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RIS Discussion Papers

Towards Formation of Close Economic Cooperation among Asian Countries

S K Mohanty, Sanjib Pohit
and **Saikat Sinha Roy**

RIS-DP # 78/2004

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Towards Formation of Close Economic Cooperation among Asian Countries

S K Mohanty, Sanjib Pohit, and **Saikat Sinha Roy***

Abstract: There have been several attempts in the past for the formation of an Asian Economic Community (AEC) with a view to enhance continental welfare within stipulated timeframe. The formation of a Close Economic Relation (CER) among some of the vibrant economies of the region, particularly JACIK Member countries (ASEAN plus three plus one) would be of immense importance in attaining such a goal. Three alternative forms of comprehensive economic liberalisation schemes may be envisaged. In this paper an effort has been made to examine the implication of CER on the region using monopolistic version of Computable General Equilibrium (CGE) for the JACIK countries. The model has been used to examine the implications of complete liberalisation of trade, investment and movement of natural persons. The results show that the proposed CER may enhance global welfare as well as welfare for individual countries in the caucus. Following formation of the proposed CER, the absolute increase in regional welfare may go beyond US$ 210 billion per annum amounting to more than 3 per cent of the region's GNP. The implications of the CER on the regional economy would be favourable in improving production efficiency, expanding exports apart from increasing returns on capital and labour.

I. Introduction

The paper estimates the extent of welfare gains consequent upon close economic cooperation among Asian countries, where close economic cooperation in Asia connotes freer cross border movements of investment, technology and skilled

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manpower in addition to free trade. 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 integration arrangements gained by bringing together resources in the region and internalising growth potential. Despite Asia's emergence as an economic space in the world economy during globalisation,[1] performance varied across countries and world economic growth bypassed large parts of Asia. In addition, fissures in growth during the Asian crises of 1997 tend to suggest that, regional economic formation is the only way to consolidate growth in Asian countries.[2] Lanteigne (2003), inquiring into the genesis of Asia's slow growth, finds Asian countries lacking initiatives in building strong institutions that could gear up regional process in a more effective manner.

There are significant developments with respect to regionalisation in Asia. Apart from smaller regional integration arrangements (RIA) like SAARC, ASEAN and BIMSTEC, there is no formal arrangement at the pan-Asian level. The enlargement of ASEAN was completed in the 1990s with four countries joining the group. The joining of Japan, Korea and China as Summit Level partners of further strengthened the ASEAN process. In November 2002, India joined the group as a Summit Level partner and there are significant policy initiatives strengthening India's close economic cooperation with the ASEAN.[3] Long term policy initiatives documented in ASEAN Vision 2020 - Chiang Mai Initiatives, Hanoi Plan of Action and Initiatives for ASEAN Integration - have given the roadmap for regional cooperation in Asia. With the success of the ASEAN, more countries are likely to join the regional caucus. An informal Japan-centred trading bloc has emerged leading to large increases in intra-regional trade and investments.[4]

There are hectic negotiations between ASEAN+3 and ASEAN+1 countries to formalise higher level of close economic cooperation in order to optimise economic welfare of these countries. The four Summit Level partners of ASEAN, 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[5] are also negotiating for bilateral FTAs among themselves with some of these initiatives taking concrete shape. The ASEAN+4 regional process – the JACIK comprising of **J**apan, **A**SEAN, **C**hina, **I**ndia and **K**orea – holds substantial potential for future growth (Kumar, 2002a).

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 optimise regional welfare gains in the medium term. This process of trade liberalisation is expected to culminate into an FTA in the region. However, a regional integration arrangement (RIA) is much larger in scope than an FTA, which includes freer movement of investment, technology and manpower.

