Draft: Nov 7, 2005
Second Draft: April 26, 2006

Preferential Trade Agreements in Asia:

Alternative Scenarios of "Hub and Spoke" *

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Abstract: The proliferation of preferential trade agreements in Asia may result in a number of hub and spoke configures with Japan, China and ASEAN competing as regional hub of bilateral FTAs. Using a newly developed global CGE model with imperfect competition, increasing return to scale and heterogeneous firm, we explore the potential economic effects of alternative hub and spoke configurations in Asia. The simulations results suggest that the regionalism approach to integration in the Asian context can hardly act as building block of global trade liberalization, if it is confined to shallow integration only. However, the regional trade agreements involving deep integration measures provide promising path towards global free trade.

1. Introduction

The past two decades witnessed a remarkable trend of regional economic integration in Asia, especially in East Asia and Southeast Asia. Asian economies have achieved rapid technological advance, robust economic growth, and substantial liberalization of trade and foreign direct investment regimes under the multilateral framework of GATT/WTO. All these factors worked together to result in a tremendous expansion of trade and FDI in the region. Between 1980 and 2003, intra-Asian trade has expanded at an average annual rate of 13.2%, higher than the 10.0% average growth of total Asian trade per year. Within East and Southeast Asia (including Japan), the ratio of intra-regional trade in total trade has increased from 32.7% in 1980 to 47.6% in 2003. This share is still lower than that in EU (65.9%), but

* The views expressed in the paper are those of the authors and should not be attributed to their affiliated

exceeded that of the North American Free Trade Area (44.9%) in 2003.

Economic integration in Asia has been largely market-driven, with private activities as primary force. In recognizing the importance of more formal institutional arrangements to facilitate the regional integration, and motivated by the formation of regional trade blocs of NAFTA and EU, Asian countries have mounted collective efforts for regional wide free trade since early 1990s. ASEAN members singed the ASEN Free Trade Area (AFTA) agreement in 1992, aiming at creating a free trade area among member countries by the year 2003. South Asian countries also announced the plan to create the South Asian Preferential Trade Area (SAPTA) in 1993.

The Asian Financial Crisis in 1997 further highlighted the importance of economic policy cooperation among East and Southeast economies. In the end of 1990s, a new wave of Asian regionalism featured by bilateral agreements and deep integration has been gathering momentum. It was led by Korea, which began its discussion of FTA with Japan in 1998 and signed the bilateral FTA with Chile in 2002. But ASEAN, China, Japan and India soon joined the pursuit of PTAs. By 2005, Asian countries (including Central Asia) had implemented 18 bilateral trade agreements and 4 regional trade agreements and had negotiated but not implemented at least 30 new PTAs. Clearly Asian countries have shifted their policy preferences from multilateral approach for global free trade to actively participating regional groups in order to gain substantially in the regional market. This strategic change in Asian commercial policy partly reflects their reaction to the slow progress of the multilateral negotiations under the WTO and APEC. However, some recent development in regional economy, such as the parallel emergence of China and India as important economic powers, have significantly changed global and regional economic landscapes and also contributed to the proliferation of PTAs in Asia.

It is worth noting that not all these RTAs occurred among geographically contiguous "natural" trading partners. Many RTAs involving Asian countries are inter-regional, such as Japan-Mexico, Korea-Chile, Singapore-US, Singapore-EFTA and Thailand-New Zealand. As Singapore is small and open economy and has dropped most its own trade barriers, it can pursue as many bilateral trade agreements as

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institution.

possible to maximize gains from free trade without worries for the negative effects of trade diversion or deterioration of terms of trade. For Japan, Korea and China, their efforts to forge inter-regional bilateral trade agreements may reflect their intentions to both secure larger foreign market access and facilitate inward and outward FDI.

Another striking feature of the new wave of Asian regionalism is that many of the new PTA initiatives go well beyond traditional trade policies of tariff and NTBs and typically include trade facilitation, services and investment liberalization, harmonization of the regulatory framework, and economic and technical cooperation. For example, the recent Japan-Singapore economic partnership agreement (JSEPA) covers issues such as regulatory reforms; facilitation of customs procedures; cooperation in science and technology, media and broadcasting, electronic commerce, advancing information and communication technology; movement of natural persons; and human resource developments. This so-called "deep integration" focuses on the removal of internal barriers that discourage the efficient allocation of international production within the region. It is often driven by the desire of multinational corporations (MNCs) to improve their competitive position within the regional market. Removal of internal barriers facilitates the realization of economies of scale and scope at a regional level through MNCs' locating their affiliates in economies where they can perform their operation most efficiently. It is argued that deep integration can lead significant externalities and productivity gains and mitigate the potential causes of conflict between PTAs and multilateral trade agreements. (Laird, 1999; ADB, 2002; Burfisher, Robinson and Thierfelder, 2004).

The proliferation of bilateralism in Asia is grounded on a number of political, economic and security considerations. But this trend is not peculiar to the Asia. Bilateral trade agreements are often preferred to multilaterals because they are less costly in terms of negotiation and enforcement efforts. They also more easily incorporate the provision of cross-broad harmonization of national policies and regulation in an effort to gain from deep integration. However, comparing with multilateral and global approach of trade liberalization, bilateralism and regionalism are still second-best options. Since the seminal contribution of Viner (1950), it has long been recognized that PTA is welfare reducing if trade diversion it caused

dominates trade creation. Moreover, overlapping PTAs with multiple and complicated provisions and rules of origin bring additional transaction costs in international trade, resulting in famous "spaghetti bowls" phenomenon (Bhagwati, Greenway and Panagariya, 1998). In this sense, skeptics of regionalism conclude that PTAs would undermine the progress of multilateral liberalization due to their discriminatory nature, rendering them as stumbling blocks for global trade liberalization (Bhagwati, 1991; Panagariya, 1999, 2000).

How will Asian regionalism evolve in the future? In the foreseeable future, the most likely scenario in Asia is a complex web of intersecting bilateral, regional and inter-regional trade agreements. The bilateralism is expected to continue prevailing, and distance or proximity does not seem to matter (Feridhanusetyawan, 2005). As a number of major Asian countries are pursuing PTAs with non-Asian partners, the concern that the formation of a large Asian block might fragment world trade is misleading. But it remains unclear whether the proliferation of bilateral PTAs will lead to region-wide trade liberalization. As Lloyd(2002) and Baldwin (2002) argue, one important factor behind the spread of bilateralism in Asia is the fear of exclusion from major market. The formation of PTAs provides strong incentive to the outsiders to join or form PTAs, especially form bilateral PTA with countries that are their major markets and have already PTAs with other countries, to counter the discrimination they would otherwise face. This leads to a domino effect that all outsiders aggressively pursue PTAs with the major powers. Baldwin (2004) cautions that the continuing pursuit of bilateralism by the regional large economies, such as Japan and China, may lead to dangerous outcome. The political economy forces that drives the domino effect in Asia tends to produce overlapping hub and spoke trade arrangements which are economic inefficient and potential divisive. However, Lloyd (2002) argues that bilateralism will likely have positive effects on the world trading system from a longer tem perspective. He emphasized that the bilateralism possibility of one country which is a member of a multi-country PTA linking on its own with outside countries offers a natural way towards enlargement and coalescence of existing PTAs. Even though the bilateral agreements lead to hubs-and-spokes, a spoke bilateral mitigate the effect of large PTAs and may result in enlargement of PTAs.

