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Preferential Trade Agreements
in Asia: Alternative Scenarios
of “Hub and Spoke”

Fan Zhai

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PREFERENTIAL TRADE AGREEMENTS IN ASIA: ALTERNATIVE SCENARIOS OF “HUB AND SPOKE”

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FOREWORD

The ERD Working Paper Series is a forum for ongoing and recently completed research and policy studies undertaken in the Asian Development Bank or on its behalf. The Series is a quick-disseminating, informal publication meant to stimulate discussion and elicit feedback. Papers published under this Series could subsequently be revised for publication as articles in professional journals or chapters in books.

CONTENTS

Abstract	vii
I. Introduction	1
II. Hub and Spoke Configurations in Asia	3
III. The Simulation Model	4
IV. Simulations and Results	6
A. Aggregate Impacts	7
B. Sectoral Results	11
C. Implications for Broader Regional and Global Trade Liberalization	15
V. Deep Integration	16
VI. Concluding Remarks	19
Appendix	20
References	23

ABSTRACT

The proliferation of preferential trade agreements in Asia may result in a number of hub-and-spoke configurations, with the Association of Southeast Asian Nations, People's Republic of China, and Japan competing as regional hubs of bilateral free trade areas. Using a newly developed global computable general equilibrium model with imperfect competition, increasing returns to scale, and heterogeneous firms, the paper explores the potential economic effects of alternative hub-and-spoke configurations in Asia. Simulation results suggest that the regionalism approach to integration in the Asian context can hardly act as a building block of global trade liberalization, if it is confined to shallow integration only. However, regional trade agreements involving deep integration measures provide a promising path toward global free trade.

I. INTRODUCTION

The past two decades have witnessed a remarkable trend of regional economic integration in Asia, especially in East Asia and Southeast Asia. Asian economies have achieved rapid technological advancement, robust economic growth, and substantial liberalization of trade and foreign direct investment (FDI) regimes under the multilateral framework of the World Trade Organization (WTO). All these factors worked together to result in a tremendous expansion of trade and FDI in the region. Between 1980 and 2004, intra-Asian trade has expanded at an average annual rate of 13.7%, higher than the 10.6% average growth of total Asian trade per year. Within Asia (including Japan and developing Asia), the ratio of intraregional trade to total trade has increased from 32.7% in 1980 to 53.0% in 2004.

Economic integration in Asia has been largely market-driven, with private activities as a primary force. Recognizing the importance of more formal institutional arrangements to facilitate regional integration; and motivated by the formation of the North American Free Trade Agreement (NAFTA) and the European Union (EU) trade blocs, Asian countries have mounted collective efforts for regionwide free trade since the early 1990s. Members of the Association of Southeast Asian Nations (ASEAN) signed the ASEAN Free Trade Area (AFTA) agreement in 1992, aiming at creating a free trade area (FTA) among member countries by 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 underscored the importance of economic policy cooperation among East and Southeast economies. By the end of the 1990s, a new wave of Asian regionalism featuring bilateral agreements and deep integration had gathered momentum. This was led by Republic of Korea (henceforth Korea), which began its discussion of FTA with Japan in 1998, and which signed a bilateral FTA with Chile in 2002. ASEAN, People's Republic of China (PRC), India, and Japan soon joined the pursuit of PTAs. By 2005, Asian countries (including Central Asia) had implemented 18 bilateral trade agreements and four regional trade agreements (RTAs) and had negotiated at least 30 new preferential trade agreements (PTAs). Asian countries shifted their policy preference from a multilateral approach to global free trade to active participation in regional groups in order to gain substantially in the regional market. This strategic change in Asian commercial policy partly reflects the region's reaction to the slow progress of multilateral negotiations under the WTO and the Asia-Pacific Economic Cooperation (APEC) forum. However, some recent developments in the regional economy, such as the parallel emergence of the PRC and India as important economic powers, have significantly changed the global and regional economic landscape and have 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–United States, Singapore–European Free Trade Association, and Thailand–New Zealand. As Singapore is a small and open economy and has dropped most of its trade barriers, it can pursue as many bilateral trade agreements as possible to maximize gains from free trade

without worries about the negative effects of trade diversion or deterioration of terms of trade. For PRC, Japan, and Korea, their efforts to forge inter-regional bilateral trade agreements may reflect their intention to both secure a larger foreign market access and to facilitate inward and outward foreign direct investment.