Young (1993) finds that growth in intra-regional trade in East Asia is a result of market-induced regionalism rather than preferential trade policies. Young, however, builds a case for a multilateral trading system rather than the formation of an East Asian RIA. Nonetheless, as DeRosa (1995) finds using simulations through a CGE model, FTA in ASEAN is largely trade creating. When all trade is covered within ASEAN, total intra-bloc 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 by 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 scare resources. Agarwala and Prakash (2002) map out the extent of movements in investments and manpower. Sinha Roy (2004) find substantial complementarities in 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 extent of welfare gains with economic integration in Asia in terms of trade, investment, technology and manpower.

This paper is an attempt estimating the welfare gains arising out of complete trade liberalisation along with free cross border investment and movements of skilled labour within JACIK is examined in a CGE framework. 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 bilateral FTAs and sectoral cooperation.[6] This is based on the simulation results of three alternate scenarios of free trade, free trade and investment, and free trade and investment along with cross-border movement of manpower.

The formulation of the three alternate scenarios is derived from the studies on impact analysis of regional integration arrangement. The exhaustive summary by Srinivasan et al (1993) shows that trade and welfare effects of regionalism are studied in three different ways: first, ex-post assessment of contribution of a particular RIA after its formation; second, counterfactual analyses assuming competitive markets and constant returns to scale technology; and third, counterfactual simulations incorporating imperfect market structure and scale economies. Even although the two types of counterfactual exercises show larger trade effects than welfare effects, Srinivasan et al (1993) find that the results greatly vary across studies. The counterfactual studies based on competitive market structure show smaller welfare effects from RIAs, while studies incorporating non-competitive market structure generally find larger welfare effects. As against two types of counterfactual exercises, World Bank (2000) reviews that there are three generations of computable general equilibrium (CGE) model estimating the impact of regional integration arrangements. First generation models assume that all markets are perfectly competitive[7], with net benefits arising only from trade creation and diversion. Second general models include increasing returns and imperfect competition, so there might be some scale and competition effects. In the third generation model, dynamics in the form of capital accumulation and technical progress are accounted for. However, as Srinivasan et al (1993) argues, these model-based counterfactual studies do not provide results in the form where it is easy to estimate the precise contribution of RIAs relative to other factors. Nonetheless, such counterfactual model-based studies remain important contributions in the literature estimating the gains of regional integration arrangements.

This paper is structured as follows. Section II delineates the structure and the parameters of the CGE model that are 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 CGE model, which captures world economic activity in 13 aggregated regions/countries and rest of the world and 26 different aggregated industries/sectors.[8] 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:

Sl No.	Country/Region	Sl No.	Country/Region
1	Japan	8	Singapore
2	Korea	9	Thailand
3	China	10	Rest of South Asia
4	India	11	NAFTA
5	Indonesia	12	EEA
6	Malaysia	13	Oceania
7	Philippines	14	Rest of the World

As is evident, depending upon the availability of data in the GTAP Database, 9 out of 14 JACIK member countries are taken into account in the model. The data limitation does not permit at this stage to model each of the countries separately.

In the sectoral definition of the model, out of the 26 sectors taken into account there are 5 agricultural sectors, 17 manufacturing sectors and 4 services sectors. However, similar sectoral break up is followed for each economy. Nonetheless, It may be noted that most of the important sectors are modelled separately for analyzing policy simulations. The sectors in the model are as follows:

Sl No.	Sectors	Sl No.	Sectors
1	Rice	14	Wood and Paper Products
2	Other Cereals	15	Petroleum and Coke
3	Dairy and Meat Products	16	Chemical and Allied Products
4	Processed food	17	Iron and Steel
5	Oil and oil seeds	18	Other Metals and Products
6	Textile fibers	19	Machinery
7	Mining	20	Electronic Equipment
8	Energy Products	21	Transport Equipment
9	Forestry & Logging	22	Other Manufacturing Products
10	Other Agricultural Products	23	Transport Services
11	Textile and Apparel	24	Communication
12	Beverages and Tobacco	25	Financial Services
13	Leather Products	26	Other Services

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, specify the behavior of optimizing agents in the economy.

