



AgEcon SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



Global Trade Analysis Project

<https://www.gtap.agecon.purdue.edu/>

This paper is from the
GTAP Annual Conference on Global Economic Analysis
<https://www.gtap.agecon.purdue.edu/events/conferences/default.asp>

Towards Formation of Close Economic Cooperation among Asian Countries*

Nagesh Kumar
S K Mohanty
Sanjib Pohit
Saikat Sinha Roy**

Annual Conference of GTAP

The 6th Annual Conference on Global Economic Analysis

June 12-14, 2003

Scheveningen, The Hague, The Netherlands

* The preliminary results of the paper was presented in an international conference on "Building a New Asia: Towards an Asian Economic Community, March 10-11, New Delhi. The authors have special word of thanks for Mukul Asher, Prabir Sengupta and Mohmed Ariff for their comments on an earlier version of the paper. The authors have benefited from the comments received from the participants at the conference. The findings of the paper and the views expressed here do not represent the organisations to which they belong. The authors are responsible for errors, if any.

** Nagesh Kumar, Director General of Research and Information System for the Non-Aligned and Other Developing Countries (RIS), New Delhi. (nkumar@ris.org.in), S.K.Mohanty, Faculty Member, RIS, New Delhi, (skmohanty@ris.org.in), Sanjib Pohit, Senior Economist, NCAER, New Delhi (spohit@ncaer.org) and Saikat Sinha Roy, Asian Development Bank, India Resident Mission, New Delhi (srsaikat@adb.org).

Towards Formation of Close Economic Cooperation among Asian Countries

I. Introduction

The paper attempts to estimate and analyse the extent of welfare gains consequent upon close economic cooperation among Asian countries, where close economic cooperation in Asia would connote, in addition to trade liberalisation, freer cross border movements of investment, technology and skilled manpower. The emergence of Asia as a regional grouping assumes importance in the context of large regional groupings such as the EU and the NAFTA gaining substantially from globalisation. These continental regional economies grew by bringing together resources in the region and internalising growth potential. Despite Asia's emergence as a vibrant economic space in the world economy and some Asian economies attaining high economic growth during globalisation,¹ performance varied across countries and world economic growth bypassed large parts of Asia. In addition, fissures in Asian growth during the crisis tend to suggest that, following Agarwala and Prakash (2002), regional economic formation is the only way to consolidate growth in countries in Asia. Lanteigne (2003), inquiring into the genesis of Asia's slow growth, finds Asian countries lack initiatives in building strong institutions that could gear up regional process in a more effective manner, despite Asia's emergence as a vibrant economic space in the world economy in the early 1990s.

There are significant developments with respect to regionalisation in Asia. Apart from smaller regional integration arrangements (RIA) like SAARC and ASEAN, there are no RIA's in Asia. There is no formal arrangement at the pan-Asian level, but an informal Japan-centred trading bloc has led to large intra-regional trade and investments. As a result, as Frankel (1997) finds, Asia effect is significant. The enlargement of ASEAN was completed in the 1990s with four countries joining the group. Joining of Japan, Korea and China as Summit Level partners of the RIA further strengthens the ASEAN process of regional integration. In November 2002, India joined the group as a Summit Level partner. There are significant policy initiatives strengthening India's close economic cooperation with the ASEAN.² Long term policy initiatives documented in ASEAN Vision 2020 - Chiang Mai Initiatives, Hanoi Plan of Action and Initiatives for ASEAN Integration - have given the road map for regional cooperation in Asia. With the success of the ASEAN efforts of regional integration, more countries are likely to join the regional caucus.

¹ A detail discussion on Asian growth in the last decade has been discussed in RIS (2003).

² Kumar (2002a). India has unilaterally declared tariff concessions to new members of ASEAN in the India-ASEAN Summit level meeting (Mohanty, 2002a).

There are hectic negotiations between ASEAN+3 and ASEAN+1 countries to formalise higher level of close economic cooperation at the regional, sub-regional and bilateral level to form FTAs in order to optimise economic welfare of these countries. The four Summit Level partners, namely, Japan, Korea, China and India have aired their views to form bilateral FTAs with ASEAN separately. Besides sizable number of countries in ASEAN+4 are also negotiating for bilateral FTAs among themselves.³ Some of these initiatives that have taken concrete shape are Japan-Korea, Japan-Singapore FTAs etc. The ASEAN+4 regional process – the JACIK comprising of Japan, ASEAN, China, India and Korea – holds substantial potential for future growth (Kumar, 2002b).

The usually adopted route to regional economic integration is in terms of free movement of merchandise within the region. For the purpose, apart from individual countries pursuing trade liberalisation, countries within a region opt for preferential trading arrangement in order to achieve higher levels of growth and optimise welfare gains for the region in the medium term. This process of trade liberalisation is expected to culminate into an FTA in the region.

Srinivasan et al. (1993) provides an exhaustive survey of impact of regional integration arrangements. For ASEAN, as DeRosa (1995) finds using simulations through a CGE model, FTA is largely trade creating. When all trade is covered within ASEAN, total intrabloc trade is expected to increase by 19 per cent. In addition, sectoral production and exports are found to increase substantially with reduction in bias against agriculture and other natural resource based sectors. With enlargement of the ASEAN, the trade and growth impacts are expected to be substantial leading to enhancement of welfare gains. Lee and Park (2002) show that even though there is no regional trade bias in China, Japan and Korea, ASEAN+3 is found to have a significant and apparent intra-regional trade bias. This is despite that these countries have no formal trade agreements. As observed earlier, close regional economic cooperation is not limited to trade alone. Intra-regional movements of investment, technology and manpower are paramount importance to optimise allocative efficiency of such scarce resources. Agarwala and Prakash (2002) map out the extent of movements in investments and manpower. Kumar and Sinha Roy (2003) find potential for substantial complementarities in production and trade and also potentials for cross-border investments, technology transfers and movements of skilled manpower within the JACIK region. Even though potentials for such complementarities are found to exist, there is no exact estimate of the possible extent of welfare gains if there is close economic cooperation in Asia in terms of trade, investment, technology and manpower.

³ Considering the fact that both ASEAN+3 (ASEAN, Japan, South Korea and China) and ASEAN+1 (ASEAN and India) are having similar policy outlook regarding their relationships with ASEAN, there is strong feeling that both the processes should merged into ASEAN+4 (Asher, 2002). Though most recent studies, viz. Agarwala and Prakash (2002) and Lee and Park (2002), gauge the impact of ASEAN+3, Kumar (2002) builds a strong case for India's inclusion in the emerging regional effort at the Asian level.

This paper is an attempt in that direction. In this paper it is argued that the regional countries may benefit more by adopting a consensus approach to form an FTA among JACIK countries, instead of going ahead with bilateral FTAs and sectoral cooperation.⁴ The implications of complete trade liberalisation along with free cross border investment and skilled labour within JACIK is examined in a CGE model. In an attempt to do so, Section II delineates the structure and the parameters of the CGE model that is estimated. Section III presents the results thus estimated. Finally, Section IV summarises the main findings and the policy implications by way of conclusion.

II. Model

The present model is a multi-regional computable general equilibrium (AGE) model, which captures world economic activity in 26 different aggregated industries/sector and 13 aggregated regions/countries and rest of the world.⁵ The database of the model is primarily drawn from the GTAP database, version 5. The additional data requirement of the model is supplemented by data from other sources such as: Handbook of Industrial Statistics, UNIDO; World Development Indicator (2002), UNDP (1994); etc. The aggregated regions of the model are given below:

SI No.	Country /Region
1	Japan
2	Korea
3	China
4	India

5	Indonesia
6	Malaysia
7	Philippines
8	Singapore
9	Thailand
10	Rest of South Asia

11	NAFTA
12	EEA
13	Oceania
14	Rest of the World

Depending upon the availability of data in the GTAP Database, we have modeled 9 out of 14 JACIK member countries in the model. The data limitation does not permit at this stage to model each of the country separately in the model economy.

⁴ Various countries in the region are in the process of forming bilateral FTA's. India is likely to sign FTA with Thailand and Singapore (Mohanty, 2002b). There are attempts to sectoral cooperation as well (Chaturvedi 2002).

⁵ The model draws inspiration from the works of Brown , Deardorff and Stern (1996), and Chadha, Pohit, Deardorff, and Stern and (Hertel (1997).