This paper attempts to shed some light on the debate of regionalism versus multilateralism through analyzing the potential impacts of hub and spoke trade arrangements in Asia. Using a newly developed global computable general equilibrium model with imperfect competition, increasing return to scale technology and firm heterogeneity in productivity, we simulate alternative scenarios of regional hub and spoke configuration. Our simulation results show that the regionalism approach to integration in the Asian context can hardly act as building block of global trade liberalization, if it is confined to shallow integration only. However, the regional trade agreements involving deep integration measures provide promising path towards global free trade.

The rest of this paper is organized as follows. Section 2 discusses the possible hub and spoke configurations in Asia. The simulation model is introduced in section 3. Section 4 discusses the simulation results. Concluding remarks follow in section 5.

2. Hub and spoke configurations in Asia

Under multiple PTAs, a hub arises when one country has simultaneously separate PTAs with individual spoke countries, while the spokes normally do not have PTAs between themselves. Compared with a corresponding full FTA, hub and spoke configuration creates multi-layers of discrimination. As the spokes are isolated in nature, there is a greater threat of trade diversion towards the hub. The "spaghetti bowls" problem is also exacerbated in hub-and-spoke system. Furthermore, the asymmetry of market access between hub and spokes gives the hub a strong advantage in attracting investment and tends to marginalize the spoke countries (Puga and Venables, 1997). A spoke country can offset its disadvantage by entering into its own set of bilateral or plurilateral RTAs or unilaterally lowering its own tariff, but the domestic political economy constraints may prevent spoke-spoke liberalization (Baldwin, 2004).

Who will be the hubs in Asia? As the two largest economies in the region, Japan and China are naturally two potential hubs. Although the hub countries are not necessarily better off in hub-and-spoke configurations than in a large full FTA, they may be motivated to negotiated bilateral agreements with

other Asian countries by political and strategic considerations. If this were the case, a two-hub, "bicycle" system may arise in Asia, with China and Japan as two individual hubs and Korea, ASEAN countries, Australia and New Zealand as spokes. This two-hub scenario is an inferior option of Asian regionalism and could be divisive economically and politically, according to Baldwin (2004).

The above two-hub configuration can be further complicated by the efforts of ASEAN to establish itself as an alternative hub. ASEAN countries have well recognized the risks of being trapped as spokes in an integrated East Asia. Its efforts to negotiate bilateral PTAs with not only China, Japan and Korea, but also the US, India, Australia and New Zealand reflect its intention to diffuse the dominance of China and Japan and enhance its negotiating leverage in regional trade agreements. Actually, given its geographic advantage, ASEAN is potentially well placed to emerge as a regional hub to link East Asia and South Asia, and it is already in a unique position at the hub of a whole series of proposed preferential agreements. However, the large diversity and heterogeneity among ASEAN members may prevent them from acting concertedly as a group in negotiations. Given the sensitivity in each ASEAN economy, bilateral and collective-ASEAN PTAs are unlikely - any preferential agreements actually singed might differ among members (Findlay, Piei and Pangestu, 2003). This will put ASEAN in a spoke rather than hub position, because the unequal market access among ASEAN countries and their PTA partner still diver trade and investment to the latter. Moreover, the internal liberalization among ASEAN members can be undermined if the members shifted attention to integration with their outside favorites, rather than with each other. Frustrated by the little progress in ASEAN internal economic integration, Singapore and Thailand have aggressively pursued bilateral PTAs with non-ASEAN members. Most regional powers, Japan, Korea and India, prefer to strike bilateral deals with ASEAN members individually to negotiate with ASEAN collectively. China had emphasized on the negotiation with ASEAN as a group in their early FTA talks, but the recent China-Thailand bilateral agreement may sign a shift of China's FTA strategy with ASEAN. Therefore, the internal weakness and external environment of ASEAN may make it hard to reap the benefits of being a hub, unless great efforts are expended to maintain cohesion and deepen its internal integration.

In South Asia, India is a natural hub of PTAs due to its size and economic power. In addition to signing SAPTA, India has entered the bilateral free trade agreements with Sri Lanka , Bhutan and Nepal. But overall, the trade integration in South Asia has been very limited. It is also arguable that if a South Asia Free Trade Area makes sense given the strong economic asymmetry in the region. For instance, Panagariya (2003) argues that South Asian countries may gain much from non-discriminatory unilateral or multilateral trade liberalization, while preferential trade arrangements would be harmful overall.

India adopted "Look East Policy" in as early as 1991 to increase its integration with economically dynamic East and Southeast Asia. This strategy is well grounded by the high degree of complementarity between the two regions, as India has strengths in services and software while East Asia has substantial hardware and manufacturing prowess (Kumar, 2005). As a part of the Look East Policy, India signed a framework trade agreement with ASEAN in 2003, which involves a FTA to be implemented over a ten-year period. India also has approached individual members of ASEAN such as Thailand and Singapore for bilateral agreement. India is jointly studying feasibility of FTAs with China, Japan, Korea, and Malaysia. Panagariya (2004) suggested that an India-China FTA could be less distorted and it will create strong impetus for an Asia-wide FTA.

3. The Simulation Model

The model used in this study is a static, computable general equilibrium model of global economy. It is built on the LINKAGE model developed at the World Bank by Dominique van der Mensbrugghe (2005), and has its intellectual roots in the group of multi-country applied general equilibrium models used over the past two decades to analyze the impact of trade policy reform (Shoven and Whalley, 1992; Hertel, 1997). The multi-country CGE model has increasingly become a standard tool for trade analysis because it can detail structural adjustments within national economies and elucidate their interactions in international markets.

The model used here generally corresponds to the second-generation CGE models which incorporate

the scale economies and imperfect competitions[1]. Some examples of generation two CGE includes: Gasiorek, Smith and Venables (1992), Harrison, Rutherford and Tarr (1997), Brown, Deardorff and Stern (2001), Bchir, Decreux, Guerin and Jean (2002), and Francois, van Meijl and van Tongeren (2005). In contrast with the previous models, we incorporate firm heterogeneity and fixed cost of exporting into our model. This enables us to investigate the intraindustry reallocation of resources and the exporting decision by firm. The empirical literature has emphasized the importance of extensive margin in trade expansion and economic growth. However, as Hummels and Klenow (2005) argued, neither traditional CGE model with representative firm and Armington national product differentiation nor the "new trade theory" model with monopolistic competition and firm-level production differentiation can match the facts about extensive and intensive export margins. Recently, a number of new heterogeneous-firm models of international trade by Bernard et al. (2003), Melitz (2003), and Yeaple (2002) introduce the extensive margin as a result of the firms' self-selection to export markets. They emphasis the interaction of entry costs of exports and productivity differences across firms operating in imperfectly competitive industries. When trade costs decrease, new firms with lower productivity enter the export markets in response to the potential higher profits. Empirical evidences have largely supported the predictions by the new heterogeneous-firm trade models.