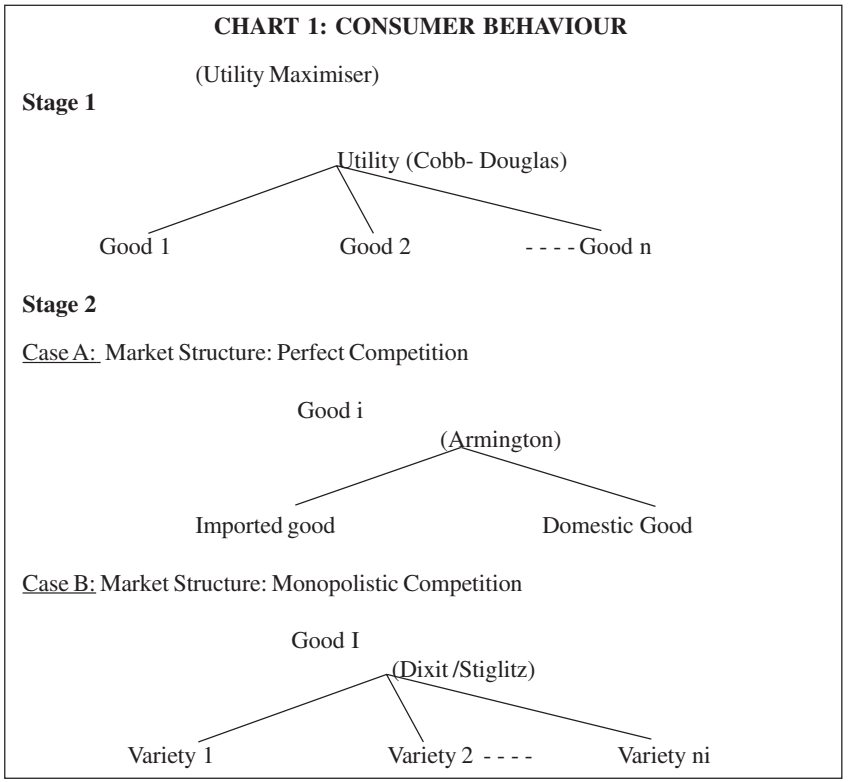
There are three principal factors of production in the model, namely, unskilled labour, skilled labour and capital. Among these three factors of production, unskilled labour is considered perfectly mobile across sectors within the country. This assumption is common in all the scenarios in the model. The latter two factors namely skilled labour and capital 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.

In the model, the assumption on market structure is different across sectors. The market structure is assumed to be perfectly competitive in agricultural sectors (viz. 1-5) and service sectors (viz. 23-26). On the other hand, monopolistic competition[9] is assumed in manufacturing sectors. 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 in the Appendix to this paper). 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 output[10] (see Chart 2 in Appendix of this paper). 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

CHART 1: CONSUMER BEHAVIOUR



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.

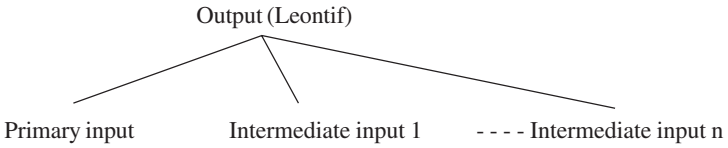
To determine prices, perfectly competitive firms set price equal to marginal cost, while monopolistically competitive firms maximize profits by setting price as an optimal markup over marginal cost. The numbers of firms in sectors under monopolistic competition are determined by the condition that there are zero profits.

