon_{it}$$

Here $u_i = \gamma_i + \epsilon_{it}$, γ_i is part of the error term

The second condition is that the γ_i variables are distributed independently of all of the *Xi* variables. If this is not the case, γ_i, and hence *u*, will be correlated with the *Xj* variables and the random effects estimation will be biased and inconsistent. In this case we have to use fixed effects estimation instead random effect, even if the first condition is satisfied.

The Variance Structure in Random Effects

In random effects, we assume the γ_i are part of the composite error term u_{it}. To construct an efficient estimator we have to evaluate the structure of the error and then apply an appropriate Generalised Least Squares (GLS) estimator to find an efficient estimator. The following assumptions must hold if the estimator is to be efficient. These are:

$E(\varepsilon_{it}) - E(\gamma_i) = 0$ $\qquad$ $E(\varepsilon_{it}^2) = \sigma^2\varepsilon$

$E(\gamma_i^2) = \sigma^2\gamma$ $\qquad$ $E(\varepsilon it\ \gamma i) = 0$ for all i, t

$E(u^2_{it}) = \sigma^2\varepsilon + \sigma^2\gamma \quad t=s;$ $\qquad$ $E(uit\ uis) = \sigma^2\gamma,\ t \neq s;$

And $E(x_{kit}\ \gamma_i) = 0$ for all k,t, i

This is a crucial assumption for the RE model. It is necessary for the consistency of the RE model, but not for FE. It can be tested with the Hausman test.

The Variance Structure in Random Effects

Derive the T by T matrix that describes the variance structure of the u_{it} for individual *i*. Because the randomly drawn γ_i is present each period, there is a correlation between each pair of periods for this individual.

$Ui' = (u_{i1}, u_{i2}, \ldots \ldots u_{iT});$ $\qquad$ then $E(u_i\ u_i') =$

$$\begin{matrix} \sigma^2\varepsilon\ \sigma^2\gamma & \sigma^2_\gamma & \sigma^2_\gamma & \sigma^2_\gamma \\ \sigma^2\gamma & \sigma^2\varepsilon\ \sigma^2\gamma & & \sigma^2\gamma \\ \sigma^2 i & .. & .. & \ldots \\ \sigma^2\gamma & \sigma^2\gamma & .. & \sigma^2\varepsilon\ \sigma^2\gamma \end{matrix}$$

$= \sigma^2\varepsilon I + \sigma^2\gamma\ ee' = \Omega$

Where $e' = (1111\ldots.1)$ is a unit vector of size T

Random Effects (GLS Estimation)

The Random Effects estimator has the standard generalised least squares form summed over all individuals in the dataset i.e.

$$\hat{\beta}_{RE} = \left[\sum_{i=1}^{N}(X'_i\Omega^{-1}X_i\right]^{-1}\sum_{i=1}^{N}X'_i\,\Omega^{-1}y_i$$

Where, given Ω, it can be shown that:

$$\Omega^{-1/2} = \frac{1}{\sigma_u}\left(I_T - \frac{\theta}{T}ee'\right) \text{ where } \theta = 1 - \frac{\sigma_u}{\sqrt{T\sigma^2{}_\lambda + \sigma^2{}_u}}$$

Relationship between Random and Fixed Effects

The random effects estimator is a weighted combination of the "within" and "between" estimators. The "between" estimator is formed from:

$$\hat{\beta}_{RE} = \psi\hat{\beta}_{BETWEEN} + (I_K - \psi)\hat{\beta}_{WITHIN}$$

Ψ depends on θ in such a way that if $\theta \rightarrow 1$ then the RE and FE estimators coincide. This occurs when the variability of the individual effects is large relative to the random errors. $\theta \rightarrow 0$ corresponds to OLS (because the individual effects are small relative to the random error).

5.2.9 Hypothesis Testing and Model Selection:

1. "Poolability" of data - Chow Test
2. Individual and fixed effects - Breusch-Pagan
3. OLS versus Fixed Effect - F-test
4. OLS versus Random Effect - Langrangian Multiplier test
5. Fixed Effect versus Random Effect - Hausman test

Test for Data Pooling – Chow test

Null (unconstrained) hypothesis – distinct regressions for each individual

Alternative (constrained) – individuals have same coefficients, no error components (simple error)

Appropriate test – F test (Chow Test)

Test for Individual Effects - Breusch-Pagan Test

$$H_0: \sigma^2{}_\lambda = \sigma^2{}_\mu = 0$$

Easy to compute – distributed as $\chi_2{}^2$

Tests of individual and time effects can be derived, each distributed as $\chi^2{}_1$

The Hausman Test

Hausman (1978) proposed a specification test to determine whether the Fixed Effects or Random Effects Model is appropriate based on the difference between the FE and RE estimates. The key issue for the test is to see whether x_i and γ_i are correlated are not.

If x_i and γ_i are uncorrelated, both estimators are consistent and we would expect the difference to be relatively small. If x_i and γ_i are correlated, RE is biased, and we would expect the difference to be large. Since time-invariant variables cannot be included in the FE regression, the test is based on coefficients for time-varying variables, only. It is not necessary to include coefficients on all time-varying variables in the test, if some variables primarily are control variables.

The null hypothesis of the test is H_0: $E\gamma_i|x_{it}) = 0$ for the one-way model

If there is no correlation between regressors and effects, then FE and RE are both consistent, but FE is inefficient.

Calculate $\hat{\beta}_{RE} - \hat{\beta}_{FE}$ and its covariance

If there is correlation, FE is consistent and RE is inconsistent.

Under the null hypothesis of no correlation, there should be no differences between the estimators. A test for the independence of the γ_i and the x_{kit}. The covariance of an efficient estimator with its difference from an inefficient estimator should be zero.

The Hausman test statistic is

$$H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})[\widehat{AVar}(\hat{\beta}_{FE}) - \widehat{AVar}(\hat{\beta}_{RE})\ ]^{-1}(\hat{\beta}_{FE} - \hat{\beta}_{RE})$$

Where $\hat{\beta}_{FE}$ and $\hat{\beta}_{RE}$ are vectors of coefficient estimates, excluding coefficients on time-invariant variables and time dummies. H is distributed asymptotically as χ^2 with degrees of freedom equal to the number of coefficients in $\hat{\beta}_{FE}$ and $\hat{\beta}_{RE}$.

Single coefficients can be tested using

$$T = \frac{\hat{\beta}_{FE} - \hat{\beta}_{RE}}{\sqrt{\widehat{Var}(\hat{\beta}_{FE}) - \widehat{Var}(\hat{\beta}_{RE})}}$$

This t-statistic has an asymptotic standard normal distribution

5.2.10 Hausman Taylor Instrumental Variable Method

The Hausman-Taylor method is an extension of the random-effects estimator. The main assumption of the Hausman-Taylor method is that the explanatory variables that are correlated with can be identified. Equation is augmented as follows:

$$Y_{ijt} = \alpha_0 + \beta_1'X_{1_{ijt}} + \hat{\beta}X_{2_{ijt}} + \delta_1 z_{1_{ijt}} + \delta_2 z_{2_{ij}} + \gamma_{ij} + \varepsilon_{ijt}$$

where X_1 are the variables that are time varying and uncorrelated with; X_2 are time varying and correlated with; Z_1 are time invariant and uncorrelated with; and Z_2 are time invariant and correlated with γ_{ij}.

The presence of X_2 and Z_2 is the cause of bias in the random-effects estimator. The strategy proposed by Hausman and Taylor (1981) is to use information already contained

The fixed effects model with time invariant variables are represented as follows

$$Y_{it} = \alpha + \sum_1^k \beta_K X_{Kit} + \sum_1^M \phi_M Z_{mi} + \gamma_i + \epsilon_{it}$$

where the x-variables are time-varying and the z-variables are assumed to be time-invariant. γ_i denotes the unit specific effects (fixed effects) of the data generating process and ϵ_{it} is the iid error term, β and Z are the parameters to estimate.

In the first stage, the fixed effects vector decomposition procedure estimates a standard fixed effects model.

$$\ddot{y_{it}} = \beta_K \sum_1^K \ddot{x_{kit}} + \ddot{e}_{it}$$

with $\ddot{y_{it}} = y_{it} - \bar{y}_i$, $\ddot{x}_{Kit} - \bar{x}_{Ki}$ and $\ddot{e_{it}} = e_{it} - \bar{e}_i$ denoting the demeaned variables of the fixed effects transformation. We run this fixed effects model with the sole intention to obtain estimates of the unit effects $\widehat{u_i}$. At this point,it is important to note that the estimated unit effects $\widehat{u_i}$ do not equal the unit effects u_i.

The following equation explains how the unit effects are computed and what explanatory variables account for these unit effects.

$$\widehat{u_i} = \bar{y_i} - \sum_1^K \boldsymbol{\beta}_K^{FE} \bar{x}_{Ki} - \bar{e_i}$$

where $\boldsymbol{\beta}_K^{FE}$ is the pooled OLS estimate of the demeaned model in equation 3. The $\widehat{u_i}$ include the unobserved unit specific effects as well as the observed unit specific effects γ, the unit means of the residuals $\bar{e_i}$ and the time-varying variables $\bar{x}_{Ki}$, whereas u_i only account for unobservable unit specific effects.

In stage 2 we regress the unit effects $\widehat{u_i}$ from stage 1 on the observed time invariant and rarely changing variables – the z-variables (see equation 5) to obtain the unexplained part h_i (which is the residual from regression the unit specific effect on the z-variables). In other words, we decompose the estimated unit effects into two parts, an explained and an unexplained part that we dub h_i

$$\hat{u}_i = \sum_{1}^{M} \phi_m z_{mi} + h_i$$

The unexplained part h_i is obtained by predicting the residuals form previous equation

$$h_i = \hat{u}_i - \sum_{m=1}^{M} \phi_m z_{mi}$$

As we said above, this crucial stage decomposes the unit effects into an unexplained part and a part explained by the time-invariant variables. We are solely interested in the unexplained part h_i.

In stage 3 we re-run the full model without the unit effects but including the unexplained part h_i of the decomposed unit fixed effect vector obtained in stage 2. This stage is estimated by pooled OLS.

$$y_{it} = \sum_{1}^{K} \beta_K x_{Kit} + \sum_{1}^{M} \phi_K z_{mi} + \delta h_i + \varepsilon_{it}$$

By construction, h_i is no longer correlated with the vector of the z-variables.

5.3 Secondary Data Analysis and Discussion of Results

The study made use of gravity model to ascertain the impact of ASEAN Regional Trade Agreement and its implications on India. Three variants of gravity model namely Basic Model, Augmented Model and an Extended model are used in the present study. The variables used in the basic model are GDP of country 'i' and 'j', per capita GDP, per capita difference between 'i' and 'j', geographical distance between them and a dummy to represent membership in the ASEAN regional agreement. These variables are traditional gravity model variables emanating from gravity equation. The basic gravity model is augmented by including variables such as continuous border, common language and common colonizer in the basic gravity equation. These variables are country specific individual features help to explain bilateral trade flows between countries. The augmented model is extended by including two dummies namely ASEAN importer and ASEAN exporter in the bilateral trade to ascertain the trade creation effect and trade diversion effect. In all the three types of models total trade is taken as the dependent variable to explain bilateral trade flows.

5.3.1 Data Source and Country Classification

The data for the models are collected from multiple sources. The trade data such as Total bilateral trade, Total Import of a country, Total Export of a country is collected using the World Integrated Trade System (WITS) maintained by the IMF, UNCTAD and the WTO. The trade data is extracted from Direction Of Trade Statistics (DOTS) of the IMF using WITS software. The disaggregated trade data such as HS-2 are collected from the COMTRADE data base of UN. The data pertaining to GDP, per capita GDP, Population of the country are collected from the World Trade Indicators database of the world bank. The geographic distance between countries and countries with common borders are collected from the database maintained by Jon Haveman. The common language and colony are collected from CEPII, France.

The data required for the gravity model is collected from 26 countries representing different geographical regions of the world. This include the five original ASEAN countries such as Indonesia, Malaysia, Philippines, Singapore and Thailand; China, Japan, South Korea from East Asian region, Australia from Asia Pacific, France, Germany, Italy, Spain and UK from Europe, Canada, Mexico and US from North America, Argentina, Brazil and Chile from Latin America, South Africa from Africa, Saudi Arabia from middle east Asia and India, Bangladesh, Pakistan and Sri Lanka from South Asia. Each country has got bilateral trade pair with other 25 countries for seventeen years. The study used the data set of 11050 bilateral trade for 650 country pair (panel) for 17 years. The data are related to the period from 1991 to 2007.

A balanced panel data set consisting 11050 bilateral trade data across different gravity variables is prepared for the analysis. Three models with two variations are used in the study. Different panel data estimation techniques such as Pooled OLS method (POLS), Maximum likelihood Estimation Method (MLE), Fixed Effect with Vector Disintegration (FEVD), Between Effect (BE) and Random Effect Method (RE) are applied to the dataset to arrive at appropriate modeling method and desirable results. The following tables explain the results of various estimation methods under different models.

5.3.2 The Basic Gravity Model -1

The basic gravity model used in the study is given as follows

$$\ln(TT_{ij}) = \alpha + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnPCGDP_i + \beta_4 lnPCGDP_j + \beta_5 lnPCGDP_{diff} - \beta_6 \ln Distance + \beta_7 ASEAN\ member + \varepsilon_{ij}$$

Where

$Ln(TT)_{ij}$ = Log of Total trade between country i and j for a year

Ln GDP_i = log of GDP of country i

Ln GDP_j = log of GDP of country j

Ln $PCGDP_i$ = log of per capita income of country i

Ln $PCGDP_j$ = log of per capita income of country j

Ln PCGDP diff = absolute difference in per capita of country i and j

Ln Distnace = log of geographical distance between country i and j

ASEAN member = dummy representing common membership to ASEAN FTA

εij = Error term

In the pooled OLS method GDP_i, GDP_j, $PCGDP_i$, $PCGDP_j$ PC_{diff} and ASEAN dummy and constant are positive and highly significant reflecting that the gravity variables exhibiting conventional relationship and the Basic model holds good in explaining the bilateral trade flows. The coefficient of ASEAN dummy is positive and significant showing ASEAN regional cooperation has a positive and significant impact in explaining bilateral trade flows. The explanatory power of the model is high as 77.70 percent of the bilateral trade is determined by the included variables.

In the ML Estimation Method, the per capita income of country 'i' and 'j' and the per capita income difference of the countries are not significant in explaining the model. But the coefficient of GDP and ASEAN coefficient improved in this model compared to OLS. Fixed effect with vector disintegration Method is introduced to incorporate country specific heterogeneity in the model to explain bilateral trade flow. The results of the model showed that all variables are highly significant in explaining trade flow. The coefficient of ASEAN dummy significantly improved showing ASEAN has greater influence on bilateral trade. Also individual country specific factors are important in explaining the coefficient of the dummy variable. While the coefficients of GDP improved considerably, the per capita income and per capita income difference are not significant and the sign of the partner country per capita income is negative.

Table: 5.1 Results of the Basic Gravity Model-1

Independent Variable	Dependent Variable =Total bilateral Trade between 'i' and j				
	Pooled OLS	MLE Method	Fixed Effect with Vector Decomposition	Between Effect (BE)	Random Effect (RE)
Ln GDPi	0.6763*** (0.0086)	0.8381*** (0.0297)	2.3272***	0.6727*** (0.0307)	0.8297*** (0.0275)
Ln GDPj	0.6746*** (0.0086)	0.8194*** (0.0294)	2.08***	0.6715*** (0.0307)	0.8118*** (0.0275)
Ln PC GDPi	0.2156*** (0.0087)	0.0377 (0.0323)	-1.7429***	0.2175*** (0.0308)	0.0475* (0.0295)
Ln PC GDPj	0.1757*** (0.0087)	-0.0015 (0.0322)	-1.5707***	0.1777*** (0.0308)	0.0081 (0.0295)
Ln PC GDPdiff	0.0702*** (0.0076)	0.0017 (0.0103)	-0.0117***	0.0831*** (0.0292)	0.0022 (0.0102)
Ln Dist	- 0.9037*** (0.0137)	-0.8287*** (0.0505)	-0.3923***	-0.9098*** (0.0487)	-0.8314*** (0.0490)
ASEAN Dummy	1.4619*** (0.0607)	1.6737*** (0.2258)	3.5152***	1.4557*** (0.2157)	1.6630*** (0.2195)
Constant	3.3160*** (0.1394)	4.5075*** (0.4783)	13.3625***	3.2623*** (0.4989)	4.4544*** (0.4626)
Adj R Sqared	77.70				11992.20 Wald Chi2(7)
F(7, 11042)	5500.92		23603.52 F(8, 11041)	408.41 F(7,642)	-8739.07 Hausman Chi2(7)
B-P / C-W Test Chi2 (1)	658.07	7734.44 LR Chi2(7)			45067.59 B&P LM Test Chi2(1)

In the BE model, all variables are significant and the parameters are closer to POLS model. In the Random Effects (RE) Model, PCGDP of country j and PC difference is not significant where as PCGDPi is significant at 10 percent level. The other variables namely GDP of the countries, the distance between them and the ASEAN dummy are highly significant and holding expected signs.

5.3.3 Basic Gravity Model – 2

In the basic gravity model the GDP of country 'i' and 'j' are included along with their per capita income.

$$\ln(TT_{ij}) = \alpha + \beta_1 lnPOP_i + \beta_2 lnPOP_j + \beta_3 lnPCGDP_i + \beta_4 lnPCGDP_j + \beta_5 lnPCGDP_{diff} - \beta_6 \ln Distance + \beta_7 ASEAN\ member + \varepsilon_{ij}$$

In the normal case GDP of a country is highly correlated with their per capita income and this can affect the parameters of the regression equation and affects the efficiency of the estimate. In order to remove this problem in the estimate, population of the country i and j are taken to represent the mass of the economy along with per capita income in the basic model-2. Other variables in the basic model such as per capita difference, distance, and ASEAN dummy are included in basic model-2. The results of the basic model change significantly with the introduction of population variable. The results are summarized in Table. No.5.2

In the Pooled Ordinary Least Squares (POLS) model, all independent variables are highly significant and showing expected signs. The difference in the Basic model-2 is the coefficients of per capita income are improved significantly compared to Basic model-1 along with the intercept term.

The per capita income country 'i' which was 0.2156 improved to 0.8920 where as the per capita income of country 'j' which was at 0.1757 has improved to 0.8503. This means that some of the effects of per capita income are captured along with GDP in the basic model. Per capita income shows the disposable income available at the hands of the consumer and an important variable in determining the final demand for the product and hence the import of the commodity from the trading partner. Also many of the Asian developing countries have huge population necessitating large import of basic commodities and their import requirements are better represented in terms of population and per capita income rather than GDP and per capita income.

Table: 5.2 Results of the Basic Gravity model-2

Independent Variable	Dependent Variable =Total bilateral Trade between 'i' and j				
	Pooled OLS Method	MLE Method	Fixed Effect Model with Vector Decomposition	Between Effect (BE)	Random Effect (RE)
Ln POPi	0.6763*** (0.0086)	0.8381*** (0.0297)	2.3273***	0.6727*** (0.0307)	0.8297*** (0.0275)
Ln POPj	0.6746*** (0.0086)	0.8194*** (0.0294)	2.08***	0.6715*** (0.0307)	0.8118*** (0.0275)
Ln PC GDPi	0.8920*** (0.0074)	0.8758*** (0.0173)	0.5843***	0.8902*** (0.0270)	0.8772*** (0.0170)
Ln PC GDPj	0.8503*** (0.0074)	0.8179*** (0.0173)	0.5093***	0.8491*** (0.0270)	0.8199*** (0.0170)
Ln PC GDPdiff	0.0702*** (0.0076)	0.0017 (0.0103)	-0.0117***	0.0831*** (0.0292)	0.0022 (0.0102)
Ln Dist	- 0.9037*** (0.0137)	-0.8287*** (0.0505)	-0.3923***	-0.9098*** (0.0487)	-0.8314*** (0.0490)
ASEAN Dummy	1.4619*** (0.0607)	1.6737*** (0.2258)	3.5152***	1.4557*** 0.2157	1.6630*** (0.2195)
Constant	-6.0161*** (0.1705)	-6.9421*** (0.5106)	-17.082***	-6.0231*** (0.6167)	-6.8850*** (0.4949)
Adj R Sqared	77.70				11992.22 Wald Chi2(7)
F(7, 11042)	5500.93		23603.56 F(8, 11041)	408.41 F(7,642)	-8739.29 Hausman Test Chi2(7)
B-P / C-W Test Chi2 (1)	658.08	7734.44 LR Chi2(7)			45067.52 B&P LM Chi2(1)

In the MLE model also the results showed improvement in terms of coefficients of per capita income of country 'i' and 'j'. Unlike the Basic model-1, the coefficients of per capita income are high and highly significant showing the importance of per capita income in explaining bilateral trade flows. While the coefficients of other explanatory variables remained same and significant, the per capita income difference is not significant.

In the Fixed Effect Model with Vector Disintegration (FEVD), all variables are highly significant and the coefficients of the parameters are significantly improved compared to other fitted models. The per capita income of country 'i' and 'j' which were negative in the basic model have turned in to positive and significant emphasizing the importance of per capita income in determining trade flows. The per capita GDP difference (PC*GDPdiffij*) between countries *i* and *j*, expressed in absolute terms, is intended to test for the Linder Hypothesis. That is, that countries with similar levels of income per capita will exhibit similar tastes, produce similar but differentiated products and trade more amongst themselves. A negative sign on the per capita GDP difference variable will support the hypothesis. The per capita GDP difference is having negative sign and significant in the model validating the 'Linder hypothesis'.

In the BE Model also all variables are significant and showing expected signs even though per capita income difference is positive here. The estimated values are closer to POLS estimation results. In RE model all variables are significant except per capita income difference. Here the parameter values are closer to the Maximum Likelihood Estimation (MLE) method.

5.3.4 Augmented Models

The basic gravity model is augmented by including some country specific variables to improve the estimation of bilateral trade flows. The variables included in the model include continuous border, common language and colony. Countries which share common land border trade more because of close proximity and lower transportation costs than countries which are located in far away places (natural trading partner hypothesis). This has been proved correct by many empirical studies (Wannacott and

Lutz, 1989; Summers, 1991; Krugman, 1993). Similarly if countries share common language, that will facilitate easier and quicker trade and reduce transaction costs. For this reason 'common language' has been included in most of the gravity model studies to find out its impact on trade flows. Common colonial master is also a significant variable in determining bilateral trade and hence used in gravity studies. Most of the developing countries were under the colonial rule of the European countries and share strong trade relationship. They have strong historical, linguistic, cultural and political ties that make increased trade a natural outcome between them. The present study augmented the Basic gravity model with these variables.

5.3.5 Augmented Gravity Model – 1

The augmented gravity model-1 used GDP as the economic mass variable along with other traditional gravity variables and augmented variables. The dependent variable of the model is the total bilateral trade between country 'i' and 'j'. The model used in the study is outlined below

$$\begin{aligned}\ln(TT_{ij}) = \alpha &+ \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnPCGDP_i + \beta_4 lnPCGDP_j \\ &+ \beta_5 lnPCGDP_{diff} - \beta_6 \ln Distance + \beta_7 ASEAN\ member \\ &+ \beta_8 Cont\ Bord + \beta_9 Com\ Lang + \beta_{10} Com\ Colony + \varepsilon_{ij}\end{aligned}$$

Where

Cont Border = dummy if countries share common border
Com Lang = dummy if countries share common official language
Com Colony = dummy if both countries were under the same colonizer

In the POLS method of the augmented Model-1 showed that all variables are significant except colony and continuous border. Common language is positively influencing the trade flows and it is highly significant. The adjusted R square is marginally improved here compared with Basic model (78.02 from 77.70) showing the relevance of these variables in gravity model. In the MLE method showed apart from PCGDPi, PCGDPj, PCGDPdiff, continuous borders, colony are not significant in explaining trade flow.

Table: 5.3 Results of the Augmented Gravity Model-1

Independent Variable	Dependent Variable = Total bilateral Trade between i and j				
	Pooled OLS	MLE Method	Fixed Effect with Vector Decomposition	Between Effect Model	Random Effect Model
Ln GDPi	0.6780*** (0.0086)	0.8396*** (0.0295)	2.3272***	0.6741*** (0.0306)	0.8321*** 0.0273
Ln GDPj	0.6773*** (0.0086)	0.8226*** (0.0292)	2.08***	0.6738*** (0.0306)	0.8157*** 0.0274
Ln PC GDPi	0.2115*** (0.0086)	0.0356 (0.0320)	-1.7429***	0.2133*** (0.0307)	0.0443 0.0294
Ln PC GDPj	0.1695*** (0.0086)	-0.0058 (0.0320)	-1.5707***	0.1714*** (0.0307)	0.0028 0.0294
Ln PC GDPdiff	0.0713*** (0.0077)	0.0015 (0.0103)	-0.0117***	0.0848*** (0.0294)	0.0020 0.0102
Ln Dist	- 0.8923*** (0.0149)	-0.8411*** (0.0554)	-0.5483***	-0.8966*** (0.0528)	-0.8428*** 0.0541
ASEAN Dummy	1.4464*** (0.0605)	1.6749*** (0.2241)	3.6043***	1.4383*** (0.2148)	1.6648*** 0.2185
Cont Border	0.0561 (0.0548)	-0.1453 (0.2029)	-1.3502***	0.0725 (0.1944)	-0.1386 0.1980
Com Language	0.3413*** (0.0282)	0.3954*** (0.1059)	0.8346***	0.3393*** (0.1001)	0.3930*** 0.1034
Colony	- 0.0319 (0.0443)	0.0201 (0.1643)	0.4755***	-0.0329 (0.1571)	0.0177 0.1604
Constant	3.2161*** (0.1511)	4.5924*** (0.5287)	14.6491***	3.1460*** (0.5398)	4.5381*** 0.5123
Adj R Sqared	78.02				12053.15 Wald Chi2(10)
F(10, 11039)	3923.03		17161.53 F(8, 11038)		-8771.45 Hausman Test Chi2(10)
Breusch- Pagan/ Cook-Weisberg test Chi 2 (1)	747.78	7750.68 LR Chi2(10)		291.63 F(10,639)	44544.44 B&P LM Test Chi2(1)

In the FEVD method of the augmented model-1 showed, all variables are significant in explaining bilateral trade. As in the case of Basic Model-1 per capita income of country 'i' and 'j' and per capita income difference are having negative sign. Among the augmented variables common language and colony are positively influencing trade while continuous border has a negative sign. The coefficient of ASEAN dummy is significantly improved here (3.6043) compared to other augmented models and marginally better than the Basic Model-1.

Continuous border and colony are not significant in Between Effect (BE) method as in the case of POLS method. In the same way PCGDPi. PCGDPj, PCGDPdiff, Cont borders and Colony are not significant in Random Effect (RE) method as in the case of MLE method.

5.3.6 Augmented Gravity Model – 2

In the Augmented Model-2 GDP of country 'i' and 'j' are replaced with population of country 'i' and 'j' to address the endogeneity problem of including GDP and per capita GDP in the same equation. All other variables are same as Augmented model-1. The results in this model showed an improvement over the previous model.

$$\begin{aligned}\ln(TT_{ij}) = \alpha + \beta_1 lnPOP_i + \beta_2 lnPOP_j + \beta_3 lnPCGDP_i + \beta_4 lnPCGDP_j \\ + \beta_5 lnPCGDP_{diff} - \beta_6 \ln Distance + \beta_7 ASEAN\ member \\ + \beta_8 Cont\ Bord + \beta_9 Com\ Lang + \beta_{10} Com\ Colony + \varepsilon_{ij}\end{aligned}$$

In the POLS models, all variables except continuous border and common Colony are significant. But here the coefficients of per capita income of country 'I' and 'j' have considerably improved compared to Augmented model-1. Per capita income of country 'i' and 'j' improved substantially and became highly significant when population is included in the MLE model.

Table: 5.4 Results of Augmented Gravity Model-2

Independent Variable	Dependent Variable = Total Bilateral Trade between i and j				
	Pooled OLS	MLE Method	Fixed Effect with Vector Decomposition	Between Effect Model	Random Effect Model
Ln POPi	0.6780*** (0.0086)	0.8396*** (0.0295)	2.3273***	0.6741*** (0.0306)	0.8321*** (0.0273)
Ln POPj	0.6773*** (0.0086)	0.8226*** (0.0292)	2.08***	0.6738*** (0.0306)	0.8158*** (0.0274)
Ln PC GDPi	0.8895*** (0.0074)	0.8752*** (0.0172)	0.5843***	0.8874*** (0.0271)	0.8765*** (0.0170)
Ln PC GDPj	0.8468*** (0.0074)	0.8168*** (0.0173)	0.5093***	0.8452*** (0.0271)	0.8185*** (0.0169)
Ln PC GDPdiff	0.0713*** (0.0077)	0.0015 (0.0103)	-0.0117***	0.0848*** (0.0294)	0.0020 (0.0102)
Ln Dist	- 0.8923*** (0.0149)	-0.8411*** (0.0554)	-0.5483***	-0.8966*** (0.0528)	-0.8428*** (0.0541)
ASEAN Dummy	1.4464*** (0.0605)	1.6749*** (0.2241)	3.6043***	1.4383*** (0.2148)	1.6648*** (0.2185)
Cont Border	0.0561 (0.0548)	-0.1453 (0.2029)	-1.3503***	0.0725 (0.1944)	-0.1386 (0.19980)
Com Language	0.3413*** (0.0282)	0.3954*** (0.1059)	0.8346***	0.3393*** (0.1001)	0.3930*** (0.1034)
Colony	- 0.0319 (0.0443)	0.0201 (0.1643)	0.4755***	-0/0329 (0.1571)	0.0177 (0.1604)
Constant	-6.1461*** (0.1770)	-6.8899*** (0.5475)	-15.7953***	-6.1645*** (0.6386)	-6.8452*** (0.5331)
Adj R Sqared	78.02				12053.17 Wald Chi2(10)
F(10, 11039)	3923.05		17161.56 F(8, 11838)		-8771.67 Hausman Test Chi2(10)
Breusch-Pagan/ Cook-Weisberg test Chi 2 (1)	747.78	7750.69 LR Chi2(10)		291.63 F(10, 639)	44544.38 B & P LM TestChi2(1)

The FEVD model gives the best results in the Augmented Gravity Model-2. All explanatory variables used in the model are highly significant and yielding expected signs (except for continuous border) with very high coefficients for ASEAN dummy. The results of the Between Effect (BE) model and Random Effect (RE) model resemble the results of POLS and MLE respectively.