The aggregated sectors of our model are as follows:

SI No.	Sectors
1	Rice
2	Other Cereals
3	Dairy and Meat Products
4	Processed food
5	Oil and oil seeds
6	Textile fibers
7	Mining
8	Energy Products

9	Forestry & Logging
10	Other Agricultural Products
11	Textile and Apparel
12	Beverages and Tobacco
13	Leather Products
14	Wood and Paper Products
15	Petroleum and Coke
16	Chemical and Allied Products
17	Iron and Steel

18	Other Metals and Products
19	Machinery
20	Electronic Equipment
21	Transport Equipment
22	Other Manufacturing Products
23	Transport Services
24	Communication
25	Financial Services
26	Other Services

In the sectoral definition of the model, there are 5 agricultural sectors, 17 Manufacturing sectors and 4 services sectors in each economy. It may be noted that most of the important sectors are modelled separately for analyzing policy simulations.

The theoretical assumptions of the model are similar to that of standard, multi-regional CGE model. The underlying equation system of the model includes two different sets of equations. One part covers the accounting relationships, which ensure that receipts and expenditures of every agent in our model economy are balanced. The other part of the equation system consists of behavioral equations, which is based on microeconomic theory. These equations, in fact, specify the behavior of optimizing agents in the economy, such as demand functions.

There are three principal factors of production in the model, namely, unskilled labour, skilled labour and capital. From these three factors of production, unskilled labour is considered mobile perfectly across sectors within the country. This assumption is common in all the scenarios in the model. The latter two factors namely skilled and investment of production are assumed to be perfectly mobile across JACIK countries in certain hypothetical scenarios in addition to being perfectly mobile across sectors within a country in all the scenarios of the model.

Two types of market structure are assumed in the model. We have assumed market structure to be perfectly competitive in agricultural sectors (viz. 1-5) and service sectors (viz. 23-26). However, market structure is assumed to be monopolistic in manufacturing sector. Of course, the market structure is generic in the sense that same type of market structure prevails in all the 13 countries/region.

Consumers and producers are assumed to use a two-stage procedure to allocate expenditure across differentiated products. In the first stage, expenditure is allocated across goods irrespective of country of origin or producing firm (see Chart 1). At this stage, the utility function is taken to be Cobb-Douglas and the production function requires intermediate inputs in fixed proportion. In the second stage, expenditure on monopolistically competitive goods is allocated across the competing varieties. However, in case of perfectly competitive goods, where individual firm supply is indeterminate, expenditure on each good is allocated over

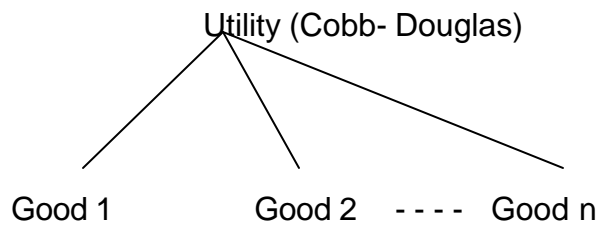
the industry as a whole. The aggregation function in the second stage is a Constant Elasticity of Substitution (CES) function.

The production function is separated into three stages. In the first stage, intermediate input and primary composite of capital and aggregate of skilled and unskilled labourers are used in fixed proportion to output⁶ (see Chart 2). In the second stage, capital and aggregate of skilled and unskilled labour are combined through a CES function to form the primary composite. In the third stage, skilled and unskilled labours are combined through a CES function to form the aggregate of skilled and unskilled labours. In the monopolistically competitive sectors, additional fixed inputs of capital and labour are required. It is assumed that fixed capital and fixed labour are used in the same proportion as variable capital and variable labour so that production functions are homothetic. Details about the production function used in the model are discussed in Chart 2 Presented below:

CHART 1: CONSUMER BEHAVIOUR

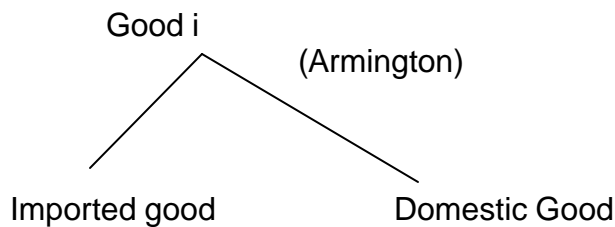
(Utility Maximiser)

Stage 1



Stage 2

Case A: Market Structure Perfect Competition



⁶ Intermediate inputs include both domestic and imported varieties.

Case B: Market Structure: Monopolistic Competition

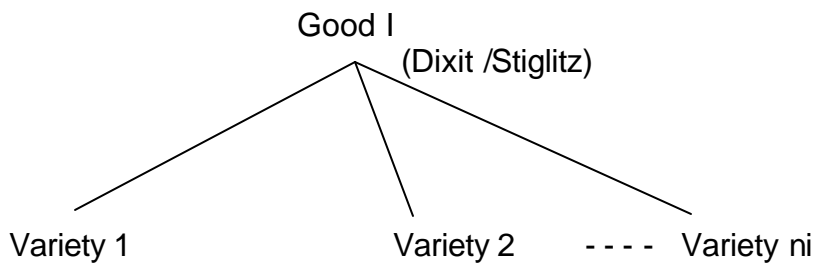
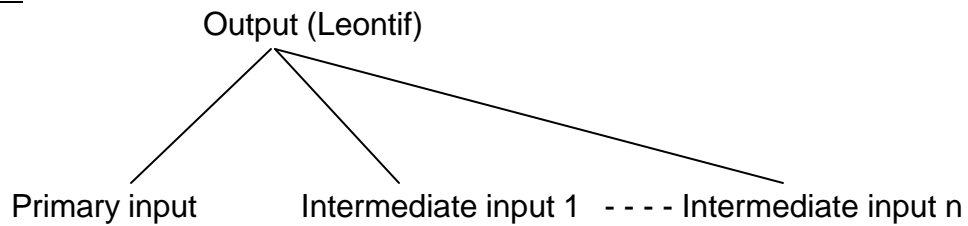


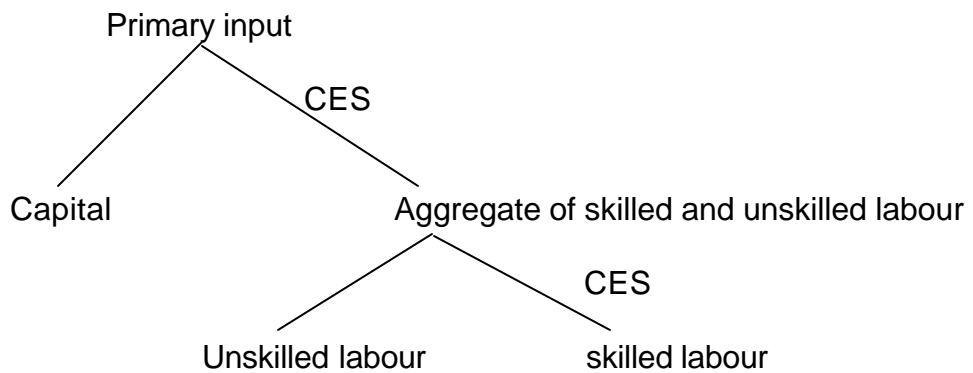
CHART 2: PRODUCER BEHAVIOR

(Cost Minimizer)

Stage 1



Stage 2: Primary Input



Stage 3: Intermediate Input

Same as in consumer stage 2

To determine prices, perfectly competitive firms set price equal to marginal cost, while monopolistically competitive firms maximize profits by setting price as an

optimal markup over marginal cost. The numbers of firms in sectors under monopolistic competition are determined by the condition that there are zero profits.

Total supply of factors of production (namely unskilled labour, skilled labour and capital) is assumed to remain fixed in our economy since the focus is on the inter-sectoral allocation of resources. The unskilled labour is assumed to be perfectly mobile across sectors within each country. Returns to unskilled labour are determined to equate factor demand to an exogenous supply of the same, which is assumed to remain fixed. In the base run, the similar equilibrating mechanism is assumed to hold for the other two factors of production, namely skilled labour and capital. However in other scenarios where we allow removal of restriction on capital movement within JACIK countries, and capital is assumed to be perfectly mobile across sectors and JACIK countries. Return to capital is determined to equate factor demand within JACIK countries to the total exogenous supply of the same, which is assumed to remain fixed. However, for the non-JACIK countries, the equilibrating mechanism for determining the return to capital is similar to that of unskilled labour. In the scenario where we have assumed that there is no restriction of movement of capital and skilled labour within JACIK member countries, return to skilled labour (in addition to that of capital) is determined to equate factor demand within JACIK countries to the total exogenous supply of the same. Again, for the non-JACIK countries, the equilibrating mechanism for determining the return to skilled labour is similar to that of unskilled labour.

World market determines equilibrium prices such that all markets clear. Total demand for each firm or sector's product must equal to total supply of that product.

The policy inputs in our model are basically the import and export tariff equivalents of trade barriers that are currently applied to the bilateral trade of the model countries of our economy.

The revenues or rents from import and export tariff equivalents are assumed to be redistributed to consumers in the tariff-levying country and are spent like any other income.