Another important 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 nontariff barriers (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 development. 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 their operations can perform most efficiently. Recent literature has 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 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, compared to the 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 the trade diversion it causes dominates trade creation. Moreover, overlapping PTAs with multiple and complicated provisions and rules of origin bring additional transaction costs in international trade, resulting in the famous “spaghetti bowl” 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 and 2000).

How will Asian regionalism evolve? In the foreseeable future, the most likely scenario in Asia is a complex web of intersecting bilateral, regional, and inter-regional trade agreements. Bilateralism is expected to continue, and distance or proximity would 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 could be misleading. But it remains unclear whether the proliferation of bilateral PTAs will lead to regionwide 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 markets. The formation of PTAs provides strong incentive to outsiders to join or form PTAs, especially to form bilateral PTAs with countries that are their major markets and already have PTAs with other countries, to counter the discrimination they would otherwise face. This leads to a domino effect of all outsiders aggressively pursuing PTAs

with the major powers. Baldwin (2004) cautions that the continuing pursuit of bilateralism by the regional large economies, such as the PRC and Japan, may lead to a dangerous outcome. The political economy forces that drives the domino effect in Asia tends to produce overlapping hub and spoke trade arrangements that are economically inefficient and potentially divisive. However, Lloyd (2002) argues that bilateralism will likely have positive effects on the world trading system from a longer-term 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 toward enlargement and coalescence of existing PTAs. Even though the bilateral agreements lead to hubs and spokes, a spoke bilateral mitigates the effect of large PTAs and may result in enlargement of PTAs.

This paper attempts to shed some light on the debate on regionalism versus multilateralism by analyzing the potential impacts of hub and spoke trade arrangements in Asia. Using a newly developed global computable general equilibrium (CGE) model with imperfect competition, increasing returns to scale technology, and firm heterogeneity in productivity, the paper simulates alternative scenarios of regional hub and spoke configurations. The rest of this paper is organized as follows. Section II discusses the possible hub and spoke configurations in Asia. The simulation model is introduced in Section III and Section IV discusses the simulation results. Concluding remarks follow in Section V.

II. HUB AND SPOKE CONFIGURATIONS IN ASIA

Under multiple PTAs, a hub arises when one country has simultaneous, separate PTAs with individual spoke countries, while the spokes normally do not have PTAs among themselves. Compared with a corresponding full FTA, hub-and-spoke configurations create multilayers of discrimination. As the spokes are isolated in nature, there is a greater threat of trade diversion toward the hub. The “spaghetti bowl” problem is also exacerbated in hub-and-spoke systems. Furthermore, the asymmetry of market access between the 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 domestic political economy constraints might prevent spoke-spoke liberalization (Baldwin 2004).

Who will be the hubs in Asia? As the two largest economies in the region, the PRC and Japan 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 negotiate 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 the PRC and Japan as two individual hubs and ASEAN countries, Australia, Korea, 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 are well aware of the risks of being trapped as spokes in an integrated East Asia. Its efforts to negotiate bilateral PTAs not only with PRC, Japan, and Korea but also with Australia, India, New Zealand, and United States (US) reflect ASEAN’s intention to diffuse the dominance of the PRC and Japan and to enhance its negotiating leverage in regional

trade agreements. Actually, given its geographic advantage, ASEAN is potentially well placed to emerge as a regional hub linking East Asia and South Asia, and it is already in a unique position as a hub in 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, any preferential agreement actually signed might differ among members. This will put ASEAN in a spoke rather than hub position, because the unequal market access among ASEAN countries and their PTA partner still diverts trade and investment to the latter. Moreover, the internal liberalization among ASEAN members can be undermined if the members shift attention to integration with their outside favorites, rather than with each other (Findlay, Piei, and Pangestu 2003). 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 including India, Japan, and Korea prefer to strike bilateral deals with ASEAN members individually to negotiate with ASEAN collectively. The PRC has emphasized negotiations with ASEAN as a group in their early FTA talks, but the recent PRC–Thailand bilateral agreement may signal a shift of the PRC’s FTA strategy with ASEAN. Therefore, the internal weakness and external environment of ASEAN might 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 bilateral free trade agreements with Bhutan, Nepal, and Sri Lanka. But overall, trade integration in South Asia has been very limited. It is also arguable if a South Asian FTA makes sense given the strong economic asymmetry in the region. For instance, Panagariya (2003) argues that South Asian countries may gain much from nondiscriminatory unilateral or multilateral trade liberalization, while PTAs would be harmful overall.