5.3.7 Extended Gravity Model

Traditionally gravity models used one dummy variable namely 'intra block trade' to calculate the sum of trade creation and trade diversion of a PTA. More recently, studies used two dummies namely 'intra block trade' and 'extra block trade' to separate trade creation effect from trade diversion effect (Bayoumi and Eichengreen, 1995; and Frankel, 1997). Taking cue from Soloaga and Winters (2001) the Extended model of the present study used three dummy variables, one that captures intra-bloc trade of ASEAN countries, a second that captures imports by ASEAN members from all countries (members and non-members), and a third that captures exports by ASEAN members to all countries. The last two dummies reflect respectively overall ASEAN "openness" to imports and exports, while the intra-bloc dummy reflects the additional effect of ASEAN FTA on members' trade. The traditional trade-diversion effect will be identified in the model by a falling propensity to import from all sources coupled with an increase in the overall propensity to import from members. If the latter outweighs the former we also have trade creation. A negative coefficient on the dummy for ASEAN exports to non-members would indicate that the PTA is harmful to non-member countries as there is export diversion from non members to members.

5.3.8 Extended Gravity model-1

The extended gravity model used GDP of country 'i' and 'j' and economic mass variable along with two additional dummy of ASEAN import and export. These dummies are useful to get the import creation/diversion and export creation/diversion of ASEAN countries with the rest of the world. The depended variable used in the study is Total trade.

The Extended Gravity Equation-1 used in the study is outlined below.

$$Ln\,(TT)_{ij} = \alpha + \beta_1\, ln\, GDPi + \beta_2\, ln\, GDPj + \beta_3\, ln\, PCGDPi + \beta_4\, lnPCGDPj + \beta_5\, ln\, PCGDP\, diff - \beta_6\, ln\, Distance + \beta_7 ASEAN\, member + \beta_8\, Cont\, Border + \beta_9\, Com\, Lang + \beta_{10}\, Com\, Colony + \beta_{11}\, ASEAN\, imp + \beta_{12}\, ASEAN\, exp + \varepsilon_{ij}$$

Where

$ASEAN_{imp}$ = dummy if the importer is an ASEAN country
$ASEAN_{exp}$ = dummy if the exporter is an ASEAN country

ASEAN Dummy represents intra ASEAN trade and all the models are revealing there is a positive intra block trade creation among ASEAN countries. The coefficient value is high in the FEVD model where the country specific effects are considered for calculating the trade flow. The coefficients from Random Effect (RE) and Maximum Likelihood Estimation (MLE) method are similar and higher than POLS and BE method.

ASEAN import dummy is also positive for all models showing ASEAN import expanded with rest of the world and there is no trade diversion. ASEAN's import from rest of the world grown faster than ASEAN's intra regional trade creation in all methods of estimation. Also there is no export diversion from rest of the world towards ASEAN member countries. This is revealed by higher coefficients of ASEAN import dummy compared to intra ASEAN trade. This means ASEAN is exporting more intensely to the rest of the world compared to its members.

Table: 5.5 Results from the Extended Gravity Equation-1

Independent Variable	Dependent Variable = Total Bilateral Trade between i and j				
	Pooled OLS	MLE Method	Fixed Effect with Vector Decomposition	Between Effect Model	Random Effect Model
Ln GDPi	0.7378*** (0.0084)	0.8412*** (0.0275)	2.3272***	0.7381*** (0.0292)	0.8349*** (0.0259)
Ln GDPj	0.7458*** (0.0084)	0.8308*** (0.0273)	2.08***	0.7468*** (0.0292)	0.8253*** (0.0259)
Ln PC GDPi	0.1974*** (0.0081)	0.0455 (0.0293)	-1.7429***	0.1999*** (0.0280)	0.0532** (0.0271)
Ln PC GDPj	0.1539*** (0.0081)	0.0021 (0.0292)	-1.5707***	0.1564*** (0.0279)	0.0097 (0.0271)
Ln PC GDPdiff	0.0798*** (0.0072)	0.0036 (0.0102)	-0.0117***	0.0957*** (0.0267)	0.0042 (0.0101)
Ln Dist	- 0.8999*** (0.0139)	-0.8495*** (0.0504)	-0.5596***	-0.9053*** (0.0480)	-0.8510*** (0.0492)
ASEAN Dummy	0.1680*** (0.0650)	0.2907 (0.2366)	1.0867***	0.1557 (0.2239)	0.2868 (0.2309)
Cont Border	0.2383*** (0.0514)	0.0847 (0.1855)	-0.9323***	0.2551 (0.1773)	0.0896 (0.1809)
Com Language	0.3048*** (0.0264)	0.3442*** (0.0964)	0.7409***	0.3031*** (0.0910)	0.3424*** (0.0940)
Colony	0.0521 (0.0414)	0.1547 (0.1501)	0.7566***	0.0449 (0.1429)	0.1514 (0.1464)
ASEAN imp	0.7975*** (0.0267)	0.7999*** (0.0945)	1.5509***	0.8061*** (0.0922)	0.7971*** (0.0922)
ASEAN exp	0.8365*** (0.0264)	0.8091*** (0.0934)	1.3315***	0.8460*** (0.0913)	0.8075*** (0.0913)
Constant	2.4298*** (0.1425)	4.1643*** (0.4834)	14.2602***	2.2820*** (0.4960)	4.1110*** (0.4680)
Adj R Sqared	80.81				12734.11 Wald Chi2(12)
F(12, 11037)	3877.71		14518.66 F(13, 11036)	305.79 F(12, 637)	-11972.66 Hausman Test Chi2(4)
Breusch-Pagan/ Cook-Weisberg test Chi 2 (1)	1050.34	7866.06 LR Chi2(12)			44544.44 B&P LM Test Chi2(1)

The decomposition of the trade effect showed ASEAN is a trade creating regional trade block and not a trade diverting one. This is primarily due to multilateral trade liberalisation and export oriented trade policies pursued by these countries while consolidating their trade regionally.

5.3.9 Extended Gravity Model – 2

In the Extended Gravity Model-2 GDP of the country 'i' and 'j' is replaced with population of the countries as the economic mass variable. This is done to overcome endogeneity problem associated with the inclusion of two related variable. The equation of the Extended Gravity Model-2 is stated below.

$$Ln\,(TT)_{ij} = \alpha + \beta_1\, ln\, POPi + \beta_2\, ln\, POPj + \beta_3\, ln\, PCGDPi + \beta_4\, lnPCGDPj + \beta_5\, ln\, PCGDP\, diff - \beta_6\, ln\, Distance + \beta_7 ASEAN\, member + \beta_8\, Cont\, Border + \beta_9\, Com\, Lang + \beta_{10}\, Com\, Colony + \beta_{11}\, ASEAN\, imp + \beta_{12}\, ASEAN\, exp + \varepsilon_{ij}$$

The introduction of population in the Extended Gravity Model-2 has transformed the per capita income variable significantly. The coefficients of the per capita income improved appreciably across the model and its sign changed from negative to positive in the FEVD model. This showed Extended Gravity Model-2 is the best fit compared to Extended Gravity model-1.

Table: 5.6 Results from Extended Gravity Model -2

Independent Variable	Dependent Variable = Total Bilateral Trade between i and j				
	Pooled OLS	MLE Method	Fixed Effect with Vector Decomposition	Between Effect Model	Random Effect Model
Ln POPi	0.7378*** (0.0084)	0.8412*** (0.0275)	2.3273***	0.7381*** (0.0292)	0.8350*** (0.0259)
Ln POPj	0.7458*** (0.0084)	0.8308*** (0.0273)	2.0800***	0.7468*** (0.0292)	0.8253*** (0.0259)
Ln PC GDPi	0.9352*** (0.0072)	0.8867*** (0.0168)	0.5843***	0.9380*** (0.0257)	0.8882*** (0.0165)
Ln PC GDPj	0.8997*** (0.0072)	0.8329*** (0.0169)	0.5093***	0.9033*** (0.0257)	0.8350*** (0.0166)
Ln PC GDPdiff	0.0798*** (0.0072)	0.0036 (0.0102)	-0.0117***	0.0957*** (0.0267)	0.0042 (0.0101)
Ln Dist	- 0.8999*** (0.0139)	-0.8495*** (0.0504)	-0.5596***	-0.9053*** (0.0480)	-0.8510*** (0.0492)
ASEAN Dummy	0.1680*** (0.0650)	0.2907 (0.2366)	1.0867***	0.1557 (0.2239)	0.2868 (0.2309)
Cont Border	0.2383*** (0.0514)	0.0847 (0.1855)	-0.9323***	0.2551 (0.1773)	0.0896 (0.1810)
Com Language	0.3048*** (0.0264)	0.3442*** (0.0964)	0.7409***	0.3031*** (0.0910)	0.3424*** (0.0940)
Colony	0.0521 (0.0414)	0.1547 (0.1501)	0.7566***	-0.0449 (0.1429)	0.1514 (0.1464)
ASEAN imp	0.7974*** 0.0267	0.7999*** (0.0945)	1.5509***	0.8061*** (0.0922)	0.7971*** (0.0922)
ASEAN exp	0.8365*** 0.0264	0.8091*** (0.0934)	1.3315***	0.8460*** (0.0913)	0.8075*** (0.0913)
Constant	-7.8182*** (0.1706)	-7.3849*** (0.5047)	-16.1842***	-7.9759*** (0.6005)	-7.3581*** (0.4932)
Adj R Sqared	80.81				12734.12 Wald Chi2(12)
F(12, 11037)	3923.05		14518.69 F(13, 11036)	305.79 F(12,637)	-11972.97 Hausman Test Chi2(12)
Breusch-Pagan/ Cook-Weisberg test Chi 2 (1)	747.78	7866.07 LR Chi2(12)			39204.00 B & P LM Test Chi2(1)

5.3.10 Hausman –Taylor Estimation Method

Hausman –Taylor estimation method is employed to address the endogeneity problem using instrumental variable technique. The time varying endogenous variables considered in the model are GDPi, PCGDPi, GDPj and PCGDPj. While PCGDPdiff is the time varying exogenous variable, all other variables are time invariant exogenous variable. The dependent variable considered in the model is log of total export. The result showed that GDP, PCGDP, distance and ASEAN dummy are highly significant in explaining bilateral trade flow. Bur the sign of PCGDP is negative which is different from traditional gravity equations. Also other variables such as PCGDP difference, Continuous border, Common language and Colony are not significant in the model.

Table: 5.7 Results from Hausman Taylor IV Method

	Dependent Variable = Total export of i to j	
	Independent Variables	Coefficient
TV Exogenous	Ln PC GDPdiff	-0.0112 (0.0119)
	Ln Dist	-0.6383*** (0.3345)
TV Endogenous	Ln GDPi	2.3880*** (0.1277)
	Ln GDPj	1.5405*** (0.1277)
	Ln PC GDPi	-2.0757*** (0.1366)
	Ln PC GDPj	-0.6641*** (0.1366)
TI Exogenous	ASEAN Dummy	3.4016*** (1.3456)
	Cont Border	-1.1330 (1.2233)
	Com Language	0.7967 (0.6407)
	Colony	0.5466 (0.9923)
	Constant	12.4051*** (3.0485)

5.4 India's trade potential with ASEAN Countries

Different modeling techniques were employed in the study to identify the most appropriate model that fits data well and confirms theoretical prescriptions. Augmented Gravity Model estimated under Fixed Effect Vector Decomposition method provides best parameters and expected sign and is selected to predict the trade potential between India and ASEAN countries. All the explanatory variables are highly significant and the coefficient of ASEAN dummy is high. The model along with the estimated parameters are presented below. The study used in sampling method to calculate the trade potential where parameters are estimated including India in the dataset.

$$\begin{aligned} ln\,TT_{ij} = {} & -15.7953 + 2.3273\, lnPOP_i + 2.08\, lnPOP_j + 0.5843\, lnPCGDP_i \\ & + 0.5093\, ln\,PCGDP_j - 0.0117\, lnPCGDP_{diff} - 0.5483\, ln\,Distance \\ & + 3.6043\, ASEAN\ member - 1.3503\, Cont\ Bord + 0.8346\, Com\ Lang \\ & + 0.4755\, Com\ Colony \end{aligned}$$

$$\begin{aligned} lnTE_{ij} = {} & -14.7838 + 2.4026\, lnPOP_i + 1.5547\, lnPOP_j + 0.3088\, lnPCGDP_i \\ & + 0.8729 lnPCGDP_j - 0.013\, ln\,PCGDP_{diff} - 0.6375\, ln\,Distance \\ & + 3.4180\, ASEAN\ member - 1.1518\, Cont\ Bord + 0.8016\, Com\ Lang \\ & + 0.5522\, Com\ Colony \end{aligned}$$

$$\begin{aligned} \ln(TI_{ij}) = {} & -16.7852 + 2.0077 \ln POP_i + 2.3577 lnPOP_j + 0.863 lnPCGDP_i \\ & + 0.2218 lnPCGDP_j - 0.0179 lnPCGDP_{diff} - 0.4928 \ln Distance \\ & + 3.6504\, ASEAN\ member - 1.2818\, Cont\ Bord + 0.9388\, Com\ Lang \\ & + 0.5167\, Com\ Colony \end{aligned}$$

Using the estimated coefficients, we can generate predicted values of India's total trade with ASEAN countries. The estimated parameters are substituted in the model and actual data of each explanatory variable is inserted to calculate India's trade potential. If the estimated trade potential is more than actual trade data, there is unmet trade potential between India and that particular ASEAN country. If estimated trade potential is lower than the actual trade data, then India already exploited the trade potential and there is limited scope to substantially improve trade through RTAs.

Trade potential can also be represented as a percentage of actual trade. This can be calculated through the following formula

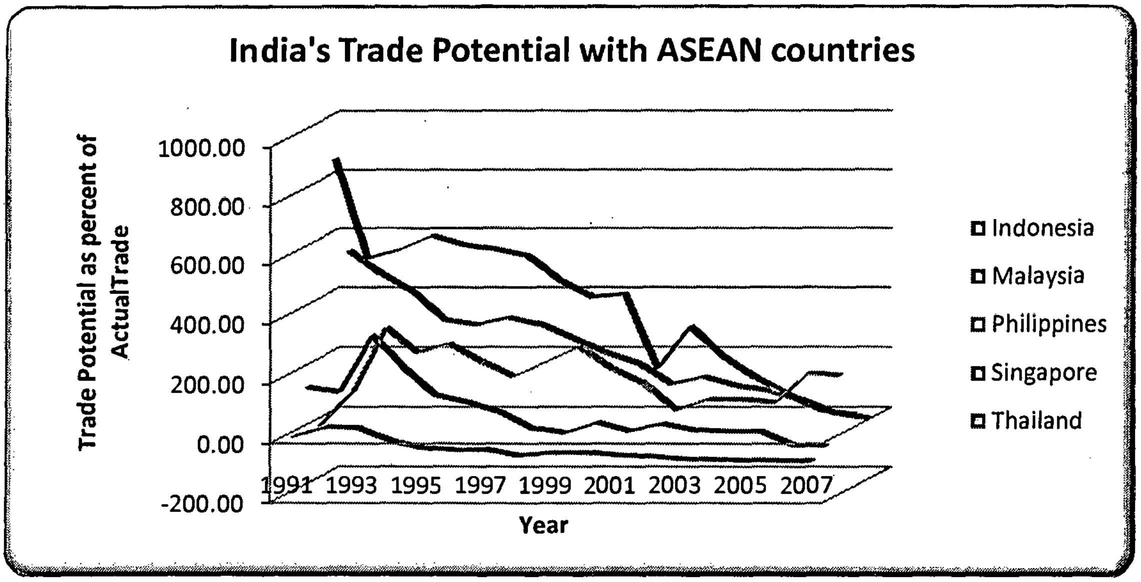
Trade Potential = [{(Potential Trade /Total Trade)-1} x 100]

A positive value represents unused trade potential where negative values represents over used trade potential. The trade potential between India and ASEAN members is calculated for the period 1991 to 2007. These results are presented in Table No.5.8

Table: 5.8 Trade Potential between India and ASEAN members
(Trade potential as percent of Actual Trade)

year	Indonesia	Malaysia	Philippines	Singapore	Thailand
1991	12.21	153.63	2.84	874.59	536.37
1992	43.78	136.31	115.47	535.28	458.71
1993	40.65	326.36	326.50	562.94	399.27
1994	-2.54	217.84	245.35	611.70	303.26
1995	-25.60	125.18	271.63	580.25	287.85
1996	-32.88	102.57	213.11	565.09	311.19
1997	-31.74	69.34	164.05	543.85	288.01
1998	-51.03	15.99	212.57	459.64	241.52
1999	-43.25	-0.04	263.12	404.37	193.61
2000	-41.38	33.56	191.85	414.30	159.15
2001	-50.10	6.44	141.45	166.51	90.06
2002	-54.54	29.44	52.53	306.57	112.78
2003	-63.16	8.60	87.34	206.06	84.45
2004	-66.19	5.69	88.62	134.91	66.52
2005	-66.87	3.74	76.76	78.39	36.43
2006	-68.62	-41.24	175.04	26.48	-7.58
2007	-70.06	-43.93	168.29	13.22	-24.16

Fig: 5.1 India's Trade Potential with ASEAN Countries



India's trade potential with Indonesia is already exploited and the actual trade exceeds potential trade in the recent years. India's actual trade with Malaysia and Thailand exceeded the potential trade for the year 2006 and 2007. But India has unmet trade potential with Philippines and Singapore. The trade potential is highest with Philippines and remained above 168 percent for the year 2007. India's trade potential with ASEAN nations are coming down as India liberalises its trade and carried out multilateral trade liberalization after 1991. Also India signed a Comprehensive Economic Cooperation agreement with Singapore and an FTA with Thailand. This gave additional fillip to bilateral trade and the potential trade is gradually exploited. A Free Trade Agreement between India and ASEAN can help increasing bilateral trade and realizing trade potential.

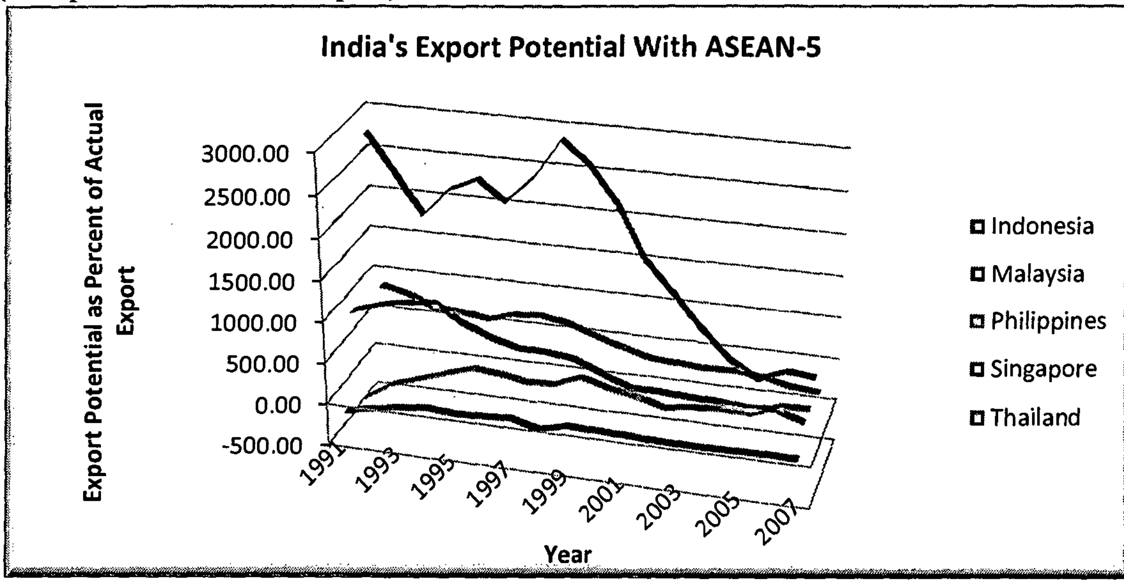
India's export potential is positive with ASEAN countries except Indonesia. The highest export potential is with Singapore followed by Malaysia, Philippines and Thailand. In the year 2007, India's export potential with Singapore was 475.25 percent, with Malaysia

256.29 percent, with Philippines 253.69 percent and with Thailand 139.92 percent. This means it can increase its exports ASEAN countries substantially after the signing of FTA agreement. But the multilateral trade liberalization carried out by India in the post liberalization period substantially reduces India's trade potential with ASEAN countries.

Table: 5.9 India's Export Potential with ASEAN Countries
(As a percent of Actual Export)

year	Indonesia	Malaysia	Philippines	Singapore	Thailand
1991	-131.37	945.55	-284.16	2848.44	843.38
1992	-66.70	1061.79	-78.70	2391.32	769.42
1993	-9.55	1128.20	28.64	1924.34	625.29
1994	27.80	1161.78	138.55	2267.75	613.36
1995	-1.33	949.53	243.41	2419.06	563.24
1996	13.99	815.84	219.54	2178.99	657.37
1997	34.62	724.08	159.57	2501.93	678.72
1998	-54.19	716.61	172.82	2977.40	619.05
1999	26.02	675.21	301.79	2723.09	507.27
2000	20.09	544.96	209.33	2296.23	403.63
2001	9.10	412.35	147.41	1654.18	308.78
2002	-11.50	410.73	56.88	1295.09	288.74
2003	-16.27	387.54	103.68	906.64	267.98
2004	-17.75	380.83	126.87	573.46	280.46
2005	-11.54	349.40	118.58	372.01	242.77
2006	-6.99	370.47	246.20	508.99	165.66
2007	-12.23	256.29	253.69	475.25	139.92

Fig: 5.2 India's Export Potential with ASEAN Countries
(As a percent of Actual Export)



Over the years India has increased its import share from ASEAN countries and exploited the import potential. Import potential was available with Philippines, Singapore and Thailand. But the signing of the CECA with Singapore and FTA with Thailand facilitated increased imports and exploitation of import potential.

Fig: 5.3 India's Import Potential with ASEAN-5

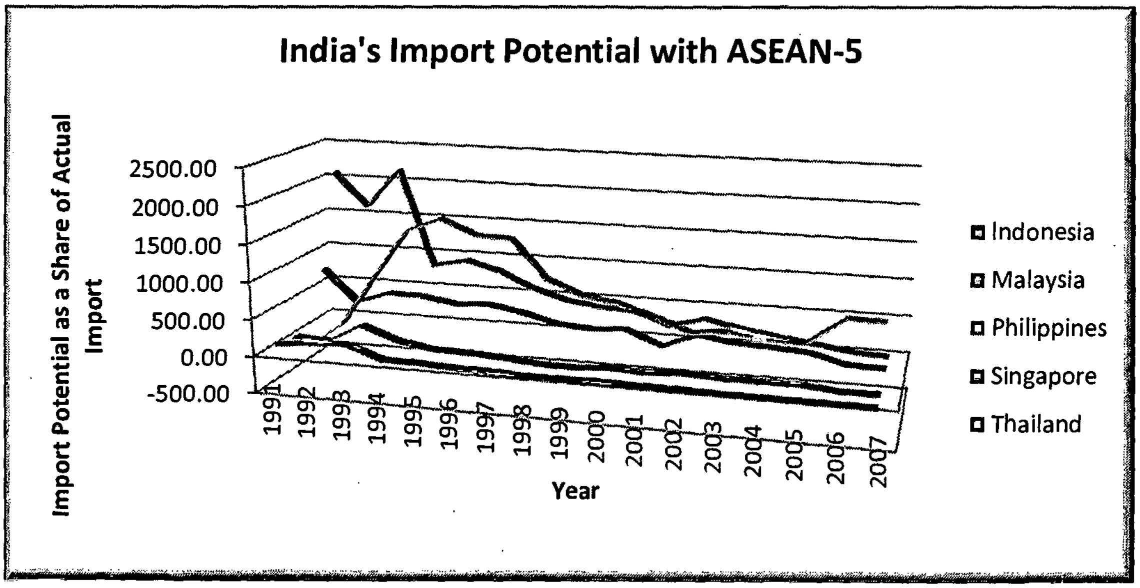


Table: 5.10 India's Import Potential with ASEAN Countries
(As a percent of Actual Import)

year	Indonesia	Malaysia	Philippines	Singapore	Thailand
1991	122.71	87.70	-170.21	798.47	2090.26
1992	174.93	62.25	175.39	358.96	1620.86
1993	192.10	317.99	867.17	511.29	2166.22
1994	23.68	149.60	1533.85	501.67	828.85
1995	18.40	65.33	1718.69	424.40	928.99
1996	-8.87	51.21	1522.80	451.26	804.18
1997	-15.87	25.22	1507.43	368.02	591.41
1998	-38.90	-19.73	999.75	244.73	450.80
1999	-35.25	-31.88	801.12	210.14	389.26
2000	-28.92	4.51	734.16	246.24	372.12
2001	-40.15	-15.55	586.57	55.53	201.20
2002	-39.82	13.12	413.79	244.61	330.29
2003	-52.89	-9.69	469.05	171.98	229.58
2004	-56.85	-11.74	390.51	146.52	154.09
2005	-58.44	-10.25	386.78	112.56	91.22
2006	-62.11	-58.34	739.78	-14.01	16.21
2007	-62.65	-57.50	731.54	-24.60	-9.97

5.4.1 Trade Potential using speed of Convergence

Empirical studies on international trade widely uses Gravity model to calculate the trade potential between trading partners. The point estimated coefficients of the explanatory variables are substituted to the actual data to get the potential trade. But Egger (2002) criticized this method of over used or under used trade potential as case of econometric mis specification. Jakab et.al. (2001) suggested the concept of 'Speed of Convergence' as an alternative to the point estimation of trade potential. The speed of convergence method exploits the dynamic structure of the data during the estimation and more reliable than the point estimation method. The average speed of convergence is defined as the average growth rate of potential trade divided by average growth rate of actual trade between the years of observation.

Speed of convergence = [(Average growth rate of Potential Trade / Average growth rate of Actual Trade) x 100] – 100

There is speed of convergence if the growth rate of potential trade is lower than that of actual trade and the computed speed of convergence is negative. There will be speed of divergence if the growth rate of potential trade is higher than that of the actual trade and it will have positive value. The speed of convergence/divergence between India and ASEAN-5 countries for total trade, exports and imports are given below.

Table: 5.11 Trade Potential between India and ASEAN-5 using Speed of Convergence

Country	Speed Total Trade Potential	Speed of Export Potential	Speed of Import Potential
Indonesia	305.6248	12.85963	223.8038
Malaysia	179.236	-63.2268	272.8992
Philippines	-48.9961	-66.7709	-82.3665
Singapore	56.9179	-64.5095	146.5991
Thailand	142.1983	-39.892	120.9248

India is having trade convergence with Philippines as actual trade is growing faster than potential trade. The other countries such as Indonesia, Malaysia, Singapore and Thailand, the potential trade is growing rapidly compared to actual trade. With regard to exports, except Indonesia there is speed of converge between India and ASEAN-5. On the imports side there is speed of convergence with Philippines and others are showing divergence.

5.5 Impact of India – ASEAN FTA: A Simulation Analysis

The economic impact of proposed India-ASEAN Free Trade Agreement is analysed using World Integrated Trade Solutions (WITS) tool. WITS is a data extraction and tariff simulation software using databases maintained by UNSD COMTRADE, UNCTAD TRAINS, and WTO IDB/CTS. The SMART simulation model of the WITS allows users to estimate the partial equilibrium impact of tariff reductions for a single market at a time. WITS simulation is largely used to simulate the impact of preferential trade agreements. This simulation involves two aspects. First a database has to be extracted to conduct simulation exercise. Secondly simulation parameters are defined to get the impact of a tariff cut arising out of a Free Trade Agreement (FTA).

The simulation exercise for the study used bilateral trade data between India and ASEAN countries for the year 2007. India is cutting tariff and the beneficiary Countries are ASEAN-10 countries. Tariff cut is done across the board and all products are affected by that. Since the attempt is to understand the impact of FTA, the new tariff rate is kept at zero percent. There arise five results from the simulation exercise. They are total trade effect, export effect on partners, effect on average duty, welfare effect and tariff revenue effect.

When India enforces 100 percent tariff cut against ASEAN countries as part of the Free Trade Agreement, they gain access to Indian market and the exports to India will increase substantially. The following table provides change in exports and revenue change out of an FTA for the exporting countries. The biggest gains in terms of exports will be achieved by Indonesia, followed by Malaysia, Singapore and Thailand. In percent terms, the highest export gains will be achieved by Vietnam (86.52 percent), Philippines (70.75 percent), Thailand (60.36 percent) and Lao PDR (42.43 percent).