The model is implemented and solved using GEMPACK.

III. Results

The implications of FTA on the regional economies of JACIK, are examined using the monopolistic version of CGE model. The existing literature on CGE emphasizes that characteristics of monopolistic behaviour is commonly observed in the manufacturing sector, whereas the agriculture and the services sectors are continued to operate under perfectly competitive environment. In order to accommodate such sector specific conditions in the model, we have chosen Dixit/Stiglitz type of monopolistic framework in the present model.

Detailed discussion on the type of monopolistic competition is discussed in Section III.

We have taken three scenarios for analysing the possible course of economic cooperation between the regional partners. In Scenario I, we have assumed a situation like free trade area where complete trade liberalisation is envisaged covering both tariff and non-tariff barriers. In Scenario II, investment is allowed to move flow freely within the JACIK region in a FTA kind of trade policy environment. The existing literature highlights that investment is one of the most important sources of economic growth in developing countries. Some studies have empirically verified that investment liberalisation complements the regional efforts in improving trade and production efficiencies among regional economies giving the example of the EU. In the JACIK region, some countries have surplus capital and many other countries need capital for financing their high return projects. In such a situation, free mobility of capital can augment the level of production and allocative efficiency of factors of production to foster intra-regional trade in a Vinerian sense of trade creation⁷. This would eventually reflect in improving welfare gains in the region.

In Scenario III, we have assumed a Free Trade Area kind of trade regime where investment and skilled labour are allowed moving freely within the region. It may be noted that movements of natural persons is a major area of discussion in the GATS. The assumption of free mobility of skilled labourers within the proposed Regional Integration Arrangement (RIA) is not only feasible but also compatible to the multilateral trade negotiations. It may be noted that the JACIK region has a large reserve of skilled natural persons, and the demand for such scarce factor has been growing rapidly in recent years with the advancement of regional economies. The possibility of allowing skilled labour to move freely may be of great help for the regional economies in restructuring their modern production sectors. In these three different Scenarios, we are trying to examine the manner in which regional countries can benefit from the regional economic liberalisation in three areas such as trade, investment and labour mobility.

Regional Welfare Gains

In Compatible General Equilibrium analysis, the main result centers around the welfare gains for the region and the world as a whole. The welfare gains as a result of economic liberalisation may be due to various policy initiative. It is a composite macro indicator reflecting combined effects of several macro-variables. The trade liberalisation policies would affect reallocation of productive factors across sector owing to surge in demand of tradable sectors within the region. In the process, allocative efficiency of the existing factor endowments alters and so also their relative real prices. Such changes are also seen in different production sectors. The scale of production as well as the level of

⁷ For details see Viner (1950). Balasa (1967) examined empirically for the first time the trade creating and trade diverting effects of the European market.

production undergo a significant change in different regional economies. The implications of such restructuring are also reflected in the calculation of welfare gains. The trade liberalisation is ultimately reflected in expansion of trade within the region. Because of various factors such as scale economies, growing demand for certain tradable items, investment liberalisation, free mobility of skilled labourers, etc., the production condition in each country undergo a change. Such structural changes may have its impact on the competitiveness of each country's exports.

The welfare implications of FTA on 14 regions including rest of world are presented in Table 1 and 2. The results indicate that the proposed FTA is likely to enhance both regional and individual member countries' welfare. The regional welfare gains would be to the tune of more than 3 per cent of the GNP of the region. The magnitude of welfare gains in absolute term could be more than US\$ 200 billion. The magnitude of absolute gains in welfare will be such that it would enhance global welfare also. The region is likely to benefit more when investment is allowed to move freely within JACIK along with FTA in the region. The regional welfare would be further enhanced significantly in a situation where investment and skilled labour to move freely within the region along with FTA. The magnitude of absolute increase in welfare gains would be US\$ 147.4 billion in Scenario I, US\$ 153.2 billion in Scenario II and US\$ 210.4 in Scenario III.

Among the ASEAN countries, the maximum welfare gains (change in welfare with respect to GNP) will be registered in case of Singapore and Thailand and moderate gains for Malaysia and Indonesia as shown in Table 1. Philippines may be benefiting the least from the proposed FTA among the listed ASEAN countries. South Korea and Japan are likely to experience sustained enhancement in their welfare gains among the non-ASEAN countries in JACIK. While China stand to gain the least among the non-ASEAN countries, India may gain moderately in Scenario I.

Allowing investment to flow freely across the JACIK countries in a FTA kind of situation would make substantial changes in welfare gains for individual countries as shown in Scenario II. In comparison with Scenario I, all most all countries in ASEAN region will stand to gain in Scenario II. Though Singapore's increase in welfare gains is likely to be significant in Scenario II, it may fall below the level what it achieved in Scenario I. Similarly, non-ASEAN countries in JACIK are also likely to improve their gains from the investment liberalisation. In terms of magnitude of welfare gains with respect to GNP, the results are consistent with the existing literature.

The world and Asia are likely to benefit substantially by ensuring free mobility of natural resource persons. In Scenario III, both investment and skilled labour are allowed to move freely within JACIK along with FTA. The results of this Scenario indicate that both regional as well as global welfare can be enhanced without invoking compensation mechanism for the losing regions in the

model⁸. In the Pareto sense, the trade liberalisation in JACIK would enhance regional as well as global welfare. In this Scenario, most of the JACIK countries are likely to gain compared to Scenario II. Both Thailand and Indonesia are likely to gain the maximum in the ASEAN region. Other ASEAN countries in the model are also likely to gain moderately in the liberalisation process. Among the non-ASEAN countries, substantial chunk of benefits will be gained by Japan and Korea. Both China and India are also likely to gain from the liberalisation process.

The welfare gains for individual regions in the model are calculated on the basis of performances of number of variables on account of various policy shocks and changes in structural macro closures. In this study, we have analysed counter-factual results of a few variables such as factor prices, scale economies, production structure and composition of exports.

Effects of Liberalisation on factor prices

In this model, we have taken two factors of production, namely, labour and capital. Labour is further subdivided into skilled and unskilled labour to suit the specific requirements of the region. Skilled labour could be a proxy for the natural persons in the mode IV of the GATS. The overall effects of free trade area on different types of factors of production have been favourable in the sense that their real prices have gone up with economic liberalisation.

Unskilled Labourers

The effects of regional liberalisation on real wage rates of unskilled labour are presented in Table 3. Under the scenario of free trade area (Scenario I), the real wage rate are likely to go up in all the JACIK countries. The increase in the real wage rate of unskilled labour is likely to be significant when investment is liberalised along with trade. The experiences of individual countries may be mixed where there is liberalisation in trade, investment and movement of skilled labour in the region.

In Scenario I, all the countries in the region are likely to experience surge in the wage rate of unskilled labour. The rise in the wage rate is likely to be robust in case of Singapore whereas other countries like Thailand and Malaysia are likely to witness moderate gains in this regard among ASEAN countries. In JACIK, real wage rate of unskilled labour is likely to increase significantly in case of Korea, whereas both China and Japan are likely to experience moderate rise

⁸ Each region in the model is likely to register gain because of anticipated policy restructuring. The need for compensation mechanism arises in a situation where some regions gains and others lose but sum of total gains becomes positive. In this case, the gainers may compensate those who incur losses in the process. By adopting such a mechanism, global welfare can be enhanced along with gains for some countries in the region.

in this regard. The increase in the real wage rate is likely to be the least in case of India among Plus-4 countries⁹.

With the liberalisation of investment along with FTA in Scenario II, most of the ASEAN countries are likely to witness decline in the change in real wage of unskilled labour as compared to Scenario I. Malaysia is the only country in ASEAN where the real wage is likely to increase in Scenario II as compared to Scenario I. Among the Plus-4 countries, real wage rate of unskilled labour are likely to go up in Japan and Korea in Scenario II as compared to the earlier one. Both India and China are likely to witness decline in the level of real wage rate, and the level of decline in the wage rate is likely to be significant in case of India.

Skilled Labour

The implications of trade liberalisation on the real wage rate of skilled labour have been positive. The impact of free trade area in Scenario I is likely to increase real wage rate of skilled labours (see Table 4). The increase in the real wage rate of skilled labour is likely to be more robust comparing unskilled labour. In ASEAN countries, such upward trend in the wage rate is likely to be felt in all countries, and perhaps more strikingly in Singapore, Thailand and Malaysia. Among other countries in the RTA such as Indonesia and Philippines, the likely impact may be moderately felt. In comparison with ASEAN countries, other members of JACIK are likely to experience moderate to low level of increase in the real wage rate of unskilled labours. In case of Japan and India, the likely increase in the real wage rate of skilled labours will be marginal.