The model presented here has a structure of production similar to that in Melitz (2003), which incorporates the firm productivity heterogeneity in Krugman (1979) monopolistic competition model. Agriculture, mining and public administration sectors are assumed to be perfect competition. In each of these three sectors, there is a representative firm operated under constant return to scale technology. The other manufacturing and services sectors are characterized by monopolistic competition. Each of them consists a continuum of firms differentiated by the varieties they produce and their productivity. Firms face fixed production cost, resulting in increasing return to scale. There is also fixed cost and variable cost associated with the exporting activities. On the demand side, the agents are assumed to have Dixit-Stiglitz

[1] See Lloyd and Maclaren(2004) for a discussion of the three generations of CGE models.

preference over the continuum of varieties[2]. As each firm is a monopolist for the variety it produces, it set the price of its product at a constant markup over its marginal cost. Firm enters domestic or export markets if and only if the net profits generated from its domestic sales or exports in a given country are sufficient to cover the fixed costs. This zero cutoff profit condition defines the productivity thresholds for firm's entering domestic and exports markets, and in turn determines the equilibrium distribution of non-exporting firms and exporting firms, as well as their average productivities. Usually, the combination of fixed export cost and variable export cost ensures that the exporting productivity threshold is higher than that for production for domestic market, i.e. only a small fraction of firms with high productivity engages in exports markets. These exporting firms supply for both domestic and export markets. Finally, the free entry of firms requires that the expected value of entry, i.e. the present value of expected average profit flows conditional on successful entry, equals to the sunk cost of entry.

The model is calibrated to the GTAP (version 6) global database. It includes nineteen-country/region and fourteen sectors. However, some information which are central to our model, such as the degree of returns to scale, the shape of productivity distribution, and the magnitude of the fixed and variable trade cost, are not available in the GTAP database. We set these parameters mainly based on the search of the relevant literature. Table 1 reports some major parameters we used in the model. The markup ratios are in the ranges of those chosen by Bchir, Decreux, Guerin and Jean (2002), Forslid, Haaland and Knarvik (2002) and Francois, van Meijl and Togeren (2005). The choices of markup ratios, together with optimal pricing rule of monopolistic firms, imply that the substitution elasticity between differentiated varieties range from 5 to 11. The firm productivity is assumed to follow Pareto distribution, of which the scale parameter is calibrated to match the assumed profit ratio in gross output. The variable trade cost takes the iceberg form. We postulate that 20% of the goods or services will melt away during the export transit for all sectors. This international trade cost is roughly in line with Obstfeld and Rogoff (2001) and Anderson and van Wincoop (2004). The fixed production cost and fixed trade cost are calibrated from the shares of

[2] We assume a more general specification of the utility function with a taste for variety parameter, λ. $\lambda \in [0,1]$ and $\lambda=0$ and $\lambda=1$ correspond to the two extreme cases of "no love of variety" and standard Dixit-Stiglitz "love of variety". Specially, we set

non-exporting firms and exporting firms in total firms. We assume that for each sector there are 80of its firms producing only for domestic markets, then the shares of exporting firms are derived from the ratio of exports in sectoral output.

Table 1: Major Parameters in the Model

	Markup ratio	Substitution elasticicty between varieties	Scale parameter in productivity Pareto distrbution
ProcFood	10%	11.0	16.7
TexApprl	10%	11.0	16.7
Chemical	15%	7.7	11.1
Material	15%	7.7	11.1
ElecEqp	12%	9.3	13.9
Vehicles	15%	7.7	11.1
Machine	15%	7.7	11.1
OthMfg	15%	7.7	11.1
Trade	25%	5.0	6.7
TransCom	25%	5.0	6.7
PrvServ	25%	5.0	6.7

4. Simulations and results

Based on the analysis in section 2, we simulate four scenarios of hub and spoke configurations in Asia. Under the first and second scenarios, China and Japan are hubs respectively. They are nick-named *ChnHub* and *JpnHub* respectively. The third and forth scenarios deal with the role of ASEAN. The third scenario (*ASEHub1*) assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. This is contrasted with the forth scenario (*ASEHub2*), under which ASEAN establishes its own free trade area and have bilateral FTAs with other Asian countries as a whole. In each of the scenarios, we eliminate all bilateral distortions, including tariff and export tax, to merchandise trade between hub and spokes, but retain the trade barriers between spokes. We do not take into account of the rules of origin that lead to higher input costs and reduction of PTA preference margin. Therefore, our simulation results may overestimate the welfare effects of PTAs. We also present the scenarios that allow us to compare the hub-and-spoke configurations with an Asia-wide FTA (*AFA*) and the multilateral global trade liberalization (*GTL*).

λ=0.5 in the model calibration.

4.1. Aggregate impacts

Table 2 and 3 present the major aggregate results on real income, exports and terms of trade from the various regional and global trade liberalization scenarios. The changes in real income (measured as equivalent variation) show that the Asian hub-and-spoke arrangement centered around China will produce net welfare gain for the world as whole of around US$18.5 billion, which is more than two times of that from ASEAN hub and three times of that from Japan hub. But these gains are not distributed evenly across region. It is not strange that the countries outside of Asia suffer due to lower exports demands and lower terms of trade faced by them. However, some Asian countries also get loss from the hub-and-spoke configurations. Typically, South Asian countries do not benefit from the bilateral FTAs with China and Japan as their pre-liberalization levels of import protection are generally high and the existing trade linkages between South Asia and East Asia are not significant – in these cases, trade diversion will dominate. Similarly, the bilateral FTAs with Japan are not beneficial for most Asian economies. Japan is relatively open for its manufacturing market and its import protection are mainly applied in agricultural and food sectors. Only Thailand and Viet Nam gain stronger competitive advantages in Japanese market through their bilateral FTAs with Japan, because processing food sector accounts for relatively larger shares of their exports to Japan.

Table 2: Impacts on Real Income

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Real Income (EV, mn US$)						
Japan	5540	7830	1656	1280	10959	24524
PRC	-2522	-119	-413	-447	-4356	21830
Korea	13991	-426	154	62	15732	27086
Hong Kong, China	1462	-122	280	230	1896	4673
Taipei,China	1206	-617	375	250	2000	2490
Indonesia	228	-77	1120	1436	1092	1386
Malaysia	479	-162	2352	3554	2839	3726
Philippines	5	-79	258	574	321	479
Singapore	489	-36	-357	448	1542	1777
Thailand	1135	1665	4005	4611	3651	4097
Vietnam	209	37	1266	1912	1665	1959
Bangaladesh	-55	-46	-121	-125	-211	-114
India	-1032	-552	898	934	-224	3697
Sri Lanka	-4	-2	10	8	14	257
Global	18506	5257	8549	11519	31611	146475
Real Income (EV, % of GDP)						
Japan	0.1	0.2	0.0	0.0	0.3	0.6
PRC	-0.2	0.0	0.0	0.0	-0.4	1.9
Korea	3.4	-0.1	0.0	0.0	3.8	6.5
Hong Kong, China	0.9	-0.1	0.2	0.1	1.2	2.9
Taipei,China	0.4	-0.2	0.1	0.1	0.7	0.9
Indonesia	0.2	-0.1	0.8	1.0	0.8	1.0
Malaysia	0.6	-0.2	2.7	4.1	3.3	4.3
Philippines	0.0	-0.1	0.4	0.8	0.5	0.7
Singapore	0.6	0.0	-0.4	0.5	1.9	2.1
Thailand	1.0	1.5	3.6	4.1	3.3	3.7
Vietnam	0.7	0.1	4.0	6.0	5.2	6.2
Bangaladesh	-0.1	-0.1	-0.3	-0.3	-0.5	-0.3
India	-0.2	-0.1	0.2	0.2	0.0	0.8
Sri Lanka	0.0	0.0	0.1	0.0	0.1	1.7
Global	0.1	0.0	0.0	0.0	0.1	0.5