Table: 5.12 Export Effect of ASEAN countries from India-ASEAN FTA

Exporter	Exports Before ($ '000)	Exports After ($ '000)	Export Change In Revenue ($ '000)	Export Percent Change
Total Brunei	284682.00	318141.00	33459.08	11.75
Total Myanmar	781878.7	945185.3	163306.6	20.89
Total Cambodia	1546.72	2123.569	576.849.00	37.29
Total Indonesia	4160112.00	5800155.00	1640042.00	39.42
Total Malaysia	4888568.00	6092717.00	1204149.00	24.63
Total Philippines	141765.9	242071.8	100305.9	70.75
Total Singapore	3724765.00	4873549.00	1148784.00	30.84
Total Vietnam	175777.3	327861.9	152084.6	86.52
Total Thailand	1819347.00	2917513.00	1098167.00	60.36
Total Lao PDR	359.088	511.455	152.367	42.43

Source: WITS simulation

India's imports from ASEAN countries will increase as a result of tariff cut done as a part of RTA. India's total import before the RTA was 162.68 billion US dollars and after the RTA it increased by another 4.075 billion US dollars. The total tariff collection before RTA was 18.64 billion dollars and this witnessed a decline of 3.228 billion dollars. A reduction in tariff means goods are available cheaper to the public and this increases the consumer welfare. The total consumer surplus out of tariff cut was to the tune of 756.206 million. Welfare effects include the total trade effect and consumer surplus that arise out of tariff reduction. A decline in the revenue collection of 3.228 billion makes the new weighted rate of revenue collection to 12.43 percent.

The total trade creation of India- ASEAN FTA is 4.075 billion US dollars and the total trade diversion is 0.1 million. The very little trade diversion (0.1 million) and a substantial trade creation makes the RTA mutually beneficial and economically viable. The tariff rate cut makes the simple customs duty to decline to 12.52 percent.

Table: 5.13 Trade, Revenue and Welfare effect of India-ASEAN FTA

Market View of India-ASEAN FTA					
Imports	Imports	Tariff	Tariff	Tariff	
Before ($ '000)	Change In	Revenue ($ '000)	New Revenue ($ '000)	Change In Revenue ($ '000)	Consumer Surplus ($ '000)
162682568.867	4075093	18642844	15414819	-3228025	**756206.4**
Revenue Impact of India-ASEAN FTA					
Revenue Effect ($ '000)	Trade Total Effect ($ '000)	Trade Value ($ '000)	Old Weighted Rate (%)	New Weighted Rate (%)	
-3228025	**4075093**	162682568.867	15.67	12.43	
Welfare Impact from India-ASEAN FTA					
Trade Total Effect ($ '000)	Welfare ($ '000)	Old Weighted Rate (%)	New Weighted Rate (%)		
4075093	**756206.4**	15.67	12.43		
Trade creation from India –ASEAN FTA					
Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Price Effect	Old Simple Duty Rate (%)	New Simple Duty Rate (%)
4075093	0.011	**4075093**	0	14.44	12.52

Source: WITS simulation

Commodity wise trade creation from India – ASEAN FTA for the ASEAN countries is listed in the appendix. The export diversion of for the rest of the world due to India-ASEAN FTA is also listed in the appendix. China, Australia, United States Saudi Arabia and Germany are the countries facing highest export diversion from India-ASEAN Free Trade Agreement.

5.6 Major Findings

Comparison of results of Model-1 and Model-2 in all three categories showed that, Population data is better representing the economic mass and due to which Per capita income is getting better coefficients in all models.

Results of Pooled OLS Model returning parameters with expected signs and highly significant coefficients. But it is not accounting the individual characteristics of countries which are very important in determining bilateral trade flows. The results of BE method are closer to Pooled OLS method and MLE results are closer to Random Effects Method. In Random effects model also, important parameters are significant and holding expected signs with a positive ASEAN dummy. But there is possibility of explanatory variables correlated and the random effect model becomes inefficient. The Hausman Taylor Estimation method employed to overcome endogeneity problem did not yield better results. Comparison of results across the models revealed the augmented Gravity Model-2 is best suited for the study with better parameters, signs and explanatory power. The Hausman Specification test carried out also validate this. Also the ASEAN dummy returns highest coefficient in this model.

India's trade potential is calculated using Augmented Model-2. India's trade potential with Indonesia is already exploited and the actual trade exceeds potential trade in the recent years. India's actual trade with Malaysia and Thailand exceeded the potential trade for the year 2006 and 2007. But India has unmet trade potential with Philippines and Singapore. The trade potential is highest with Philippines. India's export potential is positive with ASEAN countries except Indonesia. The highest export potential is with Singapore followed by Malaysia, Philippines and Thailand.

Speed of Convergence method takes in to account dynamic structure of the data in the estimation of trade potential and an improvement over point estimation method. India is having trade convergence with Philippines as actual trade is growing faster than potential trade. The other countries such as Indonesia, Malaysia, Singapore and Thailand, the potential trade is growing rapidly compared to actual trade and there is trade divergence.

With regard to exports, except Indonesia there is speed of converge between India and ASEAN-5. On the imports side there is speed of convergence with Philippines and others are showing divergence.

The study carried out a partial equilibrium simulation exercise using WITS database and software. Simulation results showed that complete elimination of tariffs by India (100 percent cut) on account of and India-ASEAN FTA, the biggest gains in terms of exports will be achieved by Indonesia, followed by Malaysia, Singapore and Thailand. In percent terms, the highest export gains will be achieved by Vietnam (86.52 percent), Philippines (70.75 percent), Thailand (60.36 percent) and Lao PDR (42.43 percent). India's imports from ASEAN countries will increase as a result of tariff cut done as a part of RTA (4.075 billion US dollars) and there will be decrease in tariff collection to the tune of 3.228 billion US dollars. A reduction in tariff increases the consumer welfare and the total consumer surplus out of tariff cut was to the tune of 756.206 million. The total trade creation of India- ASEAN FTA is 4.075 billion US dollars and the total trade diversion is 0.1 million. The very little trade diversion (0.1 million) and a substantial trade creation makes the RTA mutually beneficial and economically viable. The tariff rate cut makes the simple customs duty to decline to 12.52 percent.

CHAPTER – VI

IMPACT OF RTA ON FDI INFLOW: A CASE OF ASEAN-5 AND ITS IMPLICATIONS ON INDIA

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IMPACT OF RTA ON FDI INFLOW: A CASE OF ASEAN-5 AND ITS IMPLICATIONS ON INDIA

As regionalism gets deepened, the FTA activities move away from trade related to investment related activities to take advantage of the dynamic gains arising out of regionalization of production, economies of scale, large market and production efficiencies. The Chapter made an attempt to understand the role of Regional Trade Agreement (RTA) in attracting FDI in to union members by taking the case of ASEAN-5. The content of the chapter is presented in to three sections; the first section brought out the relationship between RTA and FDI and reviewed the studies that were conducted to explore this relationship. The second section analysed the trend, major sectors and source countries of intra and inter-regional FDI in ASEAN. A gravity model was used to determine the role of RTA in attracting FDI in ASEAN countries and results are provided in the third section. The findings emanated from the study are discussed at the end.

6.1 Role of FDI in Regional Trade Agreements

Theoretical and empirical studies on the Multinational Enterprise (MNE) activities in a country traditionally believed that international trade and international capital movements are substitutes to each other. Higher tariffs and non-tariff barriers imposed by a country necessitates foreign firms to establish affiliates to supply products in the foreign market. When a country enters in to Regional Trade Agreements, trade and non trade barriers are eliminated with partner countries. As a result free flow of international trade possible between the two countries resulting in a decline of FDI inflow in to a Host country. If the RTA increases trade liberalization among members it will further reduce tariff jumping investments in the country. In the event of regional integration, investments that were made purely on tariff jumping reasons will disappear and it can lead to outflows of FDI from the integrating area to other regions. Transport costs and economies of scale at the plant level become more relevant as tariff barriers disappear from intraregional trade.

A subsequent development in the area of MNC and FDI is the motive by enterprises of the Source country to exploit intangible assets from the Host country market. These intangible assets include technological and marketing expertise that the MNCs derive from foreign affiliates so that they can effectively compete in the international market. In this case regional integration in the form of trade liberalization would not lead to reduction in foreign investment or repatriation of projects or capital from the Source country. Economies of scale and operations in a combined large market give certain dynamic advantages to the foreign firm. But if FDI within and outside the region are substitutes, the increases in intra-regional investment may lead to reduction in foreign investment outside the region.

Investment creation occurs when the fall in trade barriers within the RTA causes a shift from lower-profitability investments to higher-profitability investments within the region. In addition, investment creation occurs when the now-larger regional market attracts more FDI from outside the region as firms that had previously exported to individual countries within the region shift from exports to FDI. *Investment diversion* occurs when the RTA causes a shift away from higher-profitability external investments to lower-profitability internal investments because the investments outside the region have become uncompetitive in the internal market. In other words, if investments are diverted into the region that would have been made or were previously made in a nonmember country, because of creating the RTA, this is investment diversion.

Foreign Direct Investment can be classified as Horizontal and Vertical based on the motive behind the investment. Horizontal FDI is designed to place production close to consumers and thereby avoid trade costs. Consequently horizontal FDI will increase as trade cost and market size in host country increase. Vertical FDI is undertaken to carry out unskilled-labor intensive production activities in locations where unskilled labor is relatively abundant. Vertical FDI will increase when there is a decrease in trade costs and increase in skill difference.

Free Trade Agreement (FTA) is pursued to reduce trade cost between partners. When two countries agree to form FTA, trade cost would fall or diminish between them. As a result, firms with vertical FDI will benefit from this and hence have more incentive to increase vertical FDI. On the other hand, there will be less tariff-jumping incentive for horizontal FDI. Vertical FDI dominates horizontal FDI in countries where skill difference is large. Hence FTA should have a positive effect on FDI where member countries have large different skill levels. Since horizontal FDI dominates vertical FDI in countries where skill difference is small, FTA should have a negative effect on FDI with similar skill levels.

There are number factors which influences the quantum of FDI between the Host and Home countries. Whether RTAs lead to increased or decreased FDI flows depends on factors like scope of the RTA, the degree of liberalization, complementarity of member relative to nonmember countries and whether trade and FDI are substitutes or complements. Regional agreements with investment chapters should, ceteris paribus, have stronger FDI impacts than agreements without such chapters because they offer more protection and reduce policy risks for foreign investments and investors.

6.1.1 Empirical Studies on the role of FDI

A cursory look at the literature of FDI revealed that at least six motives behind attracting FDI in to the Host countries. Thy are (a) labor seeking; (b) market seeking; (c) resource-extracting; (d) component-outsourcing; (e) horizontal investment in differentiated products; and (f) services-related. The first two are trade reducing and the next three are trade creating where as the services related FDI has an ambiguous relation on trade. Large number of studies that are carried out to explain the Multinational Activity in a Host nation are divided into three main categories, the horizontal motivations (Markusen, 1984; Markusen and Venables, 1998), the vertical motivations (Helpman, 1984; Helpman and Krugman, 1985) and the Knowledge-Capital model (Markusen and Maskus, 2001) that combines both the horizontal and vertical models.

6.1.2 FDI and Economic Growth

There are number of studies attempted to understand the relationship between FDI in host country and the economic growth (Carkovic and Levine (2002), Alfaro (2003), Hansen and Rand (2004), Lipsey (2002), Chowdhury and Mavrotas (2006), Cuadros, Orts and Alguacil (2001), Alfaro, Chanda, Kalemli-Ozcan and Sayek (2006). Carkovic and Levine (2002) found that the exogenous component of FDI does not exert a robust, independent influence on growth. Alfaro (2003) found FDI has a negative growth on primary sector, positive impact on manufacturing and ambiguous effect on the service sector. Hansen and Rand (2004) used Granger-causal relationships and found FDI has an impact on GDP via knowledge transfers and adoption of new technology. Lipsey (2002) said FDI promote growth through knowledge transfer that help transformation of low value exports to relatively high- tech manufacture exports. Chowdhury and Mavrotas (2006) used Toda-Yamamoto causality test to see the direction of causality between FDI and growth and found relationship changes with cases. Cuadrus, Orts and Alguacil (2001) used vector autoregressive (VAR) model to suggest a significant impact of FDI on economic growth and trade in the Latin American countries. Alfaro, Chanda, Kalemli-Ozcan and Sayek (2006) showed that the same amount of increase in FDI, regardless of the reason of the increase, generates three times more additional growth in financially well-developed countries than in financially poorly-developed countries.

The determinants of FDI flow in to a country are also subjected to analysis in a number of studies. While market size, infrastructure quality, political/economic stability, and free trade zones are important determinants for FDI, the results are mixed regarding the importance of fiscal incentives, the business/invevstment climate, labour costs, and openness (Lim, 2001). Balasubramanyam and Mahambare (2003) opined that the optimum level of FDI a country should aspire for is conditioned by the history and the stage of its industrialisation, the sources of FDI it has ease of access to and its endowments of co-operant factors and the sort of institutions it possesses to facilitate and monitor the operations of foreign firms. Borensztein, Gregorio and Lee (1995) in their study found that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. Lesher and Miroudotm (2008) demonstrated a positive interaction between trade liberalisation and productivity spillovers of FDI. Marino (2000) found that inward FDI is positively correlated to the degree of "openness" and the impact of foreign investment is significantly positive in "open" countries and significantly negative in "closed" countries. But there are divergent views on the need to have a minimum threshold stock of human capital in the Host country.

6.1.3 Role of FDI in Regional Integration

The impact of Regional Trade Agreements on the FDI inflow of Host countries attracted many empirical studies to understand the determinants, magnitude and location of FDI and to assess its impact on trade flows between Host and Source countries. Blomström and Kokko (1997) contended that FDI depends on the environmental change brought about by the regional investment agreements, the locational advantage of the country or region, the competitiveness of local firms in the integrating region, and the motives for foreign direct investment in and by the country or region in question. Jaumotte (2004) found that the RTA market size had a positive impact on the FDI received by member countries but the benefits are not uniformly distributed across members as countries with a relatively more educated labor force and/or a relatively more stable financial situation tended to attract a larger share of FDI at the expense of their RTA partners. Policies that liberalize the environment for intra-regional FDI might be necessary to promote increased intra-regional trade flows in industries where trade and FDI are strong complements (Globerman, 2002). Also liberalised intraregional trade and FDI policies will promote increased inter-regional FDI flows that will be concentrated towards larger regional economies. Dee and Gali (2003) in their paper found little evidence of beachhead investment and there is evidence of net investment creation in response to the 'new age', non-trade provisions of RTAs. Chaisrisawatsuk and Chaisrisawatsuk (2007) studied linkages between trade and FDI inflows and found they are complementary in nature. There is a need for plurilateral or multilateral agreements covering both trade and investment to attract FDI. Motta and Norman (1996) in their showed that integrating economies are more likely to gain from improving intra-regional market accessibility than from tougher external trade policy, and may wish to offer investment incentives to encourage FDI by outside firms.

The inflow of FDI in to Host country depends on number of national, foreign and international factors. The major determinants of FDI include avoiding tariffs, to take advantage of lower factor prices, and to better serve a foreign market. Most FDI migrates to countries with a high per-capita GDP (or high growth rate of GDP) and a large market size. RTA's, through trade liberalization, combine fragmented markets into a single large one and they generally increase the growth rate of member countries' GDP. (Worth,1998). Medvedev (2006) found that PTA membership is associated with a positive change in net FDI inflows, and the FDI gains are increasing in the market size of the PTA partners and their proximity to the host country. Velde and Bezemer (2004) demonstrated that membership of a region leads to further extra regional FDI inflows, but the type of regional provisions matters. Also the position of countries within a region matters in attracting FDI. Velde and Fahnbulleh (2003) discussed the effects of investment related provisions in regional trade agreements and concluded that factors such as extent of regional tariff preferences (and other trade barriers); restrictiveness of rules of origin; differences with actual regional investment rules; initial situation, including the structure of investment and existing liberalisation; plant level and firm level fixed costs; existing economic factors are important in determining FDI inflows. Countries that are more open, and whose factor proportions differ more from those in the source country are likely to benefit more from a RIA (Daude, Yeyati and Stein, 2005). Their study found common membership in a RIA increases FDI by around 28 percent but cautioned that countries that offer an attractive environment for FDI are likely to gain more.

There are number of studies that looked FDI inflow to specific RTA as a result of regional integration. Baltagi, Egger, and Pfaffermayr (2005) studied the impact of RTAs on FDI focusing the role of the Europe Agreements between the member countries of the

European Union and 10 Central and Eastern European countries over the period 1989-2001. Using Generalized Moments (GM) estimation and testing techniques the study found strong evidence for the impact of regional trade agreements on FDI. Economic interdependence has been shown to decline with geographical distance. Waldkirch (2002) investigated the effect of the North American Free Trade Agreement (NAFTA) on foreign direct investment in Mexico and found NAFTA has raised investment from the partner countries, but not from the rest of the world. The role of Regional integration in attracting Foreign Direct Investment in emerging area RTAs such as Mercosur, ASEAN, SAARC, and SADC are carried out by Kubny, Mölders, and Nunnenkamp (2008). The study revealed that country-specific factors were more important as a stimulus to FDI than regional integration *per se.* Also member countries are unlikely to equally share RIA-induced FDI inflows, even though the larger and richer members are not necessarily the winners taking all. Tayyebi and Hortamani (2005) studied the impact of the trade integration agreements (TIA) on the evolvement of FDI flows in EU and ASEAN+3 and found that regional integration in East Asia can have a significant effect on foreign direct investment implying investment creation in both blocks. The study also found that one percent change in the bilateral trade flows can increase the FDI flows between two blocks by about 0.60 percent. Changes in public policies towards multinationals and foreign direct investment in the Americas was the subject matter of study by Eden (2007). North American multinationals have engaged in locational reshufflings, designed to bring Mexico into a rationalized regional production pattern for the continental market post-NAFTA. On the other hand, in Latin America, the regional integration process is much less advanced. MNEs are still engaged in market-seeking investments, with some rationalization underway in the larger RTAs such as MERCOSUR. Witkowska (2007) discussed the relationship between regional integration and capital movement in the form of FDI under globalization using the experiences of the EU, NAFTA and AFTA. The analysis showed that the time sequence of liberalization of goods and capital markets within an integrated area changed in the 90s. Even in less developed countries, capital movement in the form of FDI is liberalized simultaneously to the liberalization of goods movement. Paez (2008) used a gravity model to analyse the effect of RTA membership on FDI flows in the Andean sub region for the period 1992-2001. The evidence suggested that RTAs in the region foster trade and divert FDI in the Andean Community Nations (ACN) despite investment protection.

Gravity Model approach was used by many studies to evaluate RTA effect on FDI inflows. Brenton, Di Mauro and Lucke (1999) used a 'gravity model' approach to assess the impact of the deepening integration between the EU and the Central and Eastern European Countries (CEECs) on FDI flows and suggested a complementary relationship between FDI and trade. The key determinant of the growth of FDI is the pace of income growth and there is no empirical evidence to suggest that FDI affects trade flow from the source country. Görg and Greenaway (2002) used a gravity model to evaluate the potential for increased FDI for a sample of Eastern European countries, following accession to the EU and showed that there is limited potential for attracting FDI in manufacturing but greater scope in services sector. Park and Park (2007) quantitatively estimated the investment creation and diversion effects of RTAs by using an extended gravity equation and found that reform-creating RTA membership, larger market size, better skilled labor, and lower trade costs all contribute positively and significantly to inward FDI stock. The study found that most of proposed East Asian RTAs promote intra-bloc FDI. López and Orlicki (2005) analyzed the potential impact of the FTAA and the EU-MERCOSUR agreement on FDI flows to MERCOSUR, using the results of a gravity model. The study found that regional integration agreements, in general, induce higher FDI inflows to host member countries and MERCOSUR countries could expect increases in FDI inflows from the two agreements. Otsubo and Umemura (1998) examined the role of FDI as a financial gravity for trade integration in APEC using a standard trade gravity model with dummies. The study found that inward FDI is a significant determinant of the direction of intra-APEC trade transactions. An augmented gravity model was used by Talamo (2007) to estimate the determinants of foreign direct investment flows using the traditional gravity equation variables such as size, level of development, distance, common language and other institutional variables such as shareholder protection and openness to FDI flows. Empirical results validate the hypothesis that corporate governance is an important determinant of FDI flows.

6.1.4 FDI in ASEAN Region

There were efforts made to understand the role of regional integration in influencing Foreign Direct Investment (FDI) in the ASEAN region through empirical studies. Uttama (2005) used knowledge-capital (KC) model to examine MNEs activities in ASEAN using panel data from 1983-2003 and said there is strong support to the horizontal model in favor of the KC model. Ismail, Smith and Kugler (2007) studied the intra-regional-FDI as well as extra-regional-FDI in the ASEAN FTA and said 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, social and non-economic factors also encourage more investors to ASEAN. Nathalie, Fung and Hitomi (2007) in their paper found aggregate FDI and trade associated with production fragmentation in East Asia are complementary in nature. The paper also called for improving the institutions for furthering and deepening the production and trade network in East Asia, which in turn will deepen the economic integration in the region. Kim and Oh (2007) in their study found a regional

FTA that would increase regional openness by 10 percent would increase intra FDI inflows by almost 2 percent. A regional exchange rate arrangement that would reduce regional exchange volatility by half would increase intra-FDI inflows by around 10 percent.

Karimi, sharif, Yusop, Zulkornain and Hook (2009) used TOPSIS approach to select the most suitable ASEAN countries for attracting FDI inflows. Through TOPSIS method, the capacity and attraction of ASEAN countries is evaluated based on ten indicators and given final rank for the period 2000-2005. Results indicate that Singapore is the most attractive for investment among ASEAN countries while ranking of some countries have changed during these years. Hiratsuka (2006) found that ASEAN Trans National Corporations (TNCs) have extended their business activities within ASEAN, East Asia, and then to the world, as both regional and global players benefiting from the process of globalization. Gander, Reynolds and Fowles (2009) used an exploratory approach to analyzing the behavior of FDI by treating FDI flows from home or source country to various members of ASEAN as random independent events over the time period 1999-2003. They showed that the random plots of FDI fit two common cumulative distribution functions (CDF), the Gumbel and the Weibull. Liu (2006) in his paper studied the impact of RTAs on the changes of FDI in China and showed that regional trade and economic integration has affected FDI in host countries since it carries out trade and investment liberalisation process. The results show that the formation and implementation of RTAs have an important impact on the changes of FDI in China. Davies, Ionascu, and Kristjánsdóttir (2007) applied the panel fixed effects with vector decomposition estimator to three FDI datasets to estimate the impact of time-invariant variables on FDI while including fixed effects. After including fixed effects, the study found that many time-invariant variables indicate the importance of vertical FDI. The paper highlighted that controversies in the literature that are driven by differences in data sets may be resolved by using this estimation technique.

6.2 Analysis of Intra and Inter Regional FDI in ASEAN

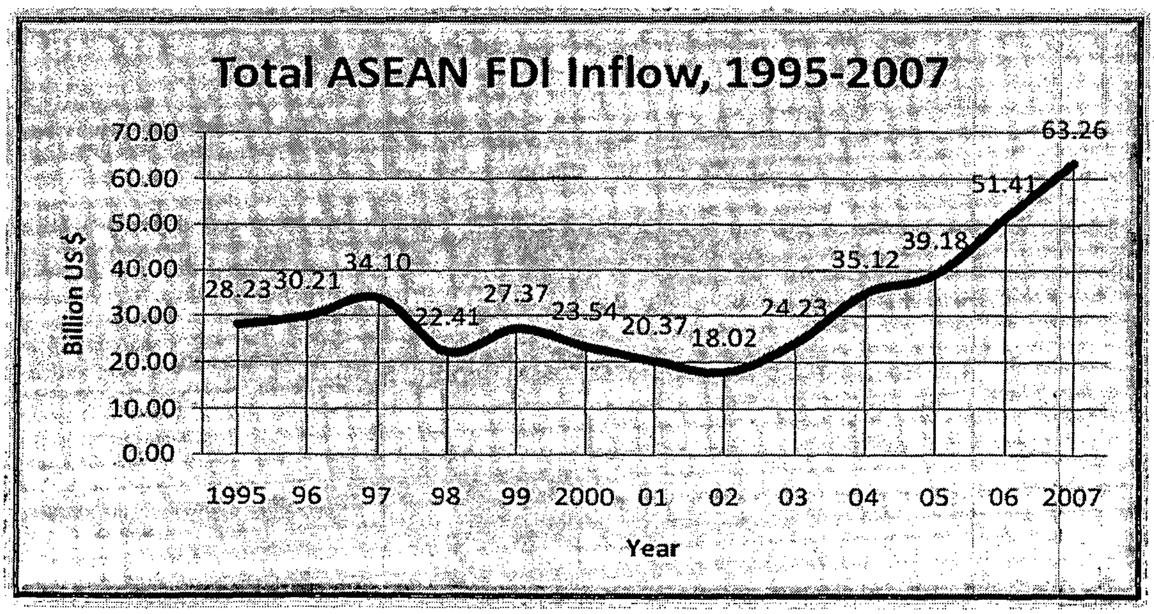
Global FDI has been growing in the last four years and reached a new record high in 2007, with an inflow of $1,833 billion, which is higher than the previous record set in 2000 (World Investment Report, 2008). This higher FDI inflow in 2007 was mainly due to higher economic growth and strong economic performance experienced by many countries across different parts of the world. The growth in FDI flows was also driven by cross-border Merger and Acquisition (M&A) activity that had happened actively in different countries and sectors all over the world. The sub prime crisis and the resultant financial crisis in USA in the second half of 2007 did not shake the confidence of FDI flows in that year, but 2008 bore the brunt of the crisis with global recession, low consumer confidence, falling profits and halt on M & A activities.

Regional distribution of FDI inflows showed that South, East and South-East Asia, and Oceania continued to receive higher FDI in 2007, reaching a new high of $249 billion, an increase of 18 percent over 2006 (World Investment Report, 2008). FDI in these region accounted for half of all FDI to developing economies. Within the Asia –Oceania region, FDI flows are moving towards South and South-East Asia, although China and Hong Kong (China) remained the two largest FDI destinations in the region.

6.2.1 FDI Inflows in ASEAN

The higher economic growth witnessed by countries across the world prior to 2007 and the vibrant policies adopted by the East Asian countries attracted huge FDI to the ASEAN region. ASEAN countries for a long time followed open economic policies and Export led growth strategy earning the name of 'miracle economies'. After the establishment of ASEAN FTA there is a steady increase in FDI inflow from rest of the world. Japan and other emerging economies of East Asia focused their attention on ASEAN countries by diversifying their horizontal and vertical FDI. As a result, ASEAN FDI which was at 28.23 billion in 1995 increased to 63.26 billion in 2007. However, the trend is not uniform for this whole period. Inward FDI marginally increased up to 1997 and after 1997 there was a steady decline in FDI inflow mainly due to East Asian crisis. East Asian crisis resulted in the exit of FDI in many ASEAN countries particularly from Indonesia posing questions on the financial architecture of ASEAN. FDI was in its lowest point in 2002 and after that riding from a favourable global environment there was a steady increase in FDI and it reached a high level of 63.26 billion US dollars in 2007.

Fig: 6.1 Total ASEAN FDI Inflow, 1995 - 2007



A country wise comparison of FDI inflow showed Singapore is the major recipient of FDI from the rest of the world for the period 1995 to 2007. Singapore receives consistently higher FDI for all the period and in 2007 it received 40.02 percent of the total ASEAN inward FDI. Malaysia, Thailand and Indonesia are the other ASEAN countries receiving noticeable FDI inflow. Thailand has succeeded in improving its inward FDI share over the period. The country which showed highest fluctuation in FDI inflow is Indonesia. From 1998 to 2003 Indonesia witnessed huge outflow of FDI as a result of the economic crisis. East Asian crisis led readjustment in regional investment within ASEAN, investment moving from volatile market to more stable economies. The less developed members of ASEAN namely Brunei, Cambodia, Laos and Myanmar had negligible share in FDI inflows and their share remained stagnant for the said period. In 2007, four ASEAN countries namely Singapore, Thailand, Malaysia and Indonesia received more than 80 percent of total ASEAN FDI inflow for the year.

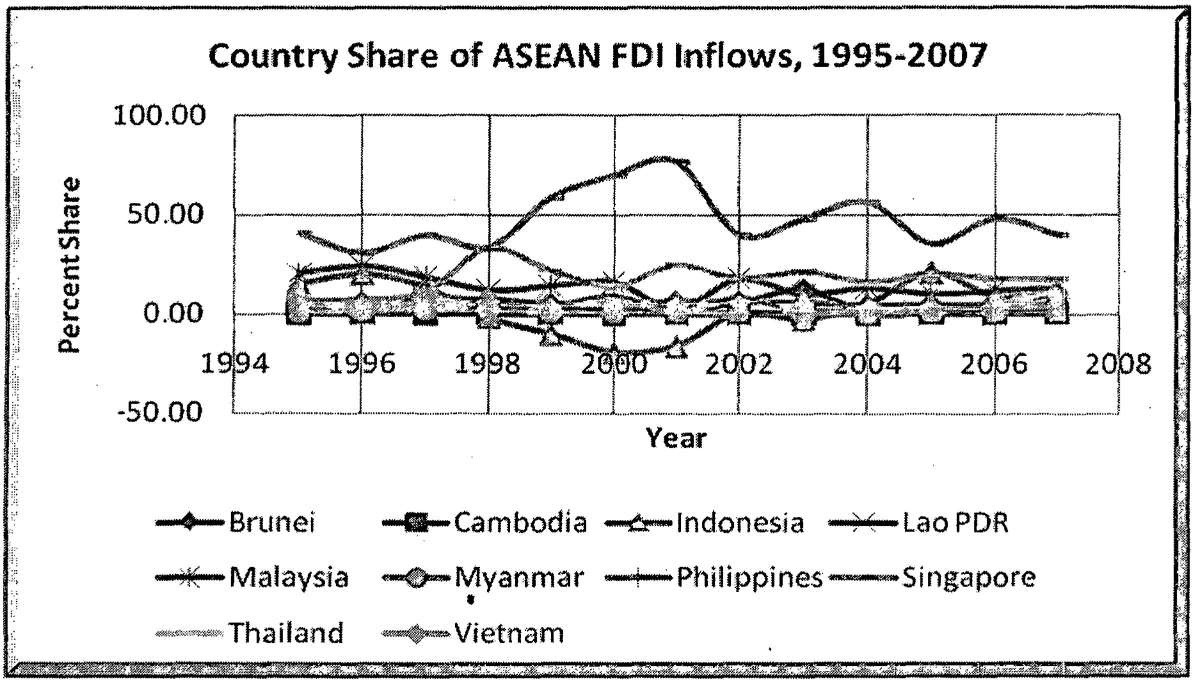
Table: 6.1 FDI Inflows to ASEAN Countries (Million US Dollars)

Year Host country	1995	2000	2005	2006	2007
Brunei	582.8 (2.06)	549.2 (2.33)	288.5 (0.74)	433.5 (0.84)	260.2 (0.41)
Cambodia	150.7 (0.53)	148.5 (0.63)	381.2 (0.97)	483.2 (0.94)	867.3 (1.37)
Indonesia	4346 (15.39)	-4550 (-19.33)	8336 (21.27)	4913.8 (9.56)	6928.3 (10.95)
Lao PDR	88.4 (0.31)	34 (0.14)	27.7 (0.07)	187.4 (0.36)	323.5 (0.51)
Malaysia	5815 (20.60)	3787.6 (16.09)	4063.6 (10.37)	6059.7 (11.79)	8401.2 (13.28)
Myanmar	317.6 (1.13)	208 (0.88)	235.9 (0.60)	427.8 (0.83)	257.7 (0.41)
Philippines	1577 (5.53)	2239.6 (9.51)	1854 (4.73)	2345 (4.56)	2928 (4.63)
Singapore	11502.7 (40.75)	16485.4 (70.03)	13928.6 (35.55)	24743.6 (48.13)	25317 (40.02)
Thailand	2070 (7.33)	3350.3 (14.23)	8048.1 (20.54)	9459.6 (18.40)	11238.1 (17.76)
Vietnam	1780.4 (6.31)	1288.7 (5.47)	2020.8 (5.16)	2360 (4.59)	6739 (10.65)
ASEAN	28230.6	23541.3	39184.4	51413.7	63260.3

Source: ASEAN FDI Database, ASEAN Secretariat

The Fig. 6.2 Showed the percent share of FDI inflows for all ASEAN countries for the period 1995 to 2007. The curve relates to Singapore stands out where as Thailand's share is showing rising trend.