In Scenario II, the increase in the real wage rate is likely to be positive but lower than that of Scenario I, where investment is allowed to move freely. With the flexibility of capital movement within the region, more investment may be available for individual JACIK countries. There are evidences that wage of labour may be affected because of the structure of manufacturing sector of developing countries. In a study (Panchamukhi et al., 1995), it is empirically examined that most of the manufacturing sectors in selected developing countries are capital-inducive, despite of abundance of labour supply in these countries. Owing to this reason, influx of foreign capital may lead to lowering of demand for skilled labours in some countries. Most of the ASEAN countries except Malaysia may encounter a situation where the real wage rate of skilled labour may either decline or unchanged in Scenario II as compared to Scenario I.

In Scenario III, a free trade area is assumed along with liberalisation of investment and skilled labour within the JACIK countries and the real wage rate may increase in some countries. The increase in the real wage rate will be more robust in Scenario III as compared to other two Scenarios. The results indicate that the countries like Indonesia, Malaysia and Philippines may face a significant rise in the real wage rate of skilled labour. However, in this scenario, both

⁹ Plus-4 countries include Japan, South Korea, China and India.

Singapore and Thailand are likely to face a situation where the net increase in the real wage rate may be lower than that of other two Scenarios. Among other JACIK countries, the trend of net change in real wage rate of skilled labours is likely to be strong in case of Japan and Korea. India is likely to witness a fall in the real wage rate.

Investments

Trade liberalisation in the JACIK region, may improve real rate of return of investment in the region. In Scenario I, all the countries in the region are likely to witness surge in the efficiency of investment as shown in Table 5. The level of increase in the rate of return of investment may vary from one country to the other. For example in ASEAN countries, most of the countries benefit from the liberalisation but the impact will be felt more strongly in Singapore, Malaysia and Thailand. Countries like Indonesia and Philippines may witness net increase in the real rate of return of investment but the magnitude increase will be very low. In case of Plus-4 countries, the net increase of return of investment will be very low as compare to ASEAN counterparts.

In Scenario II, sizable number of countries in JACIK may improve their return on investment in the second scenario as compared to Scenario I. For example, all ASEAN countries are likely to improve their position in this regard except for Singapore. Among other countries in JACIK, China and India are likely to gain whereas Japan and Korea may lose in terms of their achievement in the real rate of return of investment in Scenario II as compared to Scenario I.

In Scenario III, the rate of return of investment in number of countries is likely to increase as compared to Scenario II. Except for Philippines, other countries of the ASEAN region are likely to improve their position in gaining efficiency in investment in Scenario III as compared to Scenario II. Countries like Japan and Korea are also likely to register significant improvement in their return of investment whereas China and India may loose in this regard.

Scale Effect

In this monopolistic model, an attempt has been made to examine the magnitude of change in the scale of production. In this model, if the change in scale of production is positive, it means that there is an improvement in the efficiency of production. The overall effects of the scale of production indicate that most of the countries in the JACIK countries are likely to improve their production efficiency in some sectors or the other as shown in Table 6. The magnitude of gains in production efficiency may vary across sectors and countries. It is observed that some of the sectors in the manufacturing sector are consistently doing well in different JACIK countries. In Scenario I, the change in the scale of production is favourable in case of sizable number of sectors in JACIK countries. The efficiency gains can be noticed in both ASEAN countries

and Plus-4 countries but the coverage of sectors is more in case of latter set up countries. In ASEAN, improvement in the scale of production is significant and extended to large number of industrial grouping in specific countries like Singapore, Philippines and Malaysia.

In Scenario II, the pattern of change in scale of production is likely to be different from that of Scenario I. In the ASEAN region, the efficiency gain will be maximum in case of Malaysia whereas it would be moderate in the case of Indonesia, Philippines and Thailand. Singapore may witness decline in scale of production in sizable number of sectors in the manufacturing sector. As compared to ASEAN countries, net improvement in the scale of production will be higher in Plus-4 countries. There are some common sectors where both Japan and Korea are likely to make efficiency gains in Scenario II. Similar observations can be made for China and India too. Among the sectors, which are likely to be benefited in terms of net increase in scale of production are chemical products, metal products excluding iron and steel, machineries, electric equipments, transport equipments and other manufacturing products.

In Scenario III, liberalisation in the movement of labour may improve efficiency in almost all countries in JACIK. The results indicate that ASEAN countries may have an edge over the Plus-4 countries. The maximum efficiency gain may be noticed in Thailand and Philippines among ASEAN countries. China is likely to have an edge over other Plus-4 countries. The sectors, which may gain scale efficiency because of investment and skilled labour liberalisation in Plus-4 countries, are petrochemicals, iron and steel, other metal products, electronic equipments, transport equipments and other manufactures.

Production Effects

The impact of trade and investment liberalisation on sectoral production performances may be mixed in the JACIK region. In Scenario I, production is likely to increase in number of sectors as presented in Table 7. Among ASEAN countries, Malaysia, Philippines and Singapore, are likely to witness improvement in the production profile of large number of sectors. Among the Plus-4 countries, sectoral performance in production will be similar in case of China, Korea and India. Production in Japan is likely to increase in sizable number of technology intensive product groups. Production is likely to increase in most of the countries in the agricultural sector. Some of the high performing sectors are processed food, oil seed and beverages and tobacco. Some of the important manufacturing sectors where performances are likely to improve, are leather, metals other than iron and steel, machinery and electronic equipments. In Scenario II, only four JACIK countries, namely Japan, Korea, Singapore and Malaysia, are likely to gain in almost all production sectors of their respective economies as compared to Scenario I. In Scenario III, almost all countries in JACIK region are likely to improve their production profile as compared to Scenario II.

Effects on Exports

The results of export performances on the JACIK region indicate that the trade sector performance is rather more spectacular than that of production. All individual member countries in the region are likely to benefit in improving their export performance in large number of tradable sectors as shown in Table 8.

In Scenario I, some countries in ASEAN like Thailand, Philippines and Malaysia are likely to register increase in their exports in all sectors. Among other ASEAN countries, export of Indonesia and Singapore may face marginal decline in some sectors because of FTA in JACIK. Among other JACIK countries, China and India are likely to improve their export performances in all the sectors in a consistent as well as significant manner. Barring a few sectors, Japan and Korea are likely to register favourable growth in their exports with the JACIK region. The results indicate that exports of energy products are likely to decline in number of countries such as Japan, Korea, India and Singapore.

In Scenario II, it is observed that trade liberalisation combined with free mobility of labour is likely to improve export performance of number of regional countries in sizable number of productive sectors. The investment liberalisation in Scenario II, is likely to affect a few countries in the region. Export performances of Indonesia, Philippines and Thailand are likely to improve in all sectors as compared to results of Scenario I. In Malaysia, export performance may improve in a few sectors like processed food, other agricultural products, leather, wood and paper products, etc. Among Plus-4 countries, China and India may improve their export performances in all sectors and growth of export will be more robust in the latter case. Both Japan and Korea are likely to witness a down turn in the rate of their exports performances in Scenario II as compared to Scenario I.

The Scenario III presents a different situation than that of Scenario II. Free mobility of skilled labour along with trade and investment liberalisation may benefit sizable number of countries in the JACIK region, and will improve their export performances over Scenario II. In this Scenario, Philippines is the only country in the ASEAN region where the exports are likely to decline. Other countries like China and India outside ASEAN may face similar kind of situation like that of Philippines.

IV. Conclusion

During the last decade, the ASEAN region has emerged as a vibrant economic space in the global economy. Number of other countries in East Asia such as China, Korea and Japan have strengthened their economic partnership with the region. India also joined the exclusive club in November 2002. Though the progress in building partnership among important economies of Asia has been a recent phenomenon, the region has been progressing steadily in the post 1997 period. Some studies have suggested that lack of institutional build up,

particularly, in forming RIAs in the Asian Continent, has contributed to slow progress of Asia in comparison to its growth potentials

In recent years, attempts have been made to strengthen regional process and also the bilateral processes. Most of the countries in the JACIK countries are engaged in developing close economic relationship either with selected number of regional countries or with the region as a whole. There is a common perception among the regional countries that deepening of economic liberalisation is key to enhance regional welfare. The main thrust of the study is to formulate a common policy of FTA among JACIK countries, and this initiative may end the process of various levels of bilateral and subregional initiatives for close economic cooperation. Instead of taking these issues bilaterally, it can be very well negotiated at the regional level and all negotiations may be go through a single window. In this context, the study has attempted to examine the potential benefit of the formation of FTA among the JACIK countries.