One striking feature of the welfare effects is that China is adversely impacted as a regional FTA hub, and even experiences bigger loss in the case of Asia-wide FTA. This result can be explained by the special feature of regional trade pattern in Asia. Since 1990s, facilitated by improvement in transportation and communication services and falling trade and investment barriers, there has been a strong trend toward vertical specialization with Asian region. This is evidenced by the increasing extent of relocation of industrial activities and massive inflows of FDI into the region, particular China. As a result, China's demand for intermediate parts and components from Asia has grown sharply while its exports of final goods to advanced economies have also increased significantly. China's role as an essential assembling center for many exports from Asia to the US and EU is reflected in the emergence of "East Asian trade

triangle"[3], in which China running a sustained trade surplus with the US and EU and a deficit of about same magnitude with Korea, Taiwan, and ASEAN. Under this trade pattern, China's bilateral trade liberalization with its regional trade partners raises the relative price of intermediate parts and components to the final goods, resulting in a reduction in China's terms of trade (Table 3). Moreover, as the intra-industry trade in intermediate goods accounts a large proportion of Asian intra-regional trade, the liberalization towards an Asia-wide FTA would further raise the prices of intermediate goods, inducing larger deterioration in China's terms of trade and welfare.

Table 3: Impacts on Exports and Terms of trade

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Exports (% change relative to baseyear)						
Japan	3.2	5.4	1.8	1.6	6.3	12.1
PRC	21.4	4.1	3.4	3.3	20.4	37.5
Korea	11.0	2.2	0.8	0.7	16.1	23.7
Hong Kong, China	1.4	-0.2	-0.4	-0.4	1.3	1.6
Taipei,China	0.5	2.0	0.5	0.5	4.1	6.7
Indonesia	1.4	0.3	4.7	6.0	5.6	10.1
Malaysia	0.8	0.3	4.3	6.9	6.0	7.9
Philippines	0.5	0.9	4.1	7.3	5.9	7.1
Singapore	0.3	-0.3	-1.9	-1.8	-0.3	-3.8
Thailand	3.8	1.6	11.9	16.1	15.5	21.1
Vietnam	6.1	6.7	29.5	33.2	31.2	39.1
Bangaladesh	18.2	1.3	8.6	8.6	54.1	67.7
India	6.2	2.2	14.0	14.0	28.5	61.4
Sri Lanka	0.3	0.1	2.0	2.1	7.4	16.1
Terms of Trade (% change relative to baseyear)						
Japan	1.0	0.9	-0.1	-0.2	1.6	1.3
PRC	-1.4	-0.4	-0.8	-0.9	-2.0	-2.4
Korea	-1.3	-0.5	0.0	0.0	-1.1	-1.5
Hong Kong, China	1.3	-0.1	0.6	0.4	1.8	3.3
Taipei,China	0.8	-0.6	0.1	0.0	0.6	0.4
Indonesia	0.1	-0.1	1.9	2.2	1.4	1.6
Malaysia	0.1	-0.1	0.9	0.4	-0.3	-0.6
Philippines	-0.1	-0.2	0.2	0.2	-0.2	-0.3
Singapore	0.5	0.0	-0.1	0.8	1.9	2.5
Thailand	0.4	1.4	2.4	2.4	1.3	0.6
Vietnam	0.1	-1.3	-2.2	-0.8	-1.7	-2.4
Bangaladesh	-3.1	-0.4	-1.5	-1.6	-6.6	-5.9
India	-2.0	-0.8	-2.7	-2.8	-5.3	-5.6
Sri Lanka	0.1	0.0	-0.2	-0.3	-0.8	2.2

[3] See Roland-Holst(2002) for a simulation analysis of the development of "East Asian trade triangle".

Another factor contributing to China's welfare reduction under the scenarios of *ChnHub* and *AFA* is the changes in sectoral composition of production resulting from trade liberalization policies. This is related to the effects of firm-level product differentiation and agglomeration which are not captured in the traditional CGE models with perfect competition and national product differentiation. Japan and Korea are important markets for China's agricultural exports, although these markets are highly protected. Their trade liberalization with China results in expansion of China's agricultural sector, diverting resources out of industrial sectors. As a consequence, the industrial sectors have to contract. Since industrial sectors are assumed operated under increasing return to scale technology, the contraction of industrial sectors has negative welfare implications because of the loss of agglomeration and variety effects[4].

As a spoke country, Korea gains most from the hub and spoke configuration centered around China. China is Korea's second largest exports destination next to the US. A bilateral FTA between China and Korea can significantly boost Korea's exports, which rise by 11.0% under the scenario of *ChnHub* as shown in Table 3. ASEAN countries only see moderate gains from their spoke positions surrounding around China in terms of both welfare improvement and export expansion. Within ASEAN, the welfare gain is relatively large for Thailand, but limited for Indonesia and the Philippines. In South Asia, Bangladesh experiences rapid export growth after it has bilateral FTA with China. Bangladesh's exports structure is heavily biased towards garments sector, which is dependent on the imports of textile materials from China. The removal of tariff on textile imports from China significantly reduces the production costs of Bangladesh's textile and apparel sector, leading to a surge of exports in this sector. Although Bangladesh would benefit from the output expansion of textile and apparel activities, this benefit is partly offset by its worsening terms of trade, because of the geographic concentration of Bangladesh's garments exports on non-regional markets such as the US and EU. This result suggests the limitation of a regional preferential free trade agreement for Bangladesh.

The hub and spoke configuration centered around ASEAN exerts slightly positive impact on South

[4] The same effects have been found in analyzing the impact of Doha Round trade liberalization. See Francois, van Meijl and Togeren (2005).

Asia, and generally insignificant impact on East Asia. These reflect stronger trade linkage between South Asian and Southeast Asia, and relatively smaller economic size of ASEAN. Comparing the two scenarios of *ASEHub1* and *ASEHub2*, we can find that the intra-ASEAN trade liberalization is important for ASEAN countries – it raises their overall welfare gain by 50% relative to the scenario that they have bilateral FTAs with non-members only (*ASEHub1*). Moreover, the trade diversion effects of intra-ASEAN free trade are limited for other Asian economies – they are hardly impacted by the formation of AFTA.

