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Kym Anderson and Anna Strutt

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July 2011

Kym Anderson is Professor in the School of Economics, University of Adelaide; Anna Strutt is Senior Lecturer in Economics at the University of Waikato. This paper was prepared as a background material for the Asian Development Bank's (ADB) *Asian Development Outlook 2011*. The authors are grateful for helpful interactions with Benno Ferrarini and Ernesto Valenzuela, and for funding from ADB and the Australian Research Council. The very useful comments and suggestions from discussants and participants at the ADB Forum on South–South Economic Linkages, Manila, 10 February 2011 are gratefully acknowledged, particularly Myrna Austria, Jayant Menon, and Joseph Zveglic Jr. Thanks are also due to Tom Hertel and Terrie Walmsley for their very helpful modelling suggestions. The authors accept responsibility for any errors in the paper.

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Abstract

Developing Asia's rapid economic growth has been shifting the global economic and industrial centers of gravity away from the North Atlantic, raising the importance of Asia in world trade, and boosting South–South trade. How will trade patterns change over the next 2 decades in the course of economic growth and structural changes in developing Asia and the rest of the world?

In particular, what can be expected of developing Asia's intraregional trade and its trade with other developing country regions? This paper addresses these questions by projecting a core baseline for the world economy from 2004 to 2030 and comparing it with alternative scenarios for 2030. We employ the global economywide GTAP model and Version 7.1 of the GTAP database, and assume for the core projection that trade-related policies do not change over the next 2 decades. Alternative scenarios explore (i) slower economic growth rates in the "North", (ii) slower productivity growth in primary sectors, and (iii) various trade policy reforms in developing Asia without and with policy reforms also in the "North" and in South–South trade. Projected impacts on international prices, sectoral shares of regional gross domestic product and trade, "openness" to trade, and welfare gains from trade reforms are highlighted, in addition to their effects on regional shares of global gross domestic product and trade. The paper concludes by drawing out implications for regional and multilateral trade policy.

I. Introduction

Developing Asia's rapid economic growth is shifting the global economic and industrial center of gravity away from the North Atlantic, and accelerated globalization is causing trade to grow much faster than output, especially in Asia. Together these forces are raising the importance of developing Asia in world output and trade, as well as boosting South–South trade. Asia's share of global merchandise trade has doubled since 1973, to just over 30%, with its exports growing at three times the rate for the rest of the world over the past decade; and the People's Republic of China is now the world's largest exporter (followed by Germany and the United States). In the 1960s barely one third of the trade of Asia and Australasia was with other countries in the region, whereas in recent years that share has been more than one half—with less than one quarter with North America and Western Europe (WTO 2010). Even so, the propensity of Asia to trade with the rest of the world did not diminish over the 1970s and 1980s, thanks to its rapid growth in both gross domestic product (GDP) and share of GDP traded (Anderson and Norheim 1993).

This paper explores how trade patterns might change over the next 2 decades in the course of economic growth and structural changes in developing Asia and the rest of the world. In particular, it examines possible changes in the importance of developing Asia's intraregional trade and its trade with other developing country regions under various scenarios.

The paper begins by outlining the modelling methodology and database to be used in projecting the world economy to 2030. It then presents the results that emerge from the core projection, followed by variants on that according to some altered assumptions about growth rates and trade policies. Some caveats are then presented, before the final section draws implications for policies that can affect endowment, productivity, and income growth rates; regional trade policies; and global trade policies.

II. Modeling Methodology and 2004 Database

In this study we employ the standard GTAP model (Hertel 1997) and Version 7.1 of the GTAP database (Narayanan and Walmsley 2008). The standard GTAP model is perhaps the most widely used computable general equilibrium model for economywide global

market analysis, in part due to its robust and explicit assumptions. In its simplest form, the model assumes perfect competition and constant returns to scale in production. The functional forms are nested constant elasticities of substitution production functions. Land and other natural resources, labor (skilled and unskilled), and produced physical capital substitute for one another in a value added aggregate, and composite intermediate inputs substitute for value-added at the next constant elasticities of substitution level in fixed proportions. Land is specific to agriculture in the GTAP database, and is allowed to be mobile among alternative agricultural uses over this projection period, according to a relatively high constant elasticity of transformation which, through a revenue function, transforms land from one use to another. In the modified version of the GTAP model we use, natural resources including coal, oil, and gas, are specific to the sector in which they are mined. In the long-run model closure we adopt, labor and capital are assumed to be mobile across all uses within a country, but immobile internationally.

On the demand side there is a regional representative household whose expenditure is governed by a Cobb-Douglas aggregate utility function that allocates net national expenditures across private, government, and saving activities. The greatest advantage of this household representation is the unambiguous indicator of economic welfare dictated by the regional utility function.¹ Government demand across composite goods is determined by a Cobb-Douglas assumption (fixed budget shares). Private household demand is represented by a constant difference of elasticities functional form, which has the virtue of capturing the nonhomothetic nature of private household demands as well as permitting the user to calibrate the model to specific own-price elasticities of demand.

Bilateral international trade flows are handled through the Armington (1969) specification by which products are differentiated by country of origin. These Armington elasticities are the same across regions but are sector-specific, and the import-import elasticities have been estimated at the disaggregated GTAP commodity level (Hertel et al. 2007). For present purposes where we are dealing with very long-term changes, we have followed the typical modelling practice of doubling the short-term Armington elasticities to medium term.

The standard macroeconomic closure assumes that the levels of each region's employment of each of the productive factors are fixed in aggregate. The regional balance of trade is determined by the relationship between regional investment and savings. Investment can be allocated either in response to rates of return, with capital markets in short-run equilibrium, or in fixed shares across regions so that it moves in line with global savings. We use the fixed shares mechanism in our simulations, appropriate for the long-run simulations considered in this paper, although we do not allow international capital mobility.

¹ Altering taxes in the GTAP model does not imply a reduction in government revenue and expenditure, as government expenditures are not tied to tax revenues. A tax reduction, for example, leads to a reduction in excess burden, so regional real income increases and real expenditure—including government expenditure—may also rise.

The GTAP version 7.1 database divides the world into 112 countries/country groups, and divides each economy into 57 sectors: 20 for agriculture, food, beverages, and tobacco; six for other primary goods, 16 for manufactures, and 15 for services. For most modelling tasks, including this one, it is necessary for the sake of both computational speed and digestion of model outputs to restrict the number of regions and sectors. In the present study we initially aggregate to 33 countries/country groups and to 26 sector/product groups, as shown in column 2 of Appendix Tables 1 and 2. For the main tables shown in the text below we further aggregate to 13 regions and just four sectors, as shown in column 1 of Appendix Tables 1 and 2.

The GTAP protection database has been carefully constructed such that it represents all the significant preferential trade agreements in place as of 2004, including the ones ASEAN member governments have implemented over the past decade or so.

III. Core Projection of the Database to 2030

The GTAP database's current baseline depicts the world economy as of 2004. We project to a new core baseline for 2030 by assuming the stock of agricultural land and the trade-related policies of each country as of 2004 do not change over that 26-year period, but that national real GDP; population; unskilled and skilled labor; capital; and other natural resources (oil, gas, coal, and other minerals) grow at exogenously set rates, summarized in Appendix Table 3. The exogenous growth rates are based on ADB, OECD, USDA, and World Bank projections, along with those of Tyers and Golley (2010), Valenzuela and Anderson (2011), and Walmsley and Strutt (2009), plus historical trends in mineral and energy raw material reserves from BP (2010) and the US Geological Survey (2010). The past annual rates of change in fossil fuel reserves since 1990 are assumed to continue for each country over the next 2 decades.² For other minerals, in the absence of country-specific data, the unweighted average of the annual rate of growth of global reserves for iron ore, copper, lead, nickel, and zinc between 1995 and 2009 for all countries is used (from the US Geological Survey 2010). These rates of change in natural resources are summarized in the last four columns of Appendix Table 3.

² Reserves data are from BP (2010). For coal, however, production data are used since reserves data are not available. The growth rates for Viet Nam's oil and gas along with Thailand's coal provided implausibly high projections for the future, so they were modified.

Given those exogenous growth rates,³ the model is able to derive implied rates of total factor productivity and GDP per capita growth. For any one country the rate of total factor productivity (TFP) growth is assumed to be the same in each of its nonprimary sectors, and to be somewhat higher in its primary sectors. Higher productivity growth rates for primary activities were characteristic of the latter half of the 20th century (Martin and Mitra 2001), and are necessary in this projection if real international prices of primary products (relative to the aggregate change for all products) are to follow a relatively flat trend.⁴ Once those higher TFP growth rates for primary sectors are determined, the uniform rates for nonprimary sectors are recalculated to ensure the targeted GDP levels are obtained. Those endogenous TFP growth rates for nonprimary sectors are shown in Appendix Table 4, and the international price consequences for the core simulation are depicted in the first column of Appendix Table 5.

A. Consequences for Sectoral and Regional Compositions of GDP and Trade

The differences across regions in rates of growth of factor endowments and TFP, and the fact that sectors differ in their relative factor intensities and their share of GDP, ensure that the structures of production, consumption, and trade across sectors within countries, and also between countries, is going to be different in 2030 than in 2004.

In particular, the faster-growing developing economies (especially those of Asia) will account for considerably larger shares of the projected global economy over the next 2 decades. Their aggregate share of world GDP is projected to rise from 20% in 2004 to 35% in 2030, and for just Developing Asia from 11% to 22% (bottom rows of Table 1).

Population shares change much less, with the developing countries' share rising from 80% to 84% with Developing Asia's component falling a little, from 55% to 53% between 2004 and 2030. Thus per capita incomes converge considerably, with the ratio of the high-income to developing country average nearly halving, from 16 to 9 between 2004 and 2030. In particular, the per capita income of Developing Asia is projected to rise from 20% to 42% of the global average over the projection period (bottom rows of Table 1).

³ We note that there is much uncertainty in macroeconomic projections over this kind of timeframe. See, for example Garnaut (2011) for some discussion on the uncertain nature of GDP, population, and energy projections.

⁴ That calibration is also consistent with the World Bank projections over the next 4 decades in van der Mensbrugge and Roson (2010). An alternative in which primary product prices fall, as projected in GTAP-based projection studies in the late 20th century (e.g., Anderson et al. 1997), is considered unlikely over the next 2 decades given the slowdown in agricultural R&D investment since 1990 and its consequent delayed slowing of farm productivity growth (Alston, Babcock, and Pardey 2010). It is even less likely for farm products if biofuel mandates in the EU, the US, and elsewhere are maintained over the next decade. Timilsina et al. (2010) project that by 2020 international prices will be higher in the presence versus the absence of those mandates for sugar (10%), corn (4%), oilseeds (3%), and wheat and coarse grains (2.2%), while petroleum product prices will be 1.4% lower.

Table 1: Regional Shares of World GDP and Population, and GDP Per Capita Relative to the World Average, 2004 and the Core Projection for 2030 (percent)

	World GDP Share		World Population Share		GDP Per Capita Relative to the World Average	
	2004	2030	2004	2030	2004	2030
Western Europe	33.0	25.1	7.8	6.2	423	401
Russia	1.4	1.5	2.2	1.5	62	99
Central Asia	0.2	0.3	1.1	1.1	18	29
Rest of Eastern Europe	1.1	1.6	2.4	1.8	47	86
United States	28.5	25.1	4.6	4.5	618	564
Canada	2.4	2.3	0.5	0.5	479	506
Australia	1.6	1.6	0.3	0.3	500	519
New Zealand	0.2	0.2	0.1	0.1	378	338
Japan	11.4	7.3	2.0	1.4	569	526
China, People's Rep. of	4.1	10.6	20.4	17.1	20	62
Singapore	0.3	0.4	0.1	0.1	391	646
Indonesia	0.6	1.0	3.4	3.4	18	29
Malaysia	0.3	0.5	0.4	0.4	72	112
Philippines	0.2	0.4	1.3	1.5	16	26
Thailand	0.4	0.5	1.0	0.9	40	56
Viet Nam	0.1	0.2	1.3	1.3	8	14
Rest of Southeast Asia	0.1	0.1	1.1	1.1	5	7
Pacific Islands	0.1	0.1	0.1	0.2	38	41
Hong Kong, China	0.4	0.5	0.1	0.1	366	566
Korea, Rep. of	1.7	2.1	0.7	0.6	222	363
Taipei, China	0.7	0.8	0.4	0.3	210	301
Rest of Northeast Asia	0.1	0.1	0.4	0.4	16	20
India	1.6	3.7	17.0	17.9	9	21
Pakistan	0.2	0.6	2.4	2.7	10	21
Bangladesh	0.1	0.3	2.2	2.5	6	11
Rest of South Asia	0.1	0.2	1.2	1.4	7	14
Mexico	1.7	1.9	1.7	1.6	101	118
Argentina	0.4	0.5	0.6	0.6	61	94
Brazil	1.5	2.3	2.9	2.9	52	79
Rest of Latin America	1.7	2.4	3.5	3.6	50	67
Middle East and North Africa	2.7	3.8	5.3	6.2	52	61
South Africa	0.5	0.8	0.7	0.6	71	132
Rest of Sub-Saharan Africa	0.8	1.4	10.7	15.4	7	9
High-Income	80	65	20	16	399	398
Developing	20	35	80	84	26	42
<i>of which Asia:</i>	<i>11</i>	<i>22</i>	<i>55</i>	<i>53</i>	<i>20</i>	<i>42</i>
World	100	100	100	100	100	100

GDP = gross domestic product.

Source: Derived from the authors' GTAP Model results.

The developing country share of global exports of all products almost doubles, rising from one third in 2004 to 55% by 2030. The People's Republic of China's (PRC) share alone grows from 7% to 20% percent. Note, however, that the growth of the PRC's export share is entirely at the expense of high-income countries, as the export shares for all the other developing-country regions in Table 2 also grow. The group's import share also rises, although not quite so dramatically: the increase for Developing Asia is from 18% to 29% percent (Table 2). Capital flows explain the difference between each region's global export and import shares.

Table 2: Shares of World Exports and Imports of all Goods and Services, 2004 and 2030 (percent)

	Exports		Imports	
	2004	2030	2004	2030
Western Europe	42.3	26.3	42.5	31.0
Eastern Europe	3.6	3.9	3.2	3.7
US and Canada	13.7	10.8	18.8	18.0
ANZ	1.3	1.3	1.4	1.5
Japan	6.1	2.5	5.1	4.4
PRC	6.7	19.6	5.7	12.1
ASEAN	6.0	8.2	5.2	6.8
Pacific Islands	0.1	0.1	0.1	0.1
Rest of East Asia	6.3	6.9	5.3	5.7
South Asia	1.4	4.4	1.7	3.9
Central Asia	0.4	0.6	0.4	0.5
Latin America	5.4	6.6	4.7	5.4
Middle East and Africa	6.8	8.8	5.8	7.1
High-income	67	45	71	59
Developing	33	55	29	41
<i>of which Asia:</i>	<i>21</i>	<i>40</i>	<i>18</i>	<i>29</i>
Total	100	100	100	100

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China, US = United States.

Source: Derived from the authors' GTAP Model results.

The developing country share of primary products in world exports rises slightly and its share of manufactures in world exports rises dramatically over the projection period (doubling in Asia's case, as does its services share; see Table 3). The developing country share of primary products in world imports rises substantially though (Table 4), almost all of which is due to Developing Asia's expected continuing rapid industrialization.⁵ Developing Asia and other developing countries increase their share in total world imports by nearly half, and even by one-quarter in manufactures. The latter rise is because of

⁵ Recall, though, that we are assuming no change in agricultural trade policies over the projection period. Perhaps a more likely scenario, especially for rapidly growing Asia, would be a steady rise in agricultural protection to slow the decline in food self sufficiency, as has happened over the past 50 years in the most advanced Asian economies (see, for example, Anderson 2009).

ongoing fragmentation of global production of manufactured goods whereby the supply chain has many components whose production is footloose. In fact we understate that phenomenon because of the high degree of aggregation of manufacturing industries in the version of the GTAP model we use here.

Table 3: Regional Sectoral Shares of Global Exports of All Products, 2004 and 2030 (percent)

	Agriculture and Food	Other Primary	Manufactures	Services	Total
2004					
Western Europe	2.9	1.0	29.4	9.1	42.3
Eastern Europe	0.2	1.0	1.9	0.5	3.6
US and Canada	1.0	0.4	9.4	3.0	13.7
ANZ	0.3	0.2	0.5	0.3	1.3
Japan	0.0	0.0	5.5	0.6	6.1
PRC	0.2	0.1	6.0	0.5	6.7
ASEAN	0.4	0.4	4.4	0.7	6.0
Pacific Islands	0.0	0.0	0.0	0.0	0.1
Rest of East Asia	0.1	0.0	4.9	1.3	6.3
South Asia	0.1	0.1	0.9	0.3	1.4
Central Asia	0.0	0.2	0.1	0.1	0.4
Latin America	0.9	0.8	3.0	0.6	5.4
Middle East and Africa	0.4	3.3	2.2	0.9	6.8
High-income	4.4	2.6	46.6	13.5	67.0
Developing	2.2	4.8	21.6	4.3	33.0
<i>of which Asia:</i>	<i>0.9</i>	<i>0.7</i>	<i>16.4</i>	<i>2.8</i>	<i>20.8</i>
Total	6.6	7.4	68.2	17.8	100.0
2030					
Western Europe	2.6	1.4	16.3	5.9	26.3
Eastern Europe	0.3	1.3	1.8	0.6	3.9
US and Canada	1.5	1.0	6.3	2.0	10.8
ANZ	0.4	0.4	0.3	0.2	1.3
Japan	0.1	0.0	2.2	0.3	2.6
PRC	0.0	0.0	17.8	1.8	19.6
ASEAN	0.6	0.8	5.9	1.0	8.2
Pacific Islands	0.0	0.0	0.0	0.0	0.1
Rest of East Asia	0.1	0.0	5.5	1.3	6.9
South Asia	0.1	0.1	3.1	1.2	4.4
Central Asia	0.1	0.3	0.1	0.1	0.6
Latin America	1.0	1.5	3.4	0.7	6.6
Middle East and Africa	0.6	4.0	2.8	1.5	8.8
High-income	4.8	4.2	26.9	8.9	44.8
Developing	2.4	6.8	38.4	7.5	55.2
<i>of which Asia:</i>	<i>0.8</i>	<i>1.3</i>	<i>32.3</i>	<i>5.4</i>	<i>39.8</i>
Total	7.2	11.0	65.3	16.4	100.0

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China, US = United States.

Source: Derived from the authors' GTAP Model results.

Table 4: Regional Sectoral Shares of Global Imports of all Products, 2004 and 2030 (percent)

	Agriculture and Food	Other Primary	Manufactures	Services	Total
2004					
Western Europe	3.1	2.5	28.2	8.6	42.5
Eastern Europe	0.3	0.4	2.1	0.5	3.3
US and Canada	0.9	1.6	13.7	2.7	18.8
ANZ	0.1	0.1	1.0	0.3	1.4
Japan	0.5	0.8	2.8	1.0	5.1
PRC	0.3	0.5	4.4	0.6	5.7
ASEAN	0.3	0.4	3.8	0.8	5.2
Pacific Islands	0.0	0.0	0.1	0.0	0.1
Rest of East Asia	0.3	0.6	3.6	0.8	5.3
South Asia	0.1	0.4	1.0	0.3	1.8
Central Asia	0.0	0.0	0.3	0.1	0.4
Latin America	0.4	0.2	3.5	0.7	4.8
Middle East and Africa	0.7	0.2	3.9	1.0	5.8
High-income	4.9	5.3	47.9	13.0	71.1
Developing	2.0	2.3	20.5	4.2	28.9
<i>of which Asia:</i>	<i>1.0</i>	<i>1.9</i>	<i>13.0</i>	<i>2.5</i>	<i>18.4</i>
Total	6.9	7.6	68.3	17.2	100.0
2030					
Western Europe	1.9	1.6	20.7	6.8	31.0
Eastern Europe	0.3	0.5	2.3	0.6	3.7
US and Canada	0.6	1.5	13.3	2.6	18.0
ANZ	0.1	0.1	1.1	0.3	1.5
Japan	0.3	0.4	2.8	0.8	4.4
PRC	1.9	3.5	6.1	0.6	12.1
ASEAN	0.5	0.6	4.9	0.9	6.8
Pacific Islands	0.0	0.0	0.1	0.0	0.1
Rest of East Asia	0.3	0.8	3.8	0.8	5.7
South Asia	0.6	1.6	1.4	0.3	3.9
Central Asia	0.0	0.0	0.3	0.1	0.5
Latin America	0.4	0.4	3.8	0.8	5.4
Middle East and Africa	0.8	0.3	5.0	1.1	7.1
High-income	3.1	4.1	40.2	11.1	58.5
Developing	4.4	7.2	25.4	4.6	41.5
<i>of which Asia:</i>	<i>3.3</i>	<i>6.5</i>	<i>16.6</i>	<i>2.7</i>	<i>29.1</i>
Total	7.5	11.3	65.5	15.7	100.0

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China, US = United States.

Source: Derived from the authors' GTAP Model results.

Given the political sensitivity of farm products, regional shares of global trade in just agricultural and food products are shown in Table 5. The developing country share of exports of those goods is projected to remain virtually unchanged. However, that country group's share of global imports of farm products rises dramatically. The source of that rise is mainly the PRC but also India. This is despite the fact that agriculture's share of GDP rises slightly in those countries by 2030, as does the share of land in factorial income, instead of falling in the usual way as economic development proceeds and as occurs in other regions (see Appendix Tables 6 and 7).⁶ It is possible that these populous countries will seek to prevent such a growth in food import dependence in practice, by erecting protectionist barriers at least for food staples.

Table 5: Regional Shares of World trade in Agricultural and Food Products and Agricultural Self Sufficiency, 2004 Base and 2030 Core and Slower Growth Scenarios

(a) Regional Shares of World (including intra-EU) Trade (percent)

	Exports				Imports			
	2004 Base	2030 Core Base	2030 Slower GDP & K Growth	2030 Slower Primary TFP	2004 Base	2030 Core Base	2030 Slower GDP & K Growth	2030 Slower Primary TFP
Western Europe	43.6	36.4	35.8	32.7	45.5	25.7	24.5	23.3
Eastern Europe	3.1	4.0	3.8	4.8	4.4	3.5	3.2	3.7
US and Canada	14.4	20.3	19.1	23.4	12.4	8.2	8.0	7.5
ANZ	4.7	5.2	4.9	4.7	1.0	0.8	0.8	0.8
Japan	0.5	0.9	0.9	1.3	7.2	3.4	3.3	3.0
PRC	3.5	0.3	0.3	0.1	3.7	24.9	25.6	25.7
ASEAN	6.7	7.8	8.4	9.1	4.4	6.3	6.6	7.6
Pacific Islands	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Rest of East Asia	0.9	1.5	1.6	1.6	4.0	3.6	3.7	3.4
South Asia	2.0	1.0	1.0	1.3	1.8	7.8	8.1	6.3
Central Asia	0.5	0.8	0.8	1.0	0.4	0.4	0.5	0.5
Latin America	13.6	13.6	14.5	12.1	5.5	5.0	5.1	5.5
Middle East and Africa	6.2	8.1	8.7	7.8	9.5	10.3	10.6	12.7
High-income	66.3	66.9	64.5	66.9	70.5	41.6	39.7	38.2
Developing	33.7	33.1	35.5	33.1	29.5	58.4	60.3	61.8
<i>of which Asia:</i>	<i>13.9</i>	<i>11.5</i>	<i>12.3</i>	<i>13.2</i>	<i>14.5</i>	<i>43.2</i>	<i>44.6</i>	<i>43.6</i>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

continued.

⁶ The primary sectors' shares of GDP do not decline very much in any of the regions shown in Appendix Tables 6 and 7. This is unlike what typically has happened historically (see Schultz 1951, Clark 1957) because, unlike in the 20th century, our core projection to 2030 is calibrated to have international prices of primary products rising very slightly (for the reasons mentioned in footnote 4 above). If newly industrializing countries were to increase their agricultural protection, that would raise their agricultural share of GDP but depress international food prices relative to the core baseline.

Table 5: *continued.*

(b) Agricultural Self-Sufficiency (excluding "other food products")				
	2004 Base	2030 Core Simulation	2030 Slower GDP & K in HICs	2030 Slower Primary TFP
Western Europe	0.94	1.09	1.10	1.07
Eastern Europe	0.94	0.98	1.00	1.01
US and Canada	1.04	1.22	1.22	1.26
ANZ	1.45	1.69	1.71	1.65
Japan	0.81	0.86	0.87	0.89
PRC	0.97	0.79	0.80	0.79
ASEAN	0.97	0.88	0.88	0.84
Pacific Islands	0.92	0.85	0.86	0.84
Rest of East Asia	0.77	0.80	0.80	0.77
South Asia	1.00	0.89	0.89	0.91
Central Asia	1.05	1.11	1.12	1.14
Latin America	1.11	1.13	1.14	1.13
Middle East and Africa	0.93	0.96	0.96	0.93
High-income	0.97	1.12	1.13	1.13
Developing	0.98	0.89	0.90	0.89
<i>of which Asia:</i>	<i>0.96</i>	<i>0.84</i>	<i>0.84</i>	<i>0.84</i>

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, GDP = gross domestic product, K = capital,
 PRC = People's Republic of China, TFP = total factor productivity, US = United States.

Source: Derived from the authors' GTAP Model results.

As for the sectoral shares of national trade, the consequences of continuing Asian industrialization are again evident: primary products are less important in developing country exports and considerably more important in their imports, and conversely for nonprimary products, with the changes being largest in Developing Asia. The opposite is true for high-income countries (Tables 6 and 7), which may seem surprising. Recall, though, that what one part of the world imports, the remaining part of the world must export to maintain equilibrium. Recall also that we are assuming no growth in agricultural protectionism, which is perhaps unlikely if newly industrializing countries were to otherwise become far more dependent on food imports.

Table 6: Sectoral Shares of National Exports, 2004 and 2030 (percent)

	Agriculture and Food	Other Primary	Manufactures	Services	Total
2004					
Western Europe	6.8	2.4	69.4	21.5	100
Eastern Europe	5.8	26.6	52.7	14.8	100
US and Canada	6.9	3.1	68.3	21.7	100
ANZ	23.3	18.1	35.4	23.2	100
Japan	0.5	0.1	90.1	9.3	100
PRC	3.5	1.2	88.6	6.7	100
ASEAN	7.4	6.2	74.3	12.2	100
Pacific Islands	17.1	25.2	31.9	25.7	100
Rest of East Asia	1.0	0.2	78.4	20.4	100
South Asia	9.5	4.0	68.5	18.0	100
Central Asia	8.4	53.1	26.7	11.9	100
Latin America	16.7	15.1	56.4	11.8	100
Middle East and Africa	6.0	48.0	32.5	13.5	100
High-income	6.5	3.9	69.5	20.1	100
Developing	6.7	14.6	65.6	13.1	100
<i>of which Asia:</i>	<i>4.4</i>	<i>3.6</i>	<i>78.7</i>	<i>13.3</i>	<i>100</i>
Total	6.6	7.4	68.2	17.8	100
2030					
Western Europe	10.0	5.5	62.0	22.4	100
Eastern Europe	7.4	32.2	44.9	15.5	100
US and Canada	13.6	9.6	58.5	18.2	100
ANZ	29.8	32.1	25.4	12.6	100
Japan	2.5	1.7	84.9	10.9	100
PRC	0.1	0.1	90.5	9.3	100
ASEAN	6.9	9.2	71.6	12.3	100
Pacific Islands	11.3	31.5	30.7	26.5	100
Rest of East Asia	1.6	0.6	79.5	18.4	100
South Asia	1.6	2.7	68.9	26.8	100
Central Asia	10.0	57.7	23.2	9.0	100
Latin America	14.9	23.2	51.8	10.1	100
Middle East and Africa	6.6	45.7	31.1	16.6	100
High-income	10.8	9.4	60.0	19.9	100
Developing	4.3	12.4	69.7	13.6	100
<i>of which Asia:</i>	<i>2.1</i>	<i>3.2</i>	<i>81.2</i>	<i>13.5</i>	<i>100</i>
Total	7.2	11.0	65.3	16.4	100

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China, US = United States.

Source: Derived from the authors' GTAP Model results.

Table 7: Sectoral Shares of National Imports, 2004 and 2030 (percent)

	Agriculture and Food	Other Primary	Manufactures	Services	Total
2004					
Western Europe	7.4	5.9	66.4	20.3	100
Eastern Europe	9.3	11.0	64.7	15.0	100
US and Canada	4.5	8.5	72.8	14.1	100
ANZ	4.9	3.9	73.2	18.0	100
Japan	9.6	16.3	55.0	19.1	100
PRC	4.4	8.5	77.0	10.0	100
ASEAN	5.9	6.8	72.6	14.7	100
Pacific Islands	11.7	0.8	69.1	18.4	100
Rest of East Asia	5.3	11.5	68.2	15.0	100
South Asia	6.9	22.0	55.9	15.2	100
Central Asia	7.8	5.5	63.3	23.4	100
Latin America	7.9	4.6	73.4	14.0	100
Middle East and Africa	11.3	3.6	67.9	17.2	100
High-income	6.8	7.5	67.4	18.3	100
Developing	7.0	7.9	70.7	14.4	100
<i>of which Asia:</i>	<i>5.4</i>	<i>10.1</i>	<i>70.9</i>	<i>13.6</i>	100
Total	6.9	7.6	68.3	17.2	100
2030					
Western Europe	6.2	5.2	66.6	21.9	100
Eastern Europe	7.1	14.7	62.2	15.9	100
US and Canada	3.5	8.1	74.1	14.4	100
ANZ	4.2	3.4	72.3	20.1	100
Japan	5.8	10.1	65.3	18.7	100
PRC	15.6	29.2	50.2	5.1	100
ASEAN	7.0	8.0	72.2	12.8	100
Pacific Islands	10.8	2.6	69.0	17.6	100
Rest of East Asia	4.7	13.4	67.2	14.7	100
South Asia	15.1	40.6	36.8	7.5	100
Central Asia	6.7	7.6	63.6	22.1	100
Latin America	7.0	8.0	70.1	14.9	100
Middle East and Africa	10.9	4.0	70.0	15.1	100
High-income	5.4	7.0	68.7	19.0	100
Developing	10.6	17.3	61.0	11.1	100
<i>of which Asia:</i>	<i>11.2</i>	<i>22.2</i>	<i>57.2</i>	<i>9.4</i>	100
Total	7.5	11.3	65.5	15.7	100

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China, US = United States.

Source: Derived from the authors' GTAP Model results.

B. Consequences for South–South and other Bilateral Shares of World Trade

Turning now to bilateral trade patterns, the extent of South–South trade as a share of global trade is projected to double by 2030, rising from 12.8% to 26.5%. Among Asia's developing countries it slightly more than doubles, and for other developing countries it increases by two fifths. The share of North–North trade in global trade, by contrast, is projected to fall from 51% to 30%. Even so, the share of high-income countries' exports to Developing Asia in global trade is slightly higher by 2030, and the share of Developing Asia's exports to high-income countries in global trade is far higher, at 22% in 2030 compared with 12% in 2004 (Table 8 and Appendix Table 8). The latter is not surprising, given that the share of Developing Asia's exports in world trade doubles over this projection period, thanks not only to its high GDP growth rate but also its high and rising trade-to-GDP ratio (Table 9).

Table 8: Shares of Bilateral Trade of High-Income and Developing Countries in Global Trade, 2004 Base and 2030 Core and Slower Growth and Trade Reform Scenarios (percent)

Importer: Exporter:	High-Income	Developing Asia	Other Developing	Total
2004 Base				
High-income	51.2	9.1	6.7	67.0
Developing Asia	12.2	6.9	1.7	20.8
Other Developing	8.0	2.2	2.0	12.2
Total	71.4	18.2	10.4	100.0
2030 Core Simulation				
High-income	30.2	9.2	5.5	44.8
Developing Asia	21.5	14.2	4.1	39.7
Other Developing	7.1	5.4	2.8	15.4
Total	58.9	28.8	12.4	100.0
2030 Slower GDP and Capital Growth for HICs				
High-income	27.1	8.9	5.2	41.1
Developing Asia	22.5	15.4	4.6	42.5
Other Developing	7.3	5.9	3.2	16.4
Total	56.9	30.2	12.9	100.0

continued.

Table 8: *continued.*

Importer: Exporter:	High-Income	Developing Asia	Other Developing	Total
2030 Slower Primary TFP Growth				
High-income	28.5	10.0	7.0	45.4
Developing Asia	19.7	13.4	4.4	37.5
Other Developing	7.8	6.9	2.4	17.0
Total	56.0	30.3	13.7	100.0
2030 Core Simulation Plus ASEAN+6 Preferential Liberalization without Agriculture				
High-income	29.05	9.02	5.26	43.33
Developing Asia	21.12	16.84	3.90	41.86
Other Developing	6.95	5.12	2.73	14.80
Total	57.12	30.98	11.89	100.00
2030 Core Simulation Plus ASEAN+6 Preferential Liberalization, All Goods				
High-income	28.92	9.08	5.21	43.21
Developing Asia	21.07	17.18	3.87	42.11
Other Developing	6.93	5.03	2.72	14.68
Total	56.92	31.29	11.80	100.00
2030 Core Simulation Plus ASEAN+6 MFN Liberalization, All Goods				
High-income	27.79	10.08	4.94	42.81
Developing Asia	21.83	16.47	4.28	42.58
Other Developing	6.55	5.54	2.50	14.60
Total	56.18	32.10	11.73	100.00
2030 Core Simulation Plus Global MFN Liberalization, All Goods				
High-income	26.40	10.33	5.31	42.05
Developing Asia	20.95	15.68	5.27	41.91
Other Developing	7.62	5.83	2.58	16.04
Total	54.98	31.85	13.17	100.00
2030 Core Simulation Plus Partial South–South Trade Liberalization				
High-income	29.22	8.23	3.87	41.32
Developing Asia	19.03	16.93	6.38	42.35
Other Developing	7.04	6.30	2.99	16.33
Total	55.29	31.46	13.25	100.00

GDP = gross domestic product, HIC = high-income countries, MFN = most favored nation, TFP = total factor productivity.

Source: Derived from the authors' GTAP Model results.

Table 9: Exports Plus Imports of Goods and Services as a Proportion of GDP, 2004 Base and Alternative 2030 Simulations

	2004	2030 Core Simulation	2030 Slower HIC Growth	Slower Primary TFP Growth	ASEAN+6 NoAgri- culture	ASEAN+6 MFN	ASEAN+6 MFN	Full Liberalization	South-South Liberalization
Western Europe	0.66	0.66	0.66	0.79	0.66	0.66	0.66	0.69	0.65
Eastern Europe	0.69	0.74	0.72	0.94	0.73	0.73	0.75	0.86	0.73
US and Canada	0.27	0.30	0.30	0.37	0.29	0.29	0.30	0.31	0.29
ANZ	0.39	0.42	0.42	0.48	0.46	0.47	0.46	0.47	0.41
Japan	0.26	0.27	0.27	0.36	0.29	0.30	0.30	0.31	0.26
PRC	0.77	0.96	0.96	1.41	1.06	1.07	1.14	1.18	1.06
ASEAN	1.49	1.53	1.52	1.63	1.69	1.71	1.72	1.73	1.65
Pacific Islands	0.96	0.95	0.94	1.06	0.93	0.93	0.95	1.28	1.07
Rest of East Asia	1.05	1.07	1.06	1.38	1.12	1.14	1.18	1.22	1.15
South Asia	0.39	0.54	0.54	0.70	0.62	0.65	0.74	0.79	0.71
Central Asia	1.00	0.98	0.96	1.18	0.98	0.98	0.98	1.07	1.02
Latin America	0.49	0.50	0.49	0.62	0.50	0.50	0.50	0.60	0.56
Middle East and Africa	0.80	0.80	0.79	0.90	0.79	0.79	0.80	0.97	0.89
High-income	0.44	0.46	0.45	0.57	0.46	0.46	0.47	0.49	0.45
Developing	0.77	0.84	0.83	1.06	0.90	0.91	0.95	1.02	0.94
<i>of which Asia:</i>	<i>0.90</i>	<i>0.97</i>	<i>0.96</i>	<i>1.28</i>	<i>1.06</i>	<i>1.08</i>	<i>1.14</i>	<i>1.18</i>	<i>1.08</i>
Total	0.51	0.58	0.59	0.73	0.60	0.61	0.62	0.67	0.61

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, GDP = gross domestic product, HIC = high-income countries, MFN = most favored nation, PRC = People's Republic of China, TFP = total factor productivity.

Source: Derived from the authors' GTAP Model results.

IV. Alternative Projections to 2030

The above core projection is but one of a myriad possibilities, so in this section we explore several others and compare their economic consequences with those just summarized for 2030. Specifically, the following two alternative growth scenarios are considered, plus a set of scenarios involving varying degrees of trade policy reform:

- (i) **Reduction in rates of growth of GDP and capital** by one-third (and hence slower growth in the volume of trade) in high-income countries (the “North”).
- (ii) **Slower TFP growth in primary sectors**, so that real international prices for agricultural, mineral, and energy products by 2030 are much more above 2004 levels than in the core projection, and thus more consistent with the projections of some international agencies that specialize in those markets.
- (iii) **Full liberalization of goods trade barriers** following the formation of a free trade area among the ASEAN+6 (the PRC, Japan, the Republic of Korea, plus India, Australia, and New Zealand; see Kawai and Wignaraja 2010), under three versions of this initiative to show how much a broadening of the product and country involvement brings the potential benefits ever closer to those from global trade reform.
- (iv) **Partial liberalization of South–South goods trade barriers** aimed at bringing them down to the same as the average tariffs faced in South–North trade in 2004 for those products for which the latter are lower (most nonfarm goods; see Appendix Table 9a).

A. Reduced Rates of GDP and Capital Growth

If it is assumed the rates of growth to 2030 of GDP and capital in high-income countries are one third lower than in the core projection, this also implies slower TFP growth in all regions (Appendix Table 4), and it slows the structural transformation of output toward nonprimary sectors in Developing Asian countries (Appendix Table 6). This slowdown in high-income countries reduces their share of world GDP (by 3 percentage points) and raises the relative GDP per capita of developing countries by one ninth (Table 10).⁷ It slows slightly the increase by 2030 in the extent to which national GDP is traded

⁷ If one were to assume that this one-third reduction in growth in high-income countries also caused growth to slow by half that extent (that is, by one-sixth) in developing countries, there would be almost no change in either the regional shares of world GDP or relative GDPs per capita projected for 2030. This is because developing countries are assumed in the core scenario to continue to grow somewhat faster than high-income countries, so even if their rate of growth were to slow proportionately less, it would translate to a slowdown in GDP by a similar number of percentage points.

internationally (Table 9), which means trade would rise less over the projection period for that reason as well as because of the slower growth in GDP itself.

Table 10: Regional Shares of World GDP, and GDP Per Capita Relative to World Average, Core and Slower GDP Growth Scenarios, 2030 (percent and index)

	World GDP Share		GDP Relative to World Average	
	Core 2030 Simulation	Slower Growth in HICs	Core 2030 Simulation	Slower Growth in HICs
Western Europe	25.1	24.2	401	387
Eastern Europe	3.1	2.7	92	81
US and Canada	27.4	25.5	558	519
ANZ	1.8	1.7	490	443
Japan	7.3	7.3	526	530
PRC	10.6	11.6	62	68
ASEAN	3.0	3.3	35	38
Pacific Islands	0.1	0.1	41	44
Rest of East Asia	3.6	3.9	259	283
South Asia	4.7	5.2	19	21
Central Asia	0.3	0.3	29	32
Latin America	7.2	7.8	82	90
Middle East and Africa	5.9	6.5	27	29
High-income	64.7	61.3	398	378
Developing	35.3	38.7	42	46
<i>of which Asia:</i>	22.3	24.4	42	46
Total	100.0	100.0	100	100

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, GDP = gross domestic product, HICs = high-income countries, PRC = People's Republic of China.

Source: Derived from the authors' GTAP Model results.

With slower growth in GDP and capital there is less demand for nonfood primary products, hence their international prices relative to those for manufactures do not rise quite as much by 2030 as in the core scenario (bottom rows of Appendix Table 5).

Of particular relevance for this paper is the impact of slower high-income country growth on bilateral trade patterns. This can be seen from Table 8 and, in more detail, in Appendix Table 8. It raises the share of intra-Developing Asia trade in global trade from 14.2% to 15.4%, and of all South–South trade by almost 3 percentage points. Conversely, the share of North–North trade in global trade would be 3 percentage points lower. Similarly, regional shares of the world's agricultural trade shift away from high-income countries a little more (Table 5). If that slower growth of high-income countries did not slow down developing country growth, then all but \$116 billion of the net global cost of the slowdown (\$6,500 billion) would be borne by high-income countries (Table 11).

Table 11: Effects on Welfare and GDP of Liberalizing Trade in Asia and Globally, 2030

	Change in Welfare (in 2004 US\$ billion per year) ^a					
	Slower HIC Growth	ASEAN+6 No Agriculture	ASEAN+6 with Agriculture	ASEAN+6 MFN	Global MFN	South-South Liberalization
Western Europe	-2,203	-8.3	-7.6	18.1	65.6	-26.1
Eastern Europe	-460	-0.6	-0.5	5.8	18.1	1.9
US and Canada	-3,099	-4.1	-5.9	15.2	13.7	-19.6
ANZ	-228	1.7	12.3	4.0	7.3	-2.2
Japan	-392	14.5	29.6	25.5	33.2	-7.7
PRC	-24	2.2	-2.5	-15.0	25.1	15.5
ASEAN	-12	17.4	27.6	27.8	34.9	23.2
Pacific Islands	0	-0.1	-0.2	0.1	1.0	0.5
Rest of East Asia	-6	5.1	15.9	25.6	39.3	34.9
South Asia	3	-7.0	-2.7	16.7	26.9	18.0
Central Asia	-5	-0.1	0.0	1.1	2.9	2.5
Latin America	-19	-0.8	-1.9	4.5	18.4	13.8
Middle East and Africa	-53	-2.0	-0.2	24.3	46.4	37.7
High-income	-6,381	3.3	27.9	68.5	137.9	-53.7
Developing	-116	14.7	35.9	85.0	194.8	146.2
<i>of which Asia:</i>	<i>-44</i>	<i>17.4</i>	<i>38.0</i>	<i>56.2</i>	<i>130.0</i>	<i>94.7</i>
Other	-72	-2.7	-2.2	28.8	64.8	51.5
Total	-6,497	18.0	63.8	153.4	332.7	92.5

	Change in Real GDP (percent)				
	ASEAN+6 No Agriculture	ASEAN+6 with Agriculture	ASEAN+6 MFN	Global MFN	South-South Liberalization
Western Europe	-0.03	-0.01	0.01	0.51	-0.08
Eastern Europe	0.00	0.01	0.10	0.79	-0.02
US and Canada	0.00	0.00	0.02	0.11	-0.02
ANZ	0.11	0.09	0.16	0.17	-0.03
Japan	0.04	0.41	0.52	0.52	-0.02
PRC	0.13	0.14	0.45	0.55	0.22
ASEAN	0.67	0.79	1.95	2.08	0.92
Pacific Islands	-0.04	-0.14	0.13	2.44	1.05
Rest of East Asia	0.16	0.82	1.00	1.32	0.99
South Asia	-0.02	0.34	1.46	1.79	1.27
Central Asia	-0.04	-0.03	0.01	0.34	0.22
Latin America	0.00	-0.01	0.03	0.33	0.32
Middle East and Africa	-0.05	-0.05	0.02	1.03	0.35
High-income	0.00	0.05	0.08	0.34	-0.04
Developing	0.10	0.23	0.60	0.96	0.54
<i>of which Asia:</i>	<i>0.17</i>	<i>0.39</i>	<i>0.96</i>	<i>1.16</i>	<i>0.68</i>
World	0.03	0.11	0.25	0.55	0.15

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, GDP = gross domestic product, HIC = high-income countries, MFN = most favored nation, PRC = People's Republic of China.

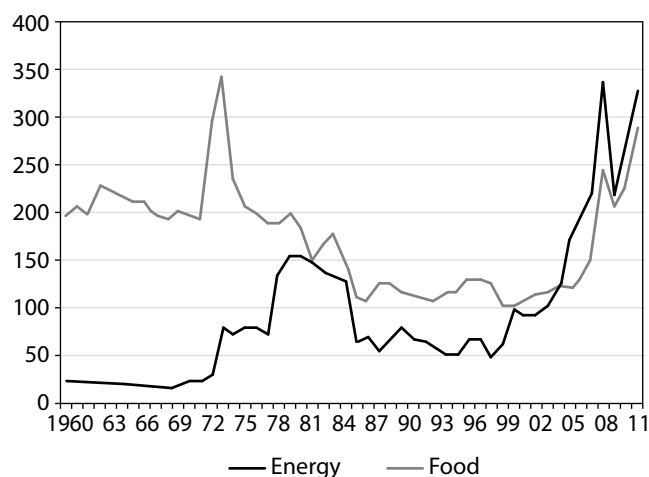
^a As measured by an equivalent variation in income.

Source: Derived from the authors' GTAP Model results.

B. Slower TFP Growth in Primary Sectors

The core projection sets higher TFP growth rates for some primary product sectors than for other sectors such that average real international prices for agricultural, mineral, and energy products by 2030 are no more than 10% above 2004 levels. That is quite different from what was experienced in the 20th century, when real primary product prices traced a long-run downward trend (apart from the 1973 and 1979 OPEC cartel-induced jumps in the price of fossil fuels). In the past decade, however, those prices have been rising (Figure 1), and price projections of several international agencies suggest they will be well above 2004 levels in the next decade or two (FAO/OECD 2010, Nelson et al. 2010, IEA 2010). Hence this second alternative scenario, in which we assume the additional TFP growth of 2 percentage points per year for forestry, fishing, and other minerals is halved. For fossil fuels, agriculture, and lightly processed food, the productivity differential in the core projection is smaller, but it too is reduced, and by the same amount as for the other natural resource sectors. These amendments lead to real international prices for farm products in 2030 to be 22% instead of just 7% above those in 2004; and those for other primary products to be 95% instead of 10% above 2004 levels (see Appendix Table 5 for details by product).

Figure 1: International Price Indexes for Food and Fossil Fuel Energy Raw Materials, 1960–2011^a (2000 = 100)



^a The 2011 data refer only to the first 2 months (January and February).

Source: World Bank, Commodity Price Data Pink Sheets, available: go.worldbank.org/5AT3JHWYU0.

Not surprisingly, the share of value added going to land and other natural resources in this scenario is much higher than in the core projection. For Developing Asia it was 5% in 2004 and 12% in the core projection in 2030 (Appendix Table 7), whereas in this slower primary TFP growth scenario for 2030 it is 26%.

The higher prices more than compensate for lower farming and mining productivity such that the share of primary products in GDP is somewhat higher in this scenario than in the core projection. The latter share for Developing Asia was 23%, whereas in this scenario it is 37% (compare the parts on “2030 core simulation” and “2030 slower primary TFP growth” in Appendix Table 6). This does not lead to developing countries being more food self-sufficient though, nor to much change in their share of global trade in farm products or in bilateral trade patterns (Tables 5 and 8). It does, however, raise considerably the share of GDP that is traded by each region (Table 9), due simply to the higher prices of primary products.

V. Trade Liberalization Scenarios

Each of the following trade liberalization scenarios is compared from the 2030 core baseline. These scenarios are intended to be indicative of potential gains that may be possible, given the anticipated size and structure of global markets in 2030. In reality, some of these agreements are already partially implemented and others, if implemented, will be staggered over time.

A. Full Liberalization of ASEAN+6 Trade Barriers versus Global Free Trade in Goods

If membership of the ASEAN free trade area were to be extended to the six additional countries currently being considered (ASEAN+6) and their goods trade were to be liberalized fully, that could go a long way toward generating the benefits that could come from global goods trade liberalization. This is because the global shares of that expanded bloc of countries in 2004 would rise from 2% to 29% for GDP, and from 6% to 38% for exports (Tables 1 and 2). But as with all such regional trading agreements, the potential benefits depend on the extent to which all trade is freed up. Hence we present results from three versions of this initiative plus global goods trade reform. Those three variants are:

- (i) All merchandise trade *except for agricultural goods* is freed within the expanded bloc (that is, on a preferential basis, with no change to barriers to trade with other countries).
- (ii) All merchandise trade *including agricultural goods* is freed within the expanded bloc.
- (iii) All merchandise trade including agricultural goods is freed within the expanded bloc *and also with the rest of the world* (that is, on a most favored nation [MFN] basis).

The economic welfare effects of those reforms are summarized in Table 11. If the ASEAN+6 initiative was purely preferential and the reform excluded farm products, the global gains would be only \$18 billion a year by 2030. That would also be the gain to Developing Asia, with high-income countries gaining another \$3 billion at the expense of other developing countries. Were agriculture *not* to be excluded from the deal, the global gains would nearly quadruple but most of them would be enjoyed in the Western Pacific, and non-Asian developing countries as a group still would be slightly worse off. Were those reforms by ASEAN+6 to be on an MFN basis (that is, removed for trade not only within the group but also with nonmembers), the global gains would more than double again, to \$153 billion per year by 2030, while the group's gain would be about 50% higher at \$56 billion. In that case non-Asian developing countries would gain around \$29 billion. For all three sets of countries, those welfare benefits are almost half what they would be if all countries of the world were to remove their barriers to goods trade. Such an extreme reform would generate welfare gains of \$333 billion per year globally by 2030, made up of just over \$130 billion each for high-income countries and Developing Asia, and about half that for other developing countries.⁸

The consequences of such reforms for the world's bilateral trade pattern are similar for all four reform options (Table 8). Not surprisingly, preferential trade reforms raise intra-developing Asian trade's share of global trade, by almost 3 percentage points. That drops back half a point if ASEAN+6 remove their barriers to trade with all partners rather than with just bloc member countries. However, South–South trade as a share of global trade is 28.8% in both cases (compared with 26.5 in the core projection), and it rises to 29.4% when all countries fully liberalize their goods trade multilaterally.

Each of these reform scenarios adds to globalization, as captured by the share of GDP traded. In the core simulation that is 58% globally, but it is 61% with ASEAN+6 preferential trade, and 67% with global free trade. For Developing Asia, those numbers are 97%, 108%, and 118%, respectively (last two rows of Table 9).

B. Partial Liberalization of South–South Trade Barriers

In this scenario, we explore the impacts of intra-South import tariffs being reduced to the average level of tariffs imposed on exports from the South to the North. Tariffs imposed by the South in the initial database tend to be relatively high, particularly to other South countries (see Appendix Table 9b). To model the impact of reduced intra-South tariffs, the South–North average tariffs for each commodity become the ceiling tariff for South–South trade, with any bilateral tariffs already lower than these remaining unaffected (that exception being predominately farm products; see Appendix Table 9a). This tariff reduction is nearly as beneficial to developing countries as a group as is a move to global

⁸ That estimated global welfare gain from freeing all of the world's merchandise trade is small both in absolute terms and compared with the welfare effect of a GDP slowdown in high-income countries (shown in column 1 of Table 11). However, as the caveats in the next section make clear, those gains from global trade reform are very much lower-bound estimates.

free trade: while it hurts high-income countries slightly, a lowering of barriers to South–South trade even to just the levels prevailing in South–North trade could bring three quarters of the gains to developing countries as would flow from a freeing of all countries’ goods trade (Table 11). Furthermore, it gives an even larger boost to the share of South–South trade in global trade, raising it to 32.6% compared with the core projection of 26.5% (Table 8).

VI. Caveats

As with the results from all other economywide projections modelling, it is necessary to keep in mind numerous qualifications. One is that for the core projection, we have assumed all trade-related policies remain unchanged through the projection period. As noted above, this is somewhat unrealistic when that simulation suggests populous developing countries such as the PRC and India would become far more dependent on food imports by 2030. We have also assumed trade expenses in the form of transport and communications costs do not change, even though they have been falling steadily during the current wave of globalization.

A trade assumption of particular note is that we allow trade imbalances to remain and even expand over time. However, even in the initial database, these are huge for the PRC and the US, and there are some quite compelling arguments that these imbalances are unlikely to be sustained over time (see Feldstein 2011 and Garnaut 2011, among others). Given that the large and rapidly growing economy of the PRC is an important driver of some of the changes we model, we tested the sensitivity of some key results to determine how they might change in an alternative scenario where the PRC’s trade surplus is constrained. In particular, we considered a fairly extreme alternative scenario in which the trade surplus for the PRC and the trade deficit for the US are essentially eliminated over the next 2 decades.⁹ Since we simply wished to test the robustness of our findings to this possibility, we did not modify other assumptions from the core baseline, including the GDP growth and capital accumulation rates, or trade balances in other regions. The importance of the PRC in global exports will decrease if it is not able to continue huge trade surpluses, while the importance of the US in global exports will increase if it no longer runs large trade deficits. Bilateral trade flows, particularly for the PRC and the US, will naturally be impacted fairly significantly by this modified assumption. There will also be repercussions for trade flows with other regions, including somewhat lower exports from most developing Asian regions to the PRC, due to the PRC’s reduced need for intermediate imported components once its net export flows are

⁹ Changes in the trade balance are accommodated here by allowing saving rates to reduce in the PRC and increase in the US, given the relationship $S-I=X-M$, consistent with the projections in Garnaut (2011). We note that the trade balance needs to be fixed relative to income to preserve homogeneity in the GTAP model, therefore it was necessary to iterate to drive the actual trade balances close to zero.

constrained. Indeed, total intra-developing Asia trade decreases significantly, given the importance of the PRC in this region. However, if we exclude the PRC from the region, total intra-developing Asian trade is a little higher than in the core baseline and we find that other developing regions also increase their relative contribution to global trade flows. If global growth rates are not impacted by the trade rebalancing, we