In this study, three scenarios are considered to examine the implications of comprehensive liberalisation in the region. In the first scenario, the policy of FTA is presented where both TBs and NTBs are allowed to be frozen completely among member countries. In the second scenario, investment is made to move freely within the region along with FTA. In the third scenario, investment and skilled labourers are allowed to move freely within the region along with FTA. A monopolistic version of CGE model has been used to examine the implications of liberalisation of trade, investment and skilled labour movements.

The results show that FTA may be welfare enhancing for all countries in the JACIK region. Further liberalisation in the form of investment or movement of natural persons (skilled labour) may improve the robustness of welfare gains among the member countries in the region. In all such situations, regional economic liberalisation also enhance global welfare. The results indicate that the absolute increase in regional welfare may go beyond US\$ 210 billion, following wider level of regional liberalisation including FTA. Formation of FTA alone may increase GNP of JACIK countries to the extent of US\$ 147.4 billion. Further liberalisation of investment along with FTA may enhance economic welfare to the extent of US\$ 153.2 billion. If further liberalisation takes place by allowing skilled labour to move freely within JACIK, GNP of the RIA may go up by US\$ 210.4 billion. It may be noted that the economic impact of investment and trade liberalisation may generate more welfare effect than FTA alone. Maximum welfare effects can be generated when investment and skilled labours will be allowed to move freely within the region along with FTA among JACIK countries. Under different liberalisation schemes, the GNP of JACIK is likely to increase between 2.2% to 3.14% because of the RIA. The implications of different schemes of trade liberalisation have favourable impact on upward movements of factor prices in JACIK countries. It is interesting to note that real wage rate of skilled labours may move faster than the unskilled labour in many countries. The

trade liberalisation is likely to improve real rate of investment in JACIK countries, but the magnitude of return to investment may vary from one country to another.

The implications of FTA on the regional economies will be favourable in improving efficiency of production in selected number of sectors. In the agricultural sector, production is likely to improve in manufacturing groups like processed food, oil seed and beverages & tobacco. The economies of scale will be mostly felt in the manufacturing sector. Some of the important areas where production performance are likely to improve are leather, metals other than iron and steel, machinery and electric equipments. The export is expected to perform better than production sector. In the export sector, all the countries of the JACIK are likely to be benefited in augmenting their export activities in the post-FTA period. Liberalisation of investment along with FTA may improve prospects of exports in sizable number of member countries. Substantial benefit may be accrued to the region when movement of natural persons is permitted to move freely across the region. With these policy changes, the region is likely to improve its capability to improve its intra-regional trade. With this initiative, world economy is also likely to benefit in improving its welfare effects in a Paretoian manner.

References

- Agrawala, R and B Prakask (2002), *Regional Cooperation in Asia: Long-term Progress, Recent Retrogression, and the Way Forward*, ERD Working Papers Series No. 28, Asian Development Bank, Manila.
- Asher, Mukul (2002), "India, China and the ASEAN: The Economic Enigma", Opinion Interview Report in **Business Line**, Singapore.
- Brown, Drusilla K., Alan V. Deardorff and Robert M. Stern. 1996. "Computational Analysis of the Economic Effects of an East Asian Preferential Trading Bloc", *Journal of the Japanese and International Economies*, 10:37-70.
- Balasa, Bela (1967), 'Trade Creation and Trade Diversion in the European Common Market', *Economic Journal*, No 77, pp 1-17.
- Chadha, Rajesh Sanjib Pohit, Alan Deardorff and Robert M. Stern (1998), *The Impact of Trade and Domestic Policy Reforms in India: A CGE Modelling Approach*, University of Michigan Press, USA.
- Chadha, Rajesh, Drusilla Brown, Alan Deardorff and Robert M. Stern, 1999. "Computational Analysis of India's Post-1991 Economic Reforms and the Impact of Uruguay Round and forthcoming WTO-2000," in *WTO 2000 South Asia Workshop*, organised by National Council of Applied Economic Research and World Bank, December 20-21, New Delhi, India. (forthcoming in *India and the WTO: A Strategy for Development*, editors Aaditya Mattoo and Robert M. Stern, *Trade and Development Series*, Oxford University Press and the World Bank.)

- Chaturvedi, Sachin (2002), Indo-Singapore on Biotechnology, **RIS Occasional Paper**, Research and Information System for the Non-Aligned and Other Developing Countries, New Delhi.
- DeRosa, D A (1995), Regional Trading Arrangements among Developing Countries: The ASEAN Example, Research No 103, IFPRI, Washington DC.
- Frankel, J A (1997), Regional Trading Blocs: In the World Economic System, Institute for International Economics, Washington DC.
- Kumar, Nagesh (2002a), ASEAN-India Vision 2020: A Conceptual Note, ASEAN-India Network of Think Tanks, Research and Information System for the Non-Aligned and Other Developing Countries, New Delhi.
- Kumar, Nagesh (2002b), Towards An Asian Economic Community: Vision of Close Economic Cooperation in Asia, **Discussion Paper No. 32**, Research and Information System for the Non-Aligned and Other Developing Countries, New Delhi.
- Kumar, Nagesh and Saikat Sinha Roy (2003), Complementarities and Potentials of Intra-regional Transfers of Investments, Technology and Skills in Asia, International Conference on 'Building an Asian Economic Community' organised by RIS, India, MIER, Malaysia, CSIS, Indonesia, SPF, Japan, 10-11 March, New Delhi.
- Hertel, T.W. (ed.) *Global Trade Analysis Project: Modelling and Applications*, Cambridge University Press, 1997.
- Lanteigne, Marc (2003), An assessment of Formal and Non-formal Arrangements for East Asian Engagement: Canada and India, Paper presented in the Seminar on 'India-Canada Dialogue on East Asia and Regional Cooperation, on February 14-15, Organised by Centre for Policy Research and Asia-Pacific Foundation of Canada, New Delhi.
- Lee, C-S and S-C Park (2002), An Examination of the Formation of Natural Trading Blocs in East Asia, **KIEP Working Paper No. 02-13**, Seoul: Korea Institute for International Economic Policy.
- Mohanty, S K (2002a), Feasibility of Extending Unilateral Tariff Preferences to Newer Members of the ASEAN: From an Indian Perspective, for India-ASEAN Summit, Report for the Ministry of External Affairs, Government of India, October, New Delhi.
- Mohanty, S K (2002b), Possibility of Close Economic cooperation between India and Singapore, Report Submitted to the Ministry of Commerce, Government of India, New Delhi.
- Mohanty, S K, Sanjib Pohit and Saikat Sinha Roy (2002), Implications of Agricultural Trade Liberalisation in Selected Industrialised Countries on Trade Prospects of South Asian Countries: A CGE Modelling Analysis, paper presented in Regional Conference on Globalisation and Agriculture: Challenges for South Asia, 4-5 December, RIS.

- Panchamukhi, V.R. et al. (1995), *Complementarity in Trade and Production: Intra-South Potentials*, Sage Publication, New Delhi.
- RIS (2003), *Globalisation and the Non-Aligned Movement: An Economic Agenda for Action, A Background Document for the NAM Summit, Kuala Lumpur, Malaysia, 20-25, February*, Research and Information System for the Non-Aligned and Other Developing Countries, New Delhi.
- Ruggie, John Gerard (1992), "Multilateralism: The Anatomy of an Institution", *International Organization*, Vol. 46 (3), Summer, pp-561-98.
- Sinha Roy, Saikat (2001), *Post-Reforms Export Growth in India: An Exploratory Analysis*, **Discussion Paper No.13**, Research and Information System for the Non-Aligned and Other Developing Countries, New Delhi.
- Srinivasan, T.N., J. Whalley and I. Wooton (1993), *Measuring the Effects of Regionalism on Trade and Welfare*, in K. Anderson and R. Blackhurst (eds.), *Regional Integration and the Global Trading System*, New York: Harvester Wheatsheaf.
- UNDP (1994), *Country Human Development Indicators*, Human Development Report Office, New York
- UNIDO, *Handbook of Industrial Statistics*, various issues.
- Viner, Jacob (1950), *The Customs Union Issue*, New York, Carnegie Endowment for International Peace.
- World Bank (2002), *World Development Indicator*, CD, World Bank, Washington D.C.
- World Bank (200), *Trade Blocs, A World Bank Policy Research Report*, Oxford University Press, Washington, USA.

Table 1: Change in Welfare*			
(in %)			
Country/Region	Scenario I	Scenario II	Scenario III
Japan	2.54	2.64	3.55
Korea	3.02	3.08	3.26
China	0.64	0.72	1.65
India	1.75	1.86	2.50
Indonesia	1.80	1.91	3.34
Malaysia	1.87	1.96	2.86
Philippines	1.33	1.45	2.46
Singapore	3.10	2.41	2.35
Thailand	2.81	2.93	3.70
JACIK	2.20	2.29	3.14
Note: * w.r.t. GNP Results of other regions such as European Economic Area, NAFTA, other South Asia, Oceania and RoW and not presented in all tables because of paucity of space.			