Total supply of factors of production (namely unskilled labour, skilled labour and capital) is assumed to remain fixed 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

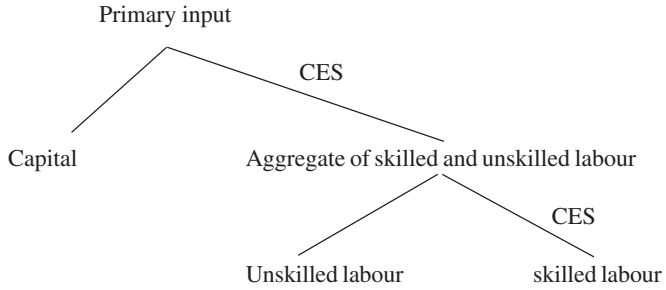
CHART 2: PRODUCER BEHAVIOR

(Cost Minimizer)

Stage 1



Stage 2: Primary Input



Stage 3: Intermediate Input

Same as in consumer stage 2

determined to equate factor demand to an exogenous supply of the same, which is assumed to remain fixed. In the base run, 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.

In the world market, equilibrium prices are determined 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 competition version of CGE model. The existing literature on CGE emphasizes that characteristics of monopolistic competition behaviour is observed in the manufacturing sector, whereas the agriculture and the services sectors operate under perfectly competitive environment. In order to accommodate such sector specific market structure conditions in the model, we have chosen Dixit/Stiglitz type of monopolistic competition framework in the present model.

As stated earlier, three alternate scenarios are estimated for analysing the possible impact of economic cooperation on regional partners. In Scenario I, we have assumed a free trade situation where complete trade liberalization is envisaged covering both tariff and non-tariff barriers. In Scenario II, investment is allowed to move freely across border within the JACIK region along with complete trade liberalization. Some studies have empirically verified growth-inducing effects of investment liberalisation, which complements improvements in trade and production efficiencies in regional economies, such as EU[11]. On the whole, this results in improvements in welfare in the region.

In Scenario III, along with free trade, free movements of investment and skilled labour are allowed 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. The JACIK region has a large reserve of skilled labour[12] and the demand for such scarce factor is likely to grow with the formation of the RIA. The possibility of allowing skilled labour to move freely may help regional economies in restructuring their modern production sectors. Relocation of factors of production along with free movement of goods within the region, efficiency improves resulting in substantial welfare gains from RIA. In these three different scenarios, we are trying to examine the extent in which countries can benefit from regional integration arrangement.

Regional Welfare Gains

In the Computable General Equilibrium analysis of regional integration arrangements, the main result consists of estimations of regional as well as global welfare gains. The welfare gains, which is a result of various regional policy initiatives, is a composite macro indicator reflecting combined effects of several macro-variables. Regional trade liberalisation leads to an expansion of trade within the region. The trade liberalisation policies result in reallocation of productive factors across sectors owing to increase in demand of tradable sectors within the region. In the process, allocation efficiency of the existing factor endowments alter and so also their relative real prices. The scale of production and the level of production also undergo significant changes in different regional economies. On the whole, the implications of such restructuring are also reflected in the calculation of welfare gains.

The welfare implications of the RIA on 14 regions including rest of world are presented in Tables 1 and 2. The regional welfare gains could be to the tune of more than US$ 200, which is equivalent to more than 3 per cent of the GNP of the region. The results indicate that the proposed FTA is likely to enhance welfare of both regional and individual member countries. The magnitude of absolute gains in regional welfare will enhance global welfare also. The region is likely to benefit more when investment is allowed to move freely within JACIK along with an agreement of free trade in the region. Larger gains will accrue in a situation where investment and skilled labour are allowed 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.

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. GNPResults of other regions such as European Economic Area, NAFTA, other South Asia, Oceania and RoW are 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

Among the ASEAN countries, Singapore and Thailand will register maximum welfare gains (change in welfare with respect to GNP), and moderate gains will accrue to Malaysia and Indonesia as shown in Table 1. The Philippines, among the ASEAN countries, may be benefiting the least from the proposed FTA. South Korea and Japan are likely to experience sustained enhancement in their welfare 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 move freely within JACIK along with free trade results in substantial changes in welfare gains for individual countries. As compared to Scenario I, all ASEAN countries will gain more in Scenario II except Singapore. Similarly, non-ASEAN countries in JACIK are also likely to improve their welfare gains from the investment liberalisation. In terms of magnitude of welfare gains with respect to GNP, the results are consistent with the existing literature.

