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**Regionalism and Globalism:  
East and Southeast Asian Trade Relations  
In the Wake of China's WTO Accession**



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Iwan Azis, and Li-Gang Liu**

## Acknowledgments

*This is the second of three studies of East Asian trade patterns in the context of China's recent economic emergence. The results presented here draw upon prior work with Dominique van der Mensbrugghe, a frequent co-author in this area who made essential contributions to the modeling effort. Opinions expressed here are those of the authors and should not be attributed to their affiliated institutions.*

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**Iwan Azis – to be added**

**Li-Gang Liu – to be added**

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## PREFACE

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Under its general research project on development paradigms, the ADB Institute Research Paper Series disseminates works-in-progress to advance general understanding of important research issues, inform interested parties, and invite comments and questions.

I trust that this series will facilitate constructive dialogue among policymakers as well as among researchers about the most beneficial course of development and growth for the Asian economies.

Peter McCawley  
Dean  
ADB Institute

## ABSTRACT

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China's accession to the WTO has profound implications for East and Southeast Asian trade relations, and many of the more established regional agreements (ASEAN, etc.) are being re-examined in this light and even challenged to include China directly. From another perspective, the commitment of such a prominent Asian economy to WTO standards for globalization calls into question the basic tenets of regionalism, even as an intermediate step to full multilateralism.

In this paper, we examine these issues empirically, using a multi-country dynamic CGE model to appraise a variety of East Asian trade regimes as they might evolve over the next fifteen years. Our results two salient features. First, we predict the emergence of a Trade Triangle that will leverage regional exports via China's expanding exports and induced domestic growth. Second, we find that for China's neighbors, the greatest national, regional, and global, gains would accrue if all countries in the region followed China's example and, more generally, pursued globalism through more comprehensive regionalism.

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# **Regionalism and Globalism: East and Southeast Asian Trade Relations In the Wake of China's WTO Accession**

**David Roland-Holst, Dominique van der Mensbrugghe, Iwan Azis, and Li-Gang Liu**

## **1. Introduction**

Over the last decade, a new landscape of economic relations has begun to emerge in the Pacific Basin. As trade rivalries between the large OECD economies in the region appear to have receded and the agenda of globalization has advanced, more countries are embracing outward economic orientation and open multilateralism as a means of accelerating domestic economic growth. Most prominent of the later entrants in the regional arena is China, whose domestic economic reforms have led it to record growth rates, dramatically accelerating export expansion and sharply raising living standards. With the entry to the WTO, China is likely to speed up its domestic and external liberalization.

China's global economic emergence is one of the defining characteristics of modern globalization. This most populous economy has also, over the last two decades, been the fastest growing, and a significant part of this growth has been leverage by external demand. While satisfying millions of foreign consumers, however, Chinese exports have engendered ambivalent and even hostile sentiments among producers, both in the markets they penetrate and among other export competing nations. The latter group is concentrated in East and Southeast Asia, and this region is facing the most significant adjustments as a result of China's dramatic opening.

Preoccupation with China's opening has also drawn new attention to East and Southeast Asian trade blocs. Many of the more established regional agreements (e.g. ASEAN) are being re-examined in light of China's accession and are even moving to include China. At the same time, adoption of the WTO agenda by this most populous of formerly nonaligned countries has given special impetus to globalization as the prevailing

standard for multilateral trade relations, calling into question the central tenets of regionalism. For these reasons, East Asia's existing trade arrangements will undergo searching examination and, in all likelihood, significant change in the coming years.

While China's growing prominence and commitment to the WTO invite a reappraisal of regionalism, the real effects of changes in existing arrangements would be far reaching and important to policy makers. For example, including China in ASEAN, or an AFTA between China, Japan, and Korea, or even a stronger version of APEC, could each induce trade diversion across the region and with respect to economies outside East Asia. Conversely, an East Asian economy that chose to follow China's current "globalization first" trade orientation might compromise established domestic and bilateral interests embedded in existing regional arrangements. Both approaches would influence domestic and foreign policy agendas in ways that are difficult or impossible to anticipate by intuition alone.

To facilitate better understanding and policy dialogue on these important issues, this paper evaluates a variety of East Asian regional trade regimes empirically. Using a multi-country, dynamic general equilibrium forecasting model, we look at the evolution of trade patterns and domestic economic structure in prominent East and Southeast Asian economies and several regional and global aggregate trading partners. In section 3.1 below, we assess the consequences of regional arrangements by comparison to a WTO-style global trade liberalization (GTL) scenario over the period to 2020. In particular, we contrast GTL with AFTA (ASEAN free trade), AFTA plus China, Northeast Asian FTA (NEAFTA: China, Japan, Korea), ASEAN+3 (ASEAN, China, Korea, and Japan), and Pacific Trilateralism (China, Japan, United State).

Generally speaking, we find that global trade liberalization (GTL) would increase overall trade more than three times as much as any arrangement confined to East Asia, and, as intuition would dictate, that the magnitude of overall gains from regionalism increase with the scope of the regional agreement. Having said this, however, we find that the structural adjustments ensuing from each agreement exhibit no such "monotonicity." Indeed, each regional agreement appears to give rise to different adjustment patterns, within the region, between it and the rest of the world, and outside



the region. The primary virtue of the present analysis, in a relatively vast narrative literature on Asian and Pacific regionalism, is that our conclusions are substantiated by detailed country and sector results over a time horizon that encompasses most of the relevant policy debate.

In a related context, a long debate has been carried in the trade literature about the incentive compatibility of regional agreements, and we examine also this issue below in the context of the East and Southeast Asia. The basic argument is that, for prospective members, unilateral trade liberalization (UTL) dominates a simple FTA, so the latter would have to be designed to include special incentives. This assertion has been supported with simplified theoretical models (3 countries, 2-3 goods) that take no account of terms-of-trade effects or more complex patterns of adjustment. In section 3.2, we examine this issue with our CGE model, doing so in a much more disaggregated framework, and our results indicate that the FTA incentive problem is empirically vacuous. In no case that we examine for this region (apart from China) does unilateralism even approach the benefits of significant multilateral liberalization, either at the regional or global level.

The smooth veneer of trade induced aggregate growth rates can mask significant structural adjustment issues. Section 3.3 extends the results comparing regional arrangements with more detailed information on sectoral trade patterns. While these are of course consistent with the more aggregate results of section 3.1 and 3.2, they reveal a more complex landscape of sectoral adjustments and implied political economy challenges that can be expected to arise in trade negotiations. Finally, section 3.4 recasts our results in the context of intra-industry trade a more detailed compositional measures of comparative advantage and competitiveness. Our results imply that established patterns of comparative advantage appear to be robust between the main regional economies, although China is migrating rapidly up the technology and value added ladders.

The path of regionalism in the East Asia is already well-trodden. Whether or not it points toward or diverges from the road to globalization, it is already conferring gains on its members and could be expected to do more of this with regional extension and

deepening. It is clear from our results, however, that more attention to the structural details of liberalization, adjustment, and growth will be needed to realize the full potential of regional trade and to facilitate an eventual transition to more open multilateralism. Empirical simulation models of the kind presented here can support this evolving policy in essential ways, identifying both the opportunities and challenges that lie ahead for globalization.

## **2. Baseline Projections: China and the Asian Trade Triangle**

Before going into the details of regional trade agreements, we want to summarize general projections with a baseline scenario covering the forecast period to 2020. The general baseline calibration procedure and more detailed information about the model and data are given in a companion paper, and here we only summarize the essential features.<sup>1</sup> The present dynamic forecasting model was constructed according to generally accepted specification standards, implemented in the GAMS programming language, and calibrated to the GTAP global database.<sup>2</sup> The result is an eighteen-country/region, eighteen-sector global CGE model, calibrated over a twenty-four year time path from 1997 to 2020.

To set the dynamic baseline, we calibrated this model to annualized real GDP growth rates obtained from consensus independent estimates displayed in the first column of Table 2.1 below.

**Table 2.1: Selected Macroeconomic Indicators, Baseline Scenario**  
(percentage annualized growth rates, 2000-2020)

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<sup>1</sup> See Roland-Holst (2002) for detailed information on the baseline estimation for this model, and van der Mensbrugghe (2002) for detailed equation documentation of the forecasting model.

<sup>2</sup> GTAP is a 66 country/region, 57 sector global database with detailed domestic industry and bilateral trade accounts. See Hertel et al (2002) for complete documentation, or consult [www.gtap.org](http://www.gtap.org)

	Real GDP	Absorption	Exports	Imports	Exp PI	Imp PI	Real ER
China	7.10	6.94	6.27	5.85	-.22	-.18	-.04
Japan	2.20	2.12	2.37	3.15	.22	-.13	.35
NIE	4.34	4.42	4.01	4.21	-.09	-.08	-.01
ASEAN	4.75	4.55	4.46	4.25	-.26	-.13	-.13
USA	2.62	2.61	3.07	2.94	.12	-.09	.21
EU	2.52	2.63	2.37	2.60	.13	.01	.13
ROW	3.65	3.65	3.69	3.40	-.19	-.09	-.11

Sources: DRI, IMF, Cambridge Econometrics.

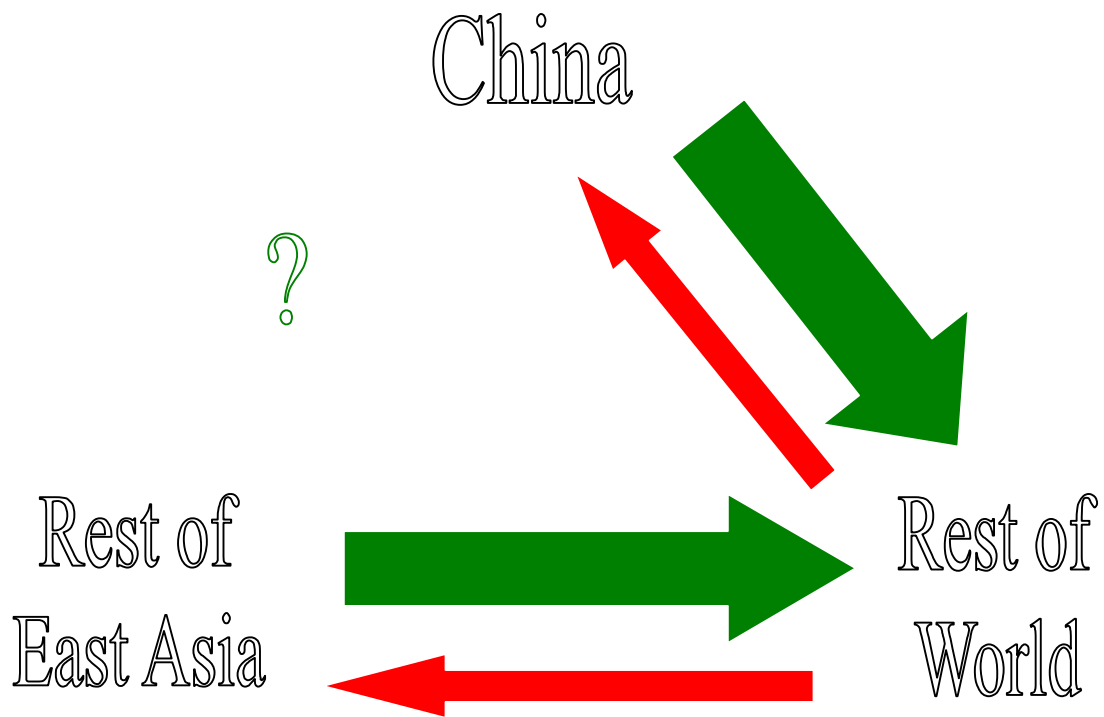
These baseline results have also been discussed extensively in Roland-Holst (2002), but a few salient points are worthy of re-emphasis. Despite optimistic growth rates in the Baseline, China in 2020 will still lag behind the United States, EU, and Japan in aggregate real GDP. However, its share of total world trade (exports + imports), will nearly equal the U.S. and significantly exceed Japan. Moreover, by about 2005 China will be Asia's largest individual importer and by about 2010 it's largest exporter. China's exports by destination will be directed primarily at the U.S. and EU. For more than half of its imports, China will rely on East and Southeast Asia. Korea and Taipei, China combined (NIE) will be the largest regional source of these, followed by Japan and ASEAN. Finally, China will become Japan's largest trading partner in terms of both imports and exports.

Now we turn to one of the most arresting and important results of this investigation, where we predict the emergence of a Trade Triangle that will leverage regional exports via China's expanding exports and induced domestic growth. This result leads to the most important inference from the current analysis, that China's expansion may represent a challenge to traditional regional exporters, but it also offers unprecedented opportunities for new export expansion. Contrary to the view that Chinese exports will stifle competitiveness and growth among its neighbors, we find that China's expansion, particularly when accelerated by WTO accession, will constitute a windfall opportunity for regional exporters.

Consider global trade patterns partitioned into three spheres, China, the Rest of East and Southeast Asia, and the Rest of the World. Recalling now that the OECD

countries account for 75% of world trade, we note that western OECD countries will dominate the third group. With this in mind, we represent trade among these groups in the year 2002 with the schematic in Figure 3.1, indicating export flows by green arrows and import flows in red. The general message here is one of head-to-head export competition by Asian economies in ROW markets. Both of the former are currently running substantial surpluses on trade in that direction, and their bilateral trade (China-ROEA) is indeterminate for the moment.

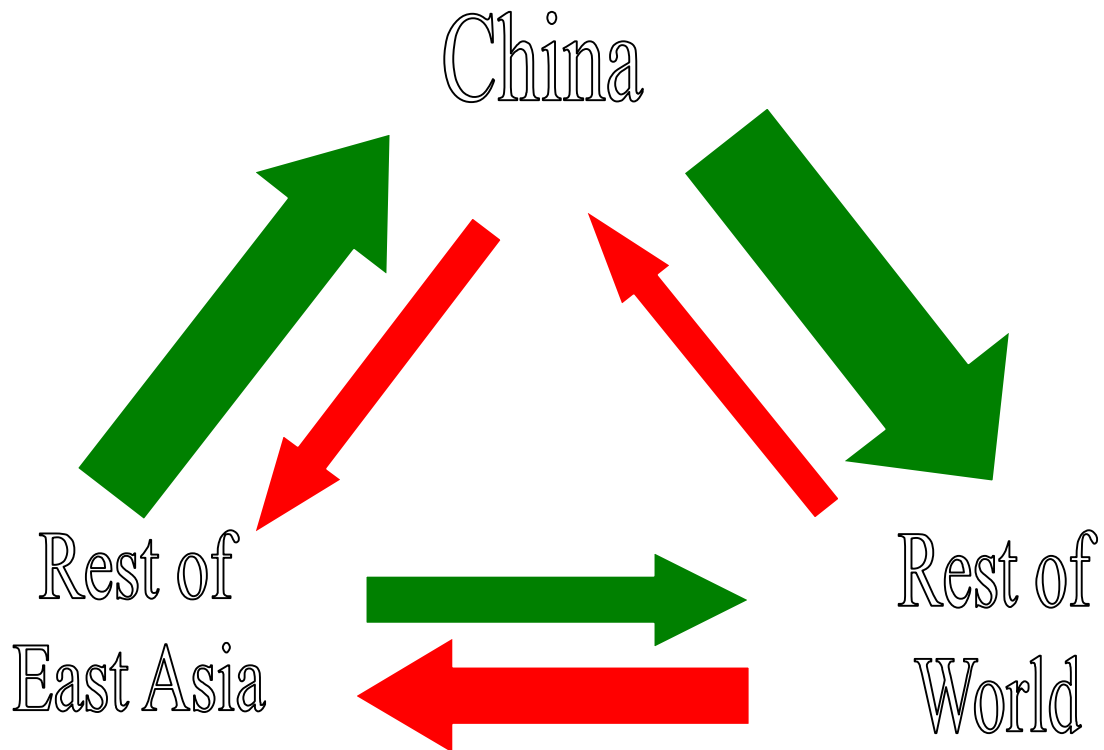
**Figure 2.1: Asian Trade Triangle 2002**



Now contrast this with a schematic rendering of the results we obtained for the baseline in 2020. Even without China fulfilling its WTO commitments, trade patterns

have shifted dramatically. In particular, China sustains and even increases its structural trade surplus with the (mainly western OECD) ROW, while at the same time developing a structural deficit of about equal magnitude with the Rest of East and Southeast Asia. Yes, China appears to have displaced other Asian exports to third region markets, but the relentless growth of its domestic absorption has offset this and created dramatic new export opportunities for its regional neighbors.

**Figure 2.2: Asian Trade Triangle 2020**



The logic behind this transitive mechanism is straightforward. Apart from its prodigious endowment of human capital, China is a very resource-constrained economy. To sustain its baseline growth rates, this economy must sharply increase absorption of

external resources, intermediates, and capital goods. This is particularly the case in export sectors, where the needs for capacity expansion to meet external demand are very substantial. Moreover, income growth in China will inexorably change demand patterns, accelerating import demand for agricultural products (meat and/or animal feed) and energy in particular.

In any case, the schematic representation is only intended to motivate the Triangle concept. Table 2.2 presents the actual bilateral balances for 2020 as forecast by the model. Here the triangle is delineated within a matrix of component trade relationships, each generally consistent with the intuition arising from the schematic.

Table 2.2: Bilateral Trade Balances Baseline Scenario  
(year 2020 in billions of 1997 USD)

<i>Exporter</i>	<i>Importer</i>							
	<i>China</i>	<i>Japan</i>	<i>NIE</i>	<i>ASEAN</i>	<i>USA</i>	<i>EU</i>	<i>ROW</i>	<i>Total</i>
<i>China</i>	0	-5	-135	-41	166	66	71	122
<i>Japan</i>	5	0	39	20	23	-15	-50	21
<i>NIE</i>	135	-39	0	19	-32	-32	-12	40
<i>ASEAN</i>	41	-20	-19	0	18	8	12	41
<i>USA</i>	-166	-23	32	-18	0	48	-40	-168
<i>EU</i>	-66	15	32	-8	-48	0	34	-41
<i>ROW</i>	-71	50	12	-12	40	-34	0	-16
<i>Total</i>	-122	-21	-40	-41	168	41	16	0

Note in the first row how China registers surpluses with the USA, EU, and ROW, while running bilateral deficits with Japan, NIE, and ASEAN. In the closure of this model, aggregate foreign savings for each country are held constant in real terms, essentially fixing aggregate trade balances in this reference case. The constituent bilateral balances are endogenous, however, and evolve in the indicated triangular relationship because of the underlying comparative advantages of the trade partners.

### 3. Simulation Results

Using the multi-country model and baseline information discussed above, we conducted a series of policy experiments reflecting more liberal East and Southeast Asian trade regimes at the global, regional, and national levels. In particular, we compared global tariff abolition with three East Asian regional arrangements that resemble Free Trade Areas presently being discussed. The results obtained make more apparent both the potential rewards of further liberalization and the very complex incentives facing East Asian participants in regional and global negotiations. Four general results are worthy of emphasis:

- 1) Global trade liberalization (GTL) confers greater aggregate gains, not only on the world but on a decisive majority of individual countries and every East Asian regional grouping considered.
- 2) The regional Free Trade Areas considered here would, in the absence of other negotiating initiatives, benefit most FTA member countries, but less so than globalization.
- 3) China's role in all these scenarios is unique and appears to be governed by complex incentives. China gains much less in relative terms than either ASEAN in the AFTA or the rest of East and Southeast Asia under GTL. The reason for this is that China can realize most of its export growth by eliminating its own protection unilaterally, while a large part of the export gain to East and Southeast Asia comes from Chinese market access.
- 4) The Trade Triangle enables China to "deliver globalization" to its regional neighbors by its accession to the WTO, i.e. East and Southeast Asia can capture most of the absolute export growth expected from full globalization by just forming an ASEAN+3 FTA. Put differently, our results indicate that, in the wake of China's WTO accession, the best strategy for East and Southeast Asia is to pursue globalism through more comprehensive regionalism.

Building upon the baseline forecasts discussed in the previous section, we examined a variety of trade liberalization scenarios for East and Southeast Asia, with reference to China's WTO accession. In particular, we compared unilateral Chinese liberalization with several examples of East and Southeast Asian regionalism and a reference Global Trade Liberalization scenario (GTL) that abolishes all tariffs. Our results are consistent with some conventional intuition and in other ways indicate the complexity of the regional negotiating environment.

At the national level, we also examine unilateral liberalization for a number of larger East Asian economies. These results are then compared to a reference scenario where bilateral partners reciprocate, conferring free market access on the country removing all its tariff barriers. Not surprisingly, these two alternatives can differ significantly, depending upon prior protection patterns and domestic resource constraints. Although there are important characteristics of the individual country scenarios, our results suggest that the choice between unilateral and negotiated tariff removal should be made on a case by case basis. Indeed, unilateral removal would rarely be preferable, but negotiated liberalization should be informed by more detailed analysis of partner-specific and sector-specific considerations.

### *3.1. Adjustments in Trade Patterns*

Before presenting more detailed results, we examine regional aggregate effects of the seven counterfactuals for trade liberalization.<sup>3</sup> The scenarios we examined included the following (each includes scenario 1 as a new baseline of China's accession to the WTO):

1. CNWTO: China joins the WTO, status quo policies elsewhere
2. AFTA: ASEAN Free Trade Area
3. AFTAPC: AFTA plus China
4. NEAFTA: Northeast Asian Free Trade Area (China, Japan, and Korea)

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<sup>3</sup> In all these scenarios, the adjustment process is driven by the underlying economic structure and changes in prior protection levels. The latter are detailed from the baseline data in Annex Table C.1.

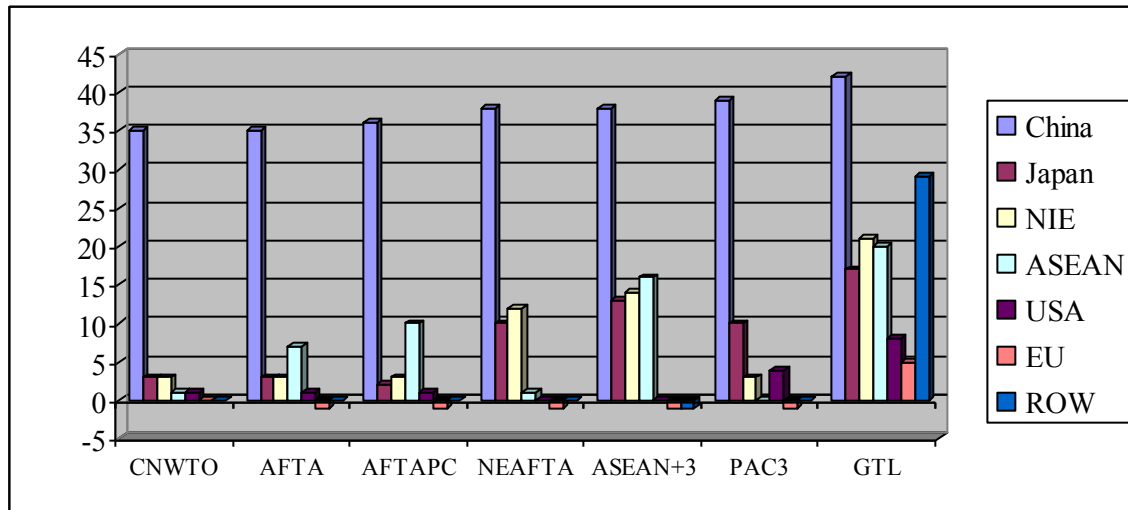


5. ASEAN+3: AFTA plus China, Japan, and Korea
6. PAC3: Pacific Trilateralism - China, Japan, USA
7. GTL: Global Trade Liberalization

The first of these represents realization of China's commitments to the WTO, assuming other countries simply continue with today's status quo policies. This then forms a revised baseline for the other scenarios, which we go on to contrast with five East Asian regional scenarios reflecting different kinds of Free Trade Areas. Scenario 2 considers the conventional notion of an ASEAN Free Trade Area (AFTA), including abolition of trade taxes between all countries in the region, with maintenance of prior individual protection against the rest of the world. Scenario 3 extends AFTA to include China, as was agreed in principal last year in Cambodia. The Fourth scenario captures another idea discussed recently, a Northeast Asian Free Trade Area, liberalizing trade between China, Japan, and Korea. The FTA for Scenario 5, ASEAN+3, is the most inclusive, bringing together the principal economies of East and Southeast Asia. Finally, we include a scenario that is of as much geopolitical as economic significance, a trilateral FTA between the world's two largest economies, the US and Japan, and China. If China's growth rate proves sustainable, it will ultimately have to be accommodated into trade and capital flow patterns that have more profound global implications. Many other scenarios could be studied with the same methodology, but these five are adequate to support initial discussion of the salient issues regarding globalization and East Asian regionalism. Finally, we include a reference case representing the hypothetical culmination of the WTO process, Global Trade Liberalization (GTL). This may be an ephemeral goal, but the results given here at least help to calibrate expectations about the potential gains from truly open multilateralism.

A general indication of the results for these FTA scenarios is given (in terms of total export effects) in Figure 1 below:

**Figure 3.1: Real Exports in 2020**  
(Percent change from baseline)



As intuition would dictate, we find that GTL yields the largest and most widespread gains, both for the region and for the rest of the world. The AFTA plus China regional FTA is beneficial to all members and expands their trade within the region and with the rest of the world, but more detailed results indicate that it induces significant trade diversion away from nonmembers.<sup>4</sup> Despite these effects, ASEAN's ability to leverage China's growth would appear to make this arrangement quite attractive to them.

China's role in all these scenarios is a unique one, however, and appears to be governed by complex incentives. China gains much less in relative terms than either ASEAN in the AFTA or the rest of East and Southeast Asia under GTL. The reason for this is that China can realize most of its export growth by eliminating its own protection unilaterally, while a large part of the export gain to East and Southeast Asia comes from Chinese market access.

<sup>4</sup> Throughout this paper, we use the term trade diversion to mean a redirection of export supply from one trade partner to another, and by trade creation we mean an increase in total exports. These concepts differ from those used in the classical theory of customs unions, where comparative costs of production are the defining characteristics.

China may have other reservations about regionalism that limit its willingness to take detours from the path to globalization. In particular, our detailed results indicate that China might experience adverse terms of trade effects by diverting its trade into smaller zones delineated by Southeast Asian regional preferences. In addition to this, it appears that most regional arrangements would reinforce China's neo-mercantilist position vis-à-vis economies outside the region. In each scenario, China is estimated to increase ex-Asian exports more than it increases ex-Asian imports, while doing the opposite for East and Southeast Asia.

These two issues could make it difficult to recruit China into East and/or Southeast Asian regional agreements, yet our results indicate its membership is essential to the gains realized by others. Barring China's participation, most regional pacts would yield only small gains and other regional economies would probably be better off going directly toward the goal of GTL. Thus, China's current orientation, i.e., GTL as reflected in its assertive WTO commitments, is the primary goal for this country and may ultimately be the best route for other East and Southeast Asian economies.

What we are seeing in the regional gains is the Trade Triangle at work. As indicated in the last section, our results predict the emergence of a systematic pattern of triangular trade for East and Southeast Asia. The Trade Triangle reveals that China's export expansion offers significant growth leverage to its neighbors. Strategic responses to China's emergence must take account of this, exploiting the Triangle to translate regionalism into globalism. The extent to which East and Southeast Asian economies can facilitate access to the Triangle through FTAs will of course depend upon negotiations involving China itself.

In particular, economies of the region need to negotiate relatively inclusive FTAs with China to avoid being crowded out of regional and extra-regional markets. The regional incidence of export gains from the Triangle depends critically on this. Our results indicate that significant trade diversion can occur among regional exporters, at the expense of those countries who opt out of an FTA including China.

Finally, China's situation in the East and Southeast Asian trading region appears to be unique in other important respects. Because of the sheer size and growth

momentum of this economy, it apparently is in a position to “go it alone” on the path to globalization, i.e. most of its own benefits from multilateralism can be captured by unilateral liberalization. This fact not only strengthens its resolve to follow that path, but could limit any incentive to be drawn into preferential, trade diverting regional agreements.

Because of these complex incentives, China possesses two carrots and one stick in regional negotiations. The carrots are access to its own domestic market and, by joining China in an FTA, greater indirect market access to the rest of the world (the Triangle induced export effect). The stick, obviously, is one of the carrots, used instead as a club: denial of market access and, worse, trade diversion arising from direct export competition by China and its partners. Clearly, the mercantile view of China is too simplistic, but this country still holds a special position in the regional negotiating environment, and other East Asian and Southeast Asian economies must take account of this fact. Overall, our results support a view that China’s global emergence represents both challenges and enormous opportunities for East Asian regional economies. The effectiveness of today’s policy makers in this context will be judged by their ability to identify both, facilitating timely adjustment to the former and proactive development of the latter.

China’s importance to the regional adjustment process is undeniable, with Chinese goods and services representing one-third to one-half of all East Asian trade growth across the four scenarios. However, a rather upbeat interpretation arises from the estimates for Chinese trade within the East Asian region. In every scenario except 2 (where it is excluded from AFTA), Chinese imports from East Asia grow faster than its regional exports.

At the same time, however, it should be noted that China’s exports to the ROW more than offset its East Asian imports. This happens because China presents higher prior protection than it faces within each of the trade groupings considered, and thus the Chinese real exchange rate depreciates in every liberalization scenario it joins. The Rest of East Asia, on the other hand, faces higher protection than it presents, driving up its real exchange rate and sending real imports above exports in every scenario. Note that these are essentially macro responses to the prior burdens of trade distortion, and tell us very

little about underlying patterns of comparative advantage. The latter are only revealed in more detailed country and sector analysis.

In the following tables, we present the bilateral trade adjustments arising from some of the FTA scenarios we considered. The differences between these are revealing, and help to elucidate the incentives facing regional negotiators. The first results, in Table 3.1, could be captioned “The China Threat Scenario,” since it reflects China’s unilateral WTO initiative with passive responses on the part of its neighbors. This represents a worst case scenario, where other East and Southeast Asian economies take no action to enhance the leverage offered by the Trade Triangle. In such a situation, our results indicate that China’s regional partners would experience serious trade diversion, crowded out Chinese export competition in both their own region and in ROW markets.

**Table 3.1: Bilateral Trade Flows<sup>5</sup> - CNWTO**

(percent changes in 2020 with respect to Baseline)

<b>Exporter</b>	<b><u>Importer</u></b>							<b>Total</b>
	<b>China</b>	<b>Japan</b>	<b>NIE</b>	<b>ASEAN</b>	<b>USA</b>	<b>EU</b>	<b>ROW</b>	
<b>China</b>	0	37	43	36	31	35	32	34
<b>Japan</b>	38	0	-4	-6	-7	-5	-5	3
<b>NIE</b>	32	-10	-7	-11	-13	-10	-10	3
<b>ASEAN</b>	28	-4	-1	-2	-5	-3	-4	1
<b>usa</b>	24	-1	1	-1	0	-1	-1	1
<b>EU</b>	22	0	1	-1	-2	-1	-2	0
<b>ROW</b>	13	0	2	2	-2	-1	-1	0
<b>Total</b>	26	5	6	2	2	0	1	3

The biggest losers are Korea and Taipei,China (NIE) who experience losses in bilateral exports of -10% (to Japan), -11% (ASEAN), and -13% (USA), -10% (RU and ROW), and even -7% of their own bilateral trade because they have missed the opportunity to enter a more liberal expansionary partnership. Japan and ASEAN are also

<sup>5</sup> As the subtitles indicate, rows of this and following tables refer to export supply, while columns refer to import demand. This Input-Output layout is used here to capture bilateral trade flows, here in terms of percent change in the terminal year.

crowded out of Asian and other ROW markets significantly, but in smaller relatively amounts. Note that trade with China itself, via the Triangle; more than offsets these losses in every case, but the foregone exports to third markets are still sacrificed.

**Table 3.2: Bilateral Trade Flows - AFTAPC**  
(percent changes in 2020 with respect to CNWTO)

<b>Exporter</b>	<b>Importer</b>							<b>Total</b>
	<b>China</b>	<b>Japan</b>	<b>NIE</b>	<b>ASEAN</b>	<b>USA</b>	<b>EU</b>	<b>ROW</b>	
<b>China</b>	0	-4	-4	47	-3	-4	-3	1
<b>Japan</b>	2	0	1	-10	1	1	1	0
<b>NIE</b>	2	0	0	-12	1	1	1	0
<b>ASEAN</b>	2	4	3	33	3	3	1	9
<b>usa</b>	1	0	0	-6	0	0	0	0
<b>EU</b>	1	0	0	-5	0	0	0	0
<b>ROW</b>	2	0	0	-7	0	0	0	0
<b>Total</b>	2	0	0	9	0	0	0	1

Contrasting these results with the recently negotiated, but still relatively limited ASEAN plus China (AFTAPC) scenario, we see in Table 3.2 that partnership with China has two prominent advantages.<sup>6</sup> Firstly, it actually increases trade with China over the CNWTO scenario, as would be expected given the new partnership. Secondly, however, it also enables ASEAN to expand its Triangle benefits and even increase exports to third markets. On the obverse, however, ASEAN significantly reduces imports from third partners, an important diversion effect. Moreover, China reduces exports to third markets, as these goods are diverted to ASEAN markets. As usual, the members of a trade conclave benefit from two components of trade expansion, new growth and diversion. Clearly, this relatively exclusive FTA may be a step in the right direction, but it cannot realize to full potential of regional trade expansion, nor carry ASEAN very far along toward globalization.

<sup>6</sup> Note for the sake of interpretation that these and other results that follow are defined as changes with respect to the CNWTO scenario (rather than the Baseline discussed earlier).

By contrast, the most inclusive scenario we consider is ASEAN+3, the results for which are given in Table 3.3. Here the benefits of a more expansive and diversified liberal market are very apparent. Including two OECD economies in particular leads to a more “North-South” FTA, with economic diversity needed to expand the basis for regional specialization and scale economies in export production. The benefits for members are quite dramatic. Indeed, their trade expansion within the region now mirrors that of China itself (compare Table 3.1), indicating the leverage of the Trade Triangle is working more effectively once the FTA can facilitate market access across the region. Interestingly, however, the main percentage gains for Asian economies come not from direct exports to China, but from intra-regional trade expansion. Asian exports to China expand only moderated over the CNWTO base, since China’s WTO accession already confers market access to Asia. What remains for this scenario to achieve is the opening of trade elsewhere in the region, facilitating multilateral linkages to complete the market growth instigated by China. These can be expected to take the form mainly of intermediate links running between China’s direct partners and its upstream and downstream counterparts, running through the complex web of regional supply chains.<sup>7</sup>

**Table 3.3: Bilateral Trade Flows – ASEAN+3**  
(percent changes in 2020 with respect to CNWTO)

<b>Exporter</b>	<b>Importer</b>							<b>Total</b>
	<b>China</b>	<b>Japan</b>	<b>NIE</b>	<b>ASEAN</b>	<b>USA</b>	<b>EU</b>	<b>ROW</b>	
<b>China</b>	0	21	33	27	-8	-9	-8	3
<b>Japan</b>	2	0	39	40	-2	-2	-2	10
<b>NIE</b>	3	50	31	43	0	-1	-2	11
<b>ASEAN</b>	4	49	35	26	5	4	0	14
<b>usa</b>	5	-4	-11	-9	1	1	1	-1
<b>EU</b>	4	-2	-10	-11	1	0	0	0
<b>ROW</b>	5	-9	-10	-8	1	0	1	-1
<b>Total</b>	4	12	10	13	-1	0	-1	2

<sup>7</sup> The multilateral chains in such Asian supply networks often represent the majority of value creation for final goods in the region, whether produced for export or domestic consumption. For a more detailed discussion of such networks and empirical estimates of their significance, see Roland-Holst (2003a).

**Table 3.4: Bilateral Trade Flows – GTL**

(percent changes in 2020 with respect to CNWTO)

<b>Exporter</b>	<b>Importer</b>							<b>Total</b>
	<b>China</b>	<b>Japan</b>	<b>NIE</b>	<b>ASEAN</b>	<b>USA</b>	<b>EU</b>	<b>ROW</b>	
<b>China</b>	0	-1	5	12	-4	4	25	6
<b>Japan</b>	4	0	19	23	5	15	29	13
<b>NIE</b>	7	28	16	37	10	17	36	18
<b>ASEAN</b>	8	25	18	21	16	23	26	19
<b>usa</b>	7	11	17	8	0	9	3	7
<b>EU</b>	13	14	32	17	15	-7	30	6
<b>ROW</b>	14	31	18	15	6	42	49	30
<b>Total</b>	9	15	18	18	7	7	27	14

Turning to the country-specific results, Table 3.4 presents bilateral trade flow adjustments in response to global trade liberalization (GTL), expressed as percentage changes with respect to the CNWTO levels forecast for 2020. This is clearly a very expansionary scenario, indicating annual export growth over the base year of between 6 and 30 percent for the trading countries/regions selected, and with bilateral growth often much higher. Trade within the residual ROW group expands by 40% above CNWTO 2020 levels, for example.

While the general impression is one of trade growth, with the overwhelming majority of flows expanding, some bilateral ties will remain fairly constant or even contract. Net changes in bilateral trade are the result of shifting relative real exchange rates, which in turn result from differences in prior protection levels. Thus it is worth noting that, even in the case of multilateral tariff abolition, trade diversion still results because of asymmetries in prior protection patterns. Fortunately, the diversionary effects are relatively small in this global free trade scenario, and they are far outweighed by trade creation at each national level and, therefore, in the aggregate.



Now we compare the globalization results with those in the most inclusive Asian FTA, ASEAN+3 (Table 3.3). As we noted above, one of the most striking features of the ASEAN+3 results is the scope and magnitude of trade diversion. As one would expect with a regional agreement, trade expands within the East and Southeast Asian bloc, but at a significant expense to trade with and within the rest of the world. There is dramatic (if uneven) expansion of bilateral trade ties across East and Southeast Asia, and many individual bilateral flows expand much more than under globalization. Despite this, however, all the E&SE regions considered experience more total trade growth under GTL.

Thus it is reasonable to ask why an ASEAN+3 would be preferable to the first scenario. The most obvious answer has to do with uncertainty and risk aversion, two salient features of the multilateral negotiating environment that have sustained regionalism in this era of globalization. In particular, many countries view a smaller, more certain (and perhaps more expedient) payoff from regional liberalization as preferable to a more hypothetical future prospect of global free trade. The relative transparency and tractability of regional accords alone might make them preferable to global ones, but of course they need not even be perceived as mutually exclusive.<sup>8</sup> On the contrary, some advocates of regionalism, particularly of the North-South variety, argue that they offer important precedence for more comprehensive global negotiations, both in terms of negotiating standards and domestic adjustments arising from conformity.

Apart from many issues related to uncertainty, impetus for a regional agreement comes from two very practical considerations. First, for every East Asian economy considered, the ASEAN+3 FTA confers most of the total import and export growth they would experience under global free trade (the average is 73%). Thus a regional agreement, in many ways easier and more certain to negotiate, gives it members most of the total trade gain that globalization might offer. An essential caveat, however, is that the composition of this trade might be different, and much of this expansion seems to be bought at the expense of relations with partners outside the region. Thus we can see from

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<sup>8</sup> See, e.g. World Bank (2000) for extensive discussion of the incentive properties of regional and multilateral agreements.

these results that regionalism is substantially beneficial, but not how it constitutes a path to globalization or, ultimately, the two can be reconciled.

Patterns of adjustment outside the region are complex, with both trade creation and diversion. The removal of an extensive set of tariffs within one region creates a new set of (*de facto*) trade preferences within the rest of the world, and we see modest offsetting ex-East Asia trade growth in most cases. Occasionally, however, small reductions in bilateral trade outside the region are probably induced by trade contraction with respect to the East Asia (see e.g. ROW). Generally speaking, economies outside the East Asia stand by and watch regional trade expand in the region and contract with respect to them, with only negligible adjustments to their other bilateral ties. Thus much of the trade growth within the East Asia region is offset by diversion.

Returning to the sub-regional arrangements, it appears there would be little enthusiasm for an AFTAPC arrangement outside East Asia since, like the other East Asian pacts, it actually reduces ROW trade. The more detailed results in Table 3.1 also reveal unwelcome trade diversion with respect to East Asian neighbors, driving down total exports and imports for Japan, Korea, and Taiwan. For the world as a whole, trade grows by less than 10% of what would arise from GTL, and for Asia total trade growth is less than half what it would be under ASEAN+3. More seriously, the biggest partner to this arrangement would obtain less than a third of the ASEAN+3 gains and about a fifth of the GTL gains from joining this discriminatory arrangement. Worse, China would be forced into a neo-mercantilist position of trying to expand ROW exports (against contracting ROW exports from E&SE Asia) while substantially cutting ROW imports. In addition, Chinese import demand would be diverted away from important regional allies such as Japan and Korea. All in all, it is unclear why China would sustain such an arrangement against more inclusive ones, particularly given its assertive prior commitment to the WTO process.

Before moving on to examine unilateralism, we summarize results from two other FTA scenarios. The first of these represents an hypothesis about northern regionalism in the Asian Pacific, referred to as a Northeast Asian Free Trade Area (NEAFTA). We examined this prospect in Scenario 5, where China, Japan, and Korea remove all tariff

barriers among themselves. Given the size of the economies being considered, both the net and compositional trade effects of this arrangement are more dramatic, as can be seen in Table 3.4. Still, total trade grows only by about half of what an ASEAN+3 agreement would yield, and only a fraction GTL's trade gains are realized. Total intra-regional trade grows by almost the same amount as under GTL, but significant ROW trade diversion offsets these gains and the region only enjoys about half the export and import growth it would under GTL. The same reasoning generally holds for China's trade. Again, however, China is in the difficult position of trying to expand exports to ROW while reducing corresponding imports.

**Table 3.4: Bilateral Trade Flows – NEAFTA**  
(percent changes in 2020 with respect to CNWTO)

<b>Exporter</b>	<b>Importer</b>							<b>Total</b>
	<b>China</b>	<b>Japan</b>	<b>NIE</b>	<b>ASEAN</b>	<b>USA</b>	<b>EU</b>	<b>ROW</b>	
<b>China</b>	0	30	38	-7	-6	-6	-6	2
<b>Japan</b>	4	0	44	1	1	1	1	7
<b>NIE</b>	4	63	37	1	3	2	1	8
<b>ASEAN</b>	3	-8	-9	0	1	1	0	0
<b>usa</b>	3	-5	-11	0	0	1	1	0
<b>EU</b>	2	-3	-10	0	0	0	0	0
<b>ROW</b>	4	-9	-10	1	1	0	0	0
<b>Total</b>	4	8	8	-1	-1	0	0	1

As a final scenario, we examine the PAC3 arrangement including Japan, China, and the US, is a idea that more grounded in regional strategic thinking. Still, given the scale and diversity of the economies considered here, these results could be interesting. Given that this arrangement also draws in an extra-regional economy, and the world's largest, it might make an interesting comparison case with respect to GTL and the Asia-only scenarios. In reality, however, this scenario is less than compelling for the two of te three countries. Japan experiences most of the trade growth because of relatively high prior protection, but significantly less than it would under ASEAN+3. Otherwise, trade diversion outweighs most of the potential export gains for both China and the US. The

US does appear to alter its trade patterns in important ways, but would presumably antagonize many trading partners in the process. While this might serve as an inducement to bring the latter into a larger regional or even global agreement, it is difficult to see the PAC3 FTA as a stable coalition in the region.

**Table 3.5: Bilateral Trade Flows – PAC3**  
(percent changes in 2020 with respect to CNWTO)

<b>Exporter</b>	<b>Importer</b>							<b>Total</b>
	<b>China</b>	<b>Japan</b>	<b>NIE</b>	<b>ASEAN</b>	<b>USA</b>	<b>EU</b>	<b>ROW</b>	
<b>China</b>	0	21	-8	-8	15	-8	-4	3
<b>Japan</b>	6	0	3	2	19	2	7	7
<b>NIE</b>	3	-5	0	-1	-5	0	-1	0
<b>ASEAN</b>	4	-9	1	1	-6	1	0	0
<b>usa</b>	5	28	1	1	0	1	0	3
<b>EU</b>	3	-3	0	0	-3	0	0	0
<b>ROW</b>	6	-5	2	1	-2	1	0	0
<b>Total</b>	4	7	0	-1	2	0	0	1

### 3.2. *Incentive Compatibility*

Since the seminal work of Viner on this subject over fifty years ago, there has been sustained debate about the incentive properties of regional arrangements, both with respect to larger universes of liberalization and, especially, in comparison to unilateral trade liberalization (UTL).<sup>9</sup> Using theoretical models with two or three goods and three countries, a number of authors have argued that regional arrangements are strategically dominated, for individual countries, by unilateral liberalization, and that incentives must therefore be devised to effect voluntary participation in FTA.<sup>10</sup> In this section, we present results that challenge the generality of this conclusion, indicating that the East Asian FTA can dominate or be dominated by unilateralism, depending upon the economy under consideration. On the basis of this and other evidence presented in this paper, we

<sup>9</sup> See e.g. Viner (1950), or a more modern statement in Kemp and Wan (1976).

<sup>10</sup> For recent writing in this vein, see e.g. de Melo, Panagariya, and Rodrik (1993), Hoekman and Leidy (1993), and Whalley (1996).

recommend that the efficacy of trade agreements be decided empirically rather than with rules-of-thumb inferred from simplified theoretical models.<sup>11</sup>

To better understand the incentives facing of a prospective FTA member, we ran a series of policy simulations to estimate the effects of two kinds of unilateralism. In the first case, the country under consideration abolishes tariffs unilaterally and without negotiated or other concessions from trading partners. This scenario we refer to simply as UTL. In the second case, we look at an extreme (and admittedly artificial) reference for negotiated liberalization, where the country abolishes its own tariffs and each of its trading partners reciprocates bilaterally while maintaining their other external tariffs at baseline levels (called UTLR for UTL Reciprocated). We see these two cases as bracketing the potential outcomes of unilateral tariff abolition for the country in question. For present discussion, we disaggregated the larger regional economies in the data set but confined ourselves to a subset them for this detailed analysis.

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<sup>11</sup> Roland-Holst and van der Mensbrugghe (2002) reached the same conclusions in a Latin American context.

**Table 3.6: Equivalent Variation National Income Effects**  
(percent of 2020 baseline income)

	1	2	3	China		Indonesia		Korea		Malaysia		Philippines		Thailand	
	AFTAPC	ASEAN+3	GTL	UTL	UTLR	UTL	UTLR	UTL	UTLR	UTL	UTLR	UTL	UTLR	UTL	UTLR
China	-.1	-.3	1.0	-.3	3.3	-.0	-.1	.1	-.5	.0	-.2	.0	-.0	.0	-.1
Indonesia	.4	1.6	1.7	-.0	-.4	.8	4.7	.1	.7	.1	.0	.0	-.1	.1	-.0
Japan	-.0	.7	.9	.3	.1	.0	-.0	.1	-.1	.0	.0	.0	-.0	.0	.0
Korea	-.2	1.9	2.4	.8	.9	.2	.1	.2	6.3	.0	-.1	.0	.0	.0	-.0
Malaysia	3.0	3.1	3.9	.7	.4	.1	-.0	.0	-.5	.6	12.7	.0	-.0	.2	-.1
Philippines	.4	-.1	.3	.1	-.7	-.0	-.1	.1	-.2	.0	-.1	-.3	3.6	.0	-.0
Singapore	6.0	5.3	5.8	1.7	1.5	.1	.2	.1	-.0	1.2	.2	.1	.1	.6	.1
Thailand	.7	2.0	3.6	.6	-.4	.1	-.0	.1	-.7	.1	-.3	-.0	-.6	-.1	11.4
Taiwan	-.3	1.6	1.5	1.1	1.3	.0	-.0	.0	-.4	.0	-.1	.0	.0	.1	.0
Vietnam	1.9	4.6	7.4	.1	-.3.0	-.1	-.5	.4	-.1.9	.0	-.7	.0	-.0	.1	-.1.6
Australia and New Zealand	-.0	1.3	1.9	.2	-.0	.0	-.0	-.0	-.0	.0	-.0	.0	.0	.0	-.0
Canada	-.0	.0	.2	.0	-.1	-.0	-.0	-.0	-.0	-.0	-.0	.0	-.0	.0	-.0
Western Europe	-.0	-.0	.8	.1	.0	.0	-.0	.0	.0	.0	.0	.0	-.0	.0	-.0
Latin America and the Caribbean	-.0	-.1	1.1	.1	-.0	-.0	-.0	.0	-.1	-.0	-.0	-.0	-.0	-.0	-.0
South Asia	-.1	-.3	.5	-.0	-.9	-.0	-.1	.0	-.4	.0	-.2	-.0	-.0	-.0	-.1
United States	-.0	-.0	.2	.1	-.0	.0	-.0	.0	.0	.0	-.0	.0	-.0	.0	-.0
Rest of the World	-.0	-.0	1.0	.1	-.2	.0	-.0	.1	-.0	.0	-.1	-.0	-.0	-.0	-.0
Developing East Asia	-.0	.2	1.0	.2	.1	.0	-.0	.0	.3	.0	-.0	.0	-.0	.0	-.0
Developing East Asia x/ China	-.0	.1	.9	.1	.0	.0	-.0	.0	-.0	.0	-.0	.0	-.0	.0	-.0
Newly industrialized economies	2.0	2.3	3.3	.8	-.0	.1	-.0	.1	-.4	.4	-.1	-.0	.6	.1	5.6
Developing East Asia & NIEs	.0	.2	1.1	.2	.1	.0	-.0	.0	.3	.0	-.0	.0	.0	.0	.2
East Asia total	.0	.4	1.1	.2	.1	.0	-.0	.0	.2	.0	.1	.0	.0	.0	.1
Low- and middle-income x/ E. Asia	-.0	-.0	.4	.1	-.1	.0	-.0	.0	-.0	.0	-.0	.0	-.0	.0	-.0
High-income	.2	.6	1.2	.2	1.0	.0	.1	.1	-.2	.1	.3	.0	.0	.0	.3
Low- and middle-income	-.0	.1	.7	.1	-.0	.0	-.0	.0	.1	.0	-.0	.0	-.0	.0	-.0
World total	.0	.2	.8	.1	.2	.0	.0	.0	.1	.0	.0	.0	-.0	.0	.1

Source: Simulation results.

Until now, we have focused on trade pattern adjustments because the political economy of trade policy is often influenced by these considerations. Whether these ultimately decide policy at the unilateral, bilateral, regional, or global level is less important than the ability of policy makers to recognize and anticipate detailed adjustment costs and benefits. For this discussion, we shall focus on aggregate national benefits arising from trade policy, as measured by changes in Equivalent Variation (EV) net national income measures, essentially aggregate real GDP.<sup>12</sup> Table 3.6 presents these aggregate estimates for two FTA scenarios, GTL, and individual UTL and UTLR, respectively, for China, Indonesia, Korea, Malaysia, and Thailand. In addition to individual country measures, we also reproduce EV calculations for five aggregates at the bottom of the table. Again, trade scenarios are across the top of the table, EV income effects down each column.

These results help complete the picture of policy incentives facing East Asian economies in the coming decades. In particular, note that globalization dominates the regional agreements for every economic region except Singapore, which benefits more from AFTAPC because other advanced Asian economies are excluded from the latter agreement. For most, but not all of East and Southeast Asia, ASEAN+3 confers most of the aggregate gains from globalization.

Perhaps the most important reservation about East Asian regionalism that emerges from these results is the fact that China would be worse off in EV terms under the FTAs considered and, perhaps ironically, even worse off as a member than as a nonmember. The simple reason for this is that trade diversion into smaller market groups will induce adverse terms of trade shifts against this large economy. In every case, China would be better off exporting to and importing from an undistorted global market. The AFTA results (Scenarios 3 and 4) offer a real incentive paradox, where China's participation is critical to the benefits enjoyed by other regional partners for the same reason – it significantly enlarges the internal market to which they would have access.<sup>13</sup>

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<sup>12</sup> Our Equivalent Variation welfare measure is standard and based on the extended linear expenditure system (ELES). See Lluch (1973) and Howe (1975) for details.

<sup>13</sup> As a separate exercise, we examined the three regional scenarios without China and the benefits accruing to members were generally a fraction of those reported here.

Unfortunately, these partners cannot provide the depth and diversity of demand and supply that China needs to maintain stable terms of trade.

Turning to the unilateral results, it is apparent that China would experience a similar fate if it removed all import protection unilaterally. Without reciprocation from its trading partners, China would be projecting its exports into protected markets, limiting its trade expansion and depressing terms of trade. Were all China's trade partners to open their borders (preferentially) to Chinese goods, the opposite effects would treble the benefits of globalization. Unfortunately, this scenario is beyond the capability of even the most determined trade negotiator. As a reference case, however, it shows precisely why globalization is preferable to regionalism for China.

For other economies in the region, the choice between unilateralism and regionalism is less clear cut. It appears, for example, that Indonesia might prefer unilateralism to an ASEAN Free Trade plus China (AFTAPC), but not to ASEAN+3. Malaysia, on the other hand, would prefer both regional arrangements to unreciprocated unilateralism, and both the Philippines and Thailand would be strictly worse off under UTL. Korea would also appear to prefer regional arrangements of which it is a member to UTL. As was already emphasized, the choice between these trade regimes is an empirical issue and cannot be decided on the basis of simplified trade theory or rules of thumb.

Overall trade flow adjustments, which ultimately drive the terms of trade and welfare effects, depend upon real exchange rates. When trade partners reciprocate, the net effect on the real exchange rate depends on the prior asymmetry between prior protection the subject country presented and faced. Countries like China, whose exports rise more than imports, are experiencing real exchange rate depreciation because they presented higher protection against imports than their exports faced. Korea, on the other hand, experiences higher import growth, resulting from real exchange rate appreciation due to lower prior own tariff levels.

Thus it becomes apparent that protection patterns exert very complex influences on the incentives governing trade negotiation. While this is hardly surprising, the net effect of in terms of real exchange rate adjustment would be very difficult to predict without detailed empirical analysis. Models of the type used here have the advantage of



being calibrated to detailed data of this kind and capture a myriad of indirect effects that give rise to the structural adjustments we are talking about. Because they use consistent economywide data sets, they can also produce aggregate measures of adjustment and welfare, and these are most often used in the literature to assess national policies.

Despite its artificiality as a policy scenario, the results for UTLR are thought-provoking since they imply that there might be some optimal level of regionalism. This is because the EV gains under UTLR exceed GTL all three regional scenarios in every case considered. The large EV gains under UTLR are mainly the result of increased national purchasing power resulting from real exchange rate appreciation. It is tempting to wonder if there is some kind of regional enlargement that would capture some of these gains and increase those of ASEAN+3. This process would be unlikely to ever exceed the gains of GTL, however, simply because of the fallacy of composition. The real exchange rate appreciation under UTLR is so great only because one country enjoys *de facto* preferences from all its partners. This benefit cannot be consistently aggregated.

### 3.3. *Sectoral Export Patterns*

Aggregate income effects and trade balances are of interest in themselves, but trade policy is often formulated from the bottom up. In other words, sectoral interests can exert significant influence on the course of bilateral and multilateral trade negotiations. Moreover, it is well known that the aggregate efficiency and growth benefits of trade liberalization can mask trade-offs between sectoral interests. For these reasons, this section takes a deeper look at the FTA scenarios, examining trade in more detailed product categories. Analysis like this can help policy makers anticipate real structural adjustments and their ensuing benefits and costs.

The tables reproduced below give (billion USD) changes in exports by country for more detailed sectors in the database. Beginning with China, Table 3.8 presents export changes for ASEAN+3, measured with respect to the Baseline. Clearly, China enjoys robust export expansion in this scenario, with total exports adding over 400 billion (1997) USD and significant expansion in most manufacturing sectors (except vehicles). Exports

to Asia dominate this growth, led by Japan, ASEAN, and the NIEs. For processed food in particular, Chinese exports to Japan increase dramatically. It should be emphasized, however, that the bilateral balances for this scenario remind us that China's imports from these partners are even greater than the export adjustments in Table 3.8.

**Table 3.8: Exports by Sector and Destination: China in ASEAN+3**  
(2020 change in 1997 billion USD, with respect to Baseline)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.000	1.287	.004	.119	.003	.007	.016	1.435
Other Grains	.000	.027	2.928	.245	.001	.008	.017	3.226
Oil Seeds	.000	.692	1.161	.002	.000	.005	.002	1.861
Sugar	.000	.015	.000	.000	.000	.002	.024	.042
Other Crops	.000	1.211	1.210	.823	.009	.027	.039	3.318
Livestock	.000	.138	.058	.108	.041	.171	.050	.566
Energy	.000	2.061	4.429	3.783	.746	.547	1.099	12.665
Processed Food	.000	32.131	8.115	6.216	.510	.802	.870	48.644
Textiles	.000	5.640	6.783	8.703	1.623	2.224	5.982	30.955
Clothing	.000	9.771	2.144	2.180	1.698	3.623	5.242	24.658
Leather Goods	.000	5.826	2.392	3.149	6.172	3.869	4.352	25.761
Basic Manufacturing	.000	12.540	21.209	16.858	13.485	11.308	10.218	85.618
Motor Vehicles	.000	.746	4.330	.032	1.291	.535	.739	7.673
Other Transport Equip.	.000	.429	.664	1.264	.829	.956	1.348	5.490
Electronic Goods	.000	7.650	7.564	12.144	16.053	12.097	6.782	62.290
Other Manufactures	.000	13.116	17.702	18.564	20.572	16.839	11.748	98.541
Construction	.000	.038	.010	.001	-.007	.071	.013	.127
Services	.000	.352	.568	.737	-1.224	2.150	-2.211	.372
Total	.000	93.669	81.270	74.930	61.804	55.240	46.330	413.243

The last comparison includes China's WTO accession, and since commitment has already been made to this it may be more interesting to examine the incremental effect of a regional FTA. Table 3.9 presents the same real export changes, measured against the CNWTO base, and we immediately see important differences. First of all, China's exports expand less than 40 billion (1997) USD as a result of adding ASEAN+3 to its WTO initiative, indicating that the latter realizes over 90 percent of China's export benefits from the combined trade measures. This was already apparent from the

aggregate export results in Figure 3.1, but here we see two important details, sharp increases of exports to relatively protected markets (e.g. Japanese processed food) and trade diversion away from the west. Indeed, such diversion is double the amount of China's export increase in this scenario, indicating that substantial market opportunities are lost to rising costs.<sup>14</sup> If China could maintain higher productivity growth rates, perhaps these markets can be held, roughly tripling the benefits of ASEAN+3 for China.

**Table 3.9: Exports by Sector and Destination: China in ASEAN+3**

(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.000	1.281	.000	.110	-.002	-.005	-.019	1.367
Other Grains	.000	.022	2.827	.131	-.001	-.005	-.012	2.963
Oil Seeds	.000	.680	1.157	-.001	.000	-.007	-.004	1.826
Sugar	.000	.013	.000	.000	.000	-.001	-.015	-.003
Other Crops	.000	1.102	1.135	.736	-.009	-.027	-.045	2.893
Livestock	.000	.062	-.008	.087	-.019	-.067	-.023	.031
Energy	.000	-1.402	1.403	.811	-.449	-.315	-.661	-.614
Processed Food	.000	29.086	7.135	5.221	-.236	-.332	-.424	40.449
Textiles	.000	2.485	3.297	6.431	-.682	-.910	-2.166	8.455
Clothing	.000	5.171	.997	1.662	-1.550	-2.333	-1.878	2.069
Leather Goods	.000	3.381	1.110	2.373	-3.415	-3.281	-1.885	-1.717
Basic Manufacturing	.000	1.119	8.616	7.073	-6.697	-5.690	-5.471	-1.051
Motor Vehicles	.000	-.155	2.209	-.642	-.470	-.185	-.262	.497
Other Transport Equip.	.000	-.138	.369	.210	-.406	-.472	-.619	-1.056
Electronic Goods	.000	-1.653	2.956	3.615	-5.217	-3.564	-1.969	-5.832
Other Manufactures	.000	.682	9.500	10.556	-10.326	-8.880	-6.528	-4.996
Construction	.000	-.017	-.002	-.001	-.004	-.045	-.011	-.081
Services	.000	-.315	-.132	-.114	-1.057	-2.437	-1.813	-5.869
Total	.000	41.403	42.569	38.258	-30.540	-28.557	-23.803	39.330

<sup>14</sup> In the forecasting model, we assume that domestic resources are fully allocated, while productivity grows at the baseline rates outlined earlier. Under these circumstances, firms face rising marginal factor costs and trade diversion effects are stronger than they would be in the case of perfectly elastic supply.

Now we compare two FTAs from the perspective of ASEAN, realization of the newly minted ASEANPC and the more inclusive ASEAN+3. Perhaps the most interesting characteristic of the first results (Table 3.10) is the fact that intra-ASEAN trade represents 79 percent of total export growth, and the contribution of the “bandwagon” effect of exports to China is relatively small. What this means is that the CNWTO scenario triggers most of the bandwagon gains, and that ASEANPC simply facilitates opening of the internal regional market. Chinese exports to ASEAN are also substantial in CNWTO (Table 3.8, 74.93 billion), but the incremental effect of combining ASEAN and China in an FTA has little effect on their “bilateral” trade.

**Table 3.10: Exports by Sector and Destination: ASEAN in AFTAPC**  
(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.106	.000	.000	1.437	-.003	-.004	-.012	1.524
Other Grains	.000	.000	.000	.000	.000	.000	-.001	-.001
Oil Seeds	.000	.000	.000	-.008	.000	.000	.000	-.008
Sugar	.020	.003	.000	.310	-.007	.000	.004	.330
Other Crops	-.035	-.057	-.034	3.938	-.081	-.189	-.114	3.429
Livestock	.004	.000	-.004	.010	.003	-.002	.000	.011
Energy	-.093	.705	.615	20.679	.031	-.030	-.388	21.519
Processed Food	2.093	.604	.191	9.168	.283	.531	1.283	14.152
Textiles	1.043	.511	.474	.883	.212	.557	.514	4.194
Clothing	.005	1.387	.521	.134	1.758	2.698	.871	7.374
Leather Goods	.234	.482	.193	.507	2.000	4.250	.786	8.452
Basic Manufacturing	.843	.351	.317	14.669	.265	.411	.001	16.857
Motor Vehicles	-.004	.041	-.007	8.352	.019	.017	.002	8.421
Other Transport Equip.	-.016	-.002	-.020	1.123	-.011	.007	-.031	1.050
Electronic Goods	.044	.487	.073	5.445	.789	.433	-.021	7.251
Other Manufactures	-.502	-.227	-.288	7.972	-.220	-.250	-.577	5.909
Construction	.000	.003	.000	.000	.002	.005	.000	.010
Services	-.179	-.290	-.261	-.211	-.733	-2.371	-1.340	-5.385
Total	3.562	3.998	1.769	74.410	4.308	6.065	.977	95.089

The situation is different in the more inclusive arrangement, however. Under ASEAN+3, ASEAN exports to China grow by twice as much, and total exports by about 60 percentage points more. Removal of Japanese protection in particular stimulates new export growth, and there is much less diversion of trade away from the west than China

experienced in these regional setups. Despite China's robust export expansion in these scenarios, ASEAN is able to increase exports in electronics to all markets. These results support the finding in related work (Roland-Holst:2003b) that ASEAN can "hold its own" in competition with China.

**Table 3.11: Exports by Sector and Destination: ASEAN in ASEAN+3**  
(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.073	2.788	.000	1.320	-.039	-.039	-.066	4.038
Other Grains	.000	.000	.000	.000	.000	.000	-.001	-.001
Oil Seeds	.000	.000	.000	-.011	.000	.000	.000	-.011
Sugar	.010	1.483	.164	.324	-.025	-.001	-.010	1.946
Other Crops	-.112	2.032	2.342	3.804	-.261	-.537	-.327	6.941
Livestock	-.028	-.019	-.016	.016	-.003	-.015	.000	-.064
Energy	1.808	1.825	4.869	20.948	-.128	-.187	-1.160	27.975
Processed Food	2.090	23.872	3.656	8.509	-.058	-.019	.867	38.917
Textiles	1.345	.937	.534	.560	.237	.674	.605	4.893
Clothing	.007	3.549	1.171	.195	2.292	4.136	1.209	12.559
Leather Goods	.239	.881	.108	.471	2.238	4.803	.899	9.638
Basic Manufacturing	1.708	5.284	4.184	9.612	.148	.053	-.274	20.716
Motor Vehicles	.012	.515	1.391	.866	.268	.562	.279	3.893
Other Transport Equip.	-.011	.010	.094	.448	.007	.039	-.020	.565
Electronic Goods	.592	1.914	5.740	5.383	3.459	1.885	.629	19.601
Other Manufactures	-.192	.090	.823	6.098	-.071	-.291	-.572	5.886
Construction	.000	.002	.000	.000	.000	.004	.001	.007
Services	-.176	-.436	-.155	-.165	-1.204	-3.294	-1.946	-7.376
Total	7.366	44.727	24.905	58.379	6.859	7.774	.113	150.123

As a final example of the detailed export analysis, we look at Japan's situation in ASEAN+3. Recall that this country, having relatively high levels of prior protection, experienced significant import penetration in most Asian FTA scenarios. Results in Table 3.12 indicate that Japan can also be a winner in the more inclusive ASEAN+3 FTA.<sup>15</sup> Our results indicate that Japanese exports would be 80 billion higher in 2020 under this FTA, and that limited trade diversion of about 10 billion more could be offset by productivity growth. Japan's biggest market growth is in ASEAN, followed by NIE and China.

**Table 3.12: Exports by Sector and Destination: Japan in ASEAN+3**  
(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.000	.000	.000	.000	.000	.001	.001	.002
Other Grains	.000	.000	.000	.000	.000	.000	.000	.000
Oil Seeds	.000	.000	.000	.000	.000	.000	.000	.000
Sugar	.000	.000	.000	.000	.000	.000	.000	.000
Other Crops	.001	.000	.048	.000	.000	-.001	-.001	.047
Livestock	.007	.000	.007	.000	.000	.001	.000	.015
Energy	.009	-.001	.192	.118	-.005	-.017	-.022	.274
Processed Food	.165	.000	3.189	.816	.034	.032	.025	4.261
Textiles	1.258	.000	.384	.730	.033	.035	.062	2.503
Clothing	.174	.000	.014	-.004	.002	.004	.006	.195
Leather Goods	.059	.000	-.003	-.011	.002	.003	.003	.053
Basic Manufacturing	1.171	.000	12.462	11.830	-.375	-.279	-.349	24.459
Motor Vehicles	.480	.000	4.591	18.342	-1.544	-.582	-.760	20.527
Other Transport Equip.	.033	.000	.157	3.101	-.061	-.082	-.168	2.980
Electronic Goods	-.779	.000	3.334	1.116	-1.108	-.546	-.258	1.760
Other Manufactures	1.544	.000	13.557	6.848	-.045	-.320	-.445	21.139
Construction	.016	.000	.000	-.002	-.002	-.070	-.012	-.070
Services	-.071	.000	-.062	.122	-.200	-.476	-.327	-1.014
Total	4.068	-.001	37.870	43.005	-3.268	-2.296	-2.246	77.132

<sup>15</sup> In this table, the small number in the Japan column represents this country's trade with its protectorates, mainly Okinawa.

### 3.4. *An Intra-industry Perspective on Competitiveness*

Even at very detailed customs lines, countries often register trade in both directions. To get a more nuanced view of East Asian competitiveness, we examine detailed intra-industry trade characteristics. Formally, define the index of intra-industry competitiveness as

$$IIC = (E-M)/(E+M)$$

where IIC ranges between -1 (100% import oriented) and 1 (100% export oriented) for any given sector  $i$ . This index is estimated for sample scenarios, countries, and trading partners in the following tables. Balassa developed a similar index, equal to  $|IIC|$ , but the sign indicates direction of trade dependence, so we preserve it here.

The following three tables present IIC results for China, ASEAN, and Japan, respectively. Note that these indexes are calculated for the ASEAN+3 scenario and thus reflect both the baseline growth rates and compositional adjustments in the model simulations. As such, they detail current patterns of specialization and, at the margin, trade creation and diversion arising from the regional FTA. As expected, we see China, ASEAN, and Japan in a trade hierarchy resulting from the baseline composition of their resource costs and growth trends.

In China's case (Table 3.13), trade with Japan is very predicable. China is strongly export oriented in primary products and light (labor intensive) industry, but more import dependent in manufactures. This reinforces the hierarchical perception of regional trade, and should come as some comfort to those who see China undermining manufacturing potential of higher income neighbors. China's trade with NIEs in many ways mirrors that with Japan, indicating that the latter group is still comfortably at the top of the regional value added hierarchy. With respect to ASEAN, however, China has a more complex relationship. We see examples of primary import dependence, but also strong export orientation in a variety of manufacturing categories. Notable exceptions are electronics and basic manufacturing, where two-way bilateral trade is nearly balanced.

With respect to the Western OECD, the results are qualitatively similar to Japan, but with respect to the ROW there again complex interdependencies. China is primary import dependent and strongly export oriented in manufactures excluding vehicles and basic manufactures.

**Table 3.13: Intra-industry Competitiveness (IIC) by Sector and Trade Partner:  
China in ASEAN+3**

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	-	1.00	1.00	-.94	1.00	1.00	.84	-.47
Other Grains	-	1.00	1.00	1.00	-.99	-.25	-.99	-.48
Oil Seeds	-	1.00	1.00	1.00	-1.00	1.00	-.98	-.78
Sugar	-	1.00	-1.00	-1.00	-	.87	-.98	-.86
Other Crops	-	.96	.92	-.54	-.94	.90	-.91	-.48
Livestock	-	.72	.44	-.64	-.68	-.43	-.64	-.51
Energy	-	.96	-.28	-.74	.90	.93	-.09	-.36
Processed Food	-	.94	.63	-.45	-.75	-.64	-.85	-.15
Textiles	-	.04	-.69	.41	.55	.72	.03	-.12
Clothing	-	.89	.73	.99	.97	.93	.95	.92
Leather Goods	-	.94	-.26	.80	.90	.79	.78	.72
Basic Manufacturing	-	-.06	-.38	.09	.29	.10	.05	-.02
Motor Vehicles	-	-.81	.52	.76	.41	-.64	.01	-.32
Other Transport Equip.	-	-.06	-.54	.85	-.26	-.07	.58	.00
Electronic Goods	-	-.32	-.42	.02	.36	.02	.82	.06
Other Manufactures	-	-.11	-.05	.44	.47	-.08	.66	.22
Construction	-	-.32	.31	1.00	-.56	-.84	.03	-.48
Services	-	.26	.32	.34	.24	.10	.38	.24
Total	-	.06	-.29	-.04	.36	.10	.25	.08

Now look at the results (Table 3.14) for ASEAN. The IIC indexes for trade with China mirror those in Table 3.13. With respect to Japan, however, ASEAN is even more specialized than China. Export dependence in primary sectors is essentially complete, and import dependence in manufactures is very high outside the components business of basic manufacturing and electronics. This is certainly what would be expected, but it implies that ASEAN is well down the value added hierarchy from Japan. Trade with NIE is about the same in primary products, but more balanced in manufactures, again indicating the place of the two in the hierarchy and ASEAN's important regional role as a component



supplier. On the whole, ASEAN shows the highest average export orientation toward the US market. It appears to be more effective in light manufacturing exports to the EU, while remaining import dependent in higher tech (e.g. capital goods) with the US. A notable exception in the latter case is vehicles, where ASEAN is net exporter to the US.

**Table 3.14: Intra-industry Competitiveness (IIC) by Sector and Trade Partner:**

**ASEAN in ASEAN+3**

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.94	1.00	-	.00	1.00	1.00	.65	.62
Other Grains	-1.00	-	-	-	-1.00	1.00	-1.00	-.99
Oil Seeds	-1.00	-	-	.00	-1.00	-	-1.00	-.96
Sugar	1.00	1.00	.99	.00	1.00	.90	-.87	.55
Other Crops	.54	1.00	.97	.00	.43	.97	.07	.39
Livestock	.64	1.00	.71	.00	-.19	-.63	-.44	.10
Energy	.74	.92	.20	.00	.09	.80	-.78	.18
Processed Food	.45	.93	.49	.00	.65	.84	.08	.49
Textiles	-.41	.13	-.69	.00	.69	.79	.68	-.16
Clothing	-.99	1.00	.94	.00	.99	.91	.96	.68
Leather Goods	-.80	.98	-.59	.00	.94	.75	.93	.48
Basic Manufacturing	-.09	-.23	-.25	.00	-.01	-.03	-.21	-.11
Motor Vehicles	-.76	-.93	-.68	.00	.13	-.45	.67	-.69
Other Transport Equip.	-.85	-.94	-.68	.00	-.93	-.80	-.53	-.78
Electronic Goods	-.02	-.11	.06	.00	.33	.05	.80	.14
Other Manufactures	-.44	-.53	-.35	.00	-.31	-.48	.15	-.30
Construction	-1.00	-.48	-	-	-.57	-.88	-.14	-.61
Services	-.34	.37	.33	.00	-.11	-.27	.32	.00
Total	.04	-.05	-.09	.00	.11	-.01	.15	.02

Finally, we examine IIC for Japan's bilateral trade in Table 3.15. Here we see the mirror of previous results for trade with China and ASEAN, and these have already been discussed. The general picture that emerges beyond this (last column) is a country with high import dependence in primary products and high export orientation in (especially advanced) manufactures. Given the relatively small trade in staple foods, these indices overstate the degree of specialization in the economy, but more liberal trade regimes will eventually push Japan in that direction. Meanwhile, the implicit import dependence signifies an important distortionary burden on domestic consumers and a large source of allocative inefficiency.

It is perhaps surprising that IICs in Japanese manufacturing are not even higher in absolute magnitude. This fact is due to robust imports of components and other intermediate goods coming from Japan's extensive global supply chains. As has been argued elsewhere (Roland-Holst:2003a), these networks are changing the face of regional and global trade, and further FTA and WTO liberalization will intensify this with an ironic result – increasing economic diversity and reducing overall specialization among the regional economies. Meanwhile, however, Japan and other high wage economies will have to rigorously maintain their commitments to invest (privately and publicly) for innovation and productivity growth if they are to sustain premium wage levels.

**Table 3.15: Intra-industry Competitiveness (IIC) by Sector and Trade Partner:  
Japan in ASEAN+3**

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	-1.00	-	-	-1.00	-.96	1.00	-.90	-1.00
Other Grains	-1.00	-	-	-	-1.00	-1.00	-1.00	-1.00
Oil Seeds	-1.00	-	-	-	-1.00	-	-1.00	-1.00
Sugar	-1.00	-	-	-1.00	-	-1.00	-1.00	-1.00
Other Crops	-.96	-	-.62	-1.00	-.98	-.52	-.98	-.97
Livestock	-.72	-	-.21	-1.00	-.96	-1.00	-.95	-.83
Energy	-.96	.00	-.96	-.92	-.71	.10	-.97	-.94
Processed Food	-.94	-	-.71	-.93	-.77	-.50	-.89	-.87
Textiles	-.04	-	.05	-.13	.12	.07	-.31	-.04
Clothing	-.89	-	-.69	-1.00	-.59	-.79	-.41	-.89
Leather Goods	-.94	-	-.87	-.98	-.82	-.93	-.74	-.94
Basic Manufacturing	.06	-	.50	.23	-.08	-.22	-.45	.05
Motor Vehicles	.81	-	.86	.93	.71	.12	.88	.66
Other Transport Equip.	.06	-	.39	.94	-.60	.79	.88	.28
Electronic Goods	.32	-	.31	.11	.33	.16	.84	.31
Other Manufactures	.11	-	.77	.53	.05	.19	.07	.27
Construction	.32	-	.20	.48	-.83	-.81	.35	-.27
Services	-.26	-	.32	-.37	-.45	-.49	-.06	-.30
Total	-.06	.00	.23	.05	.06	-.15	-.10	-.01

#### **4. Conclusions and Extensions**

In this paper, we use a global empirical simulation model to examine a variety of trade liberalization scenarios for the East Asia. In particular, we compare China's unilateral WTO initiative with a variety of East and Southeast Asian FTAs and a reference case of global trade liberalization (GTL). Our results are consistent with some conventional intuition, in other ways contradict conclusions obtained from simplified theoretical models, and above all reveal the complexity of these issues for regional policy makers.

We find that, while GTL yields the greatest and most widespread benefit, an ASEAN+3 arrangement is beneficial to most members and delivers for them the majority of gains arising from globalization. This happens because a Trade Triangle mechanism, leveraging China's export success and domestic market growth to create unprecedented new export opportunities for its regional neighbors. The East Asian Trade Triangle enables China to "deliver globalization" to the region by joining the WTO. In this sense, East Asia can capture most of the benefits of full globalization by just forming EAFTA. The other EA countries should negotiate collectively with China, with an eye toward broader objectives. Another benefit of the regional approach is its certainty and expedient relative to a much larger multilateral negotiating agenda. Thus the most important conclusion emerging from this work is that, in the wake of China's WTO accession, the best strategy for East Asia is to pursue globalism through comprehensive regionalism.

From a strategic viewpoint, we discuss incentive properties of the regional arrangements, and note that China has a special position because of its size and unilateral commitment to opening via WTO accession. China is a critical player in the regional strategic environment because its domestic market is a great prize for neighbors who rely on external demand as an essential source of growth. Despite its decisive role in most of the important regional arrangements, however, China's strategic leverage in this context is not what it appears to be. Preferential access for individual EA exporters is not sustainable under its WTO commitments. Thus China's main carrot in regional negotiations is real, but its strategic value is limited. Furthermore, EA imports are

essential to China's export capacity. The stick of denying market access is therefore not credible against most EA partners.

Beyond this, our results fail to support the theoretical suggestion, around since the 1950's, that unilateralism generally dominates FTA membership, or its corollary that prospective members must be induced to join by incentives written into the FTA agreement. Indeed, in most cases we study, prospective members actually lose or gain significantly less from UTL and would probably experience structural reversals by pursuing this as a first move toward FTA participation, thus reducing the net benefit of the latter. The only UTL that generally dominates FTA is one where each of the country's trading partners reciprocates by eliminating (only) bilateral tariffs. Not only is this a very implausible scenario, but such benefits do not aggregate into anything representing a larger regional agreement, reflecting none other than the fallacy of composition.

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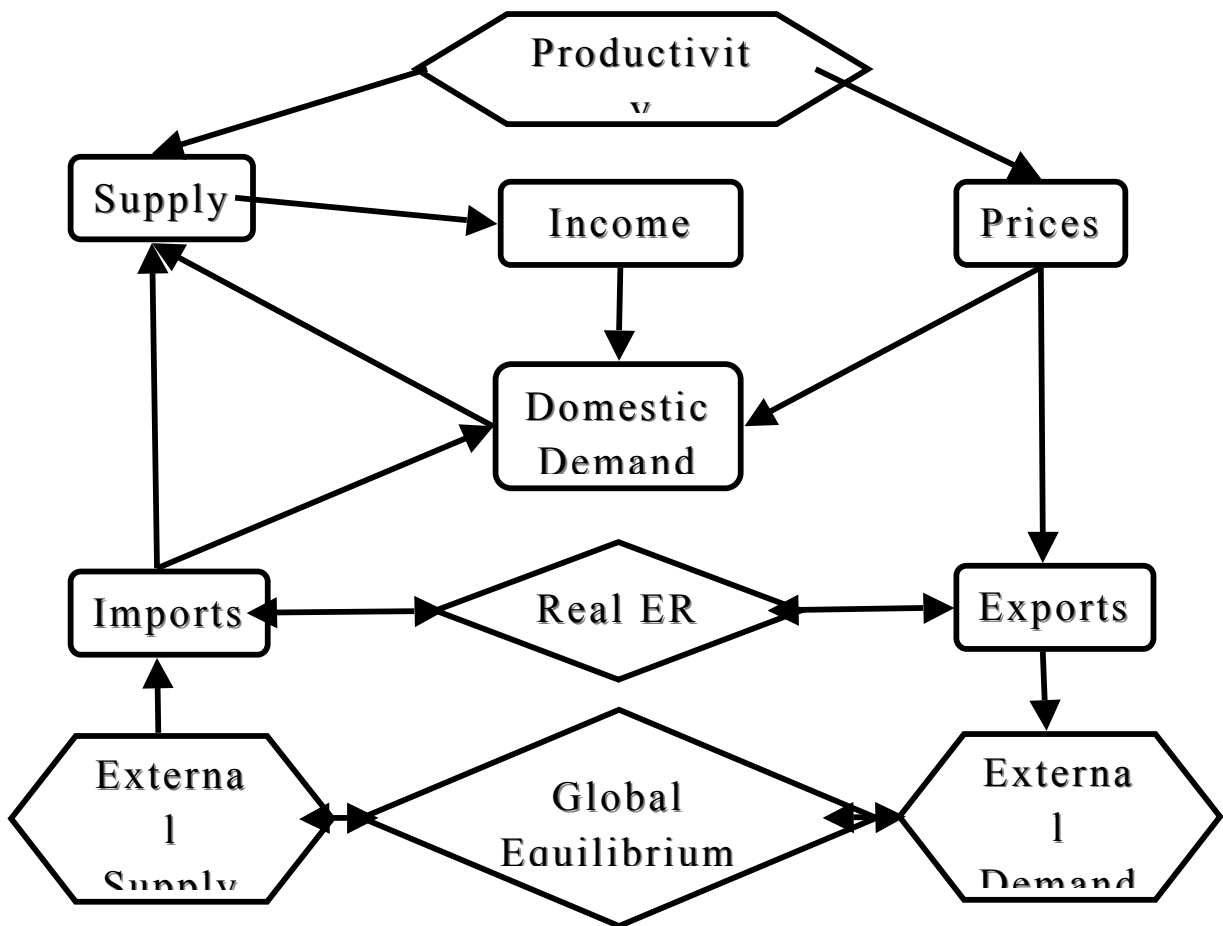
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## Annex A – Model Calibration

The model is calibrated to country and regional real GDP growth rates, obtained as consensus estimates from independent sources (DRI, IMF, Cambridge Econometrics). Using exogenous rates of implied TFP growth, the model computes supply, demand, and trade patterns compatible with domestic and global equilibrium conditions. Equilibrium is achieved by adjustments in the relative prices of domestic resources and commodities, while international equilibrium is achieved by adjusting trade patterns and real exchange rates to satisfy fixed real balance of payments constraints. The general process is schematically represented in the figure below.

**Figure B.1: General Equilibrium Calibration Mechanism**



## **Annex B - Notes on the Adjustment Process**

The calibration procedure highlights the two salient adjustment mechanisms in the model (as well as the real economies), domestic and international prices. General equilibrium price adjustments are generally well understood by professional economists but, in the multilateral context, the role of exchange rates can be a source of confusion. Generally, in a neoclassical model like this one, there are no nominal or financial variables and the function of the exchange rate is only to equalized real purchasing power between different economies.

Because models like this to not capture the aggregate price level or other nominal quantities, there is no nominal exchange rate in the sense of traditional macroeconomics or finance. Since there is no money metric in the model, all prices are relative prices, and the exchange rate (the composite relative price of foreign goods) is no exception. If there were financial assets in the model, one could define a nominal exchange rate as the relative price of two international financial assets (money, bonds, etc.). Without them, the exchange rate is defined in terms of real international purchasing power, i.e. the relative price of tradeable to nontradeable goods. In a multi-sector setting, the real exchange rate is defined as the ratio of an index of the value of all tradeables (on world markets) to an index of the value of all nontradeables.

Since any tax (or other price elevating distortion) on an import is an implicit tax on all tradeable goods, trade liberalization causes tradeable goods prices to fall and the real exchange rate depreciates. Real exchange rate depreciation also makes exports more competitive, one of the principal motives for unilateral liberalization. The general implication of this is that trade will expand rapidly for a country removing significant import protection, and more rapidly for countries removing more protection. The pattern of trade expansion, and the domestic demand and supply shifts that accompany it, depend upon initial conditions and adjustments among trading partners. At the same time, each country has rising marginal cost in production and diminishing marginal utility in consumption and, with a close multilateral trading system, trade volume changes induce terms of trade effects exactly as intuition would dictate.

## **Annex C – Baseline Trade Distortions**

Second only to baseline trade flows in their importance for the policy outcomes we consider in this paper are prior patterns of import protection. The next three tables present this information, representing a variety of perspectives on trade price distortions. For selected regions, Tables C.1 and C.2 give import protection levels by origin and destination, respectively. This helps reveal asymmetries in market openness for aggregate commodity groups. Table C.3, on the other hand, gives a matrix of trade weighted import barriers by country and region, indicating (fairly significant) asymmetries in overall domestic market access under base year (2000) patterns of trade. Table C.4 summarizes the country and regional abbreviations used in these tables.

It is important to note, even in passing, that we are not modeling significant agricultural protection in the present exercise. This means our results will generally understate the effects of trade liberalization at the aggregate level and do not fully capture sectoral adjustments, particularly in primary activities. This will be the subject of further research.

**Table C.1: Applied tariffs by region of origin**  
(percent)

	Developing East Asia					High Income East Asia				
	EAP	HYA	CUS	ROW	Total	EAP	HYA	CUS	ROW	Total
Wheat	50.8	..	0.0	0.0	49.2	109.5	256.8	409.0	293.2	192.7
Other grains	191.0	28.3	95.4	76.6	96.1	30.8	210.1	66.2	28.8	72.7
Oil seeds	76.4	78.9	86.5	87.0	86.3	69.7	76.4	56.3	64.0	58.7
Sugar	9.4	14.1	..	15.9	11.6	81.6	56.9	..	89.1	77.8
Other crops	43.6	18.1	23.3	17.6	23.7	20.0	16.5	22.4	17.7	19.6
Livestock	5.4	10.6	8.7	11.8	9.9	2.0	11.3	20.9	15.2	11.0
Energy	5.0	9.2	4.0	3.6	4.8	0.4	1.0	1.2	-0.5	0.0
Processed foods	30.3	26.8	32.7	32.5	31.0	28.2	39.1	34.6	33.5	33.3
Textile	21.5	23.5	13.9	13.9	21.3	5.5	3.3	6.2	6.3	5.5
Wearing apparel	16.8	29.6	12.0	12.0	21.1	9.9	7.1	10.3	10.8	10.0
Leather goods	10.3	9.6	8.2	6.6	9.0	12.1	5.3	10.7	10.7	11.1
Basic manufacturing	10.4	10.8	8.6	7.9	9.6	2.1	2.0	1.7	1.6	1.8
Motor vehicles	50.5	34.4	15.0	27.4	32.2	6.5	7.6	3.7	4.1	5.2
Other transp equipment	9.6	16.3	1.4	3.4	4.7	1.1	0.7	0.3	0.2	0.4
Electronic equipment	6.9	7.0	5.4	6.8	6.6	0.4	0.7	0.5	0.8	0.6
Other manufacturing	9.5	9.6	8.8	7.7	8.9	1.6	2.0	1.4	1.4	1.6
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>13.3</b>	<b>11.4</b>	<b>10.3</b>	<b>7.0</b>	<b>10.1</b>	<b>4.7</b>	<b>4.4</b>	<b>6.7</b>	<b>3.1</b>	<b>4.5</b>
Agriculture & food	51.1	23.2	49.7	31.8	38.9	28.5	43.3	43.8	32.0	36.7
Energy	5.0	9.2	4.0	3.6	4.8	0.4	1.0	1.2	-0.5	0.0
Textile & apparel	19.2	23.2	12.1	12.0	19.6	8.3	4.3	8.2	8.9	8.1
Other manufacturing	10.0	10.6	7.1	8.2	9.3	1.4	1.9	1.3	1.6	1.5
Other goods & services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes:

1. The first column (in the left hand side box) represents tariffs on imports to EAP from the four origins indicated. The first column (in the

right hand side box) represents the tariffs on imports to HYA from the four origins indicated.

2. The regional acronyms are Developing East Asia (EAP), High-income East Asia (HYA), Canada and the United States (CUS), and Europe and the rest of the world (ROW).

Source : GTAP Version 5.0.

**Table C.2: Applied Tariffs by Region of Destination**  
(percent)

	Developing East Asia					High Income East Asia				
	EAP	HYA	CUS	ROW	Total	EAP	HYA	CUS	ROW	Total
Wheat	50.8	109.5	3.5	40.9	54.8	..	256.8	0.0	34.8	169.5
Other grains	191.0	30.8	0.0	8.4	155.0	28.3	210.1	..	14.4	45.2
Oil seeds	76.4	69.7	..	6.5	45.8	78.9	76.4	0.0	0.0	61.6
Sugar	9.4	81.6	54.0	19.1	31.2	14.1	56.9	22.9	23.7	28.1
Other crops	43.6	20.0	16.0	15.6	21.5	18.1	16.5	6.5	18.9	17.0
Livestock	5.4	2.0	0.0	9.9	4.3	10.6	11.3	0.0	11.1	10.4
Energy	5.0	0.4	0.0	8.4	2.5	9.2	1.0	0.0	5.1	5.0
Processed foods	30.3	28.2	10.5	29.5	26.3	26.8	39.1	14.0	53.0	36.9
Textile	21.5	5.5	11.4	15.1	12.9	23.5	3.3	12.4	12.7	17.6
Wearing apparel	16.8	9.9	13.5	14.5	12.8	29.6	7.1	13.8	12.8	15.5
Leather goods	10.3	12.1	15.5	13.5	14.0	9.6	5.3	10.8	8.6	8.7
Basic manufacturing	10.4	2.1	3.6	9.5	6.2	10.8	2.0	3.6	8.8	7.2
Motor vehicles	50.5	6.5	2.3	15.9	14.9	34.4	7.6	2.9	13.4	10.5
Other transp equipment	9.6	1.1	3.8	5.5	5.2	16.3	0.7	1.8	10.8	8.6
Electronic equipment	6.9	0.4	1.2	6.3	2.8	7.0	0.7	1.1	5.2	3.4
Other manufacturing	9.5	1.6	2.6	7.5	4.7	9.6	2.0	2.7	6.3	5.7
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.4	0.2
<b>Total</b>	<b>13.3</b>	<b>4.7</b>	<b>4.6</b>	<b>8.4</b>	<b>7.1</b>	<b>11.4</b>	<b>4.4</b>	<b>2.6</b>	<b>6.6</b>	<b>6.4</b>
Agriculture & food	51.1	28.5	11.6	25.6	29.3	23.2	43.3	13.2	36.1	32.7
Energy	5.0	0.4	0.0	8.4	2.5	9.2	1.0	0.0	5.1	5.0
Textile & apparel	19.2	8.3	14.1	14.5	13.2	23.2	4.3	13.1	12.2	16.3
Other manufacturing	10.0	1.4	2.1	8.1	4.8	10.6	1.9	2.2	7.8	6.0
Other goods & services	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.4	0.2

Notes:

1. The first column (in the left hand side box) represents tariffs on EAP exports to the four destinations indicated. The first column (in the right hand side box) represents the tariffs HYA exports to the four destinations indicated.
2. The regional acronyms are Developing East Asia (EAP), High-income East Asia (HYA), Canada and the United States (CUS), and Europe and the rest of the world (ROW).

Source : GTAP Version 5.0.

**Table C.3: Bilateral, Trade Weighted Tariffs**  
(percent)

<u>Exporter</u>	<u>Importer</u>																											
	chn	hkg	idn	jpn	kor	mys	phl	sgp	tha	twv	vnm	anz	can	eur	lac	sas	usa	row	Total	eap	eas	nie	ean	eat	lmx	hiy	lmy	
China	chn	..	.0	7.0	8.6	25.1	8.9	11.3	.3	15.9	5.0	26.2	11.2	8.7	5.7	13.8	27.4	5.7	14.4	8.3	9.6	9.6	4.5	8.7	9.1	8.5	7.0	9.0
Hong Kong	hkg	18.2	..	6.5	4.6	5.6	2.8	2.7	.0	7.8	5.4	46.5	.0	12.4	5.2	4.4	15.4	4.2	2.4	6.3	13.4	4.3	2.9	11.2	10.9	3.6	4.9	6.8
Indonesia	idn	10.1	.0	..	5.4	5.3	10.7	6.0	.0	15.1	4.4	7.5	3.3	5.5	6.3	10.4	22.2	7.3	11.9	7.0	6.1	5.6	4.9	5.9	5.8	9.5	6.0	7.5
Japan	jpn	15.2	.0	9.6	..	7.6	8.3	6.2	.0	16.8	5.2	17.1	5.4	3.7	3.6	12.0	27.0	2.3	8.6	6.1	9.8	6.6	6.2	8.6	8.5	4.2	5.5	6.6
Korea	kor	16.4	.0	19.0	6.0	..	3.0	6.3	.0	13.4	4.5	18.0	6.4	3.0	3.9	13.3	25.4	2.9	11.6	7.7	9.6	5.8	4.5	8.7	8.8	7.6	6.1	8.7
Malaysia	mys	16.3	.0	6.6	1.8	5.4	..	4.9	.2	10.9	3.9	18.5	2.8	1.7	3.5	8.2	27.5	1.7	11.8	4.3	5.0	2.7	2.0	3.4	3.4	6.2	2.9	5.6
Philippines	phl	9.4	.0	1.1	5.2	8.9	1.4	..	.0	8.3	2.9	.0	1.5	1.3	2.4	1.8	2.3	3.8	4.8	3.3	4.6	4.3	2.4	3.9	3.8	4.0	2.3	4.2
Singapore	sgp	11.1	.0	4.4	1.2	6.2	5.0	4.0	..	11.0	3.7	14.6	1.4	.0	2.2	6.2	20.6	1.1	6.7	4.2	4.5	3.3	6.9	4.9	4.9	4.4	3.7	4.5
Thailand	tha	19.3	.0	7.8	13.4	8.0	7.1	3.4	.2	..	4.1	24.2	4.3	4.4	5.7	7.5	22.9	4.9	9.4	7.2	10.9	9.6	.7	8.1	8.2	6.8	4.6	8.9
Taiwan	twv	16.4	.0	7.9	4.5	8.0	5.4	8.8	.2	15.4	..	17.2	3.5	4.2	3.9	10.6	20.6	3.2	7.7	7.1	10.5	4.6	5.6	9.8	9.8	4.1	5.4	7.8
Vietnam	vnm	5.8	.0	.0	11.1	10.1	22.4	20.8	.0	8.5	7.9	..	1.4	10.4	10.0	9.7	.0	8.9	12.1	9.2	10.7	11.3	4.6	9.2	8.6	9.8	8.0	10.5
Australia and New Zealand	anz	14.4	.0	5.8	20.2	5.7	6.8	7.5	1.8	12.3	6.3	8.0	.0	7.9	9.2	8.6	11.4	3.0	20.5	10.3	13.4	13.2	6.3	12.2	10.7	10.7	6.9	12.4
Canada	can	22.6	.0	1.5	19.4	4.4	1.3	3.0	.0	4.2	2.9	.0	1.6	.0	3.3	9.1	7.6	.4	12.7	2.6	13.8	12.5	2.2	12.2	11.7	1.0	4.1	2.3
Western Europe	eur	11.0	.0	4.5	3.7	5.9	4.4	3.5	.1	9.5	7.3	10.7	3.4	3.8	.5	9.3	18.8	2.2	11.1	3.1	5.0	3.8	4.8	4.9	4.8	7.8	1.2	7.1
Latin America and the Caribbean	lac	19.9	.0	3.0	10.4	16.6	2.8	4.3	.5	11.8	3.1	.0	1.6	2.6	7.6	12.9	16.5	2.7	15.6	7.1	11.6	10.0	4.2	10.3	10.0	4.3	9.5	5.5
South Asia	sas	9.5	.0	3.7	10.2	8.6	8.4	5.8	.0	10.7	1.8	.0	8.1	8.9	7.3	7.8	19.5	7.0	13.9	8.7	8.4	8.1	3.4	7.3	7.3	10.6	7.0	10.0
United States	usa	13.9	.0	4.8	9.3	14.2	3.1	4.7	.1	8.7	4.2	5.1	2.8	.8	2.7	6.2	15.5	.0	8.7	5.1	9.4	8.6	3.4	8.1	7.7	9.2	3.1	9.3
Rest of the World	row	5.3	.0	2.7	1.8	5.2	3.8	1.2	.1	3.7	2.6	8.6	1.9	2.1	4.4	4.7	24.5	2.1	8.2	5.1	3.0	2.7	1.7	2.8	2.8	7.3	4.1	5.9
Total		13.9	.0	6.6	7.0	9.4	5.4	5.0	.1	11.3	5.0	15.8	3.6	1.9	1.9	8.9	20.9	2.4	10.3	4.8	7.9	6.3	4.3	7.1	6.9	6.4	3.0	6.9
Developing East Asia	eap	15.6	.0	10.6	6.7	11.3	7.2	6.7	.1	15.2	4.9	19.4	6.2	4.7	4.3	12.1	25.8	3.5	10.0	6.6	9.1	6.9	4.8	7.9	7.9	5.9	5.5	7.4
Developing East Asia	eas	15.6	.0	11.2	4.8	7.2	6.9	5.9	.1	15.2	4.9	17.0	4.8	3.6	3.8	11.6	25.3	2.8	8.7	6.1	9.0	5.7	4.8	7.7	7.6	5.1	5.1	6.9
Newly industrialized countries	nie	15.6	.0	6.0	6.6	7.2	5.4	5.4	.2	12.8	3.8	17.4	2.8	3.0	3.7	8.7	21.0	2.9	7.7	6.0	8.3	5.1	4.6	7.7	7.7	4.8	4.5	6.8
Developing East Asia	ean	15.6	.0	9.5	6.6	10.8	6.4	6.4	.1	14.7	4.7	18.7	5.4	4.3	4.1	11.6	24.6	3.4	9.6	6.5	8.9	6.4	4.8	7.8	7.9	5.7	5.3	7.2
East Asia	eat	15.5	.0	9.1	8.4	10.2	6.4	6.6	.2	14.6	4.9	18.5	4.5	4.6	4.5	11.4	23.3	3.4	10.3	6.7	9.3	7.1	4.8	8.1	8.1	5.9	5.4	7.5
Low- and middle-income	lmx	10.7	.0	4.0	6.4	10.1	3.6	3.6	.1	6.6	3.9	5.7	2.8	1.0	3.7	6.1	21.6	2.9	8.7	5.2	7.0	6.4	2.9	6.2	6.0	8.1	3.6	7.6
High-income	hiy	14.0	.0	4.8	7.6	6.9	5.0	4.6	.2	10.7	6.0	14.2	2.7	3.7	1.0	10.7	18.2	1.9	11.4	3.9	7.5	5.9	4.7	7.0	6.8	5.9	2.1	6.4
Low- and middle-income	lmy	13.9	.0	8.1	6.5	10.6	5.8	5.3	.1	11.7	4.5	17.1	4.4	1.4	3.9	7.4	23.2	3.4	9.0	5.8	8.1	6.6	4.1	7.1	7.0	7.0	4.2	7.5

Notes: China and Hong Kong are disaggregated in the 1997 GTAP 5 dataset, but aggregated in the forecasting model.  
All regional and “Total” averages are trade-weighted ad valorem equivalent rates.

**Table 3.6: Equivalent Variation National Income Effects**  
(percent of 2020 baseline income)

	1	2	3	China		Indonesia		Korea		Malaysia		Philippines		Thailand	
	AFTAPC	ASEAN+3	GTL	UTL	UTLR	UTL	UTLR	UTL	UTLR	UTL	UTLR	UTL	UTLR	UTL	UTLR
China	-.1	-.3	1.0	-.3	3.3	-.0	-.1	.1	-.5	.0	-.2	.0	-.0	.0	-.1
Indonesia	.4	1.6	1.7	-.0	-.4	.8	4.7	.1	.7	.1	.0	.0	-.1	.1	-.0
Japan	-.0	.7	.9	.3	.1	.0	-.0	.1	-.1	.0	.0	.0	-.0	.0	.0
Korea	-.2	1.9	2.4	.8	.9	.2	.1	.2	6.3	.0	-.1	.0	.0	.0	-.0
Malaysia	3.0	3.1	3.9	.7	.4	.1	-.0	.0	-.5	.6	12.7	.0	-.0	.2	-.1
Philippines	.4	-.1	.3	.1	-.7	-.0	-.1	.1	-.2	.0	-.1	-.3	3.6	.0	-.0
Singapore	6.0	5.3	5.8	1.7	1.5	.1	.2	.1	-.0	1.2	.2	.1	.1	.6	.1
Thailand	.7	2.0	3.6	.6	-.4	.1	-.0	.1	-.7	.1	-.3	-.0	-.6	-.1	11.4
Taiwan	-.3	1.6	1.5	1.1	1.3	.0	-.0	.0	-.4	.0	-.1	.0	.0	.1	.0
Vietnam	1.9	4.6	7.4	.1	-.3.0	-.1	-.5	.4	-.1.9	.0	-.7	.0	-.0	.1	-.1.6
Australia and New Zealand	-.0	1.3	1.9	.2	-.0	.0	-.0	-.0	-.0	.0	-.0	.0	.0	.0	-.0
Canada	-.0	.0	.2	.0	-.1	-.0	-.0	-.0	-.0	-.0	-.0	.0	-.0	.0	-.0
Western Europe	-.0	-.0	.8	.1	.0	.0	-.0	.0	.0	.0	.0	.0	-.0	.0	-.0
Latin America and the Caribbean	-.0	-.1	1.1	.1	-.0	-.0	-.0	.0	-.1	-.0	-.0	-.0	-.0	-.0	-.0
South Asia	-.1	-.3	.5	-.0	-.9	-.0	-.1	.0	-.4	.0	-.2	-.0	-.0	-.0	-.1
United States	-.0	-.0	.2	.1	-.0	.0	-.0	.0	.0	.0	-.0	.0	-.0	.0	-.0
Rest of the World	-.0	-.0	1.0	.1	-.2	.0	-.0	.1	-.0	.0	-.1	-.0	-.0	-.0	-.0
Developing East Asia	-.0	.2	1.0	.2	.1	.0	-.0	.0	.3	.0	-.0	.0	-.0	.0	-.0
Developing East Asia x/ China	-.0	.1	.9	.1	.0	.0	-.0	.0	-.0	.0	-.0	.0	-.0	.0	-.0
Newly industrialized economies	2.0	2.3	3.3	.8	-.0	.1	-.0	.1	-.4	.4	-.1	-.0	.6	.1	5.6
Developing East Asia & NIEs	.0	.2	1.1	.2	.1	.0	-.0	.0	.3	.0	-.0	.0	.0	.0	.2
East Asia total	.0	.4	1.1	.2	.1	.0	-.0	.0	.2	.0	.1	.0	.0	.0	.1
Low- and middle-income x/ E. Asia	-.0	-.0	.4	.1	-.1	.0	-.0	.0	-.0	.0	-.0	.0	-.0	.0	-.0
High-income	.2	.6	1.2	.2	1.0	.0	.1	.1	-.2	.1	.3	.0	.0	.0	.3
Low- and middle-income	-.0	.1	.7	.1	-.0	.0	-.0	.0	.1	.0	-.0	.0	-.0	.0	-.0
World total	.0	.2	.8	.1	.2	.0	.0	.0	.1	.0	.0	.0	-.0	.0	.1

Source: Simulation results.

Until now, we have focused on trade pattern adjustments because the political economy of trade policy is often influenced by these considerations. Whether these ultimately decide policy at the unilateral, bilateral, regional, or global level is less important than the ability of policy makers to recognize and anticipate detailed adjustment costs and benefits. For this discussion, we shall focus on aggregate national benefits arising from trade policy, as measured by changes in Equivalent Variation (EV) net national income measures, essentially aggregate real GDP.<sup>12</sup> Table 3.6 presents these aggregate estimates for two FTA scenarios, GTL, and individual UTL and UTLR, respectively, for China, Indonesia, Korea, Malaysia, and Thailand. In addition to individual country measures, we also reproduce EV calculations for five aggregates at the bottom of the table. Again, trade scenarios are across the top of the table, EV income effects down each column.

These results help complete the picture of policy incentives facing East Asian economies in the coming decades. In particular, note that globalization dominates the regional agreements for every economic region except Singapore, which benefits more from AFTAPC because other advanced Asian economies are excluded from the latter agreement. For most, but not all of East and Southeast Asia, ASEAN+3 confers most of the aggregate gains from globalization.

Perhaps the most important reservation about East Asian regionalism that emerges from these results is the fact that China would be worse off in EV terms under the FTAs considered and, perhaps ironically, even worse off as a member than as a nonmember. The simple reason for this is that trade diversion into smaller market groups will induce adverse terms of trade shifts against this large economy. In every case, China would be better off exporting to and importing from an undistorted global market. The AFTA results (Scenarios 3 and 4) offer a real incentive paradox, where China's participation is critical to the benefits enjoyed by other regional partners for the same reason – it significantly enlarges the internal market to which they would have access.<sup>13</sup>

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<sup>12</sup> Our Equivalent Variation welfare measure is standard and based on the extended linear expenditure system (ELES). See Lluch (1973) and Howe (1975) for details.

<sup>13</sup> As a separate exercise, we examined the three regional scenarios without China and the benefits accruing to members were generally a fraction of those reported here.



Unfortunately, these partners cannot provide the depth and diversity of demand and supply that China needs to maintain stable terms of trade.

Turning to the unilateral results, it is apparent that China would experience a similar fate if it removed all import protection unilaterally. Without reciprocation from its trading partners, China would be projecting its exports into protected markets, limiting its trade expansion and depressing terms of trade. Were all China's trade partners to open their borders (preferentially) to Chinese goods, the opposite effects would treble the benefits of globalization. Unfortunately, this scenario is beyond the capability of even the most determined trade negotiator. As a reference case, however, it shows precisely why globalization is preferable to regionalism for China.

For other economies in the region, the choice between unilateralism and regionalism is less clear cut. It appears, for example, that Indonesia might prefer unilateralism to an ASEAN Free Trade plus China (AFTAPC), but not to ASEAN+3. Malaysia, on the other hand, would prefer both regional arrangements to unreciprocated unilateralism, and both the Philippines and Thailand would be strictly worse off under UTL. Korea would also appear to prefer regional arrangements of which it is a member to UTL. As was already emphasized, the choice between these trade regimes is an empirical issue and cannot be decided on the basis of simplified trade theory or rules of thumb.

Overall trade flow adjustments, which ultimately drive the terms of trade and welfare effects, depend upon real exchange rates. When trade partners reciprocate, the net effect on the real exchange rate depends on the prior asymmetry between prior protection the subject country presented and faced. Countries like China, whose exports rise more than imports, are experiencing real exchange rate depreciation because they presented higher protection against imports than their exports faced. Korea, on the other hand, experiences higher import growth, resulting from real exchange rate appreciation due to lower prior own tariff levels.

Thus it becomes apparent that protection patterns exert very complex influences on the incentives governing trade negotiation. While this is hardly surprising, the net effect of in terms of real exchange rate adjustment would be very difficult to predict without detailed empirical analysis. Models of the type used here have the advantage of

being calibrated to detailed data of this kind and capture a myriad of indirect effects that give rise to the structural adjustments we are talking about. Because they use consistent economywide data sets, they can also produce aggregate measures of adjustment and welfare, and these are most often used in the literature to assess national policies.

Despite its artificiality as a policy scenario, the results for UTLR are thought-provoking since they imply that there might be some optimal level of regionalism. This is because the EV gains under UTLR exceed GTL all three regional scenarios in every case considered. The large EV gains under UTLR are mainly the result of increased national purchasing power resulting from real exchange rate appreciation. It is tempting to wonder if there is some kind of regional enlargement that would capture some of these gains and increase those of ASEAN+3. This process would be unlikely to ever exceed the gains of GTL, however, simply because of the fallacy of composition. The real exchange rate appreciation under UTLR is so great only because one country enjoys *de facto* preferences from all its partners. This benefit cannot be consistently aggregated.

### 3.3. *Sectoral Export Patterns*

Aggregate income effects and trade balances are of interest in themselves, but trade policy is often formulated from the bottom up. In other words, sectoral interests can exert significant influence on the course of bilateral and multilateral trade negotiations. Moreover, it is well known that the aggregate efficiency and growth benefits of trade liberalization can mask trade-offs between sectoral interests. For these reasons, this section takes a deeper look at the FTA scenarios, examining trade in more detailed product categories. Analysis like this can help policy makers anticipate real structural adjustments and their ensuing benefits and costs.

The tables reproduced below give (billion USD) changes in exports by country for more detailed sectors in the database. Beginning with China, Table 3.8 presents export changes for ASEAN+3, measured with respect to the Baseline. Clearly, China enjoys robust export expansion in this scenario, with total exports adding over 400 billion (1997) USD and significant expansion in most manufacturing sectors (except vehicles). Exports

to Asia dominate this growth, led by Japan, ASEAN, and the NIEs. For processed food in particular, Chinese exports to Japan increase dramatically. It should be emphasized, however, that the bilateral balances for this scenario remind us that China's imports from these partners are even greater than the export adjustments in Table 3.8.

**Table 3.8: Exports by Sector and Destination: China in ASEAN+3**

(2020 change in 1997 billion USD, with respect to Baseline)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.000	1.287	.004	.119	.003	.007	.016	1.435
Other Grains	.000	.027	2.928	.245	.001	.008	.017	3.226
Oil Seeds	.000	.692	1.161	.002	.000	.005	.002	1.861
Sugar	.000	.015	.000	.000	.000	.002	.024	.042
Other Crops	.000	1.211	1.210	.823	.009	.027	.039	3.318
Livestock	.000	.138	.058	.108	.041	.171	.050	.566
Energy	.000	2.061	4.429	3.783	.746	.547	1.099	12.665
Processed Food	.000	32.131	8.115	6.216	.510	.802	.870	48.644
Textiles	.000	5.640	6.783	8.703	1.623	2.224	5.982	30.955
Clothing	.000	9.771	2.144	2.180	1.698	3.623	5.242	24.658
Leather Goods	.000	5.826	2.392	3.149	6.172	3.869	4.352	25.761
Basic Manufacturing	.000	12.540	21.209	16.858	13.485	11.308	10.218	85.618
Motor Vehicles	.000	.746	4.330	.032	1.291	.535	.739	7.673
Other Transport Equip.	.000	.429	.664	1.264	.829	.956	1.348	5.490
Electronic Goods	.000	7.650	7.564	12.144	16.053	12.097	6.782	62.290
Other Manufactures	.000	13.116	17.702	18.564	20.572	16.839	11.748	98.541
Construction	.000	.038	.010	.001	-.007	.071	.013	.127
Services	.000	.352	.568	.737	-1.224	2.150	-2.211	.372
Total	.000	93.669	81.270	74.930	61.804	55.240	46.330	413.243

The last comparison includes China's WTO accession, and since commitment has already been made to this it may be more interesting to examine the incremental effect of a regional FTA. Table 3.9 presents the same real export changes, measured against the CNWTO base, and we immediately see important differences. First of all, China's exports expand less than 40 billion (1997) USD as a result of adding ASEAN+3 to its WTO initiative, indicating that the latter realizes over 90 percent of China's export benefits from the combined trade measures. This was already apparent from the

aggregate export results in Figure 3.1, but here we see two important details, sharp increases of exports to relatively protected markets (e.g. Japanese processed food) and trade diversion away from the west. Indeed, such diversion is double the amount of China's export increase in this scenario, indicating that substantial market opportunities are lost to rising costs.<sup>14</sup> If China could maintain higher productivity growth rates, perhaps these markets can be held, roughly tripling the benefits of ASEAN+3 for China.

**Table 3.9: Exports by Sector and Destination: China in ASEAN+3**

(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.000	1.281	.000	.110	-.002	-.005	-.019	1.367
Other Grains	.000	.022	2.827	.131	-.001	-.005	-.012	2.963
Oil Seeds	.000	.680	1.157	-.001	.000	-.007	-.004	1.826
Sugar	.000	.013	.000	.000	.000	-.001	-.015	-.003
Other Crops	.000	1.102	1.135	.736	-.009	-.027	-.045	2.893
Livestock	.000	.062	-.008	.087	-.019	-.067	-.023	.031
Energy	.000	-1.402	1.403	.811	-.449	-.315	-.661	-.614
Processed Food	.000	29.086	7.135	5.221	-.236	-.332	-.424	40.449
Textiles	.000	2.485	3.297	6.431	-.682	-.910	-2.166	8.455
Clothing	.000	5.171	.997	1.662	-1.550	-2.333	-1.878	2.069
Leather Goods	.000	3.381	1.110	2.373	-3.415	-3.281	-1.885	-1.717
Basic Manufacturing	.000	1.119	8.616	7.073	-6.697	-5.690	-5.471	-1.051
Motor Vehicles	.000	-.155	2.209	-.642	-.470	-.185	-.262	.497
Other Transport Equip.	.000	-.138	.369	.210	-.406	-.472	-.619	-1.056
Electronic Goods	.000	-1.653	2.956	3.615	-5.217	-3.564	-1.969	-5.832
Other Manufactures	.000	.682	9.500	10.556	-10.326	-8.880	-6.528	-4.996
Construction	.000	-.017	-.002	-.001	-.004	-.045	-.011	-.081
Services	.000	-.315	-.132	-.114	-1.057	-2.437	-1.813	-5.869
Total	.000	41.403	42.569	38.258	-30.540	-28.557	-23.803	39.330

<sup>14</sup> In the forecasting model, we assume that domestic resources are fully allocated, while productivity grows at the baseline rates outlined earlier. Under these circumstances, firms face rising marginal factor costs and trade diversion effects are stronger than they would be in the case of perfectly elastic supply.

Now we compare two FTAs from the perspective of ASEAN, realization of the newly minted ASEANPC and the more inclusive ASEAN+3. Perhaps the most interesting characteristic of the first results (Table 3.10) is the fact that intra-ASEAN trade represents 79 percent of total export growth, and the contribution of the “bandwagon” effect of exports to China is relatively small. What this means is that the CNWTO scenario triggers most of the bandwagon gains, and that ASEANPC simply facilitates opening of the internal regional market. Chinese exports to ASEAN are also substantial in CNWTO (Table 3.8, 74.93 billion), but the incremental effect of combining ASEAN and China in an FTA has little effect on their “bilateral” trade.

**Table 3.10: Exports by Sector and Destination: ASEAN in AFTAPC**  
(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.106	.000	.000	1.437	-.003	-.004	-.012	1.524
Other Grains	.000	.000	.000	.000	.000	.000	-.001	-.001
Oil Seeds	.000	.000	.000	-.008	.000	.000	.000	-.008
Sugar	.020	.003	.000	.310	-.007	.000	.004	.330
Other Crops	-.035	-.057	-.034	3.938	-.081	-.189	-.114	3.429
Livestock	.004	.000	-.004	.010	.003	-.002	.000	.011
Energy	-.093	.705	.615	20.679	.031	-.030	-.388	21.519
Processed Food	2.093	.604	.191	9.168	.283	.531	1.283	14.152
Textiles	1.043	.511	.474	.883	.212	.557	.514	4.194
Clothing	.005	1.387	.521	.134	1.758	2.698	.871	7.374
Leather Goods	.234	.482	.193	.507	2.000	4.250	.786	8.452
Basic Manufacturing	.843	.351	.317	14.669	.265	.411	.001	16.857
Motor Vehicles	-.004	.041	-.007	8.352	.019	.017	.002	8.421
Other Transport Equip.	-.016	-.002	-.020	1.123	-.011	.007	-.031	1.050
Electronic Goods	.044	.487	.073	5.445	.789	.433	-.021	7.251
Other Manufactures	-.502	-.227	-.288	7.972	-.220	-.250	-.577	5.909
Construction	.000	.003	.000	.000	.002	.005	.000	.010
Services	-.179	-.290	-.261	-.211	-.733	-2.371	-1.340	-5.385
Total	3.562	3.998	1.769	74.410	4.308	6.065	.977	95.089

The situation is different in the more inclusive arrangement, however. Under ASEAN+3, ASEAN exports to China grow by twice as much, and total exports by about 60 percentage points more. Removal of Japanese protection in particular stimulates new export growth, and there is much less diversion of trade away from the west than China

experienced in these regional setups. Despite China's robust export expansion in these scenarios, ASEAN is able to increase exports in electronics to all markets. These results support the finding in related work (Roland-Holst:2003b) that ASEAN can "hold its own" in competition with China.

**Table 3.11: Exports by Sector and Destination: ASEAN in ASEAN+3**  
(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.073	2.788	.000	1.320	-.039	-.039	-.066	4.038
Other Grains	.000	.000	.000	.000	.000	.000	-.001	-.001
Oil Seeds	.000	.000	.000	-.011	.000	.000	.000	-.011
Sugar	.010	1.483	.164	.324	-.025	-.001	-.010	1.946
Other Crops	-.112	2.032	2.342	3.804	-.261	-.537	-.327	6.941
Livestock	-.028	-.019	-.016	.016	-.003	-.015	.000	-.064
Energy	1.808	1.825	4.869	20.948	-.128	-.187	-1.160	27.975
Processed Food	2.090	23.872	3.656	8.509	-.058	-.019	.867	38.917
Textiles	1.345	.937	.534	.560	.237	.674	.605	4.893
Clothing	.007	3.549	1.171	.195	2.292	4.136	1.209	12.559
Leather Goods	.239	.881	.108	.471	2.238	4.803	.899	9.638
Basic Manufacturing	1.708	5.284	4.184	9.612	.148	.053	-.274	20.716
Motor Vehicles	.012	.515	1.391	.866	.268	.562	.279	3.893
Other Transport Equip.	-.011	.010	.094	.448	.007	.039	-.020	.565
Electronic Goods	.592	1.914	5.740	5.383	3.459	1.885	.629	19.601
Other Manufactures	-.192	.090	.823	6.098	-.071	-.291	-.572	5.886
Construction	.000	.002	.000	.000	.000	.004	.001	.007
Services	-.176	-.436	-.155	-.165	-1.204	-3.294	-1.946	-7.376
Total	7.366	44.727	24.905	58.379	6.859	7.774	.113	150.123

As a final example of the detailed export analysis, we look at Japan's situation in ASEAN+3. Recall that this country, having relatively high levels of prior protection, experienced significant import penetration in most Asian FTA scenarios. Results in Table 3.12 indicate that Japan can also be a winner in the more inclusive ASEAN+3 FTA.<sup>15</sup> Our results indicate that Japanese exports would be 80 billion higher in 2020 under this FTA, and that limited trade diversion of about 10 billion more could be offset by productivity growth. Japan's biggest market growth is in ASEAN, followed by NIE and China.

**Table 3.12: Exports by Sector and Destination: Japan in ASEAN+3**  
(2020 change in 1997 billion USD, with respect to CNWTO)

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.000	.000	.000	.000	.000	.001	.001	.002
Other Grains	.000	.000	.000	.000	.000	.000	.000	.000
Oil Seeds	.000	.000	.000	.000	.000	.000	.000	.000
Sugar	.000	.000	.000	.000	.000	.000	.000	.000
Other Crops	.001	.000	.048	.000	.000	-.001	-.001	.047
Livestock	.007	.000	.007	.000	.000	.001	.000	.015
Energy	.009	-.001	.192	.118	-.005	-.017	-.022	.274
Processed Food	.165	.000	3.189	.816	.034	.032	.025	4.261
Textiles	1.258	.000	.384	.730	.033	.035	.062	2.503
Clothing	.174	.000	.014	-.004	.002	.004	.006	.195
Leather Goods	.059	.000	-.003	-.011	.002	.003	.003	.053
Basic Manufacturing	1.171	.000	12.462	11.830	-.375	-.279	-.349	24.459
Motor Vehicles	.480	.000	4.591	18.342	-1.544	-.582	-.760	20.527
Other Transport Equip.	.033	.000	.157	3.101	-.061	-.082	-.168	2.980
Electronic Goods	-.779	.000	3.334	1.116	-1.108	-.546	-.258	1.760
Other Manufactures	1.544	.000	13.557	6.848	-.045	-.320	-.445	21.139
Construction	.016	.000	.000	-.002	-.002	-.070	-.012	-.070
Services	-.071	.000	-.062	.122	-.200	-.476	-.327	-1.014
Total	4.068	-.001	37.870	43.005	-3.268	-2.296	-2.246	77.132

<sup>15</sup> In this table, the small number in the Japan column represents this country's trade with its protectorates, mainly Okinawa.

### 3.4. *An Intra-industry Perspective on Competitiveness*

Even at very detailed customs lines, countries often register trade in both directions. To get a more nuanced view of East Asian competitiveness, we examine detailed intra-industry trade characteristics. Formally, define the index of intra-industry competitiveness as

$$IIC = (E-M)/(E+M)$$

where IIC ranges between -1 (100% import oriented) and 1 (100% export oriented) for any given sector  $i$ . This index is estimated for sample scenarios, countries, and trading partners in the following tables. Balassa developed a similar index, equal to  $|IIC|$ , but the sign indicates direction of trade dependence, so we preserve it here.

The following three tables present IIC results for China, ASEAN, and Japan, respectively. Note that these indexes are calculated for the ASEAN+3 scenario and thus reflect both the baseline growth rates and compositional adjustments in the model simulations. As such, they detail current patterns of specialization and, at the margin, trade creation and diversion arising from the regional FTA. As expected, we see China, ASEAN, and Japan in a trade hierarchy resulting from the baseline composition of their resource costs and growth trends.

In China's case (Table 3.13), trade with Japan is very predicable. China is strongly export oriented in primary products and light (labor intensive) industry, but more import dependent in manufactures. This reinforces the hierarchical perception of regional trade, and should come as some comfort to those who see China undermining manufacturing potential of higher income neighbors. China's trade with NIEs in many ways mirrors that with Japan, indicating that the latter group is still comfortably at the top of the regional value added hierarchy. With respect to ASEAN, however, China has a more complex relationship. We see examples of primary import dependence, but also strong export orientation in a variety of manufacturing categories. Notable exceptions are electronics and basic manufacturing, where two-way bilateral trade is nearly balanced.



With respect to the Western OECD, the results are qualitatively similar to Japan, but with respect to the ROW there again complex interdependencies. China is primary import dependent and strongly export oriented in manufactures excluding vehicles and basic manufactures.

**Table 3.13: Intra-industry Competitiveness (IIC) by Sector and Trade Partner:  
China in ASEAN+3**

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	-	1.00	1.00	-.94	1.00	1.00	.84	-.47
Other Grains	-	1.00	1.00	1.00	-.99	-.25	-.99	-.48
Oil Seeds	-	1.00	1.00	1.00	-1.00	1.00	-.98	-.78
Sugar	-	1.00	-1.00	-1.00	-	.87	-.98	-.86
Other Crops	-	.96	.92	-.54	-.94	.90	-.91	-.48
Livestock	-	.72	.44	-.64	-.68	-.43	-.64	-.51
Energy	-	.96	-.28	-.74	.90	.93	-.09	-.36
Processed Food	-	.94	.63	-.45	-.75	-.64	-.85	-.15
Textiles	-	.04	-.69	.41	.55	.72	.03	-.12
Clothing	-	.89	.73	.99	.97	.93	.95	.92
Leather Goods	-	.94	-.26	.80	.90	.79	.78	.72
Basic Manufacturing	-	-.06	-.38	.09	.29	.10	.05	-.02
Motor Vehicles	-	-.81	.52	.76	.41	-.64	.01	-.32
Other Transport Equip.	-	-.06	-.54	.85	-.26	-.07	.58	.00
Electronic Goods	-	-.32	-.42	.02	.36	.02	.82	.06
Other Manufactures	-	-.11	-.05	.44	.47	-.08	.66	.22
Construction	-	-.32	.31	1.00	-.56	-.84	.03	-.48
Services	-	.26	.32	.34	.24	.10	.38	.24
Total	-	.06	-.29	-.04	.36	.10	.25	.08

Now look at the results (Table 3.14) for ASEAN. The IIC indexes for trade with China mirror those in Table 3.13. With respect to Japan, however, ASEAN is even more specialized than China. Export dependence in primary sectors is essentially complete, and import dependence in manufactures is very high outside the components business of basic manufacturing and electronics. This is certainly what would be expected, but it implies that ASEAN is well down the value added hierarchy from Japan. Trade with NIE is about the same in primary products, but more balanced in manufactures, again indicating the place of the two in the hierarchy and ASEAN's important regional role as a component

supplier. On the whole, ASEAN shows the highest average export orientation toward the US market. It appears to be more effective in light manufacturing exports to the EU, while remaining import dependent in higher tech (e.g. capital goods) with the US. A notable exception in the latter case is vehicles, where ASEAN is net exporter to the US.

**Table 3.14: Intra-industry Competitiveness (IIC) by Sector and Trade Partner:**

**ASEAN in ASEAN+3**

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	.94	1.00	-	.00	1.00	1.00	.65	.62
Other Grains	-1.00	-	-	-	-1.00	1.00	-1.00	-.99
Oil Seeds	-1.00	-	-	.00	-1.00	-	-1.00	-.96
Sugar	1.00	1.00	.99	.00	1.00	.90	-.87	.55
Other Crops	.54	1.00	.97	.00	.43	.97	.07	.39
Livestock	.64	1.00	.71	.00	-.19	-.63	-.44	.10
Energy	.74	.92	.20	.00	.09	.80	-.78	.18
Processed Food	.45	.93	.49	.00	.65	.84	.08	.49
Textiles	-.41	.13	-.69	.00	.69	.79	.68	-.16
Clothing	-.99	1.00	.94	.00	.99	.91	.96	.68
Leather Goods	-.80	.98	-.59	.00	.94	.75	.93	.48
Basic Manufacturing	-.09	-.23	-.25	.00	-.01	-.03	-.21	-.11
Motor Vehicles	-.76	-.93	-.68	.00	.13	-.45	.67	-.69
Other Transport Equip.	-.85	-.94	-.68	.00	-.93	-.80	-.53	-.78
Electronic Goods	-.02	-.11	.06	.00	.33	.05	.80	.14
Other Manufactures	-.44	-.53	-.35	.00	-.31	-.48	.15	-.30
Construction	-1.00	-.48	-	-	-.57	-.88	-.14	-.61
Services	-.34	.37	.33	.00	-.11	-.27	.32	.00
Total	.04	-.05	-.09	.00	.11	-.01	.15	.02

Finally, we examine IIC for Japan's bilateral trade in Table 3.15. Here we see the mirror of previous results for trade with China and ASEAN, and these have already been discussed. The general picture that emerges beyond this (last column) is a country with high import dependence in primary products and high export orientation in (especially advanced) manufactures. Given the relatively small trade in staple foods, these indices overstate the degree of specialization in the economy, but more liberal trade regimes will eventually push Japan in that direction. Meanwhile, the implicit import dependence signifies an important distortionary burden on domestic consumers and a large source of allocative inefficiency.

It is perhaps surprising that IICs in Japanese manufacturing are not even higher in absolute magnitude. This fact is due to robust imports of components and other intermediate goods coming from Japan's extensive global supply chains. As has been argued elsewhere (Roland-Holst:2003a), these networks are changing the face of regional and global trade, and further FTA and WTO liberalization will intensify this with an ironic result – increasing economic diversity and reducing overall specialization among the regional economies. Meanwhile, however, Japan and other high wage economies will have to rigorously maintain their commitments to invest (privately and publicly) for innovation and productivity growth if they are to sustain premium wage levels.

**Table 3.15: Intra-industry Competitiveness (IIC) by Sector and Trade Partner:  
Japan in ASEAN+3**

Sector	China	Japan	NIE	ASEAN	USA	EU	ROW	Total
Rice	-1.00	-	-	-1.00	-.96	1.00	-.90	-1.00
Other Grains	-1.00	-	-	-	-1.00	-1.00	-1.00	-1.00
Oil Seeds	-1.00	-	-	-	-1.00	-	-1.00	-1.00
Sugar	-1.00	-	-	-1.00	-	-1.00	-1.00	-1.00
Other Crops	-.96	-	-.62	-1.00	-.98	-.52	-.98	-.97
Livestock	-.72	-	-.21	-1.00	-.96	-1.00	-.95	-.83
Energy	-.96	.00	-.96	-.92	-.71	.10	-.97	-.94
Processed Food	-.94	-	-.71	-.93	-.77	-.50	-.89	-.87
Textiles	-.04	-	.05	-.13	.12	.07	-.31	-.04
Clothing	-.89	-	-.69	-1.00	-.59	-.79	-.41	-.89
Leather Goods	-.94	-	-.87	-.98	-.82	-.93	-.74	-.94
Basic Manufacturing	.06	-	.50	.23	-.08	-.22	-.45	.05
Motor Vehicles	.81	-	.86	.93	.71	.12	.88	.66
Other Transport Equip.	.06	-	.39	.94	-.60	.79	.88	.28
Electronic Goods	.32	-	.31	.11	.33	.16	.84	.31
Other Manufactures	.11	-	.77	.53	.05	.19	.07	.27
Construction	.32	-	.20	.48	-.83	-.81	.35	-.27
Services	-.26	-	.32	-.37	-.45	-.49	-.06	-.30
Total	-.06	.00	.23	.05	.06	-.15	-.10	-.01

#### **4. Conclusions and Extensions**

In this paper, we use a global empirical simulation model to examine a variety of trade liberalization scenarios for the East Asia. In particular, we compare China's unilateral WTO initiative with a variety of East and Southeast Asian FTAs and a reference case of global trade liberalization (GTL). Our results are consistent with some conventional intuition, in other ways contradict conclusions obtained from simplified theoretical models, and above all reveal the complexity of these issues for regional policy makers.

We find that, while GTL yields the greatest and most widespread benefit, an ASEAN+3 arrangement is beneficial to most members and delivers for them the majority of gains arising from globalization. This happens because a Trade Triangle mechanism, leveraging China's export success and domestic market growth to create unprecedented new export opportunities for its regional neighbors. The East Asian Trade Triangle enables China to "deliver globalization" to the region by joining the WTO. In this sense, East Asia can capture most of the benefits of full globalization by just forming EAFTA. The other EA countries should negotiate collectively with China, with an eye toward broader objectives. Another benefit of the regional approach is its certainty and expedient relative to a much larger multilateral negotiating agenda. Thus the most important conclusion emerging from this work is that, in the wake of China's WTO accession, the best strategy for East Asia is to pursue globalism through comprehensive regionalism.

From a strategic viewpoint, we discuss incentive properties of the regional arrangements, and note that China has a special position because of its size and unilateral commitment to opening via WTO accession. China is a critical player in the regional strategic environment because its domestic market is a great prize for neighbors who rely on external demand as an essential source of growth. Despite its decisive role in most of the important regional arrangements, however, China's strategic leverage in this context is not what it appears to be. Preferential access for individual EA exporters is not sustainable under its WTO commitments. Thus China's main carrot in regional negotiations is real, but its strategic value is limited. Furthermore, EA imports are

essential to China's export capacity. The stick of denying market access is therefore not credible against most EA partners.

Beyond this, our results fail to support the theoretical suggestion, around since the 1950's, that unilateralism generally dominates FTA membership, or its corollary that prospective members must be induced to join by incentives written into the FTA agreement. Indeed, in most cases we study, prospective members actually lose or gain significantly less from UTL and would probably experience structural reversals by pursuing this as a first move toward FTA participation, thus reducing the net benefit of the latter. The only UTL that generally dominates FTA is one where each of the country's trading partners reciprocates by eliminating (only) bilateral tariffs. Not only is this a very implausible scenario, but such benefits do not aggregate into anything representing a larger regional agreement, reflecting none other than the fallacy of composition.

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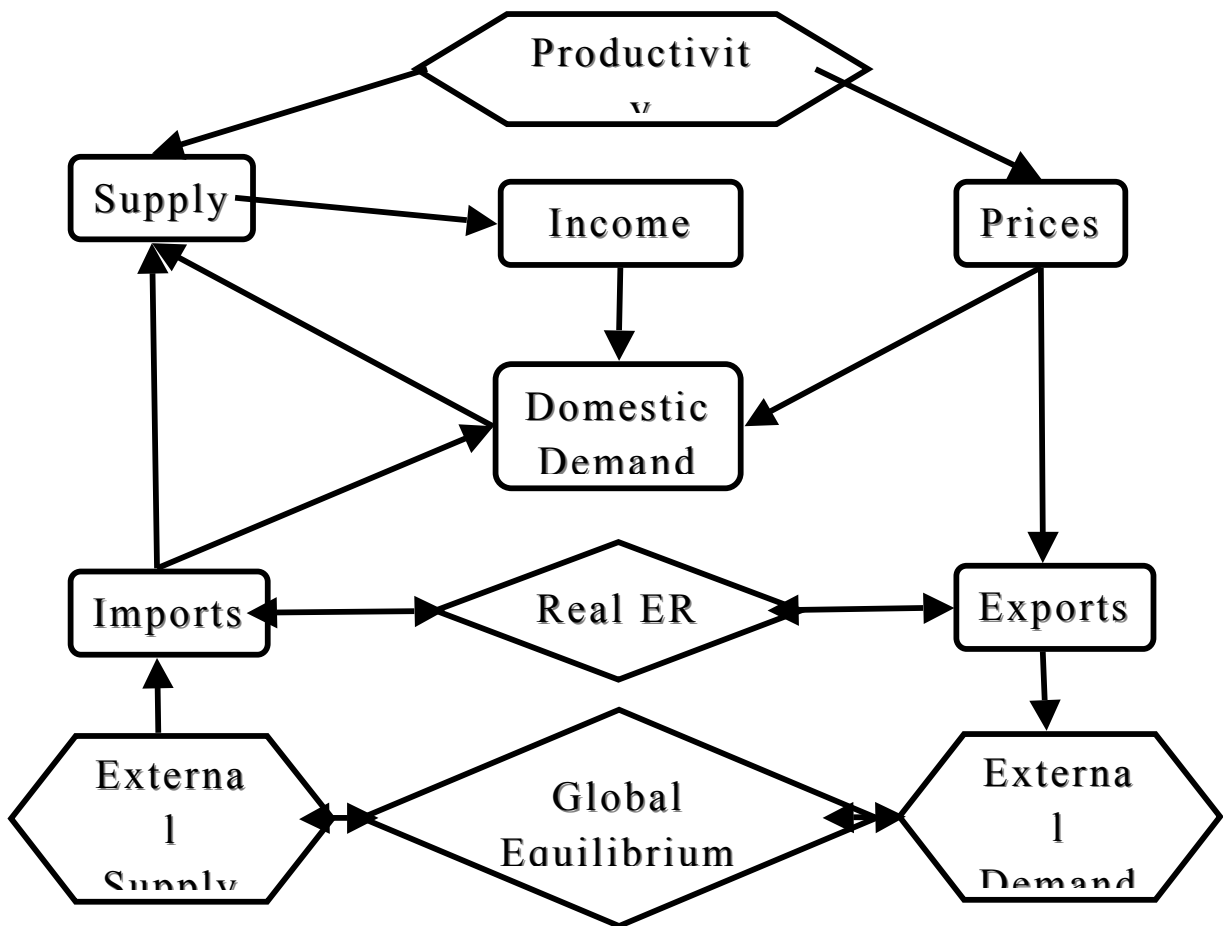


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## Annex A – Model Calibration

The model is calibrated to country and regional real GDP growth rates, obtained as consensus estimates from independent sources (DRI, IMF, Cambridge Econometrics). Using exogenous rates of implied TFP growth, the model computes supply, demand, and trade patterns compatible with domestic and global equilibrium conditions. Equilibrium is achieved by adjustments in the relative prices of domestic resources and commodities, while international equilibrium is achieved by adjusting trade patterns and real exchange rates to satisfy fixed real balance of payments constraints. The general process is schematically represented in the figure below.

**Figure B.1: General Equilibrium Calibration Mechanism**



## **Annex B - Notes on the Adjustment Process**

The calibration procedure highlights the two salient adjustment mechanisms in the model (as well as the real economies), domestic and international prices. General equilibrium price adjustments are generally well understood by professional economists but, in the multilateral context, the role of exchange rates can be a source of confusion. Generally, in a neoclassical model like this one, there are no nominal or financial variables and the function of the exchange rate is only to equalized real purchasing power between different economies.

Because models like this to not capture the aggregate price level or other nominal quantities, there is no nominal exchange rate in the sense of traditional macroeconomics or finance. Since there is no money metric in the model, all prices are relative prices, and the exchange rate (the composite relative price of foreign goods) is no exception. If there were financial assets in the model, one could define a nominal exchange rate as the relative price of two international financial assets (money, bonds, etc.). Without them, the exchange rate is defined in terms of real international purchasing power, i.e. the relative price of tradeable to nontradeable goods. In a multi-sector setting, the real exchange rate is defined as the ratio of an index of the value of all tradeables (on world markets) to an index of the value of all nontradeables.

Since any tax (or other price elevating distortion) on an import is an implicit tax on all tradeable goods, trade liberalization causes tradeable goods prices to fall and the real exchange rate depreciates. Real exchange rate depreciation also makes exports more competitive, one of the principal motives for unilateral liberalization. The general implication of this is that trade will expand rapidly for a country removing significant import protection, and more rapidly for countries removing more protection. The pattern of trade expansion, and the domestic demand and supply shifts that accompany it, depend upon initial conditions and adjustments among trading partners. At the same time, each country has rising marginal cost in production and diminishing marginal utility in consumption and, with a close multilateral trading system, trade volume changes induce terms of trade effects exactly as intuition would dictate.

## **Annex C – Baseline Trade Distortions**

Second only to baseline trade flows in their importance for the policy outcomes we consider in this paper are prior patterns of import protection. The next three tables present this information, representing a variety of perspectives on trade price distortions. For selected regions, Tables C.1 and C.2 give import protection levels by origin and destination, respectively. This helps reveal asymmetries in market openness for aggregate commodity groups. Table C.3, on the other hand, gives a matrix of trade weighted import barriers by country and region, indicating (fairly significant) asymmetries in overall domestic market access under base year (2000) patterns of trade. Table C.4 summarizes the country and regional abbreviations used in these tables.

It is important to note, even in passing, that we are not modeling significant agricultural protection in the present exercise. This means our results will generally understate the effects of trade liberalization at the aggregate level and do not fully capture sectoral adjustments, particularly in primary activities. This will be the subject of further research.

**Table C.1: Applied tariffs by region of origin**  
(percent)

	Developing East Asia					High Income East Asia				
	EAP	HYA	CUS	ROW	Total	EAP	HYA	CUS	ROW	Total
Wheat	50.8	..	0.0	0.0	49.2	109.5	256.8	409.0	293.2	192.7
Other grains	191.0	28.3	95.4	76.6	96.1	30.8	210.1	66.2	28.8	72.7
Oil seeds	76.4	78.9	86.5	87.0	86.3	69.7	76.4	56.3	64.0	58.7
Sugar	9.4	14.1	..	15.9	11.6	81.6	56.9	..	89.1	77.8
Other crops	43.6	18.1	23.3	17.6	23.7	20.0	16.5	22.4	17.7	19.6
Livestock	5.4	10.6	8.7	11.8	9.9	2.0	11.3	20.9	15.2	11.0
Energy	5.0	9.2	4.0	3.6	4.8	0.4	1.0	1.2	-0.5	0.0
Processed foods	30.3	26.8	32.7	32.5	31.0	28.2	39.1	34.6	33.5	33.3
Textile	21.5	23.5	13.9	13.9	21.3	5.5	3.3	6.2	6.3	5.5
Wearing apparel	16.8	29.6	12.0	12.0	21.1	9.9	7.1	10.3	10.8	10.0
Leather goods	10.3	9.6	8.2	6.6	9.0	12.1	5.3	10.7	10.7	11.1
Basic manufacturing	10.4	10.8	8.6	7.9	9.6	2.1	2.0	1.7	1.6	1.8
Motor vehicles	50.5	34.4	15.0	27.4	32.2	6.5	7.6	3.7	4.1	5.2
Other transp equipment	9.6	16.3	1.4	3.4	4.7	1.1	0.7	0.3	0.2	0.4
Electronic equipment	6.9	7.0	5.4	6.8	6.6	0.4	0.7	0.5	0.8	0.6
Other manufacturing	9.5	9.6	8.8	7.7	8.9	1.6	2.0	1.4	1.4	1.6
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>	<b>13.3</b>	<b>11.4</b>	<b>10.3</b>	<b>7.0</b>	<b>10.1</b>	<b>4.7</b>	<b>4.4</b>	<b>6.7</b>	<b>3.1</b>	<b>4.5</b>
Agriculture & food	51.1	23.2	49.7	31.8	38.9	28.5	43.3	43.8	32.0	36.7
Energy	5.0	9.2	4.0	3.6	4.8	0.4	1.0	1.2	-0.5	0.0
Textile & apparel	19.2	23.2	12.1	12.0	19.6	8.3	4.3	8.2	8.9	8.1
Other manufacturing	10.0	10.6	7.1	8.2	9.3	1.4	1.9	1.3	1.6	1.5
Other goods & services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes:

1. The first column (in the left hand side box) represents tariffs on imports to EAP from the four origins indicated. The first column (in the

right hand side box) represents the tariffs on imports to HYA from the four origins indicated.

2. The regional acronyms are Developing East Asia (EAP), High-income East Asia (HYA), Canada and the United States (CUS), and Europe and the rest of the world (ROW).

Source : GTAP Version 5.0.

**Table C.2: Applied Tariffs by Region of Destination**  
(percent)

	Developing East Asia					High Income East Asia				
	EAP	HYA	CUS	ROW	Total	EAP	HYA	CUS	ROW	Total
Wheat	50.8	109.5	3.5	40.9	54.8	..	256.8	0.0	34.8	169.5
Other grains	191.0	30.8	0.0	8.4	155.0	28.3	210.1	..	14.4	45.2
Oil seeds	76.4	69.7	..	6.5	45.8	78.9	76.4	0.0	0.0	61.6
Sugar	9.4	81.6	54.0	19.1	31.2	14.1	56.9	22.9	23.7	28.1
Other crops	43.6	20.0	16.0	15.6	21.5	18.1	16.5	6.5	18.9	17.0
Livestock	5.4	2.0	0.0	9.9	4.3	10.6	11.3	0.0	11.1	10.4
Energy	5.0	0.4	0.0	8.4	2.5	9.2	1.0	0.0	5.1	5.0
Processed foods	30.3	28.2	10.5	29.5	26.3	26.8	39.1	14.0	53.0	36.9
Textile	21.5	5.5	11.4	15.1	12.9	23.5	3.3	12.4	12.7	17.6
Wearing apparel	16.8	9.9	13.5	14.5	12.8	29.6	7.1	13.8	12.8	15.5
Leather goods	10.3	12.1	15.5	13.5	14.0	9.6	5.3	10.8	8.6	8.7
Basic manufacturing	10.4	2.1	3.6	9.5	6.2	10.8	2.0	3.6	8.8	7.2
Motor vehicles	50.5	6.5	2.3	15.9	14.9	34.4	7.6	2.9	13.4	10.5
Other transp equipment	9.6	1.1	3.8	5.5	5.2	16.3	0.7	1.8	10.8	8.6
Electronic equipment	6.9	0.4	1.2	6.3	2.8	7.0	0.7	1.1	5.2	3.4
Other manufacturing	9.5	1.6	2.6	7.5	4.7	9.6	2.0	2.7	6.3	5.7
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.4	0.2
<b>Total</b>	<b>13.3</b>	<b>4.7</b>	<b>4.6</b>	<b>8.4</b>	<b>7.1</b>	<b>11.4</b>	<b>4.4</b>	<b>2.6</b>	<b>6.6</b>	<b>6.4</b>
Agriculture & food	51.1	28.5	11.6	25.6	29.3	23.2	43.3	13.2	36.1	32.7
Energy	5.0	0.4	0.0	8.4	2.5	9.2	1.0	0.0	5.1	5.0
Textile & apparel	19.2	8.3	14.1	14.5	13.2	23.2	4.3	13.1	12.2	16.3
Other manufacturing	10.0	1.4	2.1	8.1	4.8	10.6	1.9	2.2	7.8	6.0
Other goods & services	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.4	0.2

Notes:

1. The first column (in the left hand side box) represents tariffs on EAP exports to the four destinations indicated. The first column (in the right hand side box) represents the tariffs HYA exports to the four destinations indicated.
2. The regional acronyms are Developing East Asia (EAP), High-income East Asia (HYA), Canada and the United States (CUS), and Europe and the rest of the world (ROW).

Source : GTAP Version 5.0.

**Table C.3: Bilateral, Trade Weighted Tariffs**  
(percent)

<u>Exporter</u>	<u>Importer</u>																											
	chn	hkg	idn	jpn	kor	mys	phl	sgp	tha	twv	vnm	anz	can	eur	lac	sas	usa	row	Total	eap	eas	nie	ean	eat	lmx	hiy	lmy	
China	chn	..	.0	7.0	8.6	25.1	8.9	11.3	.3	15.9	5.0	26.2	11.2	8.7	5.7	13.8	27.4	5.7	14.4	8.3	9.6	9.6	4.5	8.7	9.1	8.5	7.0	9.0
Hong Kong	hkg	18.2	..	6.5	4.6	5.6	2.8	2.7	.0	7.8	5.4	46.5	.0	12.4	5.2	4.4	15.4	4.2	2.4	6.3	13.4	4.3	2.9	11.2	10.9	3.6	4.9	6.8
Indonesia	idn	10.1	.0	..	5.4	5.3	10.7	6.0	.0	15.1	4.4	7.5	3.3	5.5	6.3	10.4	22.2	7.3	11.9	7.0	6.1	5.6	4.9	5.9	5.8	9.5	6.0	7.5
Japan	jpn	15.2	.0	9.6	..	7.6	8.3	6.2	.0	16.8	5.2	17.1	5.4	3.7	3.6	12.0	27.0	2.3	8.6	6.1	9.8	6.6	6.2	8.6	8.5	4.2	5.5	6.6
Korea	kor	16.4	.0	19.0	6.0	..	3.0	6.3	.0	13.4	4.5	18.0	6.4	3.0	3.9	13.3	25.4	2.9	11.6	7.7	9.6	5.8	4.5	8.7	8.8	7.6	6.1	8.7
Malaysia	mys	16.3	.0	6.6	1.8	5.4	..	4.9	.2	10.9	3.9	18.5	2.8	1.7	3.5	8.2	27.5	1.7	11.8	4.3	5.0	2.7	2.0	3.4	3.4	6.2	2.9	5.6
Philippines	phl	9.4	.0	1.1	5.2	8.9	1.4	..	.0	8.3	2.9	.0	1.5	1.3	2.4	1.8	2.3	3.8	4.8	3.3	4.6	4.3	2.4	3.9	3.8	4.0	2.3	4.2
Singapore	sgp	11.1	.0	4.4	1.2	6.2	5.0	4.0	..	11.0	3.7	14.6	1.4	.0	2.2	6.2	20.6	1.1	6.7	4.2	4.5	3.3	6.9	4.9	4.9	4.4	3.7	4.5
Thailand	tha	19.3	.0	7.8	13.4	8.0	7.1	3.4	.2	..	4.1	24.2	4.3	4.4	5.7	7.5	22.9	4.9	9.4	7.2	10.9	9.6	.7	8.1	8.2	6.8	4.6	8.9
Taiwan	twv	16.4	.0	7.9	4.5	8.0	5.4	8.8	.2	15.4	..	17.2	3.5	4.2	3.9	10.6	20.6	3.2	7.7	7.1	10.5	4.6	5.6	9.8	9.8	4.1	5.4	7.8
Vietnam	vnm	5.8	.0	.0	11.1	10.1	22.4	20.8	.0	8.5	7.9	..	1.4	10.4	10.0	9.7	.0	8.9	12.1	9.2	10.7	11.3	4.6	9.2	8.6	9.8	8.0	10.5
Australia and New Zealand	anz	14.4	.0	5.8	20.2	5.7	6.8	7.5	1.8	12.3	6.3	8.0	.0	7.9	9.2	8.6	11.4	3.0	20.5	10.3	13.4	13.2	6.3	12.2	10.7	10.7	6.9	12.4
Canada	can	22.6	.0	1.5	19.4	4.4	1.3	3.0	.0	4.2	2.9	.0	1.6	.0	3.3	9.1	7.6	.4	12.7	2.6	13.8	12.5	2.2	12.2	11.7	1.0	4.1	2.3
Western Europe	eur	11.0	.0	4.5	3.7	5.9	4.4	3.5	.1	9.5	7.3	10.7	3.4	3.8	.5	9.3	18.8	2.2	11.1	3.1	5.0	3.8	4.8	4.9	4.8	7.8	1.2	7.1
Latin America and the Caribbean	lac	19.9	.0	3.0	10.4	16.6	2.8	4.3	.5	11.8	3.1	.0	1.6	2.6	7.6	12.9	16.5	2.7	15.6	7.1	11.6	10.0	4.2	10.3	10.0	4.3	9.5	5.5
South Asia	sas	9.5	.0	3.7	10.2	8.6	8.4	5.8	.0	10.7	1.8	.0	8.1	8.9	7.3	7.8	19.5	7.0	13.9	8.7	8.4	8.1	3.4	7.3	7.3	10.6	7.0	10.0
United States	usa	13.9	.0	4.8	9.3	14.2	3.1	4.7	.1	8.7	4.2	5.1	2.8	.8	2.7	6.2	15.5	.0	8.7	5.1	9.4	8.6	3.4	8.1	7.7	9.2	3.1	9.3
Rest of the World	row	5.3	.0	2.7	1.8	5.2	3.8	1.2	.1	3.7	2.6	8.6	1.9	2.1	4.4	4.7	24.5	2.1	8.2	5.1	3.0	2.7	1.7	2.8	2.8	7.3	4.1	5.9
	Total	13.9	.0	6.6	7.0	9.4	5.4	5.0	.1	11.3	5.0	15.8	3.6	1.9	1.9	8.9	20.9	2.4	10.3	4.8	7.9	6.3	4.3	7.1	6.9	6.4	3.0	6.9
Developing East Asia	eap	15.6	.0	10.6	6.7	11.3	7.2	6.7	.1	15.2	4.9	19.4	6.2	4.7	4.3	12.1	25.8	3.5	10.0	6.6	9.1	6.9	4.8	7.9	7.9	5.9	5.5	7.4
Developing East Asia	eas	15.6	.0	11.2	4.8	7.2	6.9	5.9	.1	15.2	4.9	17.0	4.8	3.6	3.8	11.6	25.3	2.8	8.7	6.1	9.0	5.7	4.8	7.7	7.6	5.1	5.1	6.9
Newly industrialized countries	nie	15.6	.0	6.0	6.6	7.2	5.4	5.4	.2	12.8	3.8	17.4	2.8	3.0	3.7	8.7	21.0	2.9	7.7	6.0	8.3	5.1	4.6	7.7	7.7	4.8	4.5	6.8
Developing East Asia	ean	15.6	.0	9.5	6.6	10.8	6.4	6.4	.1	14.7	4.7	18.7	5.4	4.3	4.1	11.6	24.6	3.4	9.6	6.5	8.9	6.4	4.8	7.8	7.9	5.7	5.3	7.2
East Asia	eat	15.5	.0	9.1	8.4	10.2	6.4	6.6	.2	14.6	4.9	18.5	4.5	4.6	4.5	11.4	23.3	3.4	10.3	6.7	9.3	7.1	4.8	8.1	8.1	5.9	5.4	7.5
Low- and middle-income	lmx	10.7	.0	4.0	6.4	10.1	3.6	3.6	.1	6.6	3.9	5.7	2.8	1.0	3.7	6.1	21.6	2.9	8.7	5.2	7.0	6.4	2.9	6.2	6.0	8.1	3.6	7.6
High-income	hiy	14.0	.0	4.8	7.6	6.9	5.0	4.6	.2	10.7	6.0	14.2	2.7	3.7	1.0	10.7	18.2	1.9	11.4	3.9	7.5	5.9	4.7	7.0	6.8	5.9	2.1	6.4
Low- and middle-income	lmy	13.9	.0	8.1	6.5	10.6	5.8	5.3	.1	11.7	4.5	17.1	4.4	1.4	3.9	7.4	23.2	3.4	9.0	5.8	8.1	6.6	4.1	7.1	7.0	7.0	4.2	7.5

Notes: China and Hong Kong are disaggregated in the 1997 GTAP 5 dataset, but aggregated in the forecasting model.  
All regional and “Total” averages are trade-weighted ad valorem equivalent rates.