In comparison with the standard CGE with representative firm, perfect competition, constant return to scale and national products differentiation, the model in this paper generally generate larger welfare gains from trade liberalization and more uneven distribution of these gains[5]. This is because this model introduces two additional channels through which the trade liberalization yields welfare gains. The first is the Dixit-Stiglitz "love-of-variety effect", i.e. the welfare gains from the entry of firms and associated increase in variety. Trade liberalization tends to increase the profits of exporting firms and lower the exporting productivity threshold. As a result, new and less productive firms enter the export markets, resulting in a larger number of exporters. On the other hand, the number of domestic firms supplied to domestic markets decrease, because the higher exposure to imports make the less productive firms unable to survive. However, the domestic consumers still enjoy greater product variety if the losses in the number of domestic suppliers are more than offset by the number of new foreign exporters. The second channel, which is elaborated by Melitz (2003), is the productivity gains from intra-industry resource reallocation. The endogenous selection process in domestic markets drives out the least productive firms, enhancing the average productivity of firms. Similarly, the entry of new exporters may also increase average productivity if they are more productive than the average productivity level. Furthermore, the market shares and profits will be reallocated following the reduction of trade costs. All firms lose a portion of their domestic markets, but exporting firms can make up for their loss of domestic sales with

[5] The simulation results from a perfect competition version of this model are presented in Appendix for a purpose of

increased export sales. As exporting firms are more productive, this reallocation of market shares can also boost the aggregate productivity.

These theoretic insights are illuminated by our simulation results. Table 4 reports the changes in the number of non-exporting firms, number of exporting firms, and the average productivity of aggregated monopolistic competition sector. In general, the regional hub and spoke trade arrangements increase the number of exporting firms, but decrease the number of non-exporting firms. Singapore and Hong Kong are two exceptions: the number of their exporting firms decreases in most of these trade liberalization scenarios because they typically face stronger competition from other spoke countries in the hub markets. The aggregate productivities of monopolistic competition sector also increase following the regional bilateral trade liberalization, but their magnitude is very small. Again, Hong Kong and Singapore may suffer the decline of aggregate productivity under some scenarios, as their new entrants of exporting firms are less productive than the average productivity level due to their higher shares of exporting firms. Overall, the results on firm number and aggregate productivity suggest that "love-of-variety" effects from trade liberalization may dominate the aggregate productivity effects. To better understand these aggregate results, we turn to the sectoral impacts.

4.2. Sectoral results

Table 5 present the changes of output by sector. For expression simplicity, we report them only for two scenarios: *ChnHub* and *AFA*. The output reported here are measured "at the factory gate", i.e. they are not variety scaled. These sector results indicate that if China becomes a regional FTA hub, its winners are mainly electronic & electricity equipment sector and agricultural sector, while automobile, machinery and chemicals sectors are major losers. Korea experiences a large output expansion in textiles and processing food sectors, and significant contraction in agricultural sector. Southeast Asian countries lose their electronics industry to China, but gain in machinery and chemicals. The impacts on sectoral output of South Asian countries are generally modest.

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comparaision.

Table 4: Impacts on Number of Firms and Productivity

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Number of domestic firms						
Japan	-0.2	-0.3	-0.1	-0.1	-0.3	-0.4
PRC	-3.5	-0.7	-0.3	-0.3	-3.2	-3.3
Korea	1.3	-0.3	-0.1	-0.1	0.6	0.6
Hong Kong, China	-0.3	-0.1	-0.3	-0.1	-0.5	0.3
Taipei,China	0.0	-0.6	-0.1	-0.1	-0.8	-1.3
Indonesia	-0.1	-0.1	-2.1	-2.4	-2.3	-1.2
Malaysia	-0.1	-0.3	-3.4	-2.6	-2.2	-1.5
Philippines	-0.2	-0.3	-0.9	-1.4	-1.3	-1.6
Singapore	0.0	0.1	-0.2	-0.6	-0.7	-1.5
Thailand	-0.5	-2.7	-4.7	-5.9	-5.7	-7.4
Vietnam	0.0	-0.8	-4.0	-5.8	-5.5	-5.9
Bangaladesh	-1.5	-0.1	-0.7	-0.7	-4.5	-4.8
India	-0.3	-0.3	-0.8	-0.8	-2.3	-4.5
Sri Lanka	-0.1	0.0	-0.4	-0.4	-2.5	-5.5
Number of exporting firms						
Japan	3.5	6.9	2.5	2.3	7.8	13.0
PRC	18.6	4.1	4.0	3.9	16.8	38.2
Korea	10.9	2.2	1.5	1.4	17.6	25.6
Hong Kong, China	0.7	-0.1	0.1	0.1	1.2	1.3
Taipei,China	0.8	1.9	1.2	1.1	5.5	8.4
Indonesia	3.0	0.0	6.2	9.1	8.2	17.3
Malaysia	1.6	0.1	5.4	9.0	8.1	11.8
Philippines	0.3	0.6	4.1	5.9	4.4	6.2
Singapore	0.1	-0.2	-1.5	-1.5	-0.2	-3.4
Thailand	4.2	3.3	15.0	17.9	16.7	22.6
Vietnam	10.3	9.6	42.3	48.7	44.0	52.8
Bangaladesh	20.0	1.2	9.8	9.7	59.4	75.0
India	6.6	2.2	14.4	14.4	30.1	64.9
Sri Lanka	0.6	-0.1	1.8	1.8	7.9	12.1
Average productivity						
Japan	0.1	0.2	0.1	0.1	0.2	0.3
PRC	0.9	0.1	0.2	0.2	0.8	1.4
Korea	0.6	0.1	0.1	0.1	1.1	1.5
Hong Kong, China	-0.2	0.0	0.1	0.1	0.0	0.0
Taipei,China	0.0	0.1	0.2	0.2	0.5	0.7
Indonesia	0.1	-0.1	0.5	0.8	0.8	0.6
Malaysia	0.1	0.0	0.7	1.1	1.1	1.4
Philippines	0.0	0.0	0.3	0.3	0.3	0.4
Singapore	-0.1	0.0	0.0	0.1	0.1	0.0
Thailand	0.1	0.1	0.8	1.0	1.0	1.5
Vietnam	0.5	0.0	1.3	1.8	1.7	1.5
Bangaladesh	0.3	0.0	0.2	0.2	1.0	1.2
India	0.2	0.1	0.5	0.5	1.1	2.2
Sri Lanka	0.0	0.0	0.1	0.1	0.7	0.6