Welfare gains are likely to be more substantial than the earlier two scenarios when free mobility of natural persons is allowed along with free cross border movements of goods and investment. In Scenario III, the results indicate that both regional as well as global welfare can be enhanced without invoking compensation mechanism for the losing regions in the model.[13] In this Scenario III, the extent of welfare gains is more for most JACIK countries as compared to Scenario II. While Thailand and Indonesia are likely to gain the maximum in the ASEAN region, other ASEAN countries in the model are likely to gain moderately in the liberalisation process. Among the non-ASEAN countries, substantial benefits will accrue to Japan and Korea. Both China and India are also likely to gain from this liberalisation process. In the Pareto sense, free trade along with factor market liberalisation in JACIK would enhance regional as well as global welfare.

The welfare gains for individual regions in the model are calculated on the basis of number of variables. These depend on various policy shocks and changes in structural macro closures. The analysis of counter-factual results of a few variables such as factor prices, scale economies, production structure and composition of exports will help in understanding the magnitude of welfare gains accruing to individual countries in the JACIK region, the region as a whole as well as global welfare.

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 as under the mode IV of the GATS. The overall effects of a free trade area or a regional integration arrangement on different factors of production have been favourable in terms of an increase in their real prices.

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

Unskilled Labourers

The effects of a possible RIA in JACIK on real wage rates of unskilled labour are somewhat mixed. Table 3 shows real wage rates are likely to go up in all the JACIK countries under the scenario of free trade (Scenario I). The increase in the real wage rate of unskilled labour is likely to be significant when investment is liberalised along with trade. However, results are mixed when trade, investment and movement of skilled labour are liberalized 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 unskilled wage rate is likely to be robust in case of Singapore, whereas other ASEAN countries like Thailand and Malaysia are likely to witness only moderate gains. Real wage rates of unskilled labour are likely to increase significantly in Korea, whereas both China and Japan are likely to experience moderate rises in this regard. The increase in the real wage rate is likely to be the least in case of India among the Plus-4 countries[14].

With liberalisation of investment along with free trade, the increase in real wage rates of unskilled labour is likely to decline in all ASEAN except Malaysia. Among the non-ASEAN countries in the JACIK, while the increase in real wage rates is marginal in China, it is simulated to decline in India. In contrast, there is a further increase in the real wage rate of unskilled labour in Japan and Korea under this scenario as compared to Scenario I.

The results undergo significant changes under Scenario III. Most countries in the JACI are found to witness negative, and often large, growth in real wage

rate of unskilled labour when movements of skilled labour are liberalized along with free cross-border trade and investments. In sharp contrast, such a liberalization scenario is likely to prove beneficial for labour surplus economies such as China, India, and the Philippines, where growth in real wage rate of unskilled labour is significantly higher as compared to the other two scenarios.

Skilled Labour

As against the mixed impact on the wage rate of unskilled labour, the implications of regional integration arrangements on the real wage rate of skilled labour have been positive. The increase in the real wage rate of skilled labour strengthens over different scenarios with the widening of scope of the RIA. Under Scenario I, free trade is likely to lead to increase real wage rate of skilled labours (see Table 4). In ASEAN, robust growth in real wage rate of unskilled labour is a possibility in all countries, and more so in Singapore, Thailand and Malaysia. Other members of JACIK except Korea are likely to experience moderate to low increase in the real wage rate of skilled labours under free trade conditions. In particular, the possible increase in the real wage rate of skilled labours in Japan and India will be marginal in a free trade situation.

Under Scenario II, where investment is allowed to move freely along with free trade, real wage rate of skilled labour continues to increase. With increased investment following free capital movement within the JACIK region, that wage rate of skilled labour may be change given the factor intensity and structure of sectors in developing countries. While real wage rates in most ASEAN countries except the Phillppines may continue with high growth, China and India may

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

encounter lower or even negative growth in real wage rate of skilled labour under Scenario II.