India adopted a “Look East Policy” 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 an FTA to be implemented over a 10-year period. India also has approached individual members of ASEAN such as Singapore and Thailand for a bilateral agreement. India is jointly studying the feasibility of FTAs with PRC, Japan, Korea, and Malaysia. Panagariya (2004) suggested that an India–PRC FTA could be less distorted and will create strong impetus for an Asiawide FTA.

III. THE SIMULATION MODEL

The model used in this study is a static, CGE model of the global economy. It is built on the LINKAGE model developed at the World Bank by Dominique van der Mensbrugge (2005), and has its intellectual roots in the group of multicountry 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 multicountry 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 that incorporate scale economies and imperfect competition.¹ Some examples of second-generation CGE include Gasiorek, Smith, and Venables (1992); Harrison, Rutherford, and Tarr (1997); Brown, Deardorff, and Stern (2002); Bchir, Decreux, Guerin, and Jean (2002); and Francois, van Meijl, and van Tongeren (2005). In contrast with the previous models, this paper incorporates firm heterogeneity and fixed cost of exporting into the model. This enables investigation of intraindustry reallocation of resources and exporting decisions by firms. 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) introduced the extensive margin as a result of the firms’ self-selection to export markets. These new models emphasize 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 potentially higher profits. Empirical evidence has largely supported the predictions by these 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’s (1979) monopolistic competition model. Agriculture, mining, and public administration are assumed to be in perfect competition. In each of these three sectors, there is a representative firm operated under constant returns to scale technology. The manufacturing sector and service sectors are characterized by monopolistic competition. Each of them consists of a continuum of firms differentiated by the varieties they produce and their productivity. Firms face fixed production cost, resulting in increasing returns to scale. There are also fixed costs and variable costs associated with the exporting activities. On the demand side, the agents are assumed to have Dixit-Stiglitz preference over the continuum of varieties.² As each firm is a monopolist for the variety it produces, it sets the price of its product at a constant markup over its marginal cost. The 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 fixed costs. This zero cutoff profit condition defines the productivity thresholds for a firm entering domestic and export markets, and in turn determines the equilibrium distribution of nonexporting 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 domestic market production, 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 the sunk cost of entry.

The model is calibrated to the GTAP (version 6) global database. It includes 19 countries/regions and 14 sectors. However, some information central to the model, such as degree of returns to scale, shape of productivity distribution, and magnitude of fixed and variable trade cost, are not available

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

² The paper assumes a more general specification of the utility function with a taste for variety parameter, λ , as in Benassy (1996). $\lambda \in [0,1]$ 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 $\lambda=0.5$ in the model calibration.

in the GTAP database. These parameters are set based mainly on a search of relevant literature. Table 1 reports some major parameters 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 Togerem (2005). The choices of markup ratios, together with optimal pricing rule of monopolistic firms, imply that the substitution elasticity between differentiated varieties ranges from 5 to 11. 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 where around 20% of goods or services is postulated to 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 nonexporting firms and exporting firms in total firms. The model assumes that for each sector, some 80% of firms produce only for domestic markets. The shares of exporting firms are assumed based on the ratio of exports in sectoral output.

TABLE 1
MAJOR PARAMETERS IN THE MODEL

	MARKUP RATIO (PERCENT)	SUBSTITUTION ELASTICITY BETWEEN VARIETIES	SCALE PARAMETER IN PRODUCTIVITY PARETO DISTRIBUTION
Processed foods	10	11.0	16.7
Textiles and apparel	10	11.0	16.7
Chemicals	15	7.7	11.1
Materials	15	7.7	11.1
Electrical equipment and electronics	12	9.3	13.9
Vehicles	15	7.7	11.1
Machines	15	7.7	11.1
Other manufacturing	15	7.7	11.1
Trade	25	5.0	6.7
Transportation and communication	25	5.0	6.7
Private services	25	5.0	6.7

IV. SIMULATIONS AND RESULTS

Based on the analysis in Section II, four scenarios of hub-and-spoke configurations in Asia are simulated. Under the first and second scenarios, the PRC and Japan are hubs and named ChnHub and JpnHub, respectively. The third and fourth 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 fourth scenario (ASEHub2), under which ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. In each of the scenarios, all bilateral distortions, including tariff and export tax to merchandise trade between hub and spokes are eliminated, but trade barriers between spokes are retained. The

model does not take into account rules of origin that lead to higher input costs and reduction of PTA preference margin. Therefore, simulation results may overestimate the welfare effects of PTAs. Scenarios are presented that allow comparison of hub-and-spoke configurations between an Asiawide FTA (AFA) and multilateral global trade liberalization (GTL).

A. Aggregate Impacts

Tables 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 the PRC will produce net welfare gain for the world as a whole of around \$18.5 billion, which is more than two times that from an ASEAN hub, and three times that from a 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 export demand and lower terms of trade faced by them. However, some Asian countries also suffer loss from the hub-and-spoke configuration. Typically, South Asian countries do not benefit from bilateral FTAs with the PRC and Japan, as their preliberalization 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, bilateral FTAs with Japan are not beneficial for most Asian economies. Japan is relatively open for its manufacturing market and its import protection is mainly applied in the agriculture and food sectors. Only Thailand and Viet Nam gain stronger competitive advantages in the Japanese market through their bilateral FTAs with Japan, because the processed food sector accounts for relatively larger shares of their exports to Japan.

One striking feature of the welfare effects is that the PRC is adversely impacted as a regional FTA hub, and even experiences a bigger loss in the case of an Asiawide FTA. This result can be explained by the special feature of regional trade patterns in Asia. Since the 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 the Asian region. This is evidenced by the increasing extent of relocation of industrial activities and massive inflows of FDI into the region, particularly the PRC. As a result, the PRC'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. The PRC's role as an essential assembling center for many exports from Asia to the European Union (EU) and the US is reflected in the emergence of the "East Asian trade triangle".³ in which the PRC runs a sustained trade surplus with the EU and the US and a deficit of about the same magnitude with ASEAN; Korea; and Taipei,China. Under this trade pattern, the PRC's bilateral trade liberalization with its regional trade partners raises the relative price of intermediate parts and components in the final goods, resulting in a reduction in the PRC's terms of trade (Table 3). Moreover, as intra-industry trade in intermediate goods accounts for a large proportion of Asian intraregional trade, liberalization toward an Asiawide FTA would further raise the prices of intermediate goods, inducing larger deterioration in the PRC's terms of trade and welfare.

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

TABLE 2
IMPACTS ON REAL INCOME

	CHNHUB	JPNHUB	ASEHUB1	ASEHUB2	AFA	GTL
Real Income (EV, S\$ millions)						
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
Viet Nam	209	37	1266	1912	1665	1959
Bangladesh	-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, percent 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
Viet Nam	0.7	0.1	4.0	6.0	5.2	6.2
Bangladesh	-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

Note: ChnHub means the PRC is a hub; JpnHub means Japan is a hub. ASEHub1 assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. In ASEHub2, ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. AFA means Asiawide FTA and GTL means multilateral global trade liberalization. EV means Hicksian equivalent variation. GDP means gross domestic product.

TABLE 3
IMPACTS ON EXPORTS AND TERMS OF TRADE (PERCENT)

	CHNHUB	JPNHUB	ASEHUB1	ASEHUB2	AFA	GTL
Exports (percent change relative to base year)						
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
Viet Nam	6.1	6.7	29.5	33.2	31.2	39.1
Bangladesh	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 (percent change relative to base year)						
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
Viet Nam	0.1	-1.3	-2.2	-0.8	-1.7	-2.4
Bangladesh	-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

Note: ChnHub means the PRC is a hub; JpnHub means Japan is a hub. ASEHub1 assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. In ASEHub2, ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. AFA means Asiawide FTA and GTL means multilateral global trade liberalization.

Another factor contributing to the PRC'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 the PRC's agricultural exports, although these markets are highly protected. Their trade liberalization with the PRC results in expansion of the PRC's agricultural sector, diverting resources out of industrial sectors. As a consequence, the industrial sectors have to contract. Since industrial sectors are assumed to operate under increasing returns 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 the PRC. The PRC is Korea's second largest exports destination next to the United States. A bilateral FTA between the PRC 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 around the PRC 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 a bilateral FTA with the PRC. Bangladesh's exports structure is heavily biased toward the garments sector, which is dependent on the imports of textile materials from the PRC. The removal of tariffs on textile imports from the PRC significantly reduces production costs in 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 nonregional markets such as the EU and the US. 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 Asia, and generally insignificant impact on East Asia. These reflect stronger trade linkages between South Asia and Southeast Asia, and the relatively smaller economic size of ASEAN. Comparing the two scenarios of ASEHub1 and ASEHub2, intra-ASEAN trade liberalization is important for ASEAN countries—raising overall welfare gain by 50% relative to the scenario of bilateral FTAs with nonmembers 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 an ASEAN free trade area.

In comparison with the standard CGE with representative firm, perfect competition, constant returns to scale, and national product differentiation, the model in this paper generally generates 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 trade liberalization yields welfare gains. The first is the Dixit-Stiglitz "love-of-variety effect", i.e., 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

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

⁵ The simulation results from a perfect competition version of this model are presented in Appendix for purposes of comparison.

number of domestic firms supplied to domestic markets decreases, because the higher exposure to imports makes the less productive firms unable to survive. However, 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 increased export sales. As exporting firms are more productive, this reallocation of market shares can also boost aggregate productivity.

These theoretic insights are illuminated by the simulation results. Table 4 reports the changes in the number of nonexporting firms, number of exporting firms, and average productivity of the aggregated monopolistic competition sector. In general, the regional hub and spoke trade arrangements increase the number of exporting firms, but decrease the number of nonexporting firms. Hong Kong, China and Singapore 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 the monopolistic competition sector also increase following regional bilateral trade liberalization, but their magnitude is very small. Again, Hong Kong, China and Singapore may suffer a decline in aggregate productivity under some scenarios, as their new exporting firm entrants are less productive than the average productivity level due to their high number 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, the next subsection discusses sectoral impacts.

B. Sectoral Results

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

TABLE 4
IMPACTS ON NUMBER OF FIRMS AND PRODUCTIVITY (PERCENT)

	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
Viet Nam	0.0	-0.8	-4.0	-5.8	-5.5	-5.9
Bangladesh	-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
Viet Nam	10.3	9.6	42.3	48.7	44.0	52.8
Bangladesh	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
Viet Nam	0.5	0.0	1.3	1.8	1.7	1.5
Bangladesh	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

Note: ChnHub means the PRC is a hub; JpnHub means Japan is a hub. ASEHub1 assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. In ASEHub2, ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. AFA means Asiawide FTA and GTL means multilateral global trade liberalization.

TABLE 5
CHANGES OF SECTORAL OUTPUT (PERCENT)

	AGRI- CULTURE	MINING	FOOD	TEXTILE AND APPAREL	CHEMICAL	MATERIAL
ChnHub						
Japan	-1.7	-4.3	-1.4	-0.7	0.0	0.6
PRC	3.7	2.5	3.8	2.2	-3.7	-1.6
Korea	-41.3	-16.3	31.4	40.0	4.8	-1.3
Hong Kong, China	-2.2	-0.6	0.5	10.0	9.8	0.4
Taipei,China	-1.4	-4.6	-2.0	9.9	6.2	1.0
Indonesia	-0.2	-1.5	-0.3	-6.8	3.7	1.5
Malaysia	-0.9	-2.1	1.9	-1.9	7.2	1.3
Philippines	0.2	-1.3	-0.6	-2.3	1.3	0.4
Singapore	-1.3	-6.3	4.9	-13.0	1.4	2.3
Thailand	0.5	6.2	-4.7	-9.0	27.0	-1.5
Viet Nam	-0.4	-6.5	-7.3	0.1	113.5	-3.0
Bangladesh	-0.1	-1.5	-0.5	8.6	-1.1	-1.2
India	-0.1	-4.4	0.1	0.4	1.3	0.6
Sri Lanka	-0.2	0.5	-0.5	0.0	0.6	0.0
AFA						
Japan	-3.2	-6.8	-3.5	-2.3	1.6	2.6
PRC	3.6	1.7	2.3	-0.4	-3.6	-1.3
Korea	-41.0	-22.1	40.0	50.2	6.7	-1.7
Hong Kong, China	-1.8	-0.8	36.3	10.1	12.1	3.0
Taipei,China	-1.8	-8.9	-2.2	33.4	12.1	0.4
Indonesia	1.8	0.0	9.6	-10.7	0.6	1.7
Malaysia	-6.0	-1.9	66.6	27.9	0.8	0.1
Philippines	1.8	-7.8	-3.3	-0.4	3.1	0.9
Singapore	2.2	2.1	64.9	-11.0	13.1	12.6
Thailand	12.3	-10.6	32.1	-24.4	15.9	-6.7
Viet Nam	-4.8	-12.2	-6.3	62.9	99.6	-11.6
Bangladesh	0.1	-11.1	-1.8	33.7	-11.4	-17.3
India	-0.5	-2.3	-7.0	11.3	3.8	1.2
Sri Lanka	-1.0	-2.0	-2.8	3.3	-0.4	10.4

continued.

TABLE 5. CONTINUED.

	ELECTRICAL EQUIPMENT AND ELEC- TRONICS	VEHICLES	MACHINE	OTHER MANUFAC- TURING	TRADE	TRANSPORT AND COMMUNI- CATION
ChnHub						
Japan	-0.4	1.9	2.0	-0.1	0.0	-0.1
PRC	15.7	-6.6	-3.4	-1.9	-0.7	-0.6
Korea	-6.1	1.5	-4.2	10.8	3.4	-0.3
Hong Kong, China	21.2	-6.7	48.6	4.3	-1.9	-1.9
Taipei,China	-9.9	0.8	6.8	-1.4	0.0	-0.9
Indonesia	8.9	-0.9	2.5	4.1	0.4	0.5
Malaysia	-0.7	-0.9	6.0	0.2	-0.2	-0.3
Philippines	-1.2	0.4	9.0	0.0	0.1	0.0
Singapore	-1.6	-6.0	12.5	-4.1	-0.2	-0.4
Thailand	2.3	1.3	1.4	-5.3	-0.1	-0.7
Viet Nam	-6.5	-3.3	-6.1	-2.8	3.9	0.7
Bangladesh	-4.9	-1.2	-1.9	-0.7	0.2	-1.1
India	-1.1	0.9	0.5	3.7	0.1	0.4
Sri Lanka	0.6	0.2	0.5	0.5	0.1	0.4
AFA						
Japan	-2.0	5.3	3.0	-0.2	0.1	-0.2
PRC	19.1	-6.5	-3.0	-1.1	-0.5	-0.4
Korea	-7.1	5.3	-7.7	11.7	3.6	-0.7
Hong Kong, China	17.7	-7.8	47.8	8.7	-2.5	-2.4
Taipei,China	-14.8	-2.9	6.8	-0.8	-0.2	-1.5
Indonesia	0.8	-6.6	10.3	-0.5	-0.5	-0.8
Malaysia	-8.0	-19.7	24.9	12.6	-2.0	-0.1
Philippines	-1.4	49.5	15.6	-2.1	0.6	0.0
Singapore	-9.9	-20.1	15.2	1.9	-1.1	-3.6
Thailand	8.4	-10.2	22.0	-17.5	-0.6	-2.2
Viet Nam	-20.6	-12.6	19.0	-5.5	4.6	10.9
Bangladesh	-37.6	-26.5	-15.9	-17.0	-0.5	-3.6
India	0.3	-1.5	-0.5	11.4	0.3	1.2
Sri Lanka	2.0	-11.8	-7.2	1.6	-0.7	1.0

Note: ChnHub means the PRC is a hub. AFA means Asiawide FTA.

In the scenario of an Asiawide 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 the PRC in Korea's foreign trade. The PRC experiences a large increase of output for electronics and electricity equipment, and a decline in almost all other major manufacturing sectors. In ASEAN, Malaysia, Singapore, and Thailand gain in the processed food sector. Malaysia also expands its textile and apparel sector. Viet Nam significantly shifts its output structure toward the textile and apparel sector and the chemical sector, while the Philippines experiences output expansion in vehicles and machinery sectors. All ASEAN countries expand their machinery sector, and shrink their electronics sectors. In South Asia, larger structural adjustment occurs in Bangladesh, which sees a 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 the processed food sector in ASEAN countries and the agriculture sector in the PRC and Thailand mainly result from agricultural trade liberalization in Japan and Korea. But the large output adjustment in the manufacturing sector is mainly driven by the self-reinforcing forward and backward linkages, which are emphasized by the new economic geography literature and have been used to explain 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 the same region. This mechanism constitutes the forward link. More downstream firms also imply a larger home market for upstream firms, which increase their sales and profits. This constitutes the backward link. The backward and forward linkages create a positive feedback for industrial agglomeration.

The simulation results for the electronics and electrical equipment sector typically reflect the forces of agglomeration. In Asia, due to the rapid rise of regional production chains, trade in electronics is dominated by intra-industry trade in intermediate goods, including parts, components, and semifinished products. Electronic products produced in Asian countries usually comprise a high proportion of value-added produced by other regional countries. For example, in the Philippines and Singapore, the own industry input accounts for around 70% of the value of their electronic outputs, and more than 95% of these industry inputs are imported. Therefore, although a relatively high substitution elasticity between varieties is assumed in the electronics and electrical equipment sector, a strong self-reinforcing forward linkage makes the agglomeration forces in this sector strong and easily triggered by the reduction of import tariff. These agglomeration effects also exist in other manufacturing sectors.

C. Implications for Broader Regional and Global Trade Liberalization

Will the hub-and-spoke configurations analyzed in the above sections facilitate a broader regional and global integration? The above simulation results suggest a pessimistic answer. 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 Asiawide FTA and global free trade. First, although Asiawide FTA induces much larger overall welfare gains than the hub and spoke arrangements, it usually represents an inferior option for the hub countries. The PRC is worse off if it loses its hub position as a result of an Asiawide FTA. ASEAN countries, except for Singapore, also lose under the scenario of an Asiawide FTA in comparison with them being a hub with the implementation

of AFTA (scenario ASEHub2). Japan can only be slightly better off with an additional real income increase of 0.1 percentage points. Therefore, these countries may have little incentive to pursue broader regional trade liberalization, given their potential to become the FTA hub.

Second, the PRC's welfare will decrease with either hub and spoke arrangements or Asiawide free trade. This result underscores that as a large and fast-growing country, the PRC's primary interests lie in global 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 an Asiawide FTA. Korea can capture most of the benefits accruing from an Asiawide FTA through bilateral agreements with its large trade partners. Therefore, an Asiawide merchandise free trade agreement may not represent the best choice for 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 Southeast Asian countries like the Philippines are relatively small. Bangladesh even suffers welfare loss from global trade liberalization, because of the preference erosion in the EU market under global free trade. 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 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.

V. DEEP INTEGRATION

The simulations discussed in the last section are limited to shallow integration, i.e., the elimination of tariff and other policy-induced distortions to merchandise trade. As 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 typically not subject to WTO discipline. Some countries do have their own motivations to push forward with deep integration. Singapore is an important pusher of deep integration in the region, driven by its aspiration to become a regional hub of financial, transport, telecommunication, and education services. Trade in services is the main component of most of Singapore's FTAs and largely go beyond the General Agreement on Trade in Services commitments. For ASEAN countries, deep integration is an effective way to revitalize their competitiveness and attract investment, confronted with the prospect of the PRC's emergence (Sussangkarn 2004). In South Asia, given the high trade costs induced by poor infrastructure, weak regulatory environment, cumbersome customs procedures, etc., its regional economic integration depends heavily on adopting deep integration measures.

To evaluate the possible impacts of deep integration in regional trade arrangements in Asia, the six simulations in Section IV are repeated 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, it is assumed that the bilateral variable trade costs are reduced by 10% of the value of trade in the service sectors, and 5% of the value of trade in the manufacturing sector. Moreover, bilateral fixed exporting costs are also cut by 30%.

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 in some of the most trade-dependent economies such as Hong Kong, China; 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 integration, 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 India and the Philippines. The Philippines is negatively affected under the ChnHub because of significant industrial relocation toward the PRC in the electronics sector. India still experiences 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 serving as building blocks of larger trade liberalization at the regional and global levels. Actually, some important positive externalities of deep integration are not captured by the model in this paper, and the simulation exercises may underestimate the gains of deep integration.⁶ One is the potential nondiscrimination nature of deep integration. The 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. Another important positive externality is the role of deep integration in facilitating the integration of production processes across national borders. Deep integration 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 provides new impetus to global free trade.

⁶ Hertel, Walmsley, and Itakura (2001) analyze the impact of “new age” free trade between Japan and Singapore using a modified version of the dynamic GTAP model. They find this FTA would result in global gains of US\$9 billion annually. The bulk of these gains comes from custom automatization in Japan.

TABLE 6
IMPACTS ON REAL INCOME (DEEP INTEGRATION)

	CHNHUB	JPNHUB	ASEHUB1	ASEHUB2	AFA	GTL
Real Income (EV, \$ millions)						
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
Viet Nam	841	615	3921	5140	4334	5480
Bangladesh	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, percent 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
Viet Nam	2.6	1.9	12.3	16.2	13.6	17.3
Bangladesh	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

Note: ChnHub means the PRC is a hub; JpnHub means Japan is a hub. ASEHub1 assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. In ASEHub2, ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. AFA means Asiawide FTA and GTL means multilateral global trade liberalization. EV means Hicksian equivalent variation. GDP means gross domestic product.

VI. CONCLUDING REMARKS

The world trade system is increasingly evolving toward 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 ASEAN, PRC, and Japan competing as regional hubs of bilateral FTAs. Using a newly developed global CGE model with particular focus on Asia, this paper explores the possible economic effects of alternative hub-and-spoke configurations in Asia. The simulation results suggest that neither these hub-and-spoke configurations nor an Asiawide FTA can become building blocks of global free trade, if the FTAs are confined to merchandise trade liberalization only. As a major regional power, the PRC's benefits from trade liberalization can only be captured through a 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. Although the real effects of these deep integration measures in RTAs need to be tested by time, this paper argues that the deep integration approach 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 PTAs 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 toward global trade liberalization.

APPENDIX

TABLE A-1
IMPACTS ON REAL INCOME (SHALLOW INTEGRATION, CRTS MODEL)

	CHNHUB	JPNHUB	ASEHub2	AFA	GTL
Real Income (EV, \$ millions)					
Japan	3844	5391	123	7345	12670
PRC	1027	218	-984	-1005	13372
Korea	7562	-620	-110	8698	16787
Hong Kong, China	1487	-149	283	1988	3899
Taipei,China	970	-710	127	1329	1379
Indonesia	-25	-72	1330	942	668
Malaysia	220	-114	2839	2070	2170
Philippines	-5	-27	427	218	177
Singapore	353	-8	487	1395	1647
Thailand	669	1378	3661	2754	2856
Viet Nam	24	3	1285	1067	1244
Bangladesh	-140	-33	-151	-411	-451
India	-1349	-539	-282	-1722	287
Sri Lanka	-16	3	-10	-30	239
Global	10034	2427	5484	16410	87408
Real Income (EV, percent of GDP)					
Japan	0.1	0.1	0.0	0.2	0.3
PRC	0.1	0.0	-0.1	-0.1	1.2
Korea	1.8	-0.1	0.0	2.1	4.0
Hong Kong, China	0.9	-0.1	0.2	1.2	2.5
Taipei,China	0.4	-0.3	0.0	0.5	0.5
Indonesia	0.0	-0.1	0.9	0.7	0.5
Malaysia	0.3	-0.1	3.3	2.4	2.5
Philippines	0.0	0.0	0.6	0.3	0.3
Singapore	0.4	0.0	0.6	1.7	2.0
Thailand	0.6	1.2	3.3	2.5	2.5
Viet Nam	0.1	0.0	4.0	3.4	3.9
Bangladesh	-0.3	-0.1	-0.3	-0.9	-1.0
India	-0.3	-0.1	-0.1	-0.4	0.1
Sri Lanka	-0.1	0.0	-0.1	-0.2	1.5
Global	0.0	0.0	0.0	0.1	0.3

Note: ChnHub means the PRC is a hub; JpnHub means Japan is a hub. ASEHub1 assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. In ASEHub2, ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. AFA means Asiawide FTA and GTL means multilateral global trade liberalization. EV means Hicksian equivalent variation. GDP means gross domestic product.

TABLE A-2
IMPACTS ON EXPORTS AND TERMS OF TRADE (SHALLOW INTEGRATION, CRTS MODEL)

	CHNHUB	JPNHUB	ASEHUB1	ASEHUB2	AFA	GTL
Exports (percent change relative to base year)						
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
Viet Nam	5.1	5.1	24.3	28.2	26.2	32.1
Bangladesh	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 (percent change relative to base year)						
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
Viet Nam	0.3	-0.4	0.0	0.5	-0.5	-0.9
Bangladesh	-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

Note: ChnHub means the PRC is a hub; JpnHub means Japan is a hub. ASEHub1 assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. In ASEHub2, ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. AFA means Asiawide FTA and GTL means multilateral global trade liberalization.

TABLE A-3
IMPACTS ON REAL INCOME (DEEP INTEGRATION, CRTS MODEL)

	ChnHub	JpnHub	ASEHub1	ASEHub2	AFA	GTL
Real Income (EV, \$ millions)						
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
Viet Nam	463	402	2536	3604	3057	3817
Bangladesh	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, percent 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
Viet Nam	1.5	1.3	8.0	11.3	9.6	12.0
Bangladesh	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

Note: ChnHub means the PRC is a hub; JpnHub means Japan is a hub. ASEHub1 assumes ASEAN countries have bilateral FTAs with non-ASEAN Asian countries individually, but not among themselves. In ASEHub2, ASEAN establishes its own FTA and has bilateral FTAs with other Asian countries as a whole. AFA means Asiawide FTA and GTL means multilateral global trade liberalization. EV means Hicksian equivalent variation. GDP means gross domestic product.

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