Fig: 6.2 Country Share of ASEAN FDI Inflows, 1995-2007



6.2.2 Major Sources of FDI Flows to ASEAN 2005-07

Japan is the most important source of FDI for ASEAN countries as Japan diversifies its production structure towards Southeast Asia to take advantage of the lower cost of production and presence of larger market. Other important FDI contributors to the region are USA, UK and Netherlands. Intra regional investment is also gaining momentum in ASEAN. Intra ASEAN FDI which was at 7.4 percent in 2004 rose to 15 percent in 2007. Table 6.2 provided major sources of FDI to ASEAN during 2005-07.

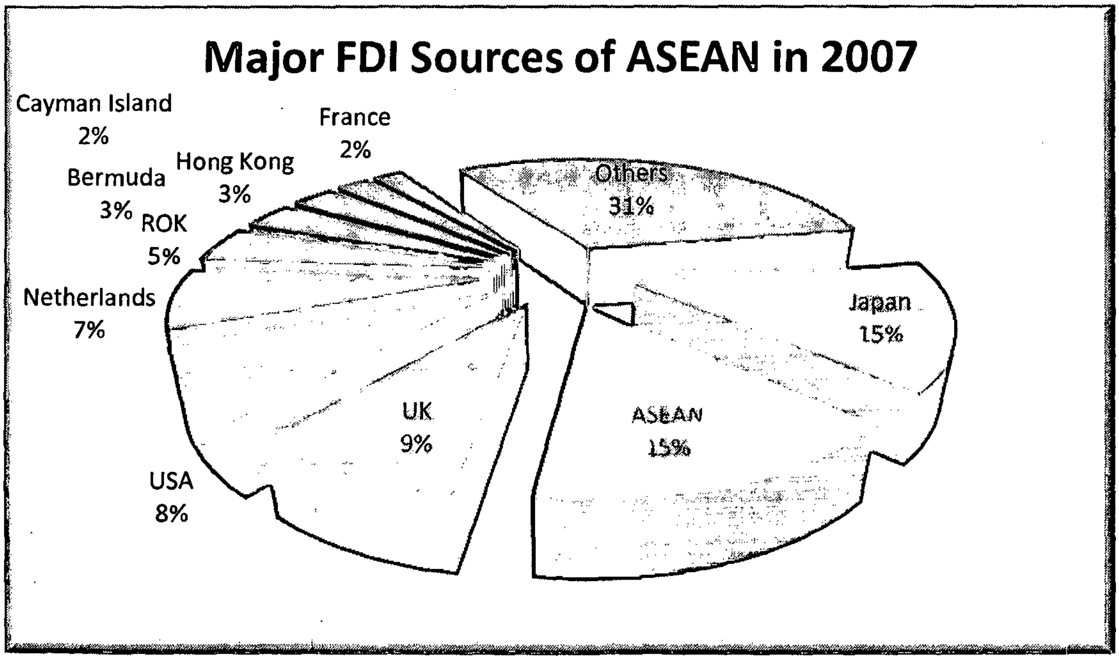
Table: 6.2 Major Sources of FDI Flows to ASEAN 2005-07

2005		2006		2007	
Country	Share	Country	Share	Country	Share
Japan	15.7	Japan	20.8	Japan	15.1
USA	12.2	ASEAN	**15.5**	ASEAN	**15.0**
UK	11.5	Netherlands	8.8	UK	8.6
ASEAN	**10.7**	UK	6.7	USA	8.0
Netherlands	5.8	USA	6.1	Netherlands	7.2
France	2.4	Cayman Islands	6.0	ROK	4.4
Luxembourg	2.2	Germany	3.0	Bermuda	3.3
Germany	1.4	Bermuda	2.9	Hong Kong	2.9
China	1.4	Hong Kong	2.7	Cayman Island	2.2
ROK	1.4	ROK	2.5	France	2.1

Source: ASEAN FDI Database, ASEAN Secretariat

In 2007, the biggest contributor for ASEAN FDI is Japan followed by ASEAN countries UK, USA and Netherlands. Republic of Korea and Hong Kong are the other Asian countries contributing FDI to ASEAN. The 2007 share of FDI to ASEAN is diagrammatically represented in fig.6.3.

Fig: 6.3 Major Sources of FDI Flows to ASEAN 2005-07



6.2.3 Cumulative FDI Inflows by Economic Sector -1999-2007

Japan is the most important source of FDI for ASEAN countries. The cumulative FDI flow for the period 1999 to 2007 from Japan amounted to 41475.2 million US dollars. Of this total FDI inflow 57.22 percent gone to manufacturing sector while 39.08 percent have gone to Services. The important service sector activity received FDI from Japan are trade/commerce (19.41 percent) and Financial services (14.28 percent). The second important source of FDI for ASEAN is USA and large proportion of this FDI has gone to services sector (76.08 percent) followed by Mining and Quarrying (9.51 percent). The cumulative FDI from EU for the period is 79833.7 million and it is evenly distributed between Manufacturing (44.94 percent) and Services (42.49 percent). Chinese FDI to the tune of 3095.4 million had gone in to ASEAN countries with Mining and Quarrying getting 33.36 percent, Manufacturing 14.65 percent and Services receiving 53.51 percent. India's FDI in to ASEAN is compiled from 2005 and the cumulative investment for the period 2005 -07 is 786.3 million. Service sector received most of the FDI (241.99 percent) and there is a net outflow of FDI in Mining and Quarrying (346.5 million) and Manufacturing (785.4 million). Important service sectors received India's FDI are real estate 861.9 million, Financial Services 467.4 million and other services, 482.5 million. Cumulative intra ASEAN FDI for the period 1999 to 2007 amounts to 36120.9 millions with Mining and Quarrying sector receiving 10.68 percent, Manufacturing sector receiving 30.44 percent and Services sector getting 56.95 percent.

6.2.4 Intra ASEAN FDI Inflow

Intra ASEAN FDI inflow is the investments received by ASEAN member countries from other members of ASEAN Free Trade Area. Thailand, Malaysia Singapore and Indonesia are the major recipients of Intra regional FDI inflow from ASEAN.

Fig: 6.4 Cumulative FDI Inflows by Economic Sector

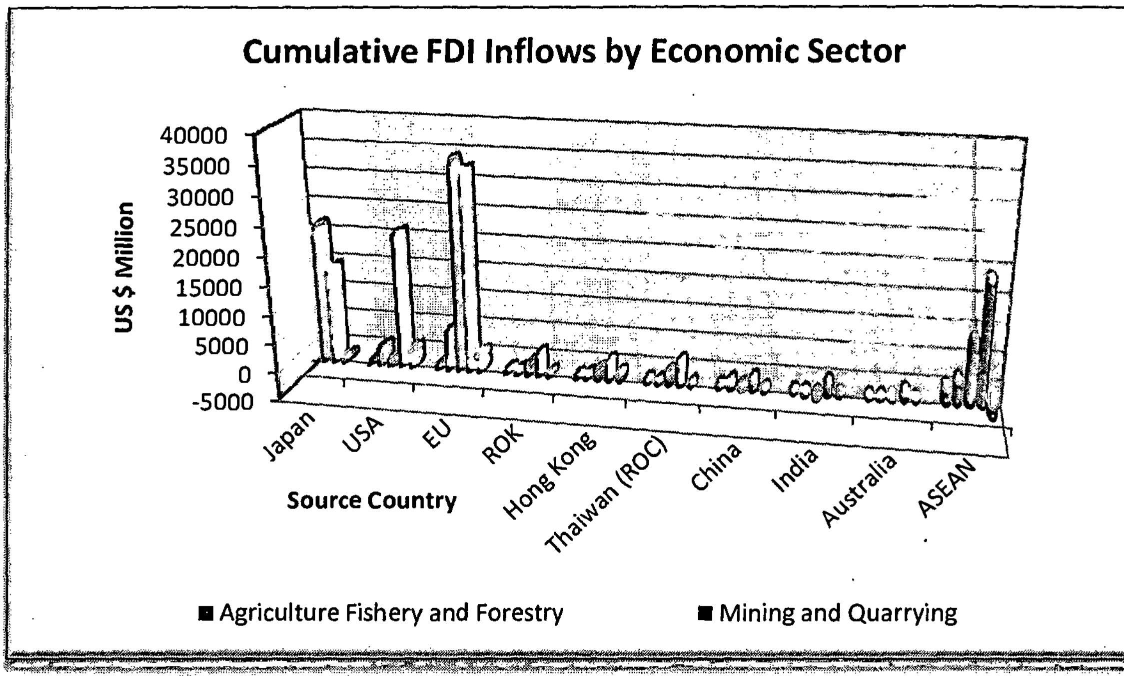


Table: 6.3 Percent share of Cumulative FDI Inflows to ASEAN by Economic Sector, 1999- 2007

Source Country/ FDI Inflows by Economic Sectors	Japan	USA	EU	ROK	Hong Kong	Taiwan	China	India	Australia	ASEAN
Agriculture Fishery and Forestry	-0.07	0.60	0.78	3.85	-0.32	1.90	1.22	0.00	1.59	7.09
Mining and Quarrying	2.06	9.51	8.24	4.68	5.69	0.82	33.36	-44.07	-0.23	10.68
Manufacturing	57.22	4.13	44.93	32.31	28.04	34.61	14.65	-99.89	7.02	30.44
Services	39.08	76.08	42.49	55.46	49.64	61.19	53.51	241.99	89.89	56.95
Construction	-0.23	-1.21	0.00	-6.96	-0.27	1.56	0.22	0.46	1.71	2.13
Trade/Commerce	19.41	24.75	14.74	13.72	15.33	2.31	15.21	11.13	42.76	7.29
Real Estate	-0.31	3.16	3.74	28.05	4.14	4.04	27.09	109.61	30.62	16.01
Financial Services	14.28	41.37	19.36	13.94	33.09	42.37	3.82	59.44	13.48	20.27
Other Services	5.94	8.01	4.64	6.71	-2.64	10.92	7.17	61.36	1.33	11.25
Others	1.70	9.68	3.56	3.70	16.94	1.49	-2.74	1.97	1.74	-5.17
Total	100	100	100	100	100	100	100	100	100	100

The share of developing countries of ASEAN viz. Cambodia, Lao PDR, Myanmar is very small and remains stagnant for long period. While the share of Vietnam is showing nominal presence, Philippines' share is becoming nil in the recent past. Singapore which is the highest receiver of FDI from outside the world is getting relatively smaller share of FDI from ASEAN members. This is because Singapore is the major source of FDI for all other members and an important driver of growth in the ASEAN region. Other prominent countries of ASEAN such as Thailand, Malaysia and Indonesia are receiving their investments from Singapore.

Table 6.4 Intra ASEAN FDI Inflow (Million US dollars and Percent share)

Year / Host Country	2003	2004	2005	2006	2007
Brunei	36.8 (1.4)	19.7 (0.7)	19.4 (0.5)	9.7 (0.1)	62.1 (0.7)
Cambodia	19.9 (0.7)	31.9 (1.1)	129.2 (3.1)	155.5 (2)	271.2 (2.9)
Indonesia	383.5 (14.2)	204.2 (7)	883.3 (21)	1353.9 (17)	1108.2 (11.7)
Lao PDR	3 (0.1)	7.8 (0.3)	6.7 (0.2)	10.6 (0.1)	100.4 (1.1)
Malaysia	251.1 (9.3)	980.2 (33.6)	720.9 (17.2)	467.8 (5.9)	3809.3 (40.1)
Myanmar	24.3 (0.9)	9.3 (0.3)	38.4 (0.9)	71 (0.9)	40.4 (0.4)
Philippines	175.4 (6.5)	71.1 (2.4)	12.7 (0.3)	-95.6 (-1.2)	2.9 (0)
Singapore	647.3 (24)	658.7 (22.6)	1138.2 (27.1)	1165.5 (14.7)	994.4 (10.5)
Thailand	1060.4 (39.2)	688.7 (23.6)	1089.6 (25.9)	4626.5 (58.2)	2566.9 (27)
Vietnam	100.4 (3.7)	242.9 (8.3)	164.7 (3.9)	181.9 (2.3)	546.3 (5.7)
Total ASEAN	2702	2914.4	4203.1	7946.9	9502.2

Source: ASEAN FDI Database, ASEAN Secretariat

6.2.5 Intra ASEAN FDI Outflow

The table 6.5 provides intra regional FDI outflow from the ASEAN region for the year 2003-07. The intra ASEAN FDI which was 2.70 billion n 2003 rose to 9.50 billion in

2007. The table 6.5 revealed that Singapore is the major source of FDI outflow in the ASEAN region. Nearly three-forth of the ASEAN outward FDI to the region is from Singapore. Malaysia is in distant second with 11.5 percent and Thailand with 7 percent is in third position in terms of outward FDI.

Table: 6.5 Intra ASEAN FDI Outflow

Year / Source Country	2003	2004	2005	2006	2007
Brunei	-6.4 (-0.2)	17.5 (0.6)	26.1 (-0.5)	-39.6 ( )	-7.3 (-0.1)
Cambodia	5.5 (0.2)	4.1 (0.1)	0.3 (0)	0.2 (0)	0.6 (0)
Indonesia	260 (9.6)	290.7 (10)	198.5 (4.7)	617.8 (7.8)	216.8 (2.3)
Lao PDR	0 (0)	1.1 (0)	-0.2 (0)	41.6 (0.5)	8.3 (0.1)
Malaysia	614.4 (22.7)	663.3 (22.8)	1284.8 (30.6)	953.3 (12)	1088.5 (11.5)
Myanmar	7.8 (0.3)	7.2 (0.2)	12.9 (0.3)	38.4 (0.5)	66.2 (0.7)
Philippines	-12.6 (-0.5)	158.8 (5.4)	82.8 (2)	159.3 (2)	85.6 (0.9)
Singapore	1683.5 (62.3)	1593.4 (54.7)	2560.8 (60.9)	5869.1 (73.9)	7227.8 (76.1)
Thailand	143.9 (5.3)	171.3 (5.9)	28.7 (0.7)	301.8 (3.8)	668.1 (7)
Vietnam	5.9 (0.2)	7 (0.2)	8.3 (0.2)	5 (0.1)	147.7 (1.6)
Total ASEAN	2702	2914.4	4203.1	7946.9	9502.2

Source: ASEAN FDI Database, ASEAN Secretariat

The less developed members of ASEAN namely Cambodia, Myanmar, Vietnam and Lao PDR have abysmal share in intra ASEAN outward FDI. Even the middle level countries such as Philippines, Indonesia and Brunei have very little FDI outflow to the region. The data revealed that Singapore plays a vital role in providing investment capital and stimulating economic development for the ASEAN region.

6.3 Modeling Bilateral FDI Flows in ASEAN – A Gravity Model Approach

The study used a gravity approach to model the bilateral FDI inflow in ASEAN countries after the initiation of trade and investment integration. The gravity model which was traditionally used to explain bilateral trade flows is extended to investment flows as gravity model variables exert great influence in attracting FDI in the host countries. The theoretical basis for a gravity model of FDI was proposed by Head and Ries (2007) since then number of papers used the model with some variations. These include recent papers including Lougani, Mody and Razin (2002), Stein and Daude (2007), Liu, Chow and Li (2007) and Hattari, Rajan, and Thangavelu (2008). Di Giovanni (2005) applies a gravity model to analyze cross-border M&A transactions while Portes and Rey (2005) and Lee (2006) apply a gravity model for portfolio equity flows.

The present study made use of three variations of the gravity model namely Basic Model, Augmented Model-1 and Augmented Model-2 to incorporate number of variables influencing FDI flows. Basic model uses traditional gravity model such as GDP, PCI, distance and regional dummy. Augmented model-1 used institutional and infrastructural variables such as Globalisation Index, Economic Freedom, Telephone density and Freedom from corruption along with traditional gravity model variables to see their effect on the bilateral FDI flows and to compare the results of the estimation. The model was further augmented with variables like Continuous Border, Common Language and Common Colony and presented as Augmented model-3.

Three different estimation techniques namely Pooled Ordinary Least Squares (POLS), Fixed Effect with Vector Decomposition (FEVD) and Random Effects Model were applied on the above three models to get an efficient estimate. In a Pooled OLS, a regression equation is run on the dataset ignoring the time and cross section dimension (ignoring specific effect). The fixed effect model examines group differences in intercepts, assuming the same slopes and constant variance across groups. Fixed effect models use least squares dummy variable (LSDV), within effect, and between effect estimation methods. The random effect model, by contrast, estimates variance components for groups and error, assuming the same intercept and slopes. The difference among groups (or time periods) lies in the variance of the error term.

The dataset for the analysis consist of 85 bilateral investment country pair collected for a period of 11 years. The Host countries of FDI are five major economies of ASEAN namely Indonesia, Malaysia, Philippines, Singapore and Thailand. Source countries of FDI are selected based on volume of investment flowing in to ASEAN from prominent countries. These include Japan, USA, Canada, France, Germany, Italy, Netherlands, UK, China, India, Korea, Hong Kong, Taiwan and five members of ASEAN namely Malaysia, Philippines, Singapore and Thailand. Each ASEAN member has seventeen bilateral country pair and the data is collected for 11 years from 1995 to 2005. There is a total of 935 bilateral investment flow against which information is also collected on 22 independent variables and the total data points of 20,570 is used in the study.

Data for the models is collected from diverse sources. Gross Domestic Product (GDP) and Per Capita Income (PCI) of the Host and Source country is collected from the World Development Indicators (WDI) of the World Bank. The Distance between the Host and Source country and countries with continuous border is taken from the database maintained by Jon Haveman. Data pertaining to Common language and Common Colonial master is taken from the database maintained by CEPII, France.

Globalisation Index is taken from KOF database. KOF maintains data for three forms of globalization namely Economic Globalisation, Social Globalisation and Political Globalisation and a composite index of Globalisation Index. The study considered three forms of Globalisation as well the composite index. Data for Economic Freedom is collected from the database maintained by the Heritage Foundation. Heritage Foundation constructs Economic Freedom index for 165 countries in the world on various parameters. The Economic Freedom Index is calculated based on variables like Business Freedom, Trade Freedom, Fiscal Freedom, Government Size, Monetary Freedom, Investment Freedom, Financial Freedom, Property Rights, Freedom from Corruption and Labour Freedom. The study considered only Trade Freedom, Investment Freedom and Freedom from Corruption along with the composite index in the study.

Telephone density of the Host country is collected from the database of World Development Indicator of the World Bank. Corporation Tax imposed by Host countries is collected from KPMG's Corporate and Indirect Tax Rate Survey 2007. KPMG International provides no client services and is a Swiss cooperative with which the independent member firms of the KPMG network are affiliated.

6.3.1 Basic Gravity Model for Bilateral FDI

The basic gravity model used in the study is outlined below

$$\ln(1 + FDI_{ijt}) = \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(PCI_{it}) + \beta_4 \ln(PCI_{jt}) + \beta_5 PCI\ Diff_{ij} + \beta_5 \ln(Dis_{ij}) + \beta_6 ASEAN_{ij} + u_{ijt}$$

Where

FDI_{ijt} = *FDI inflow to Host country 'i' from Source Country 'j' in time 't'.*

GDP_{it} = *GDP of Host Country in time 't'.*

GDP_{jt} = *GDP of Source Country in time 't'.*

PCI_{it} = *Per Capita Income of Host country in time 't'.*

PCI_{jt} = *Per Capita Income of Source country in time 't'.*

PCI Diffij = *Difference in Per Capita Income of Host and Source Countries*

Dis_{ij} = *Geographical distance between Host country and Source country.*

$ASEAN_{ij}$ = *Dummy if Host and Source country belong to ASEAN*

U_{ijt} = *Error term*

There is an estimation problem in taking log FDI as the dependable variable as many observations will have zero values or negative values (net outflows). In order to overcome this problem dependent variable is expressed as ln(1 + FDI) as suggested by Eichengreen and Irwin (1995) in their treatment of zero trades. In this way, large values of FDI, ln(1 +FDI) $\approx$ ln(FDI). GDP of the Host country and Source country represent economic mass in the Gravity model and expected to have a 'positive' sign. The sign of the difference in GDP per capita is unclear, depending on whether FDI flows are vertical or horizontal in nature. The coefficient of the distance variable is expected to return 'negative' sign as greater distance between Host and Source country makes the supervision and management of FDI difficult and hence discourage it. A positive and significant coefficient for the ASEAN dummy reveals ASEAN integration encourages increased FDI inflow in to member countries. Table 6.6 gives the results of the Basic Gravity Model of bilateral FDI.

Table: 6.6 Results of the Basic Model

Dependent Variable: Bilateral FDI inflows						
Independent Variable	Pooled OLS		Fixed Effect		Random Effect	
	Coefficient	Standard Error(SE)	Coefficient	Standard Error(SE)	Coefficient	Standard Error(SE)
GDP host	0.2501	0.1922	-9.1694***	0.4491	0.1290	0.2633
GDP Source	0.6311***	0.0842	2.0627***	0.0934	0.4046***	0.1520
PCI host	0.7926***	0.0615	11.0553***	0.4619	0.8476***	0.1093
PCI Source	0.6170***	0.0694	-1.3217***	0.1032	0.5822***	0.1245
PCI Diff	0.1209**	0.0633	0.0113	0.0512	0.0954	0.1039
Distance	- 0.9834***	0.1244	0.3871***	0.1176	- 0.7886***	0.2319
ASEAN Dummy	0.6192***	0.2476	2.7012***	0.2203	0.3345	0.4695
Constant	- 7.1504***	1.5013	- 46.9234***	2.1523	- 6.5847***	2.4178
Adj. R2	31.88					
F(7, 926)	63.38		147.74			
Breusch-Pagan/Cook-Weisberg test	19.18					

The results from Pooled Ordinary Least Squares (POLS) showed that all the gravity variables such as GDP, PCI and distance are showing expected signs. GDP, PCI, PCI differences are positive and distance is having negative sign. But only GDP Source, PCI host, PCI Source, Distance, Constant are highly significant and GDP host, PCI difference are not significant in influencing FDI flow to ASEAN countries. Host country's economic size is an important factor attracting FDI. This means countries with higher economic size attracts more FDI as it can utilize the investment for production of goods and services to local and neighbouring market. Higher Per Capita Income in the host country is also significant in attracting as it reflects the higher purchasing power of the people in the Host country. PCI of the source country is significant in the sense higher income countries are supplying funds to the ASEAN market compared to less income countries. The ASEAN dummy is positive and highly significant implying that membership in the ASEAN is significantly increasing the FDI flow in the country. The low explanatory power of the model (31.88 percent) emphasizes the fact that independent variables explaining only part of the FDI inflow in to ASEAN countries.

The Fixed Effect with Vector Decomposition (FEVD) model incorporates the country specific individual effect in to the analysis. Here a there stage estimation technique is followed to delineate the individual effect. The result from the model showed that all explanatory variables except PCI difference are highly significant in explaining the bilateral investment in ASEAN. But signs of Distance, GDP host and PCI source are not consistent with established gravity results. While coefficient of Distance is positively signed, GDP Host and PCI Source provide negative signs. This means that as the distance between Home country and Source country increases, FDI also increases. Also negative sign of the Host country implies that economically weaker countries of ASEAN attract more FDI which is not true in actual sense. The highlight of the model is the high positive and significant coefficient of the ASEAN dummy variable. This high value prescribes that ASEAN integration substantially increases FDI inflow in to ASEAN countries.

The Basic Gravity Model also employed Random Effect Method of estimation to understand the impact of RTA in influencing FDI in ASEAN countries. Random Effect method assumes individual effects are random variables coming out of a probability distribution. The estimations showed that the results are similar to the pooled OLS method. The GDP, PCI of the Host country and Source country have positive coefficients whereas distance between them is negatively related to FDI flow. While all explanatory variables yield expected signs, GDP Host, PCI diff and ASEAN dummy are not significant in explaining FDI inflow. The coefficient of ASEAN dummy is not significant and its value decreased compared to the pooled OLS model.

6.3.2 Augmented Gravity Model – 1

The basic Gravity Model is augmented with Institutional and Infrastructural variables to measure the impact of these variables on the bilateral FDI inflows. Anghel (2005) and Bénassy-Quéré, Coupet and Mayer (2007) and Daude and Stein (2004) have discussed and explored in some detail the importance of institutional variables in determining FDI flows and Hur, Parinduri and Riyanto (2007) have analyzed the importance of institutions in the case of M&A deals. The variables used in the study to represent Institutional variables are Composite Globalisation Index, Economic Globalisation, Social Globalisation, Political Globalisation, Composite Economic Freedom Index, Trade Freedom index, Investment Freedom index, Corruption Freedom index and Corporate tax structure in the host country. The infrastructural development in the Host country is represented by the telephone density in that country. A higher value in the Globalisation index means that the country has achieved higher levels of globalization compared to others. Similarly higher values in Economic, Political and Social Globalisation means higher levels of achievement in these spheres of globalization. On the same line higher scores in Economic freedom means less restrictions in terms of economic policies and the policy environment is conducive for free trade and resource transfers. Higher scores in Trade Freedom, Investment Freedom and Freedom from Corruptions also shows more developed and conducive policy environment.

If a country scores a higher point in the Globalisation Index then it can attract higher volumes of Foreign Direct investment (FDI). Similarly higher scores of Economic, Social and Political globalization also attracts high FDI to the Host country. In the same reasoning higher scores in the composite index of Economic Freedom which takes information from Trade Freedom, Investment Freedom and Freedom from Corruption and others also encourages enhanced flow of FDI in to the host country. A higher value for telephone density showed the level of infrastructural development in the country and well developed quality infrastructure attracts more FDI in to the country. On the contrary a higher Corporation tax imposed by the Host country acts as a deterrent in attracting FDI to the Host nation. The Augmented Model-1 used in the study is represented below.

$$\ln(1 + FDI_{ijt}) = \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(PCI_{it}) + \beta_4 \ln(PCI_{jt}) + \beta_5 \ln(Dis_{ij}) + \beta_6 GlobIndex_{it} + \beta_7 EcoGlo_{it} + \beta_8 SocGlo_{it} + \beta_9 PolGlo_{it} + \beta_{10} EcoFree_{it} + \beta_{11} TradeFree_{it} + \beta_{12} InvtFree_{it} + \beta_{13} CorrFree_{it} + \beta_{14} Tel_{it} + \beta_{15} CorpTax_{it} + \beta_{16} ASEAN_{ij} + u_{ijt}$$

Where

$GlobIndex_{it}$	= *Globalisation Index of Host country in time 't'.*
$EcoGlo_{it}$	= *Economic Globalisation Host country in time 't'.*
$SocGlo_{it}$	= *Social Globalisation Host country in time 't'.*
$PolGlo_{it}$	= *Political Globalisation Host country in time 't'.*
$EcoFree_{it}$	= *Economic Freedom in Host country in Time 't'.*
$TradeFree_{it}$	= *Trade Freedom in Host country in Time 't'.*
$InvtFree_{it}$	= *Investment Freedom in Host country in Time 't'.*
$CorrFree_{it}$	= *Corruption Freedom in Host country in Time 't'.*
Tel_{it}	= *Telephone Density in the Host country*
$CorpTax_{it}$	= *Corporation Tax imposed by the Host country.*

Results from the Pooled OLS method of the Augmented Model-1 showed that all important variables are significant and keeping expected signs. GDP and PCI of the source country are positive and highly significant while PCI difference and PCI of the host country are significant at 10 percent and 5 percent level of significance respectively. One unit change in the GDP of Source country increases FDI in the Host country by 0.69. Also increase in the per capita income in the source country increases FDI flow in the host country. While Distance is negatively related, other important variables such as Economic, Social and Political Globalisation, Economic Freedom and ASEAN dummy are positively signed and highly significant. Economic, Social and Political globalization efforts in the Host country attract more investments from rest of the world. Trade freedom is not significantly influencing FDI inflow because the investments are not tariff jumping in nature and the tariff rates in ASEAN is quite low compared to rest of developing countries. The positive and highly significant coefficient of the ASEAN dummy reveals that ASEAN FTA is significant in attracting inward FDI in ASEAN countries.