In Scenario III, robust increase in real wage rates of unskilled labour is found in most JACIK countries. The results indicate that the countries such as Indonesia, Malaysia and Philippines may face a significant rise in the real wage rate of skilled labour, and that for Singapore and Thailand may continue to grow high. Among other JACIK countries, while Japan, China, and Korea witness strong improvements in growth of real wage rate of skilled labours, it is likely to register a negative growth in India.

Investments

Free trade conditions in the JACIK region may improve real rate of return on investment in the region. Under Scenario I, as shown in Table 5, all the countries in the region are likely to witness improvements in the efficiency of investment, but some countries may benefit more than others. For example, most ASEAN countries benefit from trade liberalisation, but the impact on the real rate of return on investment will be felt more strongly in Singapore, Malaysia and Thailand. In the Plus-4 countries, the net increase of return on investment will be lower than the ASEAN counterparts.

In a scenario of liberalization of cross-border investment along with free trade, the return on investment has improved as compared to Scenario I. There is a marked increase for all ASEAN countries except Singapore. Among other countries in JACIK, China and India are likely to gain whereas

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

Japan and Korea may witness declining real rate of return on investment under this scenario.

In Scenario III, the rate of return on investment is found to increase further for most JACIK countries. Except for Philippines, other countries of the ASEAN region are likely to gain in terms of rate of return on investment following liberalization in movement of manpower along with merchandise and investment. Countries like Japan and Korea are also likely to register significant improvements as against the negative growth in return on investment for India.

Effects of RIA formation on production and exports

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. Table 6 shows that most JACIK countries are likely to improve their scale of production in some sectors or the other. The magnitude of gains in production efficiency is found to vary across sectors and countries. It is observed that some manufacturing sub-sectors are consistently doing well in different JACIK countries. In Scenario I, the efficiency gains can be noticed in ASEAN countries as well as the Plus-4 countries, the latter gaining more than the former. In ASEAN, improvements in the scale of production are more significant in Singapore, Philippines and Malaysia than other countries.

In Scenario II, the pattern of change in the scale of production is observed to be different from Scenario I. In the ASEAN region, efficiency gains will be the maximum for Malaysia, and moderate in the case of Indonesia, Philippines and Thailand. On the contrary, Singapore may witness decline in scale of production in large number of manufacturing sub-sectors. In this scenario as well, net improvements in the scale of production will be higher for Plus-4 countries. There are some common sectors where both Japan and Korea are likely to make efficiency gains under this scenario. Similar observations can also be made for China and India too. Among these sectors, chemicals, metal products excluding iron and steel, machineries, electric equipments, transport equipments and other manufacturing products are likely to benefit in terms of net increase in scale of production.

Table 6: Change in Scale of Production (in %)

S NO	SECTORS	JPN	KOR	CHK	IND	IDN	MYS	PHL	SGP	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	Mining	-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	Mining	-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

Table 6 continued

Table 6 continued

S NO	SECTORS	JPN	KOR	CHK	IND	IDN	MYS	PHL	SGP	THA
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	Mining	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

Liberalisation in the movement of labour may also improve efficiency in these countries. Under this scenario, as against the earlier scenario, ASEAN countries may have an edge over the Plus-4 countries. The maximum efficiency gain is noticed in Thailand and Philippines among ASEAN countries. China is likely to have an edge over other Plus-4 countries. The sectors in Plus-4 countries, which have largest scale effect on account of investment and skilled labour liberalisation, are petrochemicals, iron and steel, other metal products, electronic equipments, transport equipments and other manufactures.