Table 5: Changes of Sectoral Output

	Agric	Mining	ProcFood	TexApprl	Chemical	Material	ElecEqp	Vehicles	Machine	OthMfg	Trade	TransCom	PrvServ	PubAdmin
ChnHub														
Japan	-1.7	-4.3	-1.4	-0.7	0.0	0.6	-0.4	1.9	2.0	-0.1	0.0	-0.1	0.0	0.0
PRC	3.7	2.5	3.8	2.2	-3.7	-1.6	15.7	-6.6	-3.4	-1.9	-0.7	-0.6	-0.2	-0.3
Korea	-41.3	-16.3	31.4	40.0	4.8	-1.3	-6.1	1.5	-4.2	10.8	3.4	-0.3	0.6	0.0
Hong Kong, China	-2.2	-0.6	0.5	10.0	9.8	0.4	21.2	-6.7	48.6	4.3	-1.9	-1.9	-1.7	-1.1
Taipei,China	-1.4	-4.6	-2.0	9.9	6.2	1.0	-9.9	0.8	6.8	-1.4	0.0	-0.9	0.3	-0.3
Indonesia	-0.2	-1.5	-0.3	-6.8	3.7	1.5	8.9	-0.9	2.5	4.1	0.4	0.5	0.2	-0.1
Malaysia	-0.9	-2.1	1.9	-1.9	7.2	1.3	-0.7	-0.9	6.0	0.2	-0.2	-0.3	-0.4	-0.2
Philippines	0.2	-1.3	-0.6	-2.3	1.3	0.4	-1.2	0.4	9.0	0.0	0.1	0.0	-0.1	0.0
Singapore	-1.3	-6.3	4.9	-13.0	1.4	2.3	-1.6	-6.0	12.5	-4.1	-0.2	-0.4	-1.0	-0.3
Thailand	0.5	6.2	-4.7	-9.0	27.0	-1.5	2.3	1.3	1.4	-5.3	-0.1	-0.7	0.3	0.0
Vietnam	-0.4	-6.5	-7.3	0.1	113.5	-3.0	-6.5	-3.3	-6.1	-2.8	3.9	0.7	-0.2	-2.8
Bangaladesh	-0.1	-1.5	-0.5	8.6	-1.1	-1.2	-4.9	-1.2	-1.9	-0.7	0.2	-1.1	-0.4	-0.7
India	-0.1	-4.4	0.1	0.4	1.3	0.6	-1.1	0.9	0.5	3.7	0.1	0.4	0.2	-0.1
Sri Lanka	-0.2	0.5	-0.5	0.0	0.6	0.0	0.6	0.2	0.5	0.5	0.1	0.4	0.2	0.0
AFA														
Japan	-3.2	-6.8	-3.5	-2.3	1.6	2.6	-2.0	5.3	3.0	-0.2	0.1	-0.2	0.1	0.0
PRC	3.6	1.7	2.3	-0.4	-3.6	-1.3	19.1	-6.5	-3.0	-1.1	-0.5	-0.4	-0.2	-0.2
Korea	-41.0	-22.1	40.0	50.2	6.7	-1.7	-7.1	5.3	-7.7	11.7	3.6	-0.7	0.7	-0.3
Hong Kong, China	-1.8	-0.8	36.3	10.1	12.1	3.0	17.7	-7.8	47.8	8.7	-2.5	-2.4	-2.2	-1.2
Taipei,China	-1.8	-8.9	-2.2	33.4	12.1	0.4	-14.8	-2.9	6.8	-0.8	-0.2	-1.5	0.3	-0.7
Indonesia	1.8	0.0	9.6	-10.7	0.6	1.7	0.8	-6.6	10.3	-0.5	-0.5	-0.8	-0.2	-0.3
Malaysia	-6.0	-1.9	66.6	27.9	0.8	0.1	-8.0	-19.7	24.9	12.6	-2.0	-0.1	-1.9	0.2
Philippines	1.8	-7.8	-3.3	-0.4	3.1	0.9	-1.4	49.5	15.6	-2.1	0.6	0.0	-0.1	-0.5
Singapore	2.2	2.1	64.9	-11.0	13.1	12.6	-9.9	-20.1	15.2	1.9	-1.1	-3.6	-3.6	-0.5
Thailand	12.3	-10.6	32.1	-24.4	15.9	-6.7	8.4	-10.2	22.0	-17.5	-0.6	-2.2	0.0	-1.5
Vietnam	-4.8	-12.2	-6.3	62.9	99.6	-11.6	-20.6	-12.6	19.0	-5.5	4.6	10.9	-1.6	-12.0
Bangaladesh	0.1	-11.1	-1.8	33.7	-11.4	-17.3	-37.6	-26.5	-15.9	-17.0	-0.5	-3.6	-0.8	-1.5
India	-0.5	-2.3	-7.0	11.3	3.8	1.2	0.3	-1.5	-0.5	11.4	0.3	1.2	0.8	-0.2
Sri Lanka	-1.0	-2.0	-2.8	3.3	-0.4	10.4	2.0	-11.8	-7.2	1.6	-0.7	1.0	1.2	0.0

In the scenario of Asia-wide FTA, the changes in Korea's sectoral output are quite similar to that obtained from the scenario of *ChnHub*. This reflects the dominant role of China in Korea's foreign trade. China experiences large increase of output for electronic & electricity equipment, and decline in almost all other major manufacturing sectors. In ASEAN, Malaysia, Singapore and Thailand gain in processing food sector. Malaysia also expands its textile & apparel sector. Viet Nam significantly shifts its output structure towards textile & apparel sector and chemical sector, while the Philippines experiences output expansion in vehicles and machinery sectors. All ASEAN countries expand their machinery sector, and shrink their electronic sectors. In South Asia, larger structural adjustment occurs in Bangladesh, which sees 33.7% increase of its textile and apparel output, and 11.4-37.6% production reduction in other manufacturing sectors.

What factors drive the above structural adjustment in production and trade? The existing pattern of import protection across Asian countries is one key determinant. For instance, the expansion of processing food sector in ASEAN countries and agricultural sector in China and Thailand are mainly resulted from the agricultural trade liberalization in Japan and Korea. But the large output adjustment in manufacturing sector are mainly driven by the self-reinforcing forward and backward linkages, which are emphasized by the new economic geography literatures and have been used to explain the industrial concentration and agglomeration. These linkages stem from the interaction of trade cost, love of variety and the input-output linkage in production. When trade across borders incurs costs, a larger number of upstream firms in a region implies a lower price level for intermediate inputs to downstream firms in same region. This mechanism constitutes the forward link. More downstream firms also imply a larger home market for upstream firms, which increases their sales and profits. This constitutes the backward link. The backward and forward linkages create a positive feedback for industrial agglomeration.

The simulation results on electronics & electrical equipment sector typically reflect the forces of agglomeration. In Asia, due to the rapid rise of regional production chains, the trade in electronics is dominated by the intra-industry trade in intermediate goods, including parts, components and semi-finished products. The electronic products produced in Asian countries usually comprise a high

proportion of value-added produced by other regional countries. For example, in Philippines and Singapore, the own industry input accounts for around 70% of the values of their electronic outputs, and more than 95% of these own industry inputs are imported. Therefore, although we assumed a relatively high substitution elasticity between varieties in electronic & electrical equipment sector, a strong self-reinforcing forward linkage causes that the agglomeration forces in this sector is strong and it is easily triggered by the reduction of import tariff. These agglomeration effects also exist in other manufacturing sectors.

4.3 Implications for broader regional and global trade liberalization

Will the hub and spoke configurations analyzed in above sections facilitate a broader regional and global integration? The above simulation results suggest a pessimistic answer to this question. By observing Table 2, three salient implications can be extracted from the comparison of welfare effects of alternative hub and spoke configurations with that of Asia-wide FTA and global free trade. First, although Asia-wide FTA induces much larger overall welfare gains than the hub and spoke arrangements, it usually represents an inferior option for the hub countries. China is worse off if it loses its hub positions as a result of Asia-wide FTA. ASEAN countries, except for Singapore, also lose under the scenario of Asia-wide FTA in comparison with them being a hub with the implementation of AFTA (the scenario *ASEHub2*). Japan can only be slightly better off with additional real income increase of 0.1 percentage points. Therefore, these countries may have little incentives to pursue broader regional trade liberalization, given their potential to become the FTA hub.

Second, China's welfare will decrease with either hub and spoke arrangements or Asia-wide free trade. This result underscores that as a large and fast growing country, China's primary interests lie in global wide multilateral trade liberalization. Its benefits from, and enthusiasm for regional trade arrangement may be limited.