Fixed Effect Gravity Model showed that GDP source, PCI host, PCI source, Distance, Economic globalization, Economic Freedom, Freedom from Corruption, Telephone density, Corporation Tax and ASEAN dummy are highly significant in explaining FDI inflow in ASEAN. A positive GDP and PCI of the host country means the economically rich countries are providing FDI to ASEAN countries and FDI flow increases with increase in GDP and PCI of the source country. The negative sign of the distance variable is in tune with the theoretical insight that more distance between the host and Source country, the cost of management and regulation of fund increases leading to a fall in FDI.

Table: 6.7 Results of the Augmented Model – 1

Independent Variable	Pooled OLS		Fixed Effect		Random Effect	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
GDP Host	1.2081	(0.7007)	0.2449	0.5779	1.2200**	0.6234
GDP Source	0.6985***	(0.0805)	3.5828***	0.1526	0.6735***	0.1514
PC Host	0.9111*	(0.5672)	2.3723***	0.4715	0.8443*	0.5017
PC Source	0.6358***	0.0657)	-2.8167***	0.1732	0.6292***	0.1204
PC Diff	0.1151**	(0.0602)	0.0056	0.0497	0.1035	0.0997
Distance	-1.0367***	(0.1185)	-1.3752***	0.0988	-1.0337***	0.2278
GLOB. Index	- 24.9595***	(6.2566)	-7.5873	5.2098	- 19.4300***	6.1691
Eco.Globalisation Index	16.3829***	(3.1125)	10.2114***	2.5757	14.3129***	2.8684
Soc.Glob. Index	6.5170***	(2.5373)	0.9187	2.1030	4.8248**	2.4008
Pol. Globalisation Index	5.5299***	(1.3110)	1.2766	1.0967	3.9685***	1.3568
ECO. Freedom	8.9662***	(2.6012)	8.4691***	2.1386	8.6228***	2.3387
Trade Freedom	0.1517	(1.0436)	0.1700	0.8580	0.2412	0.9117
Invt. Freedom	-1.2728**	(0.5474)	-0.9659**	0.4503	-1.1675***	0.4788
Corr. Freedom	-0.9778***	(0.3375)	-0.9859***	0.2774	-1.0145***	0.3094
Telephone	-0.9116***	(0.1745)	-1.0013***	0.1435	-0.9238***	0.1730
Corporation Tax	2.9246**	1.3150)	2.7131***	1.0811	2.9689***	1.1375
ASEAN Dummy	0.7086***	(0.2342)	1.1203***	0.1935	0.6376	0.4566
Constant	- 64.0697***	13.8960	- 58.4151***	11.4273	- 63.5398***	12.2708
Adj. R2	39.25					
F (17, 916)	36.46					
Breusch – Pagan/ Cook Weisberg Test	4.81					

The positive coefficient of Economic Globalisation and Economic Freedom explains the well documented relationship between these variables and FDI. If a country is well integrated in to the global economic structure with a relative ease on the movement of resources, commodities and capital; they tend to attract more foreign capital. Similarly countries with greater economic freedom with less policy led distortions on the market and larger mobility can attract more investment. Trade Freedom is not significant mainly because FDI inflows will fall if the two countries can freely trade their goods. But the coefficients of Telephone density and Freedom from Corruption are negatively signed in this model. The striking feature of the model is that ASEAN dummy is positive and significant emphasizing the favourable impact of ASEAN in attracting FDI.

In the random effects model, variables such as GDP and PCI of the Source country, Distance, Globalisation Index, Economic Globalistion, Political Globalisation, Economic Freedom, Investment Freedom, Freedom from Corruption, Telephone density and Corporation tax are highly significant in explaining FDI inflows in to ASEAN. But Globalisation Index, Investment Freedom, Freedom from Corruption and Telephone density are having negative sign showing the inverse relationship between these variables and FDI in the model. An interesting result of the model is that ASEAN dummy is not significant even though it got positive coefficient.

6.3.3 Augmented Gravity Model – 2

The Augmented Gravity Model-1 is further extended by including variables such as Continuous Border, Common Language and Common Colony to incorporate their influence and to see whether they have perceptible influence in explaining bilateral FDI flows. FDI moves quickly to proximate countries compared to far away countries and expected to give a positive coefficient. If the Host country and Source country share common official language it will reduce transaction cost and managing them away places is easy. This also expected to have a positive influence on the FDI inflow. Countries which were under a same colonizer share historical, political and cultural relationship which enhances increased trade flow and greater investment flows. They are also expected to give positive coefficients in the gravity model. All three variables are represented in a binary variable taking value 1 if the source and host countries share the common features and zero otherwise. The Augmented Gravity Model-2 is represented below in the equation.

$$\begin{aligned}\ln(1 + FDI_{ijt}) = {} & \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(PCI_{it}) + \beta_4 \ln(PCI_{jt}) \\ & + \beta_5 \ln(Dis_{ij}) + \beta_6 GlobIndex_{it} + \beta_7 EcoGlo_{it} + \beta_8 SocGlo_{it} + \beta_9 PolGlo_{it} \\ & + \beta_{10} EcoFree_{it} + \beta_{11} TradeFree_{it} + \beta_{12} InvtFree_{it} + \beta_{13} CorrFree_{it} \\ & + \beta_{14} Tel_{it} + \beta_{15} CorpTax_{it} + \beta_{16} ASEAN_{ij} + \beta_{17} ContBord_{ij} \\ & + \beta_{18} ComLang_{ij} + \beta_{19} Colony_{ij} + u_{ijt}\end{aligned}$$

$ContBord_{ij}$	= *Host country and Source Country share common border*
$ComLang_{ij}$	= *Host country and Source Country have common official Language*
$Colony_{ij}$	= *Host country and Source country have common colonial master*

Results from the Pooled OLS method of the Augmented Gravity Model showed that except PCI difference, Trade Freedom, and Common language all are significant at least at 10 percent level of significance. GDP and PCI of the source country is positively signed and highly significant in impacting FDI inflow in to ASEAN. Distance is negatively signed and highly significant. Investment freedom, Freedom from Corruption, Telephone density and Continuous Border are having negative signs.

In the case of Fixed Effect model all but PCI difference, Trade Freedom and Corporation tax are not significant in explaining the FDI inflow. Continuous Border, Common Language and Common colony are highly significant variables explaining the FDI inflow.

Table: 6.8 Results of the Augmented Model – 2

Independent Variable	Pooled OLS		Fixed Effect		Random Effect	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
GDP Host	1.3185**	(0.6826)	-7.6771***	0.7572	1.2642	0.6241
GDP Source	0.7275***	(0.0809)	2.0455***	0.0990	0.6936***	0.1431
PC Host	0.9618*	0.5516)	9.7129***	0.6658	0.8606*	0.5009
PC Source	0.6363***	0.0650)	-1.2840***	0.1174	0.6200***	0.1128
PC Diff	0.0904	(0.0593)	0.0113	0.0507	0.0936	0.0947
Distance	-1.2411***	(0.1275)	-2.2962***	0.1227	-1.2260***	0.2312
Globalis. Index	-26.6579***	(6.0977)	-13.5578***	5.2453	-20.7314***	6.0866
Eco.Glob. Index	17.0898***	3.0325)	11.0076***	2.6055	14.8220***	2.8527
Soc.Glob. Index	6.8330***	(2.4668	5.9626***	2.1032	5.1570**	2.3744
Pol. Glob. Index	6.1407***	1.2886)	2.8499***	1.1126	4.3740***	1.3407
Eco.Freedom	9.2652***	(2.5304)	9.1905***	2.1569	8.7665***	2.3337
Trade Freedom	0.0564	(1.0153)	0.7218	0.8662	0.1990	0.9126
Invt. Freedom	-1.2757***	0.5321)	-1.4507***	0.4536	-1.1823***	0.4785
Corr. Freedom	-0.9485***	(0.3290)	-1.2602***	0.2809	-1.0007***	0.3090
Telephone	-0.9124***	(0.1705)	-0.5543***	0.1466	-0.9220***	0.1720
Corporation Tax	2.8819**	(1.2780)	0.7669	1.0953	2.9480***	1.1384
ASEAN Dummy	0.7983**	(0.2467)	-0.9935***	0.2314	0.6825	0.4491
Cont. Border	-0.6987**	(0.3233)	-2.4416***	0.2911	-0.5717	0.5867
Comm. Language	0.1702	(0.1831)	-12.9410***	0.7233	0.0792	0.3275
Colony	2.2150***	(0.3163)	5.6633***	0.3274	2.2183***	0.5853
Constant	-63.9261***	(13.5230)	-74.5144***	11.5409	-62.4311***	12.2748
Adj. R2	42.63					
F(20, 913)	35.66					
BP/ Cook Weisberg Test	4.81					

But the sign of Continuous Border and Common language are negative where as Common colony is positively influencing FDI. The coefficient of ASEAN dummy turns negative even though it is highly significant. For the Random Effects Method, GDP Host, PCI difference, Trade Freedom, ASEAN dummy, Continuous Border, Common Language are not significant in explaining FDI inflow in to ASEAN countries. The factors influencing FDI in ASEAN according to this model are, GDP and PCI of the source country, Distance, Globalisation index, Economic Freedom, Telephone density and Common Colony. The coefficients and signs RE model are closer to Pooled OLS method.

6.3.4 Hausman Specification Test

Hausman Specification Test is used for model selection from Fixed Effect Model and Random Effects Model of panel data estimation.

b = consistent under Ho and Ha;

B = inconsistent under Ha, efficient under Ho;

Test Ho = difference in coefficients not systematic

When the null hypothesis is accepted there is no systematic difference in the coefficients and the Random Effects model is preferred. When the null hypothesis is rejected, specific effects are correlated to explanatory variables and the Fixed Effect Model is preferred over Random Effect model. Higher Hausman value means selection of Fixed Effect model over the Random Effects model.

Chi2 (20) = (b-B)'[(V_b - V_B) ^ (-1)] (b-B)

= 345.83 > table value (45.3)   Prob > chi2 = 0.00

The Computed H value is higher than the table value suggesting selection of Fixed Effect Model over Random Effects.

Comparison of results of three alternate models namely Basic Gravity Model, Augmented Gravity Model-1 and Augmented Gravity Model-2 revealed that Augmented Gravity Model-1 gives better parameters and economic relationship between variables through higher coefficient value and expected signs. Among the alternative estimation techniques, the Fixed Effect with Vector Decomposition gives high coefficient for ASEAN dummy which is highly significant at 1 percent level. The Hausman's Specification test for model selection validate this.

6.3.5 Implications on India

India actively engaged in Comprehensive Economic Cooperation Agreements with number of Countries and draw important lessons from ASEAN integration process to attract more FDI. The secondary data analysis revealed that FDI inflow in to ASEAN increased rapidly after the establishment of ASEAN. The empirical model developed in this chapter to study the RTA effect on FDI showed ASEAN regional integration positively and significantly influencing the inflow of FDI in to the region.

The Augmented Gravity Model-1 of the study showed that Per Capita income, Distance, Economic Globalistion, Economic Freedom, Freedom from Corruption, Telephone density and corporation tax are significant variables influencing FDI inflow in to a region. These factors are favourably placed in India to attract large FDI. After the initiation of New Economic Policy in 1991, the economic growth rate of the country shifted to higher trajectory with average growth exceeding six percent per annum. As a result Per Capita Income of the country is also rising rapidly leaving a large middle class population with rising purchasing power. The sheer size of the market attracts large number of multinational firms in to the country. The market size along with highly skilled manpower, low cost of infrastructure and operation and availability of skilled IT/BPO workforce make India a hot destination for FDI.

It is clearly evidenced from the study that Globalisation process has an influence on the FDI Inflow of countries/regions. India is also undergoing globalization process and getting integrated in to the world economies since 1991. Trade barriers are gradually reduced and investment restrictions are removed to have greater interactions with the rest of the world. As part of the FTAs and CECAs, India is reducing trade barriers against many countries. This helps in attracting more FDI in to India. The study also found that institutional and infrastructural factors are crucial in attracting FDI in to an RTA. Transport, roads, power, water availability, port and airport facilities are lagging behind international standards and acting as a constraint for FDI in India. Institutional factors such as procedural delay, ground level hassles, rigid labour laws and policy continuity are important in attracting FDI in to India. India need hot pursuit reform measures on these infrastructural and institutional areas in getting required FDI.

India's Regional Trade Agreements with ASEAN can have a positive impact on the FDI. India with huge population and large working class population is fast becoming the production house of the world. A conducive policy environment based on the experiences of ASEAN regional integration and increased investment cooperation between India and ASEAN can benefit India. A well integrated Indian economy with south East Asia is more attractive and vibrant in attracting FDI.

6.3.6 Major Findings

Empirical studies reviewed in the chapter revealed a general consensus that Regional Economic Integration positively influences the FDI flow in to the country. There is a steady increase in FDI inflow in to ASEAN countries with Singapore receiving largest share and Thailand improving its share recently. Japan, USA and UK are the major source of FDI to the ASEAN countries while there is a steady improvement in intra ASEAN FDI share. Service sector is the major recipient of FDI followed by manufacturing; within service sector Financial services, Trade/commerce and real estate are attracting more FDI. Malaysia, Thailand and Indonesia are the major recipient of intra ASEAN FDI. But more than three-forth of the intra ASEAN FDI is originating from Singapore and acting as a driver of ASEAN development. Among the alternate models developed in the study, Augmented model-1 yields better parameters and signs for the explanatory variables. Fixed Effect with Vector Decomposition (FEVD) proved to be better method of estimation compared to other methods with better parameters and established relationships. Hausman Specification test validates this.

A positive and highly significant ASEAN dummy emphasized that ASEAN regional integration positively influenced FDI inflow in to the region. The important factors influencing FDI in the Host country are Per Capita income, Distance, Economic Globalistion, Economic Freedom, Freedom from Corruption, Telephone density and corporation tax. Tariff levels are low in ASEAN and tariff jumping FDI are a remote possibility. The FDI entering in to ASEAN countries are mainly due to better infrastructure, institutional quality and policy coherence and to take advantage of the dynamic gains present in the region as a result of integration.

CHAPTER – VII

SUMMARY OF FINDINGS, CONCLUSION AND SUGGESTIONS

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The study is carried out at the time when multilateralism is at cross roads facing unprecedented difficulties to chalk out a plan of action for addressing international trade issues forcing nations to tread alternative path of regionalism and bilateralism. There are divergent views on the role and impact of regionalism-building block, stumbling block, complementary, feasibility- and the debate is not resolved yet. The countries that were pursuing multilateral trade policies as a matter of principle are also turning towards regionalism not to lose out in the new policy milieu reducing the inertia required for resolution at the multilateral trade negotiations. The study focused on the development of Regionalism as a methodology to achieve trade liberalization and free trade as against the backdrop of the difficulties faced by Multilateralism. The broad objective of the study is to understand and analyse the economic impact of regional grouping on the trade flow of the members and nonmembers and its resultant impact on the welfare of the participating nations. The study systematically looked in to the regional integration efforts in Association of South East Asian Nations (ASEAN), a prominent RTA in emerging Asia and how it influences trade and investment flow in Asia and rest of the world.

India is one of the fastest growing economies in the world today emerging as an important driver of world growth. With rapidly growing large middle class market, large pool of cheap human resources and acquired competencies in some industries and services make India an attractive partner for trade and investment by many countries. India after initial hesitation is exploring the path of Regional Trade Agreements with many countries to improve its trade performance. India initiated 'Look East Policy' knowing well the importance of East Asia, particularly ASEAN in shaping the regional development and future growth prospects. In August 2009 India and ASEAN signed a FTA with the aim of removing tariffs by 2020 and achieving greater cooperation in trade, investment and services. In this context, the study identified the complementary sectors and commodities for enhanced trade between India and ASEAN. The possible trade effect of India- ASEAN FTA is estimated by constructing different models in the Gravity equation framework. Based on the parameters of the best fit model trade potential between India and ASEAN is calculated. As regional cooperation moves from shallow engagements to deeper integration, members experience dynamic gains from FDI, economies of scale, regionalization of production, MNC activities and productivity gains. This made the study to analyse the inflow of FDI in to ASEAN countries after the establishment of ASEAN and the lessons India can lean in the context of India-ASEAN FTA.

7.1 Summary of Findings

The study is divided in to seven chapters. The first chapter introduces the research topic and delineates the research problem to be investigated in the study. The objectives of the study, significance of the research issue, methodology used in the study, chapter scheme and limitations of the study are outlined here.

The second chapter titled 'Regional Trade Agreements – Theoretical and empirical developments' systematically reviewed the theoretical evolution and empirical advancements in the area of regional economic integration in general and RTAs in particular. A careful review of the literature has showed that there is no unanimity on the theoretical and empirical aspects of trade creation/diversion effect, specification of the empirical models and the impact of RTAs on the multilateral trade liberalization. It is important to conduct more studies using different methodologies to resolve these issues.

Also Asia is fast emerging the centre of gravity of world economic activity and ASEAN is the most dynamic RTAs in Asia. India has signed an FTA with ASEAN for trade in goods as part of the comprehensive economic cooperation. It is observed from the literature survey that not many studies have been done on the economic impact of India ASEAN Free Trade Agreement and the sectors and products affected by it. Survey of literature revealed that there are number of methodological and measurement problems encountered in the impact studies of Regional Trade Agreements. These include functional forms, considering zero bilateral trade, heteroscadasticity, fixed effect model versus random effect model, endogeniety problem and use of log form. More studies are required to address these problems and compare the results. The review of literature divulged that there is research gap in the study area and it needs to be covered with substantive studies.

The third chapter of the study titled 'Economic and Trade profile of ASEAN and India' brought out the economic structure and trade performance of ASEAN countries and India. The chapter provided broad trend in world trade in the recent past, growth of number of Regional Trade Agreements (RTAs) and their trade share, economic and trade profile of ASEAN countries and India ASEAN trade performance and trade relations. A careful study on the flow of international trade and the composition and direction of trade across regions and grouping revealed that world trade is entering to the difficult stage of recession after growing impressively for six years. Even though world trade is growing more than world output rate, the growth is not uniform across the regions. As the number of Regional Trade Agreements increased, intra regional trade account for a higher share of world trade compared to inter regional trade resulting in formation of fiercely competing trade blocs.

ASEAN is a vibrant trade bloc in Asia with lower tariffs, export orientation and trade facilitation. But there is diversity in size, population, level of development, trade liberalistion, and economic and financial stability among ASEAN members. ASEAN-6 countries are dominant players of ASEAN trade contributing majority of exports and imports. Intra regional trade share in ASEAN is increasing steadily but much smaller than EU and NAFTA and higher than Mercosur and ANDEAN. The top ten commodity group account 72.1 percent of the ASEAN export and 75.3 percent ASEAN import for the year 2006. Brunei and Cambodia export less diversified products and exports of Thailand, Singapore and Malaysia are more diversified. Cambodia and Lao PDR import small variety of products. USA, Japan, European Union (25) and China are the major trade partners of ASEAN. Tariff levels are much lower in ASEAN compared to India.

India is experiencing trade dynamism in the post 2002 period. Manufacturing sector provides maximum export and within the manufacturing sector, the four product categories namely Engineering Goods, Chemicals and related products, Gems and Jewellery and textiles and readymade garments are the major items of export. USA is India's important export partner even though its share is coming down in recent years. UAE, China, Singapore and UK are the other important countries India export its products. Petroleum, crude and products single largest item of import. China has emerged as the most important source of import for India. ASEAN India trade was growing steadily in the nineties except during East Asian crisis period. The trade between ASEAN and India grew at double digit rate in the recent years.

Chapter four, five and six form the core of the study and analysed the research objectives. Chapter 4 titled 'Trade Complementarity between India and ASEAN' constructed trade indices for India and ASEAN to measure the intensity and comparative advantage between sectors and product groups between these economies. The results showed that

India's export intensity as well as import intensity is above one for most of the years. This means India's exports and imports are intense with ASEAN countries compared with its trading pattern with rest of the world. The natural trading partner theory reveals countries tend to trade more with neighbors and close proximate partners. ASEAN's Export Intensity Index is higher than Import Intensity Index as it exports more to India compared to its imports. Country wise look at the trade intensity shows, India's export Intensity is above one for Indonesia, Malaysia, Myanmar, Singapore, Thailand and Vietnam. India's Import intensity is very low with Brunei, Cambodia, Lao PDR, Philippines, and Vietnam reflecting the small quantum of imports it is having with these countries. The intra ASEAN Trade Intensity Index is high for all the years. This means ASEAN intra regional trade is significantly higher compared with ASEAN's share in world trade.

Revealed Comparative Advantage (RCA) for major categories of commodities is constructed for India and ASEAN countries to identify the trade complementarities and similarity. Commodity wise, Agricultural Commodities in India got a high RCA and can export to Brunei, Cambodia and Singapore who have disadvantage in this product category. Food products are part of agricultural products and follow the same pattern as that of agricultural products. For Fuel and Mining products Brunei, Indonesia and Vietnam have comparative advantage and can trade with India. India's RCA for fuel is weak and can import petroleum products from Brunei, Indonesia and Vietnam who are the oil exporters of ASEAN or from Malaysia and Singapore who refine crude oil and export.

India's RCA for Manufacture is high and there is a possibility in trade with Indonesia and Vietnam who got low comparative advantage. India has large deposit of Iron ore and major exporter of Iron and Steel to other countries. All the ASEAN countries having weak comparative advantage in Iron and Steel and there is a trade complementarity between them and India. India's export of Chemical products are increasing and reveals a high comparative advantage. RCA for Chemicals is weak for Brunei, Cambodia, Indonesia, Malaysia, Philippines and Vietnam and low for Singapore and Thailand. This complementarity in trade structure gives opportunity for India to export more Chemical products to ASEAN countries. Similarly, India got high RCA in Pharmaceutical products and export them to weak RCA ASEAN countries.

With regard to Machinery and Transport equipment, India's RCA is weak and can import them from high RCA ASEAN countries such as Malaysia, Philippines and Singapore. The core competence of East Asian countries is in Office and Telecom Equipments in which the newly industrializing ASEAN countries such as Malaysia, Singapore, Philippines and Thailand have a strong comparative advantage and export large quantities to different parts of the world. For Electronic Data Processing and Office Equipment the same pattern continues with Malaysia, Philippines, Singapore and Thailand exhibiting strong comparative advantage. For Telecom, Malaysia has a strong comparative advantage whereas Indonesia, Singapore and Thailand got low RCA. For Integrated Circuits and Electronic Components, Malaysia, Philippines, Singapore and Thailand are having strong comparative advantage. ASEAN countries do not enjoy comparative advantage in Automotive sector as Japan and recently South Korea dominating the Asian market. The same is true with India and there is limited possibility of trade between India and ASEAN in Automotive sector. India has a strong comparative advantage in Textiles and got a favorable trading environment with ASEAN as most of the countries got weak comparative advantage. But with regard to clothing there is similarity in trade structure as most of the ASEAN counties have strong comparative advantage similar to India.

In order to get comparative advantage in specific products, RCA is calculated for HS-2 level classification. Of the 24 agriculture related HS-2 digits commodities, 9 categories showed trade complementarity between India and ASEAN. These include Edible vegetables and certain roots(HS-07),Edible fruit and nuts; peel of citr (HS-08), Prod.mill.indust; malt; starches (HS-11); Oil seed, oleagi fruits; miscall gr(HS-12), Animal/veg fats & oils & their clea (HS-15), Prep of meat, fish or crustaceans(HS-16),Residues & waste from the food indu (HS-23) and Tobacco and manufactured tobacco (HS-24). The highest RCA for India in agricultural products is in Vegetable plaiting materials; veg (HS14) and Coffee, tea, matï and spices (HS-09) and for ASEAN is Animal/veg fats & oils & their clea (HS15) and Prep of meat, fish or crustaceans (HS-16). The highest absolute difference in RCA is for Vegetable plaiting materials; veget (HS-14) and Coffee, tea, matï and spices (HS-09).

For Chemical products the trade complementarity is present in Salt; sulphur; earth &ston; plaste (HS-25), Ores, slag and ash (HS-26), Mineral fuels, oils & product (HS-27), Tanning/dyeing extract; tannins (HS-32) and Explosives; pyrotechnic prod; match (HS-36). For other manufactured products, the complementarity is present in Rubber and articles thereof (HS-40), Raw hides and skins (HS-43) and Articles of leather; saddlery/harne (HS-43). India's strong comparative advantage in Textiles and related products include Silk (HS-50), Cotton (HS-52), Other vegetable textile fibres; pap (HS-53), Man-made filaments (HS-54), Carpets and other textile floor co (HS-57)Art of apparel & clothing access(HS-61), Art of apparel & clothing access (HS-62). India enjoys comparative advantage in many mineral products compared to ASEAN countries. These include Iron and steel (HS-72) Articles of iron or steel (HS-73), Copper and articles thereof (HS-74) and Zinc and articles thereof (HS-79) in which India got high RCA against ASEAN. ASEAN has strong RCA for Electrical machinery, equipments, parts thereof (HS-85) and high RCA for Nuclear reactors, boilers, machinery (HS-84) against India and export lot of items to India.

In order to get trade complementarity at a more disaggregate level, RCA is calculated for HS-4 level of classification. The top five highest RCA for India in the HS-4 digits are Glass inners for vacuum flasks , Cooking or heating apparatus, Oil-cake and other solid residues, Keyboard pipe organs; harmoniums and other organic compounds. The top five highest RCA for Malaysia in the HS-4 digits are Accordions and similar instruments, Felt hats and other felt headgear, Palm oil and its fractions, Vegetable materials of a kind used and Articles of apparel and clothing. The top five highest RCA for Philippines in the HS-4 digits are Natural sponges of animal origin, Photocopying apparatus incorporatin, Coconut (copra), palm kernel or baby dolls representing only human being and Tin plates, sheets and strip. The top five highest RCA for Singapore in the HS-4 digits are Oxygen-function amino-compounds, Glands and other organs for organo, Light-vessels, fire-floats, dredger, Prepared unrecorded media for sound and Bituminous mixtures. The top five highest RCA for Thailand in the HS-4 digits are Natural rubber, balata, gutta-perch, Manioc, arrowroot, salep, Jerusalem, Vulcanised rubber thread and cord, Rice and Unused postage, revenue or similar.

Chapter-5 is titled as 'Trade Creation and Trade Potential between ASEAN and India: A Gravity Model Analysis'. The Gravity Model framework was used to measure the trade creation/diversion in ASEAN and the trade potential between India and ASEAN. Three Models namely Basic Model, Augmented Model and Extended Model were used in the study. Each Model has two variations with Model-1 using GDP as economic mass variable where as Model-2 used Population as economic mass variable. Each model used five different estimation methods namely Pooled OLS Method, Maximum Likelihood Estimation Method (MLE), Fixed Effect with Vector Decomposition (FEVD), Between Effect Model (BE) and Random Effect Method (RE).

Comparison of results of Model-1 and Model-2 in all three categories showed that, Population data is better representing the economic mass and due to which Per capita income is getting better coefficients in all models. Results of Pooled OLS Model returning parameters with expected signs and highly significant coefficients. But it is not accounting the individual characteristics of countries which are very important in determining bilateral trade flows. The results of BE method are closer to Pooled OLS method and MLE results are closer to Random Effects Method.

In Random effects model also, important parameters are significant and holding expected signs with a positive ASEAN dummy. But there is possibility of explanatory variables correlated to individual specific effects and the random effect model then becomes inefficient. The Hausman Taylor Estimation method employed to overcome endogeneity problem did not yield better results.

Comparison of results across the models revealed that the augmented Gravity Model-2 is best suited for the study with better parameters, signs and explanatory power. The Hausman Specification test carried out also validate this. Also the coefficient of ASEAN dummy is positive and highly significant with highest value in this model.

India's trade potential is calculated using Augmented Model-2. India's trade potential with Indonesia is already exploited and the actual trade exceeds potential trade in the recent years. India's actual trade with Malaysia and Thailand exceeded the potential trade for the year 2006 and 2007. But India has unmet trade potential with Philippines and Singapore. The trade potential is highest with Philippines. India's export potential is positive with ASEAN countries except Indonesia. The highest export potential is with Singapore followed by Malaysia, Philippines and Thailand.

Speed of Convergence method takes in to account dynamic structure of the data in the estimation of trade potential and an improvement over point estimation method. India is having trade convergence with Philippines as actual trade is growing faster than potential trade. The other countries such as Indonesia, Malaysia, Singapore and Thailand, the potential trade is growing rapidly compared to actual trade and there is trade divergence. With regard to exports, except Indonesia there is speed of converge between India and ASEAN-5. On the imports side there is speed of convergence with Philippines and others are showing divergence.

The study carried out a partial equilibrium simulation exercise using WITS database and software. Simulation results showed that complete elimination of tariffs by India (100 percent cut) on account of and India-ASEAN FTA, the biggest gains in terms of exports will be achieved by Indonesia, followed by Malaysia, Singapore and Thailand. In percent terms, the highest export gains will be achieved by Vietnam (86.52 percent), Philippines (70.75 percent), Thailand (60.36 percent) and Lao PDR (42.43 percent).

India's imports from ASEAN countries will increase as a result of tariff cut done as a part of RTA (4.075 billion US dollars) and there will be decrease in tariff collection to the tune of 3.228 billion US dollars. A reduction in tariff increases the consumer welfare and the total consumer surplus out of tariff cut was to the tune of 756.206 million. The total trade creation of India- ASEAN FTA is 4.075 billion US dollars and the total trade diversion is 0.1 million. The very little trade diversion (0.1 million) and a substantial trade creation makes the RTA mutually beneficial and economically viable. The tariff rate cut makes the simple customs duty to decline to 12.52 percent.