Production Effects

Along with significant scale effects across sectors, the JACIK countries are likely to observe growth in production under different scenarios. Despite variations in sectoral performance, growth of production improves across sectors in the JACIK region. Agricultural production may register significant improvements in most of these countries. Some of the high performing sectors are processed food, oil seed and beverages and tobacco. Some of the important manufacturing sectors where performance is also likely to improve are leather, metals other than iron and steel, machinery and electronic equipments. As presented in Table 7, Malaysia, Philippines and Singapore, are the only ASEAN countries likely to witness improvements in the production of large number of sectors under Scenario I. Sectoral performance in production will be similar in case of China, Korea and India. In Japan, production is likely to increase only in case of technology intensive product groups. In Scenario II, only four JACIK countries, namely Japan, Korea, Singapore and Malaysia, are likely to gain in almost all production sectors. Growth in production improves in all JACIK countries under Scenario III as compared to the other scenarios.

Effects on Exports

The impact of regional integration on export performance in JACIK calibrated under three different scenarios is more spectacular than production. Table 8 shows that all individual member countries in the region are likely to benefit in improving their export performance in large number of tradable sectors.

Following FTA in JACIK, some ASEAN countries such as Thailand, the Philippines and Malaysia are likely to register strong increases in their exports across sectors. Among other JACIK countries, China and India are likely to improve their export performance in all the sectors under conditions of free trade. Barring a few sectors, Japan and Korea are likely to register favourable

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

Table 7 continued

Table 7 continued

S NO	SECTORS	JPN	KOR	CHK	IND	IDN	MYS	PHL	SGP	THA
					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

Table 7 continued

Table 7 continued

S NO	SECTORS	JPN	KOR	CHK	IND	IDN	MYS	PHL	SGP	THA
					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

Table 8 continued

Table 8 continued

S NO	SECTORS	JPN	KOR	CHK	IND	IDN	MYS	PHL	SGP	THA
					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

Table 8 continued

Table 8 continued

S NO	SECTORS	JPN	KOR	CHK	IND	IDN	MYS	PHL	SGP	THA
					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

growth in their exports. The results indicate that exports of energy products are likely to decline in number of countries such as Japan, Korea, India and Singapore. These results indicate the following. It is likely that there is significant trade creation leading to increase in total volume of exports from this region. Larger trade diversion may also result in significant improvements in intra-regional trade. The results improve considerably with liberalization of investment and labour movement within the region.

Under Scenario II, it is observed that trade liberalisation combined with free mobility of capital is likely to improve export performance in sizable number of sectors of a number of countries in the region. Export performance of Indonesia, Philippines and Thailand improve in all sectors as compared to results of Scenario I. In Malaysia, export performance of a few sectors like processed food, other agricultural products, leather, wood and paper products, etc. may improve further. Among Plus-4 countries, China and India may improve their export performances in all sectors and growth of export will be more robust in case of India[15]. However, sectoral export growth rates for Japan and Korea are expected to decline 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 will further improve sectoral export performances of most JACIK countries. In this Scenario, export growth of some sectors in China, India and the Philippines is likely to decline.

IV. Conclusion

Most JACIK countries are engaged in developing close economic relationship among themselves. There is a common perception that deepening of economic relationship among these countries through liberalisation is key to enhancing regional welfare. However, the lack of an institutional structure in the form of a regional integration arrangement in Asia has contributed to slow progress of Asia as compared to other regions of the world as well as against its potentials. In this context, the study has attempted to examine the potential benefits of the formation of an RIA 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 free trade is pursued where both tariff barriers and non-tariff barriers are

completely dismantled among member countries. In the second scenario, cross-border investment is allowed 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 complete 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. The results indicate that the absolute increase in regional welfare may go beyond US$ 210 billion amounting to more than 3 per cent of the regions GNP. Further, it may be noted that the economic impact of investment and trade liberalisation may generate more welfare effect than FTA alone. In particular, 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. Simulation estimates show that the 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. In all such scenarios, regional economic liberalisation also enhances global welfare.

The different scenarios under regional integration arrangements are favourable impact on upward movements of factor prices in JACIK countries. The real wage rates of both skilled and unskilled labour are likely to witness an upward trend with the former increasing at a more rapid rate than the latter. The impact on real return on investment is also found to be positive, which strengthens with deepening of liberalisation across sectors in JACIK countries. However, the magnitude of increase in the rate of return on investment may vary across countries.

The implications of RIA on the regional economy will be favourable in improving efficiency of production in a number of sectors. In the agricultural sector, production is likely to improve in like processed food, oil seed and beverages and tobacco. The scale effect will be large in the manufacturing sector. Some of the important areas where production performance is likely to

improve are leather, metals other than iron and steel, machinery and electrical equipments. Exports are expected to witness higher growth than production. All JACIK countries are likely to be improve export performance in the post-FTA period. Liberalisation of investment along with FTA may result in better prospects of exports in a sizable number of Asian countries. Export growth prospects and possibilities of intra-regional trade may further improve when free cross-border movement of natural persons is also permitted within the region. With policy changes in terms of free trade, cross-border investments and movement of manpower within the JACIK, countries in the region are likely to witness substantial growth in exports and production, observe better returns on capital and labour, and result in significant welfare gains in the Pareto sense.

Endnotes

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

[2] See Agarwala and Prakash (2002).

[3] India has unilaterally declared tariff concessions to new members of ASEAN at the India-ASEAN Summit level meeting (Mohanty, 2002a).

[4] Frankel (1997) finds that Asia effect is significant in explaining intra-regional trade.

[5] 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 a strong feeling to merge both the processes 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 (2002b) builds a strong case for India's inclusion in the emerging regional effort at the Asian level. The ASEAN+4 is often called the JACIK comprising of Japan, ASEAN (10), China, India and Korea.

[6] 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 form sectoral cooperation as well (Chaturvedi 2002) within Asia.

[7] In number of studies where the focus is on analysis of non-manufacturing sectors, perfect competition assumption is generally considered while computing simulation results. In a study, Mohanty, Pohit and Sinha Roy (2002), examined the implications of trade liberalisation under AoA on South Asian economies, and perfect competition assumption in the agricultural sector was taken while undertaking the impact analysis.

[8] The model draws inspiration from the works of Brown , Deardorff and Stern (1996), Hertel (1997) and Chadha, Pohit, Deardorff, and Stern (1998).

[9] In this paper, agriculture and services sectors are assumed in the model as perfectly competitive. The product of each of these sectors is homogenous but differentiated from imports using standard Armington type asssumption. The manufacturing sector is characterised as being monopolistically competitive with free entry of firms, and the products that are produced and traded are assumed to be differentiated by firms. Product differentiation by firm dispenses with the Armington assumption, so that the potentially strong terms-of-trade effects are greatly diminished. Variaties enter via a Dixit-Stiglitz (1977) aggregation function into both utility and production function with implication that greater variety reduces cost and increases utility. For modelling Dixit-Stiglitz type monopolistic competitive, the GTAP database is supplemented with other sources of data such as sectoral information on number of firms and their wage bills (UNIDO), wage differences between skilled and unskilled labourers (UNDP, 1994) and number of other structural variables (World Bank, 2002).

[10] Intermediate inputs include both domestic and imported varieties.

[11] Balassa (1967) estimated for the first time the trade creating and trade diverting effects of the European market. For details on trade creation and diversion, see Viner (1950).

[12] Kumar and Sinha Roy (2003) have provided some indicative estimates of the large reserve of skilled labour in the JACIK region.

[13] 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 same 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 same countries in the region.

[14] Plus-4 countries include Japan, South Korea, China and India.

[15] Examining the implications of economic reforms in India, Sinha Roy (2001) found that the export sector received a major boost during the liberal policy regime in the 1990s and in the new millennium. Using a countrywide CGE model for India, Chadha, Brown, Deadorff and Stern (1999) also arrived at similar findings.

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