Third, from the perspective of spoke countries, South Asian countries will lose or gain very little from the Asia-wide FTA. Korea can capture most of its benefits accruing from Asia-wide FTA through bilateral agreements with its large trade partners. Therefore, an Asia wide merchandise free trade

agreement may not represent the best choices of spoke countries as well.

Table 2 also shows that the welfare effects of global free trade are much larger than that of regional free trade, especially for East Asian countries. But the gains of South Asian countries and some South East Asian countries like the Philippines are relatively small. Bangladesh even suffers welfare loss from global trade liberalization, because its output expansion in textile and apparel sector is more than offset by the shrinking of other important manufacturing sectors. Trade liberalization is not necessarily beneficial to every participant. Some poor, underdeveloped countries may risk being marginalized and deindustrialized during global trade liberalization. This highlights the importance of complementary structural and institutional reform in those countries as well as the national and international efforts in infrastructure investment and technical cooperation. Without these efforts, some less underdeveloped countries may be endangered as net losers of global free trade.

5. Deep Integration

The simulations discussed in last section are limited to shallow integration, i.e. the elimination of tariff and other policy-induced distortions to merchandise trade. As we have mentioned, the new wave of PTAs in Asia and in the world has gone substantially beyond conventional free trade agreements and includes a number of "behind the border" issues which are typically not subject to WTO disciplines. To evaluate the possible impacts of deep integration in regional trade arrangements in Asia, we repeat the 6 simulations in section 4 on the assumption that services liberalization and trade facilitation are included in bilateral free trade agreements, in addition to the removal of merchandise trade distortions. Specially, in these new simulations, we assume that the bilateral variable trade costs are reduced by 10% of the value of trade in services sectors, and 5% of the value of trade in manufacturing sectors. Moreover, the bilateral fixed exporting costs are also cut by 30%.

Table 6 Impacts on Real Income (Deep Integration)

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Real Income (EV, mn US$)						
Japan	16105	45463	10776	9186	41665	84122
PRC	31837	7734	2961	2185	20673	69826
Korea	19595	2964	2379	1834	30787	52463
Hong Kong, China	10435	2063	3330	3451	17914	29960
Taipei,China	3148	2797	3358	2908	12800	19842
Indonesia	852	1476	6086	7780	6445	9093
Malaysia	1451	2125	10774	16227	13549	19149
Philippines	-86	1374	4565	6318	4882	7225
Singapore	1780	1345	6005	11177	11279	16077
Thailand	2390	4809	12164	15101	12341	16522
Vietnam	841	615	3921	5140	4334	5480
Bangaladesh	183	-21	59	19	711	1557
India	-713	-330	2493	2180	4150	17008
Sri Lanka	30	50	144	114	493	1287
Global	76542	59772	56909	70551	157061	1211800
Real Income (EV, % of GDP)						
Japan	0.4	1.1	0.3	0.2	1.0	2.1
PRC	2.8	0.7	0.3	0.2	1.8	6.2
Korea	4.7	0.7	0.6	0.4	7.4	12.6
Hong Kong, China	6.6	1.3	2.1	2.2	11.3	18.8
Taipei,China	1.1	1.0	1.2	1.1	4.7	7.2
Indonesia	0.6	1.0	4.3	5.5	4.5	6.4
Malaysia	1.7	2.4	12.4	18.7	15.6	22.0
Philippines	-0.1	2.0	6.6	9.2	7.1	10.5
Singapore	2.1	1.6	7.2	13.5	13.6	19.4
Thailand	2.1	4.3	10.8	13.5	11.0	14.7
Vietnam	2.6	1.9	12.3	16.2	13.6	17.3
Bangaladesh	0.4	0.0	0.1	0.0	1.6	3.4
India	-0.2	-0.1	0.5	0.5	0.9	3.7
Sri Lanka	0.2	0.3	0.9	0.7	3.2	8.3
Global	0.3	0.2	0.2	0.2	0.5	4.0

Three observations arise out of the scenarios of regional free trade agreements with deep integration (Table 6). First, the rewards of deep integration are significantly higher than that of traditional shallow integration. This is most evident from the remarkable real income changes of some most trade dependent regional economies, such as Hong Kong, Malaysia and Singapore. Second, the results from the scenario of Japan as a hub stand in sharp contrast to that involving shallow integration only. Under shallow, only a few countries can benefit from the bilateral free trade agreement with Japan because of the relatively open market in Japan. However, through deep integration, the gains of bilateral agreement with Japan are larger for most Asian economies. ASEAN countries can receive especially large benefits because of their intensive bilateral trade. Third, there are almost no losers from trade liberalization, under either hub and

spoke arrangements or regional/global free trade. The two exceptions are the Philippine and India. The Philippine is negatively affected under the *ChnHub* because of significant industrial relocation towards China in electronics sector. India still experience welfare losses under the scenarios of *ChnHub* and *JpnHub* because of the weak bilateral trade linkages between India and East Asia.

The larger welfare gains arising from deep integration, and the potential Pareto improvement it brings about, make bilateral trade agreements better serve as building blocks of lager trade liberalization at regional and global levels. Actually, some important positive externalities of deep integration are not captured by the model we use and our simulation exercises may underestimate the gains of deep integration[1]. One is the potential nondiscrimination nature of deep integration. Our above simulations assume that the reduction in trade costs is applied bilaterally or to PTA members only. However, some PTA-based deep integration reforms can extend their reduction of transactions or market access costs to all trade partners. A clear example is the simplification of custom clearance procedures included in PTAs, which reduces the costs of imports from all sources (Hoekman and Konan, 2001). Another important positive externalities is the role of deep integration in facilitating the integration of production processes across national borders. It in turn potentially facilitates technology transfer and the realization of scale economy (Evans, Holmes, Iacovone and Robinson, 2004). With these externalities, deep integration offers more opportunity to gain from PTAs, and provide new impetus to global free trade.

6. Concluding Remarks

The world trade system is increasingly evolving towards a blend of regional and multilateral disciplines. As a consequence of the proliferation of bilaterism in Asia, a range of hub and spoke trade arrangements are likely to emerge, with Japan, China and ASEAN competing as regional hub of bilateral FTAs. Using a newly developed global CGE model with particular focus on Asia, we explore the possible economic effects of alternative hub and spoke configurations in Asia. Our simulation results suggest that

[1] Hertel, Walmsley and Itakura (2001) analyze the impact of "new age" free trade between Japan and Singapore using a modified version of dynamic GTAP model. They find this FTA would result in global gains of US$ 9 billion annually. The bulk of

neither these hub and spoke configurations nor an Asia-wide FTA can become building blocks of global free trade, if the FTAs are confined to merchandise trade liberalization only. As a major regional power, China's benefits from trade liberalization can only be captured through multilateral approach. Another regional power, Japan, can only offer limited market growth potential following trade liberalization with Asian countries. South Asia can hardly gain from their free trade agreements with East Asian countries. Therefore, the regionalism approach focusing on shallow integration only does not represent an efficient way for Asian economies to maximize the benefits of trade liberalization.