Table 2: Absolute Change in Welfare			
(Million US\$)			
Country/Region	Scenario I	Scenario II	Scenario III
Japan	107625.7	111807.0	150695.2
Korea	13042.9	13317.4	14075.7
China	6326.5	7100.0	16327.7
India	6971.3	7378.6	9937.0
Indonesia	3760.3	3993.9	6968.1
Malaysia	1950.4	2045.6	2984.0
Philippines	1038.2	1131.8	1912.1
Singapore	2292.5	1786.7	1741.4
Thailand	4409.8	4594.7	5799.7
JACIK	147417.6	153155.7	210440.9

Table 3: Change in Real Wage of Unskilled Labour			
(in %)			
Country/Region	Scenario I	Scenario II	Scenario III
Japan	0.38	0.54	-4.12
Korea	1.85	1.95	-0.90
China	0.74	0.60	1.66
India	0.18	-0.61	2.92
Indonesia	1.04	1.00	-1.21
Malaysia	1.95	2.08	-0.16
Philippines	0.80	0.76	2.07
Singapore	2.99	2.07	-3.83
Thailand	2.04	1.90	-2.40

Table 4: Change in Real Wage of Skilled Labour			
(in %)			
Country/Region	Scenario I	Scenario II	Scenario III
Japan	0.41	0.58	3.17
Korea	1.74	1.91	2.13
China	0.93	0.55	1.26
India	0.18	-1.27	-0.41
Indonesia	1.12	1.04	2.03
Malaysia	2.22	2.36	2.83
Philippines	0.73	0.45	1.33
Singapore	3.18	2.31	2.05
Thailand	4.22	3.84	3.23

Table 5: Change in Real Return of Investment			
(in %)			
Country/Region	Scenario I	Scenario II	Scenario III
Japan	0.37	-0.01	3.06
Korea	1.10	0.68	2.02
China	0.85	1.84	1.15
India	0.16	1.35	-0.52
Indonesia	0.84	1.00	1.92
Malaysia	2.12	2.16	2.72
Philippines	0.85	1.73	1.22
Singapore	3.22	0.77	1.94
Thailand	2.04	2.55	3.12

Table 6: Change in Scale of Production

(in %)

S No	Sectors	ipn	kor	Chk	ind	idn	mvs	phl	sap	tha
Scenario I										
1	Textile fibers	-0.39	1.81	1.46	0.25	-0.19	1.66	1.50	2.50	0.00
2	Minina	-0.56	-1.68	0.00	1.16	-0.20	-0.32	0.79	-0.57	-1.03
3	Energy Products	-0.83	-1.63	-0.15	0.21	-0.61	-1.01	0.78	1.41	-0.49
4	Forestry & Logging	-0.34	1.10	-0.16	-0.14	0.33	0.12	-0.56	-0.04	-0.38
5	Other Agricultural Products	-0.32	-0.37	0.29	0.10	0.10	0.50	0.88	5.17	3.49
6	Textile and Apparel	0.33	0.75	-0.17	0.08	-0.05	0.99	-0.37	3.98	0.28
7	Beverages and Tobacco	0.95	1.71	1.21	0.23	1.65	3.03	2.39	2.69	1.18
8	Leather Products	1.11	1.73	0.89	0.39	1.92	6.15	2.78	2.72	0.74
9	Wood and Paper Products	0.30	0.91	0.72	0.07	0.56	1.03	0.63	1.28	0.23
10	Petroleum and Coke	0.80	1.23	0.29	-0.17	-0.47	-1.93	0.08	3.52	-0.73
11	Chemical and Allied Products	0.39	1.39	0.95	0.28	0.61	1.79	0.92	2.51	0.72
12	Iron and Steel	0.33	0.78	0.73	0.10	-1.40	0.19	0.67	0.76	-0.25
13	Other Metals and Products	0.23	1.50	0.71	0.14	0.89	1.62	1.49	2.48	1.11
14	Machinery	0.28	1.26	0.88	0.23	2.65	1.71	1.50	2.59	1.27
15	Electronic Equipment	0.28	2.33	1.56	0.60	0.98	1.87	1.35	3.34	1.63
16	Transport Equipment	0.33	1.35	0.43	0.16	1.05	1.37	3.05	2.81	0.60
17	Other Manufacturing Products	0.32	0.90	0.68	0.13	0.33	0.89	1.00	1.61	0.68
Scenario II										
1	Textile fibers	0.06	2.43	0.65	-1.54	-0.38	1.76	0.55	3.21	-0.91
2	Minina	-0.03	-1.07	-0.83	-0.95	-0.37	-0.28	-0.06	1.32	-1.80
3	Energy Products	-0.44	-1.05	-1.08	-2.08	-0.67	-0.81	-0.04	0.47	-1.50
4	Forestry & Logging	-0.02	1.41	-0.78	-2.02	0.16	0.18	-1.31	1.35	-1.10
5	Other Agricultural Products	-0.06	-0.01	-0.33	-0.45	-0.03	0.54	0.18	6.34	2.90
6	Textile and Apparel	0.28	0.87	-0.73	0.41	-0.09	1.04	-0.80	4.48	-0.07
7	Beverages and Tobacco	0.89	1.55	1.54	0.46	1.72	3.05	2.78	1.79	1.28
8	Leather Products	1.06	1.66	1.09	0.25	2.01	5.99	3.05	2.55	0.57
9	Wood and Paper Products	0.26	0.85	1.03	0.22	0.56	1.07	0.77	1.13	0.15
10	Petroleum and Coke	0.66	1.14	0.48	-0.55	-0.61	-1.71	-0.43	3.20	-1.17
11	Chemical and Allied Products	0.30	1.23	1.39	0.75	0.63	1.82	1.11	1.19	0.76
12	Iron and Steel	0.27	0.79	0.95	0.22	-1.62	0.26	0.34	1.62	-0.54
13	Other Metals and Products	0.19	1.41	1.03	0.63	0.90	1.69	1.94	1.58	1.13
14	Machinery	0.22	1.15	1.26	0.65	2.84	1.79	2.17	1.36	1.38
15	Electronic Equipment	0.23	2.20	1.89	0.83	0.90	2.00	1.38	1.83	1.62
16	Transport Equipment	0.28	1.32	0.37	0.33	1.09	1.48	3.57	1.59	0.48
17	Other Manufacturing Products	0.26	0.82	1.05	0.47	0.33	0.96	1.26	1.36	0.72
Scenario III										
1	Textile fibers	5.96	6.00	0.69	-2.57	2.47	4.29	0.98	4.77	1.53
2	Minina	5.93	1.85	-0.74	-1.98	2.40	1.78	0.64	4.03	-0.04
3	Energy Products	4.04	2.56	-0.57	-3.57	3.10	1.83	1.06	-0.02	1.02
4	Forestry & Logging	4.47	3.11	-0.79	-2.90	2.51	1.81	-0.87	3.52	0.56
5	Other Agricultural Products	3.53	1.63	-0.27	-0.78	2.14	2.45	0.37	8.37	4.93
6	Textile and Apparel	1.00	1.59	-0.54	-0.25	0.89	2.35	-0.40	5.59	0.98
7	Beverages and Tobacco	-0.50	0.61	1.78	0.67	1.54	2.92	3.20	-0.18	1.38
8	Leather Products	-0.02	0.77	1.39	0.19	1.77	5.54	3.49	2.81	1.20
9	Wood and Paper Products	-0.25	0.34	1.22	0.34	0.54	0.92	1.00	1.12	0.50
10	Petroleum and Coke	1.16	1.60	0.53	-0.85	2.19	0.18	-0.08	3.56	0.05
11	Chemical and Allied Products	-0.22	0.80	1.52	1.06	0.80	2.10	1.35	0.26	0.94
12	Iron and Steel	0.30	1.35	1.29	0.37	0.46	1.14	0.55	3.43	-0.01
13	Other Metals and Products	-0.41	0.42	1.30	0.92	1.46	1.72	2.23	0.73	1.52
14	Machinery	-0.39	0.79	1.52	1.05	2.82	1.77	2.80	-0.01	1.72
15	Electronic Equipment	-0.18	1.46	2.35	1.08	2.44	1.93	2.22	0.00	2.04
16	Transport Equipment	-0.43	0.66	0.60	0.52	1.69	2.28	4.32	0.05	1.11
17	Other Manufacturing Products	-0.29	0.34	1.15	0.66	0.54	1.56	1.46	1.47	0.90