The sixth chapter titled 'Impact of RTA on FDI inflow: A case of ASEAN-5 and its implications on India' studied the FDI implications of ASEAN regional cooperation. Study found that after the establishment of ASEAN FTA there is a steady increase in FDI inflow in to ASEAN from rest of the world except during East Asia Crisis period. A country wise comparison of FDI inflow showed Singapore is the major recipient of FDI from the rest of the world for the period 1995 to 2007, Malaysia, Thailand and Indonesia are the other ASEAN countries receiving noticeable FDI inflow. The less developed members of ASEAN namely Brunei, Cambodia, Laos and Myanmar had negligible share in FDI inflows and their share remained stagnant for the said period. Japan, USA, UK and Netherlands are the important source of FDI for ASEAN. The share of Intra regional FDI share is increasing and became second important source of FDI after Japan. Thailand, Malaysia Singapore and Indonesia are the major recipients of Intra regional FDI inflow from ASEAN. Nearly three-forth of the intra ASEAN FDI is coming from Singapore and acting as a major driver of economic development in the ASEAN region.

A Gravity Model approach is used to model FDI inflow in to ASEAN countries. Three different Models namely Basic Model, Augmented Model-1 and Augmented Model-2 were used for the study. Estimation techniques such as Pooled Ordinary Least Squares (POLS), Fixed Effect with Vector Decomposition (FEVD) and Random Effects Model were employed on above three models.

The results of the pooled OLS method showed that all variables except host GDP are significant at 5 percent significance level. The coefficient of RTA dummy is positive and significant at 1 percent level of significance. FDI inflows in to a country also depends the infrastructural, institutional and tax structure of the economy. In Basic Model, ASEAN dummy is significant only in Pooled OLS and Fixed Effect but not significant in and Random Effect Method. But coefficient of distance got positive sign in Fixed Effect. In Augmented Model-1, coefficients and signs of important parameters are on expected lines. In Augmented Model-2, ASEAN dummy is significant but negatively signed.

Among the alternate models developed in the study, Augmented model-1 yields better parameters and signs for the explanatory variables. Fixed Effect with Vector Decomposition (FEVD) proved to be better method of estimation compared to other methods with better parameters and established relationships. Hausman Specification test validates this. A positive and highly significant ASEAN dummy emphasized that ASEAN regional integration positively influenced FDI inflow in to the region. Based on the results, we can construe that India-ASEAN FTA can help in attracting more FDI in to India.

7.2 **Conclusion**

Based on the various findings outlined above, the study makes certain valid conclusions as follows.

Firstly, emergence of Regional integration has become the most important trade development in the recent past with large number of regional, bilateral and trilateral agreements. The ASEAN regional integration has succeeded in improving trade performance of ASEAN countries. The simultaneous engagement of regionalism and multilateral trade liberalization by ASEAN did not adversely affect multilateral trading environment. India is one of the highest tariff country in the world and trade liberalistion and tariff reduction through FTA will do more good to the world trade than otherwise.

Secondly, inferences from the trade indices computed for understanding the trade structure between India and ASEAN revealed that there are complementary sectors and products available for enhancing trade cooperation between the trading partners. ASEAN countries are in different stages of economic development and India can have trade cooperation with some of them in all product categories. While India can export food grains to small and developed countries of ASEAN, it can import edible and other agricultural products from other ASEAN countries. India enjoy advantage in minerals whereas they can import crude oil from ASEAN. India had advantage in some manufactured items like chemicals, Iron and Steel, Jems and Jewellery and can export them to many ASEAN countries. ASEAN has comparative advantage in Electrical and Electronic components and India can import them from ASEAN. With regard to Textiles and Clothing there is intense competition between ASEAN and India to increase market share. Reduction of tariffs will have a short term impact on India's exports but can consolidate in the medium term through productivity gains and efficiency.

Thirdly, implementation of Free Trade Agreement between India and ASEAN can create trade between the countries. This is demonstrated in the Gravity model used in the study. There is positive and highly significant coefficient for ASEAN dummy which clearly shows a positive influence of the FTA on bilateral trade. The result is reiterated in the simulation exercise. The simulation result showed that there is a significant trade creation, negligible trade diversion and a considerable improvement in welfare for the people through consumer surplus.

Fourthly, the study showed that there is unmet trade potential existing between India and ASEAN countries. India has unmet trade potential with Philippines and Singapore, export potential with Malaysia, Philippines, Thailand and Singapore and import potential with Philippines, Singapore and Thailand. India is having trade convergence with Philippines as actual trade is growing faster than potential trade. The other countries such as Indonesia, Malaysia, Singapore and Thailand, the potential trade is growing rapidly compared to actual trade and there is trade divergence.

Fifthly, based on the results obtained in the study, Regional Economic Integration positively influences the FDI flow in to the country. There is a steady increase in FDI inflow in to ASEAN except during the period of East Asian Crisis. Gravity model used in the analysis is also substantiating this point. Traditional Gravity variables such as GDP, PCI, Distance and RTA dummy along with Institutional, Infrastructural and Policy enabling variables are influencing FDI flow in to a RTA member country. India can learn lessons from this as it strives to attract FDI for its economic development. India's GDP and PCI income is growing rapidly these years and east Asia is closer to it geographically. A FTA with necessary reforms in Institutional and policy environment can attract large FDI flow in to the country.

Sixthly, regionalism is here to stay and countries need to know how to cope with it. Regionalism offers certain advantages which multilateralism cannot offer. These include low transaction cost, deeper integration, option to choose partners, tailor made agreements to give large scale benefit to partners and strategic and geo political advantage. Also the clout generated out of regionalism can be used for further multilateral negotiations. Asia is emerging as a third axis of global economic power centre after EU and NAFTA. ASEAN is the center of Asian regional consolidation. ASEAN plus agreements and resultant Asian Economic Community are steps in this direction. Through India-ASEAN FTA, India can integrate with the ASEAN economies which can give long term gains in competency, efficiency and productivity.

7.3 Implications of the study

The study has far reaching implications, not only to the policy makers in India but the policy makers of ASEAN countries and the world at large. India is coming out of the protected economic environment and engagement with ASEAN can gives important lessons for its economic restructuring. ASEAN has developed competencies in many fields and India can benefit out of it. To integrate with ASEAN market effectively India need to reform its economic, institutional and infrastructural bottlenecks. ASEAN also gains from India's size and human resources. No big international player can ignore in the decades to come. A resurgent Asia with ASEAN, India and China will affect the world output growth and the global demand and supply of commodities. The study based on the analysis highlighted the importance of having greater cooperation between India and ASEAN.

Regional Trade agreements are a reality in the post WTO trade regime as it provides certain advantages to the members. Experiences from regional trade liberalization can offer important lessons to WTO on certain difficult negotiating issues. The results from the study show ASEAN created trade after initiating regional integration measures. This implies prospective members of can enhance trade potential by forging a RTA. The study revealed both India and ASEAN can gain from RTA as there are complementarity sectors between them. Also there are problematic areas with India's trade structure resembling that of less developed economics of ASEAN such as Vietnam, Cambodia, Myanmar and Laos. There are some sectors and product groups such as agricultural commodities and textiles that will be affected by clash of interest. ASEAN may gain more than India immediately from the agreement, as their MFN tariff rates are much smaller than India and comparable to the developed world. India can gain in the medium and long run period with service sector, labour intensive sector and high skilled engineering sector contributing more to the trade with increase in FDI flow and transfer of technology. Also integrating with ASEAN helps India to harmonise its policies with East Asian partners that is necessary for a broad Asian Economic Community. Forging strategic and critical FTAs along with broad liberalization can reduce any adverse impact of regionalism. India requires large FDI to unleash its economic potential. East Asian countries and China demonstrated to the world that right mix policies could attract large FDI flows. The study shows forging FTA with key partners can increase FDI flow in a country.

7.4 Suggestions

i. India – ASEAN FTA should be implemented in a staggered manner to reduce adverse effects on India's agricultural sector.

ii. The negative list should reflect the Indian reality and great attention should be given in finalizing the list particularly the Agricultural sector as it can affect the livelihood of millions of population.

iii. Negotiations should start immediately on Service sector, FDI and other important areas where India got maximum potential.

iv. Well chalked out domestic reform in Infrastructural, Institutional and Policy environment to give efficiency and competency to Indian exporters.

v. Trade facilitation measures to reduce transaction costs of Indian exporters.

vi. A rehabilitation and restructuring program for the affected sections of the population due to India- ASEAN FTA.

vii. Creating Standards and Quality for products and services which are compatible to ASEAN market and easy accessibility of information about the market for fully exploring the ASEAN market.

viii. India should engage broader multilateral trade liberalization along with Free Trade Agreements to minimize adverse impacts of RTA.

ix. India should take active leadership in regional affairs which is important for gainful outcomes at multilateral negotiations.

7.5 Limitations and scope for further research

The study has its share of limitations which are beyond the control of the researcher. The study mainly relied on the gravity framework of analysis and the other prominent method namely Computable General Equilibrium method is not attempted for want of data and software. Also non linear regressions models are not attempted in the study. The study did not consider the new age provisions of RTAs which include imperfect market structure, scale economy and intra industry trade. The study considered only five original members of ASEAN and the new members who have joined at later periods are excluded from the analysis for lack of complete information. Existing bilateral trade agreements are also not considered in assessing the impact of India- ASEAN RTA. Also truncated models were not used to consider zero values in the FDI model. There is scope for further research using Computable General Equilibrium models, non-linear regression models and more comprehensive study considering the 'new age provisions' of RTA.

REFERENCES

REFERENCES

Agostino, Maria Rosaria; Francesco Aiello and Paola Cardamone (2007), 'Analysing the Impact of Trade Preferences in Gravity Models: Does Aggregation Matter?' Working Paper 07/4, TradeAG, Agricultural Trade Agreements. Available at www.tradeag.eu

Albertin, Giorgia (2008), 'Regionalism or Multilateralism? A Political Economy Choice', *IMF Working Paper*, WP/08/65, March 2008

Alfaro, Laura (2003), 'Foreign Direct Investment and Growth: Does the Sector Matter?' Harvard Business School, April 2003

Alfaro, Laura; Chanda, Areendam; Kalemli-Ozcan, Sebnem and Sayek, Selin (2006), 'How Does Foreign Direct Investment Promote Economic Growth? Exploring the Effects of Financial Markets on Linkages', paper circulated under the title "FDI Spillovers, Financial Markets and Economic Development." June 2006.

Alho, Kari E.O. (2005), 'A Gravity Model Under Monopolistic Competition', European Network of Economic Policy Research Institutes, Working Paper No. 33/March 2005.

Aminian, Nathalie; K.C. Fung and Hitomi Iizaka (2007), 'Foreign Direct Investment, Intra-Regional Trade and Production Sharing in East Asia', *RIETI Discussion Paper* Series 07-E-064

Amjadi, A., and L.A. Winters. (1997), 'Transport costs and "natural" integration in Mercosur'. Policy Research Working Paper, 1742, International Trade Division, The World Bank. Washington, D.C.

Andriamananjara, Soamiely (2003), 'On the Relationship Between Preferential Trade Agreements and the Multilateral Trading System', US International Trade Commission, April 2003.

Anghel, B. (2005). 'Do Institutions Affect Foreign Direct Investment?' Universidad Autónoma de Barcelona, mimeo (October 2005).

Arellano M. and S. Bond (1991) 'Some Tests of Specification for Panel Data: Monet Carlo Evidence and a Application to Employment Equations', *Review of Economic Studies*, 58, 277-297.

ASEAN Secretariat, ASEAN Statistical Yearbook, 2006

ASEAN Secretariat, ASEAN Investment Report, 2006.

Asher, M.G. (2006), 'Case for a Robust India- Taiwan Economic Partnership', Policy Briefs No.25, New Delhi: Research and Information Systems (RIS).

Asher, M.G. and Sen, R (2005), 'India-East Asia Integration: A Win-Win for Asia', *Economic and Political Weekly*, 60, 36, pp.3932-3941.

Baier S.L. and Berstrand J.H. (2002) 'On the endogeneity of international trade flows and free trade agreements'. Paper presented at the Midwest International Economics Conference, Northwestern University, Evanston, Illinois, May 3-5, 2002.

Baier, Bergstrand (2005). 'Do Free Trade Agreements Actually Increase Members'International Trade?' Federal Reserve Bank of Atlanta, WP 2005-3.

Bair, Scottt.L, Bergstrand, Jeffery H., Egger, Peter and McLaughlin, Patrick A. (2008), 'Do Economic Integration Agreements Actually Work? Issues in Understanding the Causes and Consequences of the Growth of Regionalism', *The World Economy*, 2008, pp.461-497

Balassa, B. (1962), The theory of economic integration. London: George Allen and Unwin.

Balasubramanyam, V.N and Mahambare, Vidya (2003) 'Foreign Direct Investment in India', Lancaster University Management School, Working Paper, 2003/001

Baldwin, Richard (1993). 'A domino theory of regionalism,' CEPR Discussion Paper 857; NBER Working Paper, 4465.

Baldwin, Richard. 2006. Baldwin, R. (2006) 'Multilateralising Regionalism: Spaghetti Bowls as Building Blocs on the Path to Global Free Trade', *The World Economy*, Volume 29, Issue 11.

Baldwin (2008), 'Big-Think Regionalism: A Critical Survey', NBER Working Paper Series No.14056, June

Baldwin, R and F.Robert-Nicoud (2005), 'Juggernaut Model-Lego Version', (Mimeo GIIS)

Baldwin, R. and Taglioni, D. (2006). 'Gravity for Dummies and Dummies for Gravity Equations', NBER Working Paper No. W12516.

Baldwin, R.E. (1997) 'The Causes of Regionalism' *The World Economy*, Vol. 20, No. 7, pp. 865-888.

Baltagi, B. H. (2005), 'Econometric Analysis of Panel Data' (3d. ed.) Chichester, UK: John Wiley and Sons.

Baltagi, Badi, H; Egger,Peter and Pfaffermayr, Michael (2005), 'Estimating Regional Trade Agreement Effects on FDI in an Interdependent World', Center for Policy Research, October 2005.

Batra, Amita, (2004), 'India's Global Export potential: The Gravity Model Approach', Working Paper No. 151, ICRIER, New Delhi.

Bchir, Mohamed Hedi and Fouquin, Michel (2006), 'Economic Integration in Asia: Bilateral Free Trade Agereements Versus Asian Single Market', CEPII No. 2006 – 15.

Bénassy-Quéré,Agnes; Coupet, Maylis and Mayer, Thierry (2007), 'Institutional Determinants of Foreign Direct Investment', CEPII, No. 2005-05, April.

Benedictis, Luca De and Vicarelli, Claudio (2004), 'Trade Potentials in Gravity Panel Data Models', ISTITUTO DI STUDI E ANALISI ECONOMICA, Working paper No. 44, May 2004

Bergsten, C. Fred. 1997. 'Open Regionalism'. *The World Economy* 20(5): 545-565.

Beers, Cees van (2000), 'Is the Gravity Model a Flawed Instrument in Measuring Economic Integration Effects', Department of Economics, Delft University of Technology, Delft, The Netherlands.

Bhagwati (1992), 'Regionalism versus Multilateralism', *The World Economy* 15(5): 535-556

Bhagwati, Jagdish. 1993. Regionalism and Multilateralism. In Jaime de Melo and Arvind Panagariya (eds.) 'New Dimensions in Regional Integration', Cambridge: Cambridge University Press.

Bhagwati and Panagaria (1996), Bhagwati, J., and A. Panagariya, eds. 1996. 'The Economics of Preferential Trade Agreements', Washington, DC: American Enterprise Institute Press.

Bhagwati, Jagdish and Arvind Panagaria. (1996), 'The Theory of Preferential Trade Agreements: Historical evolution and Current Trends'. *American Economic Review*, 86:2, PP. 82-87.

Bhattacharya, Swapan K. And Bhattacharyay, Biswa N. (2006), 'Prospects Of Regional Cooperation In Trade, Investment And Finance In Asia: An Empirical Analysis on Bimstec Countries And Japan', Cesifo Working Paper No. 1725, May 2006.

Bhattacharya, Swapan K. (2004), 'Does Bangladesh Benefit from Preferential Trade with India? A Gravity Analysis', *Economic and Political Weekly*, November 27, 2004.

Bhattacharya, Swapan. K.and Bhattacharyay, Biswa N. (2007), Gains and Losses of India-China Trade Cooperation – A Gravity Model Impact Analysis, Cesifo Working Paper No. 1970, April 2007

Bhattacharyya, Ranajoy and Banerjee, Tathagata (2006), 'Does the Gravity Model Explain India's Direction of Trade'? A Panel Data Approach, Indian Institute of Management, Ahmedabad, W.P. No.2006-09-01, September 2006

Bird, Graham and Rajan, Ramkishen S. (2002), 'The Political Economy of a Trade-First Approach to Regionalism', Visiting Researchers Series No. 2(2002), Institute of Southeast Asian Studies, 2002.

Blomström, M. and A. Kokko (2003), Blomström, Magnus and Ari Kokko (1997) 'Regional Integration and Foreign Direct Investment: A Conceptual Framework and Three Cases', Policy Research Working Paper 1750, World Bank, Washington, D.C.

BOAO Forum for Asia, Annual Report 2007: 'Economic Integration in Asia', Beijing: Boao Forum for Asia.

Borchert, Ingo (2008), 'Trade Diversion under Selective Preferential Market Access', Policy Research Working Paper 4710, The World Bank, 2008

Borenzstein, E., J. De Gregorio, and J.W. Lee, 1995, 'How Does Foreign Direct Investment Affect Economic Growth?' NBER Working Paper No 5057.

Brada, J. and Mendez, J. (1988), 'Exchange Rate Risk, Exchange Rate Regime and the Volume of International Trade', *Kyklos*, 41 pp. 263-280.

Brenton, P., L. Di Mauro, L .Francesca and M. Lucke (1999), 'Economic Integration and FDI: An Empirical Analysis of Foreign Investment in the EU and in Central and Eastern Europe', *Empirica*, Vol. 26, No. 2, pp. 92–121.

Brown, Drusilla K; Deardorff, Alan V and Stern, Robert M (2000), 'CGE Modeling and Analysis of Multilateral and Regional Negotiating Options', Paper presented in the conference, "Issues and Options for the Multilateral, Regional and Bilateral Trade Policies of the United States and Japan" University of Michigan, October 2000.

Bun M.J.G., Klaassen F. J.G.M. (2002), 'The Importance of Dynamics in Panel Gravity Models of Trade'. Unpublished, University of Amsterdam.

Burfisher, M.E., S. Robinson, and K. Thierfelder (2003) 'Regionalism: Old and New, Theory and Practice' Paper presented to The International Agricultural Trade Research Consortium (IATRC) Conference, Capri, Italy.

Cabalu, Helen and Alfonso, Cristina (2007), 'Does AFTA Create or Divert Trade?', *Global Economy Journal*, Volume 7, Issue 4, The Berkeley Electronic Press, 2007

Caldentey, Esteban Perez and Ali, Anesa (2006), 'Regional Trade Agreements: The Mainstream Approach and an Alternative Treatment', Eastern Economic Association, Annual Meetings, February 2006.

Caporale, Guglielmo Maria; Rault, Christophe, Sova, Robert and Sova, Anamaria (2008), 'On the Bilateral Trade Effects of Free Trade Agreements between the EU-15 and the CEEC-4 Countries', IZA Discussion Paper No. 3782, October 2008.

Cardamone, P. (2007), 'A Survey of the Assessments of the Effectiveness of Preferential Trade Agreements Using Gravity Models.' TradeAG Working Paper 07/09. European Commission

Carkovic, M and R.Levine (2002), 'Does Foreign Direct Investment Accelerate Economic Growth', University of Minnesota, Working Paper.

Carrere, C. (2003), 'Revisiting the Effects of Regional Trading Agreements on Trade Flows with Proper Specification of the Gravity Model,' CERDI, 2003.10.

Carrere, Celine and Schiff, Maurice (2004), 'On the Geography of Trade: Distance is Alive and Well', Policy Research Working Paper Series, 2306, The World Bank.

Carrillo, Carlos and Carmen A Li (2002) 'Trade Blocks and the Gravity Model: Evidence from Latin American Countries', University of Essex, UK.

Chaisrisawatsuk, Santi and and Chaisrisawatsuk, Wisit, (2007), 'Imports, Exports and Foreign Direct Investment Interactions and Their Effects', Asia-Pacific Research and Training Network on Trade Working Paper Series, No 45, October 2007

Chowdhury, Abdur and Mavrotas George (2006), 'FDI and Growth: What Causes What?' UNU, 2006

Centred ' Etudes Prospectives etd ' Informations Internationales (CEPII) (2007), 'Economic Integration in East Asia', No 265 _ March 2007.

Cernat L. (2001), 'Assessing Regional Trade Arrangements: Are South-South Rtas More Trade Diverting?' Policy Issues in International Trade and Commodities Study Series No. 16, United Nations Conference on Trade and Development

Chang, W and L.A.Winters (2002), 'How Regional Blocs Affect Excluded Countries: The Price Effects of Mercosur', *American Economic Review*, Vo.92, No.4, pp.889-904

Cheng and Wall (2005) Cheng, I., and H. Wall (2005), 'Controlling for Heterogeneity in Gravity Models of Trade and Integration', Federal Reserve Bank of St. Louis Review, vol. 87, pp. 49-63.

Cheng, I-Hui and Ying-Yi Tsai, (2005), 'Estimating the Staged Effects of Regional Economic Integration on Trade Volumes', National University of Kaohsiung, July 2005.

Cheong, David (2008), 'The Effect of AFTA: A Disaggregated Analysis', John Hopkins University, SAIS Bologna Center, August, 2008.

Cheow, Eric Teo Chu (2005), 'Strategic Relevance of Asian Economic Integration', *Economic and Political Weekly*, September, 2005.

Cipollina, Maria and Salvatici, Luca (2006), 'Reciprocal trade agreements in gravity models: a meta-analysis', TradeAG, Agricultural Trade Agreements, Working Paper 06/12.

Clarete R., Edmonds C., Wallack J.S. (2003) 'Asian regionalism and its effects on trade in the 1980s and 1990s'. *Journal of Asian Economics*, Vol. 14, pp. 91-129.

Coe, David T.,Elhanan Helpman, and Alexander W. Hoffmaister (1997), 'North –South R&D Spillovers', *Economic Journal*, 107: 134-149.

Coulibaly, Souleymane (2007), 'Evaluating the Trade Effect of Developing Regional Trade Agreements: A Semi-Parametric Approach', World Bank Policy Research Working Paper 4220, May 2007.

Coulibaly, S. (2004), 'On the Assessment of Trade Creation and Trade Diversion Effects of Developing RTAs,' Paper Presented at the Annual Meeting 2005 of the Swiss Society of Economics and Statistics on "Resource Economics, Technology, and Sustainable Development".
Available at http://www.wif.ethz.ch/resec/sgvs/078.pdf)

Crawford and Laird (2001) Crawford, J-A and S. Laird (2001) 'Regional Trade Agreements and the WTO', *North American Journal of Economics and Finance*, Vol. 12, pp. 193-211.

Cruz, Moritz (2008), 'Can Free Trade Guarantee Gains from Trade?', Research Paper No. 2008/97 UNU-WIDER 2008.

Cuadros, A., V. Orts and M.T. Alguacil (2001), 'Openness and Growth: Re-Examining Foreign Direct Investment, Trade and Output Linkages in Latin America', CREDIT Research Paper, No. 01/04, University of Nottingham

Damuri, Yose Rizal; Atje, Raymond and Gaduh, Arya B (2006), 'Integration and Trade Specialization in East Asia', CSIS Working Paper Series, WPE 094

Daude, C. and E. Stein (2004). 'The Quality of Institutions and Foreign Direct Investment,' mimeo, University of Maryland (February).

Daude, Christian; Yeyati, Eduardo Levy and Stein, Ernesto, (2005), 'Regional Integration and the Location of Foreign Direct Investment', Paper presented at 2001 LACEA Regional Integration conference.

Davies, Ronald B. ; Ionascu, Delia and Kristjánsdóttir, Helga(2007) , 'Estimating the Impact of Time-Invariant Variables on FDI with Fixed Effects', University of Oregon, Eugene, May 2007

Dee, Philippa and Jyothi Gali. 2003. 'The Trade and Investment Effects of Preferential Trading Arrangements,' NBER Working Paper Series 10160, NBER.

de Groot, Henri L.F., Gert-Jan Liners, Piet Rictveld and Uma Subramanian (2004), 'The Institutional Determinants of Bilateral Trade Patterns', *Kyklos*, Blackwell Publishing, Vol.57 (1) pp.103-123.

De Rosa, Dean A. (1998), 'Regional Integration Arrangements: Static Economic Theory, Quantitative Findings, and Policy Guidelines'. Background Paper for the Research Report entitled Regionalism and Development, World Bank Policy Research Report, Washington D.C.

Dee, P (2007), 'East Asian Economic Integration and Its Impact on Future Growth', *The World Economy*, 30, 3, 405-423.

Dee P. and J. Gali (2003) 'The Trade and Investment Effects of Preferential Trading Agreements' NBER Working Paper No. 10160.

Dennis, David J. and Yusof, Zainal Aznam (2003), 'Developing Indicators of ASEAN Integration- A Preliminary Survey for a Roadmap', REPSF, Project 02/001, Final Report August 2003

Desker, B (2004), 'In Defence of FTAs: from Purity to Pragmatism in East Asia', *The Pacific Review*, Vol.17, No 1, March pp. 3-26.

di Giovanni, J. (2005). 'What Drives Capital Flows? The Case of Cross-border Activity and Financial Deepening,' *Journal of International Economics*, 65, pp.127-149.

Economist Intelligence Unit (2007), 'Trading up: A new export landscape for ASEAN and Asia', An Economist Intelligence Unit briefing paper, Sponsored by DHL Asia-Pacific.

Eden, Lorraine (2007), 'Multinationals, Foreign Direct Investment and the New Regionalism in the Americas', Paper Presented at the Third IDB/CEPII Conference "The New Regionalism- Progress, Setbacks and Challenges", Inter American Development Bank, Washington DC. February 9-10, 2006.

Egger P. (2000) 'A Note on the Proper Econometric Specification of the Gravity Equation'. *Economic Letters*, 66, pp.25-31.

Egger, P. (2002), 'An Econometric View on the Estimation of Gravity Models and the Calculation of Trade Potentials', *The World Economy* 25 (2): 297 – 312.

Eichengreen, B. and D. Irwin (1995). 'Trade Blocs, Currency Blocs and the Reorientation of Trade in the 1930s,' *Journal of International Economics*, 38, pp.1-24.

Estevadeordal, Freund and Ornelas (2005) Estevadeordal, A., Freund, C. & Ornelas, E. (2006), 'Do Regional Trade Agreements Promote External Trade Liberalization?' Evidence from Latin America, Working Paper.
Found at http://professores.ibmecrj.br/erg/wkshops/papers/20060922.pdf

Ethier, Wilfred J.(1998), 'The New Regionalism'. *The Economic Journal*, 108: pp. 1149-1161.

Florence Jaumotte (2004), 'Foreign Direct Investment and Regional Trade Agreements: The Market Size Effect Revisited', International Monetary Fund WP/04/206, 2004

Foroutan, F. (1998) 'Does Membership in a Regional Preferential Trade Arrangement Make a Country More or Less Protectionist?' Working Paper No. 1898, World Bank, Washington, D.C.

Feridhanusetyawan, Tubagus. (2005), 'Preferential Trade Agreements in the Asia-Pacific Region', IMF Working Paper WP/05/149 (July), International Monetary Fund, Washington, DC.

Fernández, Raguel (1997), 'Returns to Regionalism: An Evaluation of Non Traditional Gains from Regional Trade Agreements', Paper Presented at the World Bank's International Trade Division Program on Regionalism and Development, WP 1816.

Fiorentino, R.V., L.Verdeja and C. Toqueboeuf (2006), 'The Changing Landscape of Regional Trade Agreements:2006 Update', WTO Discussion Paper 12.

Fonseca, Renato; Azevedo, Marcelo S. and Velloso, Edson, (2005), 'Trade Potential Between Brazil and India An examination based on comparative advantage structures', CNI – National Confederation of Industry / Brazil, July 2005

Frankel, J.A., ed. (1997) Regionalization of the world economy. Chicago: University of Chicago Press.

Frankel, J. A. and Romer, D. (1999) 'Does Trade Cause Growth?' *American Economic Review* 89, 3: 379-399.

Fratianni, Michele and Oh, Chang Hoon (2007), 'On the Relationship Between RTA Expansion and Openness', Indiana University, Kelley School of Business, Bloomington, June 2007.

Freund, C. (2000), 'Different Paths to Free Trade: The Gains from Regionalism', *Quarterly Journal of Economics*, 115, 4, 1317–41.

Freund, C.L and J. McLaren (1999), 'On the Dynamics of Trade Diversion: Evidence from Four Trade Blocs', International Finance Working Paper No.637, June 1999.

Fukase, Emiko and Winters, Alan L. (2003), 'Possible Dynamic Effects of AFTA for the New Member Countries', *The World Economy*, 2003.

Gander, James P., Reynolds, Steve and Fowles, Richard (2009), 'FDI Flow Volatility and ASEAN Members: An Exploratory Approach', Department of Economics Working Paper No: 2009-06, University of Utah.

Gavin, Brigid (2006), 'Regional Trade Agreements in Asia-Implications for the Multilateral Trade System', UNU-CRIS Occasional Papers, 0-2006/28

Gilbert, J., Scollay R. and Bora, B (2001), 'Assessing Regional Trading Arrangements in the Asia –Pacific, Policy Issues in International Trade and Commodities Services', No.15, UNCTAD.

Globerman, Steven, (2002), 'Trade, FDI and Regional Economic Integration: Cases Of North America And Europe', Paper presented at a conference entitled "Enhancing Investment Cooperation in Northeast Asia", Honolulu, Hawaii, August 7-9, 2002.

Go`rg, H, and D. Greenaway (2002), 'Is there a potential for increases in FDI for Central and Eastern European countries following EU accession', GEP Research paper 2002//31.

Grossman, Gene and Helpman, Elhanan (1994), 'Protection for Sale', *American Economic Review*, September 1994, 84(4), pp.833-50.

Grossman, Gene and Helpman, Elhanan (1995) 'The Politics of Free Trade Agreements', *The American Economic Review*, Vol. 85, No. 4, pp. 667-690.

Guangsheng (2006), 'Assessment on Performance of ASEAN Economic Integration', *International Review*, Autumn 2006, Volume 44

Gupta, A and M. Schiff (1997), 'Outsiders and Regional Trade Agreements Among Small Countries: The Case of Regional markets', Policy Research Working Paper Series 1847. World Bank, November.

Hansen, Henrik and Rand, John (2004), 'On the Causal Links between FDI and Growth in Developing Countries', December 2004

Haveman, Jon D; Lei, Vivian and Janet Netz, (2001), 'International Integration and Growth: A Survey of Empirical Investigation', *Review of Development Economics*, 5(2) pp.289-311

Hapsari, Indira and Mangunsong, Carlos (2006), 'Determinants of AFTA Members' Trade Flows and Potential for Trade Diversion', ARTNeT Working Paper Series, No. 21, November 2006

Harmsen, R. and M. Leidy (1995), 'Regional Trading Arrangements', Chapter VI in International trade Policies: Volume II: "The Uruguay Round and Beyond", Background Papers. Edited by N. Kirmani, N. Calika, R. Harmsen, M. Leidy, A. Subramanian, and P. Uimonen. Series: World Economic and Financial Surveys. International Monetary Fund, Washington, D.C.

Harrigan, James (1994), 'Scale Economies and Volume of Trade', *The Review of Economics and Statistics*, Vol.76, No.2, (May 1994), pp.321-328.

Harris, Mark N and Matyas, Laszlo (1998), 'The Econometrics of Gravity Models', Melbourne Institute Working Paper No. 5/98, February 1998.

Hasebe, Yuichi and Shrestha, Nagendra (2006), 'Economic Integration in Asia: An International Input – Output Analysis', *The World Economy* pp.1709-1757.

Hattari, Rabin; Rajan,Ramkishen S. and Thangavelu, Shandre (2008), 'Understanding Intra-ASEAN FDI Flows: Trends and Determinants and the Role of India and China', January 2008.

Hausman J. A. (1978), 'Specification Tests in Econometrics'. *Econometrica*, vol. 46, pp. 1251-1271.

Hausman J. A. and Taylor W. E. (1981), 'Panel data and unobservable individual effects'. *Econometrica*, vol. 49, pp. 1377–1398.

Head, K. and J. Ries (2007). 'FDI as an Outcome of the Market for Corporate Control:Theory and Evidence,' *Journal of International Economics*.

Helmers, Christian and Pasteels, Jean-Michel (2005), 'TradeSim (third version), a gravity model for the calculation of trade potentials for developing countries and economies in transition', ITC Working Paper, Market Analysis Section, International Trade Center (ITC) Geneva, Switzerland.

Helpman, E. and P. Krugman. (1985), 'Market Structure and International Trade' Cambridge, United States. MIT Press

Helpman, E. (1984), 'A Simple Theory of Trade with Multinational Corporations', *Journal Of Political Economy* 92. 457-71

Helpman, E. (1984), 'A Simple Theory of Trade with Multinational Corporations', *Journal of Political Economy* 92. 457-71

Henderson, Daniel J. and Daniel L.Millimet (2008), 'Is Gravity Linear?', *Journal of Applied Econometrics,* John Wily and Sons Ltd. Vol.23(2) PP. 137-172.

Hertel, T.N; W. Martin, K. Yanagishima and M. Dimaranan (1995), 'Liberalizing Manufactures in a Changing World Economy' in Martin and Winters Edited, "The Uruguay Round and Developing Countries", World Bank Discussion Paper, 307, Washington DC.

Hertel, Walmsley and Itakura (2001) Hertel, Thomas W., Terrie Walmsley, and Ken Itakura (2001), 'Dynamic Effects of the "New Age" Free Trade Agreement between Japan and Singapore', mimeo, Center for Global Trade Analysis (GTAP), Purdue University. September.

Hoekman and Konan (1999) Hoekman, Bernard, and Denise Eby Konan (1999), 'Deep Integration, Nondiscrimination, and Euro-Mediterranean Free Trade', Policy Research Working Paper 2130, World Bank, Washington, DC.

Holmes, Tammy (2005), 'What Drives Regional Trade Agreements that Work?', HEI Working Paper, No. 07/2005, Graduate Institute of International Studies, Geneva.

Hur,J; Parinduri and Y.E. Riyanto (2007), 'Cross border M&A Inflows and the Quality of Institutions: A Cross Country Panel Data Analysis' Working Paper No. 2007/08, Singapore Centre for Applied and Policy Economics, National University of Singapore.

Ismail, Normaz Wana; Smith, Peter; Kugler, Maurice (2007), 'Regional Economic Integration and Intra Regional Trade: The Evidence from the Association of Southeast Asian Nations (ASEAN) Free Trade Area', paper presented in Singapore Economic Review Conference, 2007

Ismail, Normaz Wana., Smith, Peter and Kugler, Maurice, (2007), 'Regional Economic Integration and Foreign Direct Investment: Evidence from the ASEAN Free Trade Area', Singapore Economic Review Conference 2007, 1st - 4th August 2007, Singapore.

Jayanthakumaran and Sanidas (2005), 'The Impact of Unilateral and Regional Trade Liberalisation on the Intra-ASEAN 5 Founding Nations' Exports and Export-GDP Nexus, Faculty of Commerce-Economics Working Paper, University of Wollongong

Jing Sik Kim and Yonghyup Oh, (2007), 'Determinants of Intra-FDI inflows in East Asia: Does Regional Economic integration affect Intra FDI?', Korea Institute for International Economic Policy, KIEP, working Paper 07-01.

Jensen, Paul E. (2000), 'Analysis of Bilateral Trade With Panel Data', *Review of International Economics*, 8(1), 86-99, 2000.

Kandogan (2004) Kandogan, Y. (2004), 'The role of international blocs on trade: A comparison across gravity models', University Of Michigan- Flint School Of Management Working Paper Series No: 2004-01

Karimi, Mohammad sharif, Yusop, Zulkornain and Siong Hook , Law (2009), 'Location decision for foreign direct investment in ASEAN countries' (A TOPSIS Approach), MPRA Paper No. 15000, posted 03. May 2009 / 18:02.

Karmakar, Suparna (2005), 'India–Asean Cooperation In Services – An Overview,' ICRER Working Paper No. 176, November 2005

Kawai, Masahiro (2004), 'Regional Economic Integration and Cooperation in East Asia,' mimeo

Kawai, Masahiro. 2007. 'Evolving Economic Architecture in East Asia,' ADB Institute Discussion Paper No. 84, ADB Institute

Kawai, M., and G. Wignaraja (2008), 'Regionalism as an Engine of Multilateralism: A Case for a Single East Asian FTA', Working Paper Series on Regional Economic Integration 14. February. Manila: ADB.

Kee, H.L., M. Olarreaga, and P. Silva (2003), 'Market Access for Sale: Latin Americas Lobbying for US Tariff Preferences,' Center for Economic Policy Research (CEPR), Discussion Paper No. 4077.

Kemp, M., and H.Y. Wan. (1976), 'An elementary proposition concerning the formation of customs union,' *Journal of International Economics* 6 (1): 95-97.

Kien N. T. and Hashimoto Y. (2005), 'Economic analysis of ASEAN Free Trade Area; by a country panel data,' Discussion Papers in Economics and Business, No. 05-12.

Kim, S., and J-W. Lee. (2008), 'Real and Financial Integration in East Asia,' ADB Regional Cooperation and Integration Working Paper N.17.

Kiyota, Kozo (2006), 'An Analysis of the Potential Economic Effects of Bilateral, Regional, and Multilateral Free Trade,' RIETI Discussion Paper Series 06-E-027, June 2006.

Clausing, Kimberly, (2001), 'Trade Creation and Trade Diversion in the Canada – United States Free Trade Agreement,' *Canadian Journal of Economics* 34 (3), 677-696.

KOF-Index of Globalisation-Index website http://globalization.kof.ethz.ch/.

Koo,Won. W; Kennedy, P.Lynn and Skripnitchenko, Anatoliy (2006), 'Regional Preferential Trade Agreements: Trade Creation and Diversion Effects,' *Review of Agricultural Economics*, Volume 28, No.3, pp 408-415.

Krishna, P. (1998). 'Regionalism and Multilateralism: A Political Economy Approach,' *Quarterly Journal of Economics,* February 1998, Vol. 113, No. 1, Pages 227-250.

Krishna, Praveen and Bhagwati, J. (1997), 'Necessarily Welfare Enhancing Customs Union with Industrialisation Constraints: The Cooper-Massel, Johnson-Bhagwati Conjecture,' *Japan and the World Economy*, Elsevier Vol.9(4) pp. 441-446.

Krishnakumar, Jaya, (2002), 'A SUR – EC- AR System Gravity Model of Trade,' University of Geneva.

Krueger, A.O. (1993), 'Free Trade Agreements as Protectionist Devices: Rules of Origin,' NBER Working Paper No.4352.

Krueger A. (1999), 'Trade creation and trade diversion under NAFTA.' NBER Working Paper N. 4729.

Krugman, Paul (1993), 'Regionalism versus Multilateralism: Analytical Notes,' in Jaime de Melo and Arvind Panagaria, eds, "New Dimensions in Regional Integration," Cambridge, New York, Melbourne: Cambridge University Press.

Krugman, P. (1980), 'Scale Economies, Product Differentiation, and the Pattern of Trade', *American Economic Review*, 70, 5, 950–59.

Kubny, Julia; Mölders, Florian and Nunnenkamp, Peter (2008), 'Regional Integration and FDI in Emerging Markets,' Kiel Working Paper No. 1418 | April 2008

Kumar, N. (2002), "Towards an Asian Economic Community: The Relevance of India", Discussion Paper No.34, Research and Information System for Non-Aligned and other Developing Countries (RIS), New Delhi, 2002.

Kumar, N. (2005), 'Regional Economic Cooperation in Asia: Relevance and a Possible Roadmap for a Broader Asian Economic Community', Paper presented at the 4th High-Level Conference on "Asian Economic Integration: Towards an Asian Economic Community," Research and Information System for Developing Countries, New Delhi, 18–19 November.

Leamer, E, and Levinsohn, J. (1995), 'International Trade Theory:The Evidence,' Vol.III, Edited by G. Grossman and K. Rogoff, Elsevier Science B.V., pp.1339-1394.

Lee (2008), 'Measuring Trade Creating Effects of RTAs: A Fixed Effect Estimation Approach,' *Journal of International Economic Studies*, Vol.12, No.1. pp139-156.

Lee J-W. and Park I. (2005), 'Free Trade Areas in East Asia: Discriminatory or Nondiscriminatory?," *The World Economy*, Vol. 28, pp 21-48.

Lee and Park (2007), 'In Search of Optimised Free Trade Agreements and Applications to East Asia,' *The World Economy*, Vol. 30(5), pp.783-806.

Lee, Jong-Wha and Shin, Kwanho (2005), 'Does Regionalism Lead to More Global Trade Integration in East Asia,' Paper presented at the Claremont Regional Integration Workshop with Particular Reference to Asia, February 2005.

Lee, Jong-Wha, Innwon Park and Kwanho Shin (2004), 'Proliferating Regional Trade Arrangements: Why and Whither?' mimeo.

Lendle, Andreas (2007), 'The ASEAN Free Trade Agreement: Building Bloc or Stumbling Bloc for Multilateral Trade Liberalization?,' HEI Working Paper No: 23/2007, Graduate Institute of International Studies, Geneva

Lesher, M. and Mioudot, S (2006), 'Analysis of the Economic Impact of Investment Provisions in Regional Trade Agreements,' OECD Trade Policy Working Paper No.36

Levy, P. (1997), 'A Political-economic Analysis of Free-trade Agreements', *American Economic Review*, 87, 4, 506–19.

Levy Yeyati, Eduardo, Ernesto Stein, and Christian Daude (2003), 'Regional integration and the location of FDI.' Working Paper 492, Inter-American Development Bank (IADB).

Lim, Ewe-Ghee (2001), 'Determinants of, and the Relation Between, Foreign Direct Investment and Growth: A summary of the Recent Literature,' IMF Working Paper, WP/01/175, 2001.

Limão, Nuno (2006), 'Preferential Trade Agreements as Stumbling Blocks for Multilateral Trade Liberalization: Evidence for the United States,' *American Economic Review*, 96, 3, pp 896-914.

Linders, Gert-Jan M and Henri F.F.De Groot (2006), 'Estimation of Gravity Equation in the Presence of Zero Flows,' Tinbergen Institute Discussion Papers 06-072/3, Tinbergen Institute.

Lipsey, (1960), 'The theory of customs unions: A general survey', *Economic Journal* 70 September: 496-513.

Lipsey, R. E., (2002), 'Home and Host Country Effects of FDI,' NBER Working Paper 9293.

Liu, Tianshu (2004), 'Implication of Trade Creation and Trade Diversion Effect on Trade between RTAs and China and Australia,' School of Economics & Finance, Royal Melbourne Institute of Technology, Australia, Proceedings of the 16th Annual Conference of the Association for Chinese Economics Studies, 19 - 20 July 2004

Liu, Tianshu (2006), 'Empirical study on the impact of regional trade agreements on strengthening China's FDI,' paper presented at the ACESA 2006 "Emerging China: Internal Challenges and Global Implications," Victoria University, Melbourne, 13-14 July 2006.

Liu, L.G., K. Chow and U. Li (2007), 'Determinants of Foreign Direct Investment in East Asia: Did China Crowd Out FDI from Her Developing East Asian Neighbours?,' *China and the World Economy*, May-June, pp.70-88.

Lloyd, Peter,J. and Maclaren, 'Donald (2004), Gains and Losses from Regional Trading Agreements: A Survey,' *The Economic Record*, Vol.80, No. 251 December 2004, 445 - 467.

Llyod, Peter and Smith, Penny (2004), 'Global Economic Challenges to ASEAN Integration and Competitiveness: A Prospective Look,' REPSF Project 03/006a, Final Report, September 2004.

López, Andrés And Orlicki, Eugenia (2005), 'Regional Integration And Foreign Direct Investment: The Potential Impact Of The FTAA And The EU-Mercosur Agreement On FDI Flows into Mercosur Countries,' Centro de Investigaciones para la Transformación (CENIT).

Lougani,P., A. Mody and A.Razin (2002), 'The Global Disconnect: The Role of Transactional Distance and Scale Economies in Gravity Equations, *Scottish Journal of Political Economy*, 18 pp.526-543.

Low, L. (2003), 'Multilateralism, Regionalism, Bilateral and Cross regional FTA: All Paved with good intentions for ASEAN', *ASEAN Economic Journal*, 17 (1),22

Madani, Dorsati (2001), 'Regional Integration and Industrial Growth Among Developing Countries: The Case of 3 ASEAN Members,' World Bank

Magee (2003) Magee, Christopher, 2003, 'Endogenous Preferential Trade Agreements: An Empirical Analysis,' *Contributions to Economic Analysis & Policy*, 2 (1), article 15, http://www.bepress.com/bejeap/contributions/vol2/iss1/art15.

Magee, Chritopher S.P. (2008), 'New Measures of Trade Creation and Trade Diversion,' Journal of Onternational Economics, Volume 75, 2nd July pp.349-362.

Mahani, Zainal-Abidin (2002), 'ASEAN Integration: At Risk of Going in Different Direction,' *World Economy*, Vol.25, N0,9, pp.1263-1277, 2002

Manchin, M. & A. Pelkmans-Balaoing (2007), 'Rules of Origin and the Web of East Asian Free Trade Agreements,' World Bank Policy Research Working Paper 4273, July 2007.

Marino, Andrea (2000), 'The Impact of FDI On Developing Countries Growth : Trade Policy Matters,' CEMAFI , Université de Nice-Sophia Antipolis, France 2000.

Markusen, J. (1984), 'Multinationals, Multi-Plant Economies, and the Gains from Trade', *Journal of International Economics* 16 205-26

Markusen, J. and K. Maskus, (2001), 'General-Equilibrium Approaches to the Multinational Firm: A Review of Theory and Evidence,' NBER Working Paper 8334. Cambridge, United States: National Bureau of Economic Research Department.

Markusen, J. and Venables, A. (1998), 'Multinational Firms and the New Trade Theory,' *Journal of International Economics* 46 183-203

Medvedev, Denis (2006), 'Beyond Trade: The Impact of Preferential Trade Agreements On Foreign Direct Investment Inflows,' World Bank Policy Research Working Paper 4065, November 2006.

Martinez-Zarzoso, Inmaculada And Felicitas Nowak-Lehmann (2003), 'Augmented Gravity Model: An Empirical Application To Mercosur-European Union Trade Flows,' *Journal Of Applied Economics*, Vol. Vi, No. 2 (Nov 2003), 291-316

Martinez-Zarzoso, Lehmann D., and Horsewood (2005), 'Regional Trading Agreements: Dynamic Panel Data Evidence from The Gravity Model,' September 2005

Mattoo, Aaditya and Subramanian, Arvind, (1999), 'India and the Multilateral Trading System after Seattle: Toward a Proactive Role,' World Bank-NCAER Workshop on South Asia and the WTO, New Delhi, December 20-21,1999.

McPherson, Matthew and Trumbull, William (2008), 'Rescuing Observed Fixed Effects: Using the Hausman-Taylor Method for Out of Sample Trade Projection,' *International Trade Journal*, 22:3 pp.315-340

Meade, J.E. (1955), The Theory of Customs Unions, Amsterdam: North-Holland.

Melitz J. (2007), 'North, South and distance in the gravity model', *European Economic Review,* Vol. 51 pp. 971-991.

Menon, Jayant. (2007), 'Building Blocks or Stumbling Blocks? The GMS and AFTA in Asia,' *ASEAN Economic Bulletin*, August, 2007.

Menon, Jayant (2000), 'The Evolving ASEAN Free Trade Area: Widening and Deepening,' *Asian Development Review* 18(1): 49–72.

Mohanty, S.K; and Pohit, Sanjib (2007), 'Welfare Gains from Regional Economic Integration in Asia: ASEAN+3 or EAS,' RIS-Discussion Paper No. 126, September 2007

Motta, Massimo and George Norman (1996), 'Does Economic Integration Cause Foreign Direct Investment?' *International Economic Review,* Vol. 37, No. 4, pp. 757-783.

Nag, B. and Nandi, A. (2006), 'Analysing India's Trade Dynamics vis-à-vis SAARC Members Using The gravity Model,' *South Asia Economic Journal*, 7, 83-98.

Ng, F. and A. Yeats (2003), 'Major Trade Trends in East Asia: What Are Their Implications for Regional Cooperation and Growth?', World Bank Policy Research Working Paper 3084 (The World Bank).

Nitsch, Volker and Sturm, Danel M (2005). 'Trade Liberalisation Effects of Regional Trade Agreements'.

Ohyama, M. (1972), 'Trade and welfare in general equilibrium,' Keio Economic Studies 9: 37-73.

Okamoto, Yumico (2005) ASEAN, China, and India: Are they more Competitive or Complementary to each Other?, Department of Policy Studies, Doshisha University, Japan. Available at http://www.elib.doshisha.ac.jp

Ornelas, (2003), 'Trade Creating Free Trade Areas and the Undermining of Multilateralism,' University of Georgia, November, 2003

Otsubo, Shigeru and Tetsuo Umemura, Tetsuo (1988), 'Foreign Direct Investment and Complementarity as Determinants of Intra-APEC Trade Flows: A Gravity Model Analysis,' APEC Discussion Paper, No. 19, APEC Study Center, Nagoya University, March, 1998.

Owen, N (1983), Economies of Scale, Competitiveness and Trade Patterns within the European Community, Oxford, Clarendon.

Paez, Laura (2008), 'Regional Trade Agreements and Foreign Direct Investment: Impact of Existing RTAs on FDI and Trade Flows in the ANDEAN Community and Implications of a hemispheric RTA in the Americas,' Swiss Review of International Economic Relations, September, 2008.

Panagaria, A. (1994), 'East Asia and New Regionalism in the World Trade,' *World Economy,* 17:6 pp.817 – 839, 2004.

Panagaria, A. (1995), 'Rethinking the New Regionalism' Presented at the World Bank Conference on Trade Expansion Programme, 23-24 January 1995.

Panagaria, A. (1996), 'The Free Trade Areas of the Americas: Good for Latin America?' *The World Economy,* Vol.19, No.5, : 485-515

Panagaria, A. and K.Krishna (1997), 'On the Existence of Necessarily Welfare Enhancing Free Trade Areas,' Department of Economics, University of Maryland, No.32

Panagariya, A. (1999), 'The Regionalism Debate: An Overview', *The World Economy,* 22, 4, 455–76.

Panagariya, Arvind, (2000), 'Preferential Trade Liberalization: The Traditional Theory and New Developments,' *Journal of Economic Literature* 38, 287-331.

Panagariya, Arvind (1999), 'Preferential Trading and Welfare: The Small – Union Case Revisited,' Department of Economics, University of Maryland, 1999

Panagariya, A (2004), 'India's Trade Reform: Progress, Impact and Future Strategy,' March 4, Columbia University, 2004

Park, Innwon and Park, Soonchan (2007), 'Reform-creating Regional Trade Agreements and Foreign Direct Investment: Applications for East Asia,' MPRA Paper No.1817, February 2007.

Park, Innwon (2008), 'Regional Trade Agreements in East Asia: Will They Be Sustainable?,' MPRA Paper No. 5068, posted 01. March 2008 / 13:47, February 2008 Online at http://mpra.ub.uni-muenchen.de/5068/

Pearson, Scott R. and Ingram,William D (1980), 'Economies of Scale, Domestic Divergences and Political Gains Economic Integration in Ghana and the Ivory Coast,' *Journal of Political Economy*, 88(5): 994-1008

Perroni, C. and Whalley, J. (1994), 'The New Regionalism: Trade Liberalization or Insurance?,' NBER Working Paper No. 4626.

Piermartini, Roberta and Robert Teh (2005), 'Demystifying Modelling Methods for Trade Policy,' WTO Discussion Paper 10 (September), World Trade Organization, Geneva.

Pleumper and Troeger (2006), 'Estimation of Time-Invariant and Rarely Changing Variables in Finite Sample Panel Analysis with Unit Fixed Effects, University of Essex, Working Paper Series

Plummer, M. G. (2006), 'Toward Win-Win Regionalism in Asia: Issues and Challenges in Forming Efficient Trade Agreements,' ADB Working Paper Series on Regional Economic Integration, October.

Plummer, Michael G. (2007), 'Best Practices' in Regional Trading Agreements: An Application to Asia,' *The World Economy*, pp.1771 – 1796, 2007.

Plummer, M. G., and G. Wignaraja (2007), 'The Post-Crisis Sequencing of Economic Integration in Asia: Trade as a Complement to a Monetary Future,' ADB Working Paper Series on Regional Economic Integration No. 9. Manila: ADB.

Polak, J., (1996), 'Is APEC a Natural Regional Trading Bloc? A Critique of the 'Gravity Model' of International Trade', *The World Economy*: 533–543.

Pomfret, Richard (2007), 'Is Regionalism an Increasing Feature of the World Economy?' *The World Economy*, pp: 923-947.

Porojan, A (2000), 'Trade Flows and Spatial Effects: The Gravity Model Revisited,' University of Derby.

Portes, Richard and Helene Rey, (2000), 'The Determinants of Cross-Border Equity Flows: The Geography of Information.' Revised version of CEPR Discussion Paper, 2225, January.

Pradhan, Samir Ranjan (2006), 'India's Export Potential to the Gulf Cooperation Council (GCC) Countries: A Gravity Model Analysis,' Asia-Pacific Research and Training Network on Trade Post Workshop Reports.

Rahman, Mustafizur; Shadat, Wasel Bin and Das, Narayan Chandra (2006), 'Trade Potential in SAFTA: An Application of Augmented Gravity Model,' Paper 61, Centre for Policy Dialogue (CPD), December 2006

Rajen, Ramkishen S. (2003), 'Production Sharing in East Asia, Implications for India, *Economic and Political Weekly*, September 6, 2003.

Rana, Pradumna. (2006), 'Economic Integration in East Asia: Trends, Prospects, and a Possible Roadmap,' ADB Working Paper Series on Regional Economic Integration No. 2.

Roberts, Benjamin, A. (2004), 'A Gravity Study of the Proposed China-ASEAN Free Trade Area,' *The International Trade Journal*, Winter, 2004.

Rodriguez, F. and Rodrick, D. (1999), 'Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-Country Evidence' Centre for Economic Policy Research, Discussion Paper Series, No. 2143.

Rose, A. K. (2004). 'Do We Really Know that the WTO Increases Trade?' *American Economic Review,* 94, 1: 98-114.

Rose, A., (2005), 'Which International Institutions Promote International Trade?', *Review of International Economics* 13(4):682–98.

Ryrfeldt, Elin and Sundblad, Olof (2006), 'The gravity model revisited - An evaluation of the predictive ability of the gravity model,' Stockholm School of Economics, January 2006.

Sager, Michelle, (1997), 'Regional Trade Agreements: Their Role and the Economic Impact on Trade Flows,' *The World Economy*, 239-252.

Sakakibara, E. and S. Yamakawa, (2003), 'Regional integration in East Asia: challenges and opportunities', Part I: History and Institutions, Policy Research Working Paper 3078, World Bank.

Sally, Razeen (2006), 'FTAs and the Prospects for Regional Integration in Asia,' ECIPE Working Paper No. 01/2006

Sanidas, Elias (2009), 'Patterns and Distances of Catch-up in Trade: China and East Asia,' *China Economic Journal*, Vol.2, Issue 1, February 2009, pp 105-118

Sanso M., Cuairan R., Sanz F (1993), "Bilateral Trade Flows, the Gravity Equation, and Functional Form". *The Review of Economics and Statistics*, Vol. 75, pp. 266-275.

Saqib, Mohammed and Taneja, Nisha (2005), 'Non-Tariff Barriers and India's Exports: The Case of ASEAN and Sri Lanka,' ICRIER, Working Paper No. 165, July 2005.

Schiff (1998) Schiff, Maurice (1997), 'Small Is Beautiful: Preferential Trade Agreements and the Impact of Country Size, Market Share and Smuggling,' *Journal of Economic Integration* 12: 359-87.

Schiff, M. and S. Andriamananjara (1998), Regional Groupings among Microstates, World Bank Policy Research Paper No.1922, World Bank.

Schiff, M., and Y. Wang, (2004), 'North-South Technology Diffusion, Regional Integration, and the Dynamics of the 'Natural Trading Partners' Hypothesis,' World Bank, June, Washington, DC.

Schiff and Winters (1999) Schiff, M. and L. A.Winters (1998), 'Regional Integration as Diplomacy,' *World Bank Economic Review* 12 (2): 271-295.

Schott, Jeffrey J. (2004), 'Free Trade Agreements: Boon or Bane of the World Trading System,' in "Free Trade Agreements: US Strategies and Priorities," ed. J.J. Schott. Washington: Institute for International Economics; Song and Xu. 2000.

Scollay, Robert(2001), 'The Changing Outlook for Asia – Pacific Regionalism,' *The World Economy,* Vol.24. No.9, Sep 2001.

Sen, Rahul (2007), 'Bilateral Free Trade and Economic Cooperation Agreements in ASEAN: Evolution, Characteristics and Implications for Asian Economic Integration,' Paper presented at a Workshop on ASEAN integration held at ICRIER, New Delhi.

Serlenga, Laura and Shin, Yongcheol (2004), 'Gravity Models of the Intra-EU Trade: Application of the Hausman-Taylor Estimation in Heterogeneous Panels with Common Time- Specific Factors,' University of Edinburgh.

Shepherd, Ben and. Wilson, John S (2008), 'Trade Facilitation in ASEAN Member Countries: Measuring Progress and Assessing Priorities,' Policy Research Working Paper 4615, The World Bank, May 2008.

Silva, J.M.C. Santos and Tenreyro, Silvana (2003), 'Gravity-Defying Trade,' March 26, 2003.

Smith, A and Venables, A.J. (1988), 'Completing the Internal Market in the EC, Some Industry Simulations,' *European Economic Review*, 32, 1501-25.

Soesastro, Hadi (2005), 'Accelerating ASEAN Economic Integration: Moving Beyond AFTA,' CSIS Working Paper Series, WPE 091, March

Sohn, Byeong Hae (2002), 'Regionalisation of Trade and Investment in East Asia and Prospects for Further Regional Integration,' *Journal Asia Pacific Economy*, 7:2, 160-181.

Sohn, Chan-Hyun (2005), 'Does the Gravity Model Explain South Korea's Trade Flows?' *The Japanese Economic Review*, Vol.56, No.4, December 2005.

Soloaga, Isidro, and Alan Winters. 2001. Regionalism in the Nineties: What Effect on Trade? North American Journal of Economics and Finance 12 (1).

Stein, E and C.Daude (2007), 'Longitude Matters:Time Zones and the Location of Foreign Direct Investment,' 71 *Journal International Economics*, pp. 96-112.

Sulamaa, Pekka and Mika Widgrén. (2005), 'Asian Regionalism versus Global Free Trade: A Simulation Study on Economic Effects,' Discussion Papers, The Research Institute of the Finnish Economy.

Summers, L.H. (1991), 'Regionalism and the world trading system, In Policy implications of trade and currency zones,' A symposium sponsored by the Federal Reserve Bank of Kansas City. Jackson Hole, Wyoming, August 22-24, 1991.

Talamo, Chiara (2007), 'The Role of Corporate Governance in Attracting Foreign Direct Investment,' Paper presented at Annual Conference on "Role of Foreign Direct Investment in Shaping Competitive Advantages," Warsaw, June 22, 2007, World Economy Research Institute.

Tayyebi, Seyed Komail and Hortamani, Amir (2005) , 'The Impact of Trade Integration onFDI Flows: Evidence from EU and ASEAN+3,' Paper presented at the Conference Titled "International Trade and Logistics, Corporate Strategies and the Global Economy-European and East Asian Experiences," Sep 28-29, 2005.

Teresa L.C (2002), 'Income in the Gravity Model of Bilateral Trade: Does Endogeneity Matter?' *The International Trade Journal*, XV!:2, Summer 2002, 161-180.

Thirlwall (2000), 'Trade, Trade Liberalisation and Economic Growth: Theory and Evidence,' Economic Research Papers No.63, African Development

Thornton, John and Goglio, Alessandro (2002), 'Regional Bias and Intra Regional Trade in South East Asia,' *Applied Economics Letters*, 9:4, 205-208

Tongzon, Jose (2005), 'ASEAN –China Free Trade Area: A bane or Boon for ASEAN Countries,' *The World Economy*, pp. 191 – 210, 2005.

Tovias, Alfred (2008), 'The Brave New World of Cross-Regionalism,' CEPII, Working Paper No 2008-03

Tran Van Hoa (2003), 'New Asian Regionalism: Evidence on ASEAN+3 Free Trade Agreement from Extended Gravity Theory and New Modelling Approach,' University of Wollongong, Economics Working Paper Series 2003

Tho, Tran Van (2002), 'AFTA in the Dynamic Perspective of Asian Trade,' Japan Centre for Economic Research (JCER) Paper No.77, April 2002.

UNCTAD, World Investment Report, 2008

Urata and Okabe (2007) Urata, Shujiro and Okabe, Misa (2007), 'The Impacts of Free Trade Agreements on Trade Flows: An Application of the Gravity Model Approach,' RIETI Discussion Paper Series 07-E -052 (Revised), July 2007

Uttama, Nathapornpan (2005), 'Foreign Direct Investment in ASEAN Countries: An Empirical Investigation,' University of Nantes, August 2005.

Vamvakidis (1999) Vamvakidis, A. (1998) 'Regional Trade Agreements Versus Broad Liberalization: Which Path Leads to Faster Growth?,' Time-Series Evidence'. IMF Working Paper, No. WP/98/40, International Monetary Fund, Washington, D.C.

Vanek, J (1965), General Equilibrium of International Disvriminaton: The Case of Customs Unions, Cambridge, Massachusetts, Harvard University Press.

Velde, D. and Bezemer. D. (2004), egional Integration and Foreign Direct Investment in Developing Countries,' part of a larger DFID/EC-PREP funded research project on Regional Integration and Poverty.

Velde and Fahnbulleh (2003) Velde, D.W. te and M. Fahnbulleh (2003), 'Investment-related Provisions in Regional Trade Agreements.' background paper available from http://www.odi.org.uk/iedg/projects/ec_prep.html.

Venables, Anthony (1999), 'Regional Integration Agreements: A force for Convergence or Divergence?,' Paper prepared for the Annual Bank Conference on Development Economics in Paris, June 1999.

Venables, Anthony (2000), 'International Trade; Regional Economic Integration,' Paper prepared for the 'International Encyclopedia of Social and Behavioural Sciences', July 2000.

Viner, J. (1950), The customs union issue. New York: Carnegie Endowment for International Peace.

Wacziarg, Romain and Welch, Karen Horn (2003), 'Trade Liberalisation and Growth,' November 2003

Waldkirch (2003), 'The 'New Regionalism' and Foreign Direct Investment: The Case of Mexico, *Journal of International Trade and Economic Development*, 2003, 12, pp. 151-184.

Walsh (2008), Keith (2008), 'Trade in Services: Does Gravity Hold?,' *Journal of World Trade* 42(2): 315-334, 2008.

Wang, Jiangyu (2006), 'China, India and Regional Economic Integration in Asia: The Policy and Legal Dimensions,' The Chinese University of Hong Kong, August 2006.

Westerlund, Joakim and Wilhelmsson, Fredrik (2006), 'Estimating the Gravity Model without Gravity using Panel Data,' February 2006.

Witkowska, Janina (2007), 'Regional Integration and Capital Mobility in the World Economy: Experiences of the European Union, NAFTA and AFTA,' International Trade and Finance Association Working Paper 12, Year, 2007

Whalley, John. (1996), 'Why Do Coüntreis Seek Regional Trade Agreements,' In Frankel, Ed., The Regionalisations of the World Economy, Chicago: Chicago University Press.

Whalley, John (2006), 'Recent Regional Agreements: Why So Many, Why So Much Variance In Form, Why Coming So Fast, And Where Are They Headed?,' Cesifo Working Paper No. 1790, August 2006.

Winters, L.A. (1997), 'Regionalism and the Rest of the World, : Theory and Estimates of the Effects of European Integration,' *Review of International Economics*, Special Supplement, pp. 134-147.

Winters, L.A. and W. Chang (2000), Regional Integration Import Prices: An Empirical Investigation, *Journal of International Economics,* Vol.51, No.2:363-377.

Wonnacott (1996), 'Trade and investment in a hub-and-spoke system versus a free trade Area,' *The World Economy* 19 (3): 237-252.

Wonnacott and Wonnacot (1981), 'Is unilateral tariff reduction preferable to a customs union? The curious case of the missing foreign tariffs,' *American Economic Review* 71 (4): 704-714.

Wonnacott and Wonnacot (1992), 'The customs union issue reopened,' The Manchester School 60 (2): 119-135.

Wonnacott, Paul, and Mark Lutz, (1989), 'Is There a Case for Free Trade Agreements?' In Schott, J., ed., "Free Trade Areas and U.S," Trade Policy (Institute for International Economics: Washington D.C.) 59-84.

World Bank (2004), Trade, Regionalism and Development: Global Economic Prospects 2005 Washington, D. C: World Bank.

World Bank, World Development Indicators Database.

World Investment Report (2008), UNCTAD, UN, New York and Geneva, 2008.

WTO, World Trade Statistics 2005, 2007, 2008

WTO, World Trade Report, 2008, 2009

Worth, T. (1998) 'Regional trade Agreements and Foreign Direct Investment' Chapter 7 in Burfisher, M.E. and E.A. Jones (Eds.) Regional Trade Agreements and U.S. Agriculture. Economic Research Services, U.S. Department of Agriculture. Agricultural Economic Report No. 771, Washington, D.C.

Yeats, A. (1997), Does Mercosur's trade performance raise concerns about the effects of Regional trade arrangements? Policy Research Working Paper, 1729. International Trade Division, The World Bank. Washington, D.C.

Yihong, Tang and Weiwei, Wang (2006), An Analysis of Trade Potential Between China and ASEAN within China-ASEAN FTA, University of International Business and Economics (UIBE), China

Yoshimatsu, Hidetaka (2002), Preferences, Interests, and Regional Integration: The Development of the ASEAN Industrial Cooperation Arrangement, Review of International Political Economy, Vol. 9, No. 1 (Mar., 2002), pp. 123-149.

Zhang, Y., et al. (2006). Towards an East Asia FTA: Modality and Road Map. A Report by Joint Expert Group for Feasibility Study on EAFTA. ASEAN. Jakarta.

Zissimos, Ben (2002), Why are Trade Agreements Regional? A Theory Based on Noncooperative Networks, Warwick Economic Research Papers, No 652, Department of Economics, University of Warwick.

APPENDICES

APPENDIX -1

Table: 4.A-1 RCA for India in HS4 digit Classification – Top 35 Items

Commodity Category	Commodity Name	Share in India's Export	India's RCA four digits
7012	Glass inners for vacuum flasks or f	0.00	58.92
7417	Cooking or heating apparatus of a k	0.00	54.91
2305	Oil-cake and other solid residues,	0.02	49.89
9203	Keyboard pipe organs; harmoniums an	0.00	46.82
2942	Other organic compounds.	1.31	46.30
5307	Yarn of jute or of other textile ba	0.03	44.33
5310	Woven fabrics of jute or of other t	0.04	43.61
0909	Seeds of anise, badian, fennel, cor	0.13	38.21
1403	Vegetable materials of a kind used	0.00	37.15
8006	Tin tubes, pipes and tube or pipe f	0.00	33.78
5303	Jute and other textile bast fibres	0.00	32.25
6703	Human hair, dressed, thinned, bleac	0.10	32.11
2705	Coal gas, water gas, producer gas a	0.00	30.42
2514	Slate, whether or not roughly trim	0.02	26.04
2513	Pumice stone; emery; natural corund	0.04	24.21
2516	Granite, porphyry, basalt, sandston	0.29	22.73
0801	Coconuts, Brazil nuts and cashew nu	0.37	22.46
1203	Copra.	0.01	21.87
6304	Other furnishing articles, excluding	0.61	19.63
5207	Cotton yarn (other than sewing thre	0.05	18.28
4204	Articles of leather or of composite	0.00	18.27
5701	Carpets and other textile floor cov	0.21	18.00
0904	Pepper of the genus Piper; dried or	0.19	15.93
1207	Other oil seeds and oleaginous frui	0.28	15.70
7102	Diamonds, whether or not worked, bu	8.19	15.13
5705	Other carpets and other textile flo	0.17	15.08
4003	Reclaimed rubber in primary forms o	0.02	14.43
1202	Ground-nuts, not roasted or otherwi	0.15	14.29
5205	Cotton yarn (other than sewing thre	0.92	14.24
7414	Cloth (including endless bands), gr	0.00	13.79
6214	Shawls, scarves, mufflers, mantilla	0.32	13.63
2525	Mica, including splitings; mica was	0.02	13.55
8904	Tugs and pusher craft.	0.17	12.53
7614	Stranded wire, cables, plaited band	0.11	12.52
2838	Fulminates, cyanates and thiocyanat	0.00	12.27

Source: Computed from DOTS data extracted through WITS

Table: 4.A-2 RCA for Malaysia in HS4 digit Classification – Top 35 Items

Commodity Category	Commodity Name	Share in Malaysia's export	RCA Malaysia
9204	Accordions and similar instruments;	0.00	53.4038
6503	Felt hats and other felt headgear,	0.00	48.1461
1511	Palm oil and its fractions, whether	6.41	47.1762
1402	Vegetable materials of a kind used	0.00	29.2936
4015	Articles of apparel and clothing ac	1.07	28.7228
1516	Animal or vegetable fats and oils a	0.90	23.2167
4007	Vulcanised rubber thread and cord.	0.10	22.1984
7805	Lead tubes, pipes and tube or pipe	0.00	21.8032
1513	Coconut (copra), palm kernel or bab	0.46	21.6412
8520	Magnetic tape recorders and other s	0.01	21.6169
3823	Industrial monocarboxylic fatty aci	0.78	20.4770
9009	Photocopying apparatus incorporatin	0.04	17.1583
8001	Unwrought tin.	0.30	17.0337
9008	Image projectors, other than cinema	0.07	16.7933
7011	Glass envelopes (including bulbs an	0.11	16.4317
1805	Cocoa powder, not containing added	0.09	15.1921
1804	Cocoa butter, fat and oil.	0.32	14.3278
7803	Lead bars, rods, profiles and wire.	0.00	13.8401
8004	Tin plates, sheets and strip, of a	0.00	12.0953
4001	Natural rubber, balata, gutta-perch	1.22	11.8684
8540	Thermionic, cold cathode or photo-c	0.27	9.8956
4412	Plywood, veneered panels and simila	0.92	9.4225
8527	Reception apparatus for radio-telep	1.00	9.1224
1517	Margarine; edible mixtures or prepa	0.36	9.0678
7109	Base metals or silver, clad with go	0.00	9.0186
7319	Sewing needles, knitting needles, b	0.02	8.7091
9006	Photographic (other than cinematogr	0.18	7.6246
7406	Copper powders and flakes.	0.04	7.5702
7203	Ferrous products obtained by direct	0.08	6.8157
4005	Compounded rubber, unvulcanised, in	0.36	6.3772
8473	Parts and accessories (other than c	5.47	6.2976
9030	Oscilloscopes, spectrum analysers a	0.78	6.1056
7014	Signalling glassware and optical el	0.02	5.8965
2521	Limestone flux; limestone and other	0.01	5.8761
0105	Live poultry, that is to say, fowls	0.07	5.6900
9114	Other clock or watch parts.	0.04	4.1640
7006	Glass of heading 70.03, 70.04 or 70	0.04	4.1404

Source: Computed from DOTS data extracted through WITS

Table: 4.A-3 RCA for Philippines in HS4 digit Classification – Top 35 Items

Commodity Category	Commodity Name	Share in Philippines Export	RCA Philippines
0509	Natural sponges of animal origin.	0.00	184.74
9009	Photocopying apparatus incorporatin	0.27	126.82
1513	Coconut (copra), palm kernel or bab	2.12	99.75
9502	Dolls representing only human being	0.00	90.44
8004	Tin plates, sheets and strip, of a	0.00	79.66
2830	Sulphides; polysulphides, whether o	0.40	78.29
9601	Worked ivory, bone, tortoise-shell,	0.03	49.04
9203	Keyboard pipe organs; harmoniums an	0.00	45.70
0801	Coconuts, Brazil nuts and cashew nu	0.49	29.64
2604	Nickel ores and concentrates.	0.41	21.70
4706	Pulps of fibres derived from recove	0.12	20.14
0803	Bananas, including plantains, fresh	0.81	17.33
4418	Builders' joinery and carpentry of	1.83	17.29
7402	Unrefined copper; copper anodes for	0.32	17.25
5805	Hand-woven tapestries of the type G	0.00	15.76
2616	Precious metal ores and concentrate	0.24	14.82
8002	Tin waste and scrap.	0.02	13.43
7803	Lead bars, rods, profiles and wire.	0.00	12.88
7403	Refined copper and copper alloys, u	2.67	11.94
8532	Electrical capacitors, fixed, varia	1.14	11.81
6310	Used or new rags, scrap twine, cord	0.03	10.34
4017	Hard rubber (for example, ebonite)	0.03	9.96
9016	Balances of a sensitivity of 5 cg o	0.03	9.85
4501	Natural cork, raw or simply prepare	0.00	9.74
2807	Sulphuric acid; oleum.	0.10	9.59
1212	Locust beans, seaweeds and other al	0.05	7.72
4813	Cigarette paper, whether or not cut	0.05	7.40
4402	Wood charcoal (including shell or n	0.02	7.30
1520	Glycerol, crude; glycerol waters an	0.02	7.00
2008	Fruit, nuts and other edible parts	0.49	6.97
1604	Prepared or preserved fish; caviar	0.62	6.95
8541	Diodes, transistors and similar sem	3.67	6.75
6503	Felt hats and other felt headgear,	0.00	6.73
8542	Electronic integrated circuits and	9.73	6.28
9104	Instrument panel clocks and clocks	0.00	6.23
2306	Oil-cake and other solid residues,	0.12	4.21

Source: Computed from DOTS data extracted through WITS

Table: 4.A-4 RCA for Singapore in HS4 digit Classification – Top 35 Items

Commodity Category	Commodity Name	Share in Singapore Exports	RCA Singapore
2922	Oxygen-function amino-compounds.	1.61	14.9909
3001	Glands and other organs for organo-	0.32	12.1184
8905	Light-vessels, fire-floats, dredger	0.86	11.3108
8523	Prepared unrecorded media for sound	1.72	9.6141
2715	Bituminous mixtures based on natura	0.08	8.7370
9114	Other clock or watch parts.	0.09	8.6007
2935	Sulphonamides.	0.28	7.8781
8542	Electronic integrated circuits and	11.26	7.2781
1518	Animal or vegetable fats and oils a	0.07	7.1482
7319	Sewing needles, knitting needles, b	0.01	7.0139
2902	Cyclic hydrocarbons.	1.26	6.9863
7006	Glass of heading 70.03, 70.04 or 70	0.06	6.8930
9110	Complete watch or clock movements,	0.01	6.3900
3818	Chemical elements doped for use in	0.46	6.2228
2932	Heterocyclic compounds with oxygen	0.27	6.0252
1401	Vegetable materials of a kind used	0.01	5.8373
3811	Anti-knock preparations, oxidation	0.47	5.8282
9033	Parts and accessories (not specifie	0.13	5.3947
2710	Petroleum oils and oils obtained fr	24.16	5.3488
3810	Pickling preparations for metal sur	0.05	5.2819
1805	Cocoa powder, not containing added	0.03	5.0966
3825	Residual products of the chemical o	0.01	5.0307
8473	Parts and accessories (other than c	4.28	4.9197
7806	Other articles of lead.	0.01	4.6639
3705	Photographic plates and film, expos	0.02	4.3700
8522	Parts and accessories suitable for	0.25	4.3579
9011	Compound optical microscopes, inclu	0.05	4.3390
2915	Saturated acyclic monocarboxylic ac	0.36	4.1225
1804	Cocoa butter, fat and oil.	0.09	4.1127
3902	Polymers of propylene or of other o	0.81	3.9819
2713	Petroleum coke, petroleum bitumen a	0.40	3.9677
8906	Other vessels, including warships a	0.06	3.8945
9108	Watch movements, complete and assem	0.02	3.8152
1901	Malt extract; food preparations of	0.35	3.8093
0410	Edible products of animal origin, n	0.00	3.7381
8543	Electrical machines and apparatus,	0.49	2.5763
4907	Unused postage, revenue or similar	0.09	2.5684

Source: Computed from DOTS data extracted through WITS

Table: 4.A-5 RCA for Thailand in HS4 digit Classification – Top 35 Items

Commodity Category	Commodity Name	Share in Thailand Exports	RCA Thailand
4001	Natural rubber, balata, gutta-perch	3.82	37.09
0714	Manioc, arrowroot, salep, Jerusalem	0.27	34.80
4007	Vulcanised rubber thread and cord.	0.11	24.51
1006	Rice.	3.47	22.31
4907	Unused postage, revenue or similar	0.77	22.01
2006	Vegetables, fruit, nuts, fruit-peel	0.08	18.74
1903	Tapioca and substitutes therefor pr	0.01	18.40
1108	Starches; inulin.	0.26	16.37
1604	Prepared or preserved fish; caviar	1.39	15.63
9307	Swords, cutlasses, bayonets, lances	0.01	14.85
1605	Crustaceans, molluscs and other aqu	0.82	14.71
4014	Hygienic or pharmaceutical articles	0.15	13.96
3505	Dextrins and other modified starche	0.26	11.44
6909	Ceramic wares for laboratory, chemi	0.21	11.24
1102	Cereal flours other than of wheat o	0.05	10.83
7103	Precious stones (other than diamond	0.29	10.77
9108	Watch movements, complete and assem	0.06	10.67
5204	Cotton sewing thread, whether or no	0.01	10.61
7104	Synthetic or reconstructed precious	0.04	10.37
8001	Unwrought tin.	0.18	10.17
4015	Articles of apparel and clothing ac	0.38	10.11
1602	Other prepared or preserved meat, m	1.02	10.01
5406	Man-made filament yarn (other than	0.01	9.63
8548	Waste and scrap of primary cells, p	0.30	9.41
9002	Lenses, prisms, mirrors and other o	0.46	8.81
0306	Crustaceans, whether in shell or no	0.76	8.69
1106	Flour, meal and powder of the dried	0.01	8.66
2520	Gypsum; anhydrite; plasters (consis	0.07	8.60
9114	Other clock or watch parts.	0.09	8.14
2008	Fruit, nuts and other edible parts	0.55	7.81
6912	Ceramic tableware, kitchenware, oth	0.07	7.57
8415	Air conditioning machines, comprisi	1.83	7.49
2917	Polycarboxylic acids, their anhydri	0.62	7.00
4414	Wooden frames for paintings, photog	0.05	6.97
40	Rubber and articles thereof.	6.58	6.81

Source: Computed from DOTS data extracted through WITS

APPENDIX –II

Commodities with Highest Trade Potential with India

Table 5A-1 Commodities with Highest Trade Potential for Brunei

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Diversion Effect ($ '000)	Old Simple Duty Rate (%)
270900	33,171.60	19,272.19	13,899.41	5
760200	263.493	91.907	171.586	12.5
440725	8.124	0	8.124	12.5
846291	4.074	1.921	2.153	12.5
870210	1.955	0.369	1.585	12.5
731816	3.69	2.341	1.349	12.5

Source: Compiled from WITS Simulation Results

Table 5A-2 Commodities with Highest Trade Potential for Cambodia

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
151110	442.926	3.702	439.224	100
91030	68.193	14.866	53.327	30
120799	33.429	16.68	16.749	30
610620	5.104	0.068	5.036	12.5
720241	9.993	5.403	4.59	20
610349	2.967	0.11	2.858	12.5
853890	4.326	2.773	1.552	12.5
610990	1.748	0.957	0.791	12.5
731819	1.613	1.247	0.367	12.5

Source: Compiled from WITS Simulation Results

Table 5A-3 Commodities with Highest Trade Potential for Lao PDR

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
130190	125.471	58.953	66.517	30
320710	15.179	8.042	7.137	12.5
841440	6.188	4.505	1.683	12.5
121190	1.198	0.199	0.999	30
382200	0.467	0.278	0.189	12.5
680530	1.134	0.988	0.146	12.5
846691	1.665	1.53	0.135	12.5

Source: Compiled from WITS Simulation Results

Table 5A-4 Commodities with Highest Trade Potential for Indonesia

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
151110	367,784.50	2,975.88	364,808.62	100
270119	223,429.37	119,818.95	103,610.42	12.5
151319	102,986.08	0	102,986.08	100
90111	95,951.39	2,719.12	93,232.27	100
252310	92,708.69	403.949	92,304.75	12.5
730611	42,818.51	1,357.19	41,461.32	12.5
730619	42,818.51	1,357.19	41,461.32	12.5
151190	53,828.81	20,445.83	33,382.98	100
151321	25,294.62	401.564	24,893.06	100
260300	76,658.15	52,681.12	23,977.03	5
400122	22,803.89	579.009	22,224.88	25
382319	22,362.93	1,488.31	20,874.62	30
80131	31,768.09	12,514.01	19,254.08	30
271390	16,101.38	1,930.10	14,171.29	10
843041	15,402.53	1,502.91	13,899.62	12.5

Source: Compiled from WITS Simulation Results

Table 5A-5 Commodities with Highest Trade Potential for Philippines

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
151319	43,848.63	0	43,848.63	100
350691	10,651.51	124.299	10,527.21	12.5
870840	6,190.83	890.32	5,300.51	12.5
720890	5,740.58	2,910.11	2,830.47	20
480100	3,820.26	1,984.02	1,836.25	12.5
720421	1,860.75	449.466	1,411.28	20
730290	1,451.68	64.688	1,386.99	12.5
240220	1,331.40	84.832	1,246.57	30

Source: Compiled from WITS Simulation Results

Table 5A-6 Commodities with Highest Trade Potential for Malaysia

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
270900	267,320.65	154,977.79	112,342.85	5
151110	80,997.31	675.815	80,321.49	100
761090	72,981.09	770.688	72,210.40	12.5
890690	34,249.61	652.116	33,597.49	12.5
841581	25,702.50	158.35	25,544.15	12.5
720421	29,834.08	7,106.22	22,727.86	20
382319	17,386.37	1,174.46	16,211.91	30
271113	34,252.20	18,232.75	16,019.45	10
440341	14,414.74	3.608	14,411.13	5
291521	13,239.70	554.511	12,685.19	12.5
290243	13,720.96	1,410.83	12,310.13	10
440399	14,766.99	3,419.98	11,347.01	5
720836	14,107.61	2,984.14	11,123.46	20
690810	11,021.18	141.32	10,879.86	12.5
940310	10,521.95	801.958	9,719.99	12.5

Source: Compiled from WITS Simulation Results

Table 5A-7 Commodities with Highest Trade Potential for Myanmar

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
71339	56,128.50	1,369.00	54,759.51	30
71331	34,188.91	5,702.93	28,485.98	30
71390	29,904.41	3,068.85	26,835.56	30
440349	13,868.45	6,159.61	7,708.84	5
440399	7,908.27	1,856.73	6,051.54	5
71320	8,732.65	5,001.57	3,731.08	30
440839	1,874.36	134.549	1,739.81	12.5
30613	1,777.62	63.27	1,714.35	30
440890	1,188.00	164.674	1,023.33	12.5
71332	1,046.38	500.986	545.396	30

Source: Compiled from WITS Simulation Results

Table 5A-8 Commodities with Highest Trade Potential for Singapore

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
291521	44,766.23	1,731.12	43,035.11	12.5
290250	60,961.64	20,314.55	40,647.09	12.5
860900	39,176.83	184.78	38,992.05	12.5
843041	27,219.34	2,605.59	24,613.74	12.5
720421	27,711.34	6,607.95	21,103.39	20
490700	24,126.10	4,157.21	19,968.89	12.5
841940	19,405.34	151.191	19,254.14	12.5
271119	18,600.13	1,953.76	16,646.38	10
830241	14,473.34	244.299	14,229.04	12.5
350691	13,066.96	152.136	12,914.82	12.5
491199	15,894.07	3,289.44	12,604.63	12.5
844331	26,746.73	15,231.52	11,515.21	12.5
852841	23,597.43	14,623.58	8,973.86	12.5
852851	23,597.43	14,623.58	8,973.86	12.5
852861	23,597.43	14,623.58	8,973.86	12.5
290110	9,345.90	572.951	8,772.95	12.5
291612	10,826.33	2,147.53	8,678.81	12.5
730840	8,738.87	128.13	8,610.74	12.5
848620	9,837.92	1,765.45	8,072.46	12.5

Source: Compiled from WITS Simulation Results

Table 5A-9 Commodities with Highest Trade Potential for Thailand

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
840820	314,462.00	9,632.54	304,829.45	12.5
570320	54,915.53	438.309	54,477.22	12.5
852872	42,959.92	7,697.91	35,262.01	12.5
852871	42,253.76	7,697.91	34,555.85	12.5
720421	34,003.72	8,081.52	25,922.20	20
680911	17,061.39	17.934	17,043.46	12.5
680919	14,120.58	66.876	14,053.70	12.5
842810	15,314.89	1,395.36	13,919.53	12.5
851989	11,368.32	844.591	10,523.72	12.5
481840	11,090.78	685.915	10,404.87	12.5
690890	10,492.76	142.519	10,350.24	12.5
400122	10,430.81	274.417	10,156.39	25

Source: Compiled from WITS Simulation Results

Table 5A-10 Commodities with Highest Trade Potential for Vietnam

HS Code	Trade Total Effect ($ '000)	Trade Diversion Effect ($ '000)	Trade Creation Effect ($ '000)	Old Simple Duty Rate (%)
90111	62,646.20	2,066.56	60,579.64	100
330741	7,789.63	56.862	7,732.77	12.5
90240	10,190.08	3,411.44	6,778.64	100
720421	7,346.95	1,769.99	5,576.97	20
230120	4,435.68	722.706	3,712.97	30
640320	3,403.10	31.597	3,371.50	12.5
270111	4,268.59	1,356.36	2,912.22	12.5
90411	6,655.18	4,276.35	2,378.83	70
841451	2,358.33	71.6	2,286.73	12.5
220290	1,403.14	110.657	1,292.49	30
293299	1,703.22	478.346	1,224.88	12.5
400121	1,376.26	239.212	1,137.05	25
90611	2,057.09	962.23	1,094.86	30
90619	2,057.09	962.23	1,094.86	30
890200	1,119.58	101.715	1,017.86	12.5

Source: Compiled from WITS Simulation Results

Table 5A-11Countries with Highest Export Diversion from India – ASEAN FTA

Exporter	Before ($ '000)	After ($ '000)	Change in Revenue ($ '000)
Total China	14,357,682.06	14,115,009.55	-242,672.51
Total Australia	6,610,919.82	6,494,793.80	-116,126.01
Total United States	8,263,273.44	8,147,332.77	-115,940.67
Total Saudi Arabia	12,700,352.23	12,609,003.46	-91,348.77
Total Germany	7,331,362.42	7,258,054.12	-73,308.30
Total Korea, Rep.	3,952,020.98	3,886,976.66	-65,044.32
Total Japan	4,304,753.49	4,253,516.49	-51,237.00
Total Iran, Islamic Rep.	7,369,338.44	7,325,587.43	-43,751.00
Total United Arab Emirates	7,383,445.65	7,340,743.65	-42,702.00
Total United Kingdom	4,072,142.82	4,039,690.23	-32,452.60
Total Nigeria	7,012,549.57	6,983,442.58	-29,106.99
Total Bhutan	136,589.00	107,935.92	-28,653.09
Total Taiwan, China	1,474,886.14	1,446,720.51	-28,165.63
Total Sri Lanka	477,566.35	450,026.65	-27,539.70
Total Netherlands	1,148,402.15	1,122,714.11	-25,688.04
Total France	2,074,656.74	2,050,102.75	-24,553.99
Total Kuwait	5,322,698.69	5,298,480.75	-24,217.94
Total Chile	1,903,277.06	1,879,820.63	-23,456.43
Total Italy	2,573,964.94	2,550,555.29	-23,409.65
Total Russian Federation	1,400,982.52	1,378,770.35	-22,212.17
Total Iraq	5,509,129.70	5,487,419.00	-21,710.70
Total South Africa	2,422,003.48	2,404,283.33	-17,720.14
Total Switzerland	9,087,741.81	9,070,939.18	-16,802.63
Total Sweden	1,442,883.98	1,427,709.00	-15,174.98
Total Hong Kong, China	2,126,679.52	2,111,601.78	-15,077.74
Total Belgium	4,096,440.59	4,084,856.50	-11,584.10
Total Canada	1,097,982.08	1,086,655.49	-11,326.60
Total Qatar	1,961,797.97	1,950,812.58	-10,985.39
Total Spain	589,820.73	580,613.90	-9,206.83
Total Brazil	884,045.45	875,049.17	-8,996.28
Total Bangladesh	210,143.08	201,688.27	-8,454.81
Total New Zealand	256,594.53	249,208.33	-7,386.20
Total Yemen	1,878,456.97	1,871,071.70	-7,385.27
Total Ukraine	806,148.30	799,020.41	-7,127.89
Total Norway	697,175.17	690,209.82	-6,965.35
Total Nepal	294,734.13	287,866.45	-6,867.67
Total Unspecified	522,695.61	516,216.52	-6,479.09

Source: Compiled from WITS Simulation Results