The regional experience in recent years illustrates that shallow integration may be associated with the pursuit of a deeper integration agenda. We argue that the deep integration approach, which extend the coverage of FTAs to a number of "behind the border" issues such as trade and investment liberalization, trade facilitation, competition policy, harmonization of the regulation framework, and movement of persons, provides more opportunity to gain from FTAs. Deep integration entails increased efficiency and better allocation of resources due to increased competition and lower transaction costs. It can mitigate the discriminatory nature of preferential trade agreements as some deep integration measures are applied on a nondiscriminatory basis. As more and more regional FTAs involve deep integration measures, they promise large benefits for Asian economies and will act as stepping stones towards global trade liberalization.

these gains comes from the custom automization in Japan.

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Appendix:

Table A-1: Impacts on Real Income (Shallow integration, CRTS model)

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Real Income (EV, mn US$)						
Japan	3844	5391	439	123	7345	12670
PRC	1027	218	-886	-984	-1005	13372
Korea	7562	-620	-26	-110	8698	16787
Hong Kong, China	1487	-149	440	283	1988	3899
Taipei,China	970	-710	236	127	1329	1379
Indonesia	-25	-72	1122	1330	942	668
Malaysia	220	-114	2243	2839	2070	2170
Philippines	-5	-27	164	427	218	177
Singapore	353	-8	-277	487	1395	1647
Thailand	669	1378	3172	3661	2754	2856
Vietnam	24	3	730	1285	1067	1244
Bangaladesh	-140	-33	-142	-151	-411	-451
India	-1349	-539	-252	-282	-1722	287
Sri Lanka	-16	3	-4	-10	-30	239
Global	10034	2427	3784	5484	16410	87408
Real Income (EV, % of GDP)						
Japan	0.1	0.1	0.0	0.0	0.2	0.3
PRC	0.1	0.0	-0.1	-0.1	-0.1	1.2
Korea	1.8	-0.1	0.0	0.0	2.1	4.0
Hong Kong, China	0.9	-0.1	0.3	0.2	1.2	2.5
Taipei,China	0.4	-0.3	0.1	0.0	0.5	0.5
Indonesia	0.0	-0.1	0.8	0.9	0.7	0.5
Malaysia	0.3	-0.1	2.6	3.3	2.4	2.5
Philippines	0.0	0.0	0.2	0.6	0.3	0.3
Singapore	0.4	0.0	-0.3	0.6	1.7	2.0
Thailand	0.6	1.2	2.8	3.3	2.5	2.5
Vietnam	0.1	0.0	2.3	4.0	3.4	3.9
Bangaladesh	-0.3	-0.1	-0.3	-0.3	-0.9	-1.0
India	-0.3	-0.1	-0.1	-0.1	-0.4	0.1
Sri Lanka	-0.1	0.0	0.0	-0.1	-0.2	1.5
Global	0.0	0.0	0.0	0.0	0.1	0.3

Table A-2: Impacts on Exports and Terms of Trade (Shallow integration, CRTS model)

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Exports (% change relative to baseyear)						
Japan	3.3	5.7	1.6	1.5	6.2	11.0
PRC	20.4	4.0	3.2	3.1	19.2	34.5
Korea	9.7	2.0	0.9	0.8	14.5	20.5
Hong Kong, China	1.0	-0.2	-0.1	-0.1	1.1	1.2
Taipei,China	1.0	1.8	0.8	0.7	4.5	7.1
Indonesia	1.2	0.2	5.0	6.3	5.5	8.8
Malaysia	0.8	0.2	4.4	6.5	5.7	7.1
Philippines	0.6	0.6	3.7	6.4	5.3	6.8
Singapore	0.2	-0.1	-1.1	-0.8	0.2	-1.7
Thailand	3.3	4.1	11.5	14.6	13.7	18.5
Vietnam	5.1	5.1	24.3	28.2	26.2	32.1
Bangaladesh	16.8	1.0	6.8	6.8	46.9	58.2
India	6.0	2.2	13.1	12.9	27.2	60.1
Sri Lanka	0.2	0.0	1.6	1.6	6.6	13.3
Terms of Trade (% change relative to baseyear)						
Japan	0.9	0.9	0.0	-0.1	1.6	1.2
PRC	-0.4	-0.2	-0.5	-0.5	-1.1	-1.9
Korea	-0.8	-0.4	0.0	0.0	-0.6	-0.9
Hong Kong, China	1.2	-0.1	0.4	0.2	1.7	3.1
Taipei,China	0.8	-0.6	0.1	0.0	0.9	0.7
Indonesia	0.1	-0.1	1.9	2.3	1.4	1.7
Malaysia	0.1	-0.1	1.4	1.0	0.3	-0.1
Philippines	-0.1	-0.1	0.2	0.4	-0.1	-0.3
Singapore	0.4	0.0	-0.3	0.6	1.7	2.0
Thailand	0.5	1.0	2.6	2.7	1.6	1.1
Vietnam	0.3	-0.4	0.0	0.5	-0.5	-0.9
Bangaladesh	-2.2	-0.3	-0.9	-1.0	-5.2	-5.6
India	-1.0	-0.5	-2.3	-2.4	-3.7	-5.4
Sri Lanka	-0.2	0.0	-0.3	-0.4	-0.7	2.6

Table A-3: Impacts on Real Income (Deep integration, CRTS model)

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Real Income (EV, mn US$)						
Japan	10685	31478	6064	4654	27609	51425
PRC	26447	6631	1443	909	18568	46729
Korea	11189	1671	1368	973	18914	34382
Hong Kong, China	7681	1269	2470	2320	13324	21457
Taipei,China	2160	1646	2054	1678	8688	13504
Indonesia	298	1512	4933	5934	4941	5634
Malaysia	722	1430	8254	11733	9495	12398
Philippines	18	877	2742	3825	2952	4239
Singapore	1075	923	3987	7799	8035	11776
Thailand	1310	3373	8245	10193	8166	10718
Vietnam	463	402	2536	3604	3057	3817
Bangaladesh	19	-6	-10	-44	247	700
India	-1299	-277	657	459	1333	9488
Sri Lanka	10	47	108	82	338	1018
Global	48211	38850	33252	41280	98417	840150
Real Income (EV, % of GDP)						
Japan	0.3	0.8	0.1	0.1	0.7	1.3
PRC	2.3	0.6	0.1	0.1	1.6	4.1
Korea	2.7	0.4	0.3	0.2	4.5	8.2
Hong Kong, China	4.8	0.8	1.6	1.5	8.4	13.5
Taipei,China	0.8	0.6	0.7	0.6	3.2	4.9
Indonesia	0.2	1.1	3.5	4.2	3.5	4.0
Malaysia	0.8	1.6	9.5	13.5	10.9	14.3
Philippines	0.0	1.3	4.0	5.6	4.3	6.2
Singapore	1.3	1.1	4.8	9.4	9.7	14.2
Thailand	1.2	3.0	7.3	9.1	7.3	9.6
Vietnam	1.5	1.3	8.0	11.3	9.6	12.0
Bangaladesh	0.0	0.0	0.0	-0.1	0.5	1.5
India	-0.3	-0.1	0.1	0.1	0.3	2.0
Sri Lanka	0.1	0.3	0.7	0.5	2.2	6.6
Global	0.2	0.1	0.1	0.1	0.3	2.8