Table 7: Change in Production										
(in %)										
S No	Sectors	jpn	kor	Chk	ind	idn	mys	phl	sgp	tha
Scenario I										
1	Rice	-0.11	-0.91	-0.46	-0.20	-0.51	0.16	-0.95	-0.13	4.98
2	Other Cereals	-2.17	-11.01	1.65	-0.08	0.71	1.18	-0.06	2.66	4.03
3	Dairy and Meat Products	-0.32	1.76	0.10	-0.06	-0.45	-0.06	-0.78	2.17	1.87
4	Processed food	-0.15	3.69	1.92	6.19	2.91	3.13	0.33	3.70	5.07
5	Oil and oil seeds	-0.25	0.04	-0.04	0.19	0.97	5.83	1.06	2.48	-1.09
6	Textile fibers	-0.69	1.51	1.49	0.26	-0.27	1.61	1.46	1.98	-0.08
7	Mining	-0.79	-1.94	0.01	1.25	-0.23	-0.38	0.76	-0.74	-1.09
8	Energy Products	-1.70	-2.98	-0.11	0.31	-0.70	-1.04	0.93	-0.16	-0.58
9	Forestry & Logging	-0.46	1.04	-0.16	-0.13	0.32	0.10	-0.56	-0.43	-0.41
10	Other Agricultural Products	-0.68	-0.59	0.27	0.14	0.02	-0.04	0.90	4.23	3.74
11	Textile and Apparel	0.12	-0.03	-0.21	-0.14	-0.66	0.78	-0.76	3.65	-0.10
12	Beverages and Tobacco	0.57	3.12	1.49	0.54	1.08	2.57	2.35	1.68	0.19
13	Leather Products	-0.47	3.18	1.98	1.27	1.99	7.83	2.93	2.24	0.26
14	Wood and Paper Products	-0.32	-0.56	-0.16	-0.05	1.98	1.42	-0.11	-0.11	-0.89
15	Petroleum and Coke	0.16	0.47	-0.76	-0.12	-0.73	-3.50	0.03	4.69	-0.84
16	Chemical and Allied Products	0.42	0.49	-0.22	-0.27	-0.41	1.40	-0.03	1.81	0.33
17	Iron and Steel	0.94	-1.04	-0.48	-0.22	-2.62	-1.49	-0.05	-0.19	-3.41
18	Other Metals and Products	0.14	-0.75	0.17	0.27	-0.65	0.59	1.18	1.13	-0.44
19	Machinery	0.81	-0.80	-0.06	-0.18	2.18	1.19	2.73	0.41	0.42
20	Electronic Equipment	0.10	0.52	1.30	-0.22	0.46	1.70	1.32	0.60	1.42
21	Transport Equipment	0.41	0.01	-0.42	-0.10	-2.63	-0.74	3.62	0.57	-1.73
22	Other Manufacturing Products	0.04	-1.07	0.13	0.28	-0.66	-0.32	0.29	0.08	-0.44
23	Transport Services	-0.30	-1.02	0.01	0.07	-0.39	-0.08	0.04	-0.53	-0.58
24	Communication	-0.16	-1.01	-0.12	-0.10	-0.55	-0.43	-0.45	0.00	-0.60
25	Financial Services	-0.16	-0.67	-0.14	0.05	-0.54	-0.09	-0.54	-0.87	-0.77
26	Other Services	-0.06	-0.72	-0.28	-0.13	-0.27	-0.49	-0.10	-0.26	-1.02
Scenario II										
1	Rice	0.19	-0.55	-1.07	-1.86	-0.63	0.23	-1.65	1.32	4.40
2	Other Cereals	-1.53	-10.13	0.98	-1.81	0.54	1.48	-1.14	5.41	3.03
3	Dairy and Meat Products	-0.03	2.03	-0.52	-1.82	-0.58	-0.08	-1.53	2.91	1.18
4	Processed food	0.11	3.89	1.19	4.48	2.74	3.11	-0.47	4.49	4.26
5	Oil and oil seeds	0.05	0.42	-0.79	-1.59	0.84	5.89	0.23	3.89	-1.85
6	Textile fibers	-0.17	2.25	0.65	-1.54	-0.46	1.73	0.39	3.69	-1.04
7	Mining	-0.19	-1.26	-0.82	-1.01	-0.40	-0.34	-0.15	1.27	-1.90
8	Energy Products	-1.01	-2.13	-1.08	-2.18	-0.77	-0.83	-0.24	2.71	-1.78
9	Forestry and Logging	-0.12	1.36	-0.78	-2.02	0.15	0.16	-1.32	1.27	-1.13
10	Other Agricultural Products	-0.35	-0.21	-0.35	-1.65	-0.13	0.00	0.13	6.01	3.09
11	Textile and Apparel	0.41	0.24	-0.80	-1.85	-0.80	0.84	-1.38	4.59	-0.72
12	Beverages and Tobacco	0.88	3.44	0.75	-1.05	0.94	2.56	1.74	2.61	-0.42
13	Leather Products	-0.17	3.58	1.33	-0.51	1.90	7.45	2.29	3.09	-0.37
14	Wood and Paper Products	0.02	-0.18	-1.02	-2.03	1.76	1.40	-1.02	1.51	-1.70
15	Petroleum and Coke	0.40	0.73	-1.68	-1.73	-0.89	-3.26	-0.54	5.00	-1.31
16	Chemical and Allied Products	0.77	0.86	-1.19	-2.23	-0.67	1.41	-1.04	3.22	-0.56
17	Iron and Steel	1.30	-0.60	-1.48	-2.24	-2.95	-1.44	-1.10	1.41	-4.65
18	Other Metals and Products	0.48	-0.32	-0.69	-2.08	-0.89	0.63	0.40	2.64	-1.26
19	Machinery	1.09	-0.41	-0.79	-1.76	2.14	1.24	2.18	1.66	-0.35
20	Electronic Equipment	0.39	0.85	0.67	-1.73	0.28	1.80	0.99	0.98	0.61
21	Transport Equipment	0.67	0.26	-1.03	-1.63	-2.79	-0.60	3.14	1.31	-2.35

22	Other Manufacturing Products	0.37	-0.72	-0.63	-1.50	-0.86	-0.27	-0.61	1.46	-1.16
23	Transport Services	-0.01	-0.67	-0.69	-1.65	-0.53	-0.02	-0.66	0.55	-1.28
24	Communication	0.14	-0.63	-0.82	-1.81	-0.71	-0.32	-1.23	0.89	-1.30
25	Financial Services	0.14	-0.36	-0.86	-1.76	-0.67	-0.01	-1.23	0.49	-1.51
26	Other Services	0.22	-0.42	-0.82	-1.80	-0.39	-0.41	-0.85	0.67	-1.65
Scenario III										
1	Rice	4.22	1.12	-0.97	-2.83	1.87	1.98	-1.35	3.72	6.77
2	Other Cereals	6.81	-6.64	1.08	-2.83	3.50	4.08	-0.83	9.97	5.85
3	Dairy and Meat Products	4.20	3.66	-0.44	-2.85	1.91	1.57	-1.14	4.70	3.01
4	Processed food	4.11	5.18	1.19	3.35	5.14	4.90	-0.15	6.36	5.82
5	Oil and oil seeds	4.47	2.23	-0.75	-2.68	3.55	7.39	0.63	7.24	0.16
6	Textile fibers	6.29	6.48	0.70	-2.58	2.53	4.59	0.86	6.57	1.68
7	Mining	6.22	1.88	-0.73	-2.12	2.42	1.81	0.50	4.06	-0.05
8	Energy Products	6.05	3.56	-0.57	-3.78	3.17	1.85	1.21	6.85	1.15
9	Forestry & Logging	4.54	3.12	-0.81	-2.92	2.52	1.80	-0.87	3.73	0.54
10	Other Agricultural Products	4.11	1.47	-0.30	-2.67	2.47	2.00	0.33	8.72	5.38
11	Textile and Apparel	4.16	1.88	-0.60	-2.69	1.38	2.43	-0.89	6.22	0.86
12	Beverages and Tobacco	5.80	5.64	0.74	-2.07	3.02	4.24	2.01	5.32	1.07
13	Leather Products	4.59	6.23	1.41	-1.54	3.90	7.85	2.64	4.95	1.07
14	Wood and Paper Products	4.88	2.27	-0.99	-3.19	4.03	3.19	-0.68	4.59	-0.23
15	Petroleum and Coke	4.03	2.45	-1.45	-2.87	2.14	-1.03	-0.15	5.63	-0.05
16	Chemical and Allied Products	5.37	2.97	-1.23	-3.44	1.87	3.10	-0.88	5.48	0.93
17	Iron and Steel	5.98	1.75	-1.65	-3.47	-0.25	0.22	-0.89	4.10	-3.50
18	Other Metals and Products	5.31	2.34	-0.69	-3.59	1.84	2.28	0.89	5.41	0.14
19	Machinery	5.34	1.46	-0.82	-2.97	4.27	2.68	2.61	4.02	0.73
20	Electronic Equipment	4.61	2.71	0.71	-3.03	2.66	3.11	1.67	2.44	1.52
21	Transport Equipment	4.73	2.04	-0.92	-2.75	-0.45	0.95	3.60	3.27	-1.15
22	Other Manufacturing Products	4.90	1.40	-0.49	-2.62	1.73	1.41	-0.51	3.75	0.37
23	Transport Services	4.66	1.61	-0.58	-2.79	2.12	1.85	-0.31	2.82	0.23
24	Communication	4.35	1.37	-0.61	-2.93	1.66	1.34	-0.75	2.89	0.32
25	Financial Services	4.54	1.77	-0.74	-2.93	2.07	1.72	-1.01	3.39	0.43
26	Other Services	4.36	1.43	-0.65	-2.83	2.11	1.38	-0.40	2.73	-0.03

Table 8: Change in Exports

(in %)

S No	Sectors	jpn	kor	Chk	ind	idn	mys	phl	sgp	tha
Scenario I										
1	Rice	-0.7	6.79	10.03	0.93	8.91	8.91	9.94	-0.31	16.82
2	Other Cereals	-0.62	3.54	27.02	7.21	9.14	0.64	6.82	9.52	7.05
3	Dairy and Meat Products	5.5	29.63	14.07	9.59	1.58	5.57	9.28	6.52	21.09
4	Processed food	7.55	21.83	19.52	12.61	16.39	9.84	11.02	7.94	11.25
5	Oil and oil seeds	8.35	6.42	16.2	8.68	5.01	7.71	2.95	7.35	9.88
6	Textile fibers	6.57	1.34	12.04	4.06	1.56	4.22	0.96	2.2	7.22
7	Mining	3.23	-0.52	2.77	2.35	0.22	1.6	2.41	-2.12	1.03
8	Energy Products	-0.13	-2.64	2.01	1.5	-0.51	0.5	0.74	-4.17	2.65
9	Forestry & Logging	5.03	7.32	7.61	4.48	2.19	0.11	2.63	-0.95	1.57
10	Other Agricultural Products	5.4	10.35	13.42	3.65	4.81	7.46	17.48	6.4	13.91
11	Textile and Apparel	6.48	9.61	8.38	4.13	3.04	14.61	3.05	8.38	18.57
12	Beverages and Tobacco	12.09	6.12	5.59	2.34	2.71	4.98	4.03	2.38	3.36
13	Leather Products	6.25	6.27	3.12	2.24	2.05	8.42	4.02	3.07	1.36
14	Wood and Paper Products	5.1	4.42	3.05	2.14	3.98	3.96	2.51	1.22	2.39
15	Petroleum and Coke	1.58	4.02	2.51	3.72	1.27	0.55	3.15	5.42	1.04
16	Chemical and Allied Products	3.18	4.58	3.26	2.5	2.44	3.65	4.69	2.54	4.01
17	Iron and Steel	4.6	3.77	4.26	2.82	3.2	1.7	4.68	1.79	2.89
18	Other Metals and Products	3.55	1.26	2.76	2.83	2.71	3.4	3.71	3.06	2.6
19	Machinery	1.95	1.47	2.61	2.17	4.21	2.39	3.59	1.14	2.41
20	Electronic Equipment	0.6	1.04	3.13	2.93	1.79	1.71	2.44	0.6	2.14
21	Transport Equipment	1.13	0.69	2.78	2.33	5.95	2.97	9.63	0.79	2.8
22	Other Manufacturing Products	2.52	2.1	2.23	1.89	2.02	2.06	3.52	1.54	2.08
Scenario II										
1	Rice	-0.37	7.34	9.57	0.18	8.71	8.94	9.07	1.04	16.28
2	Other Cereals	-0.24	4.06	26.33	5.23	8.94	0.8	5.78	11.57	6.37
3	Dairy and Meat Products	5.83	29.98	13.22	7.64	1.6	4.74	8.29	8.02	20.21
4	Processed food	7.99	22.04	18.47	10.86	16.08	9.66	9.89	9.05	10.38
5	Oil and oil seeds	8.25	6.64	15.53	6.62	4.84	7.74	2.07	8.85	9.12
6	Textile fibers	7.07	1.68	11.33	1.95	1.38	4.31	-0.09	3.86	6.52
7	Mining	3.64	0.15	1.98	0.37	0.01	1.26	1.65	0.65	0.11
8	Energy Products	0.14	-2.38	1.22	-0.58	-0.52	0.71	0.45	-1.91	1.99
9	Forestry & Logging	5.36	7.77	6.77	2.2	1.94	0.24	1.67	1.06	0.64
10	Other Agricultural Products	5.88	11.03	12.63	1.82	4.55	7.42	16.42	8.1	13.2
11	Textile and Apparel	6.66	9.97	7.36	2.86	2.84	14.26	2.22	9.97	17.74
12	Beverages and Tobacco	12.37	6.39	4.95	0.77	2.59	4.93	3.49	3.41	2.83
13	Leather Products	6.61	6.66	2.49	0.43	1.96	8.01	3.43	4.18	0.79
14	Wood and Paper Products	5.4	4.81	2.31	0.49	3.69	3.89	1.69	2.87	1.54
15	Petroleum and Coke	1.77	4.11	2.19	2.59	1.39	1.29	3.22	5.59	1.36
16	Chemical and Allied Products	3.45	4.83	2.66	1.41	2.24	3.72	4.11	3.75	3.22
17	Iron and Steel	4.77	4.16	3.6	1.43	2.94	1.86	4.27	2.67	2.19
18	Other Metals and Products	3.82	1.57	2.18	1.48	2.52	3.52	3.16	4.24	1.93
19	Machinery	2.21	1.83	2.01	0.87	4.18	2.48	3.11	2.25	1.72
20	Electronic Equipment	0.88	1.36	2.64	1.26	1.57	1.82	2.14	0.98	1.38
21	Transport Equipment	1.37	0.91	2.22	1.05	5.85	3.05	9.25	1.54	2.29
22	Other Manufacturing Products	2.86	2.53	1.49	0.47	1.8	2.16	2.84	2.53	1.47
Scenario III										
1	Rice	2.82	9.68	9.69	0.11	10.6	10.73	9.01	3.72	18.95
2	Other Cereals	4.03	7.12	27.16	4.61	12.18	1.94	5.97	14.77	10.17

3	Dairy and Meat Products	8.84	32.04	13.14	6.57	3.87	5.49	8.41	10.45	22.17
4	Processed food	12.18	23.43	18.01	9.65	17.96	11.17	9.8	11.22	11.88
5	Oil and oil seeds	9.69	8.41	16.22	5.47	7.22	9.15	2.47	12.17	11.25
6	Textile fibers	12.32	3.43	12.04	1.02	3.96	6.36	0.39	6.67	10.13
7	Mining	8.08	3.32	2.69	-0.24	3.13	3.29	3.39	3.26	2.06
8	Energy Products	3.46	2.46	3.78	-1.84	3.76	3.89	1.52	1.35	4.53
9	Forestry & Logging	9.11	10.53	6.67	1.38	4.15	1.89	2.11	3.89	2.66
10	Other Agricultural Products	10.49	13.44	12.35	0.97	6.78	9.47	16	10.69	15.86
11	Textile and Apparel	9.18	11.8	7.14	2.38	4.6	15.51	2.38	12.11	19.4
12	Beverages and Tobacco	16.81	8.55	5.08	-0.13	4.45	6.44	3.84	6.13	4.24
13	Leather Products	11	9.43	2.61	-0.54	3.94	8.33	3.86	6.26	2.17
14	Wood and Paper Products	9.62	7.47	2.4	-0.35	5.6	5.54	2	6.04	3.04
15	Petroleum and Coke	3.47	5.19	3.05	2.36	4.61	3.95	3.91	6.03	2.87
16	Chemical and Allied Products	7.12	6.76	2.94	0.83	4.19	5.35	4.65	5.81	4.71
17	Iron and Steel	8.73	6.2	3.75	0.51	5.01	3.37	4.93	4.71	3.58
18	Other Metals and Products	8.22	3.64	2.39	0.72	4.44	5.17	3.92	6.75	3.33
19	Machinery	6.19	3.7	2.14	-0.03	5.84	3.93	3.67	4.49	2.86
20	Electronic Equipment	4.84	3.24	2.94	-0.27	3.37	3.12	2.82	2.44	2.3
21	Transport Equipment	5.07	2.53	2.38	0.26	7.62	4.53	9.87	3.41	3.38
22	Other Manufacturing Products	7.04	4.9	1.65	-0.41	3.94	3.75	3.17	4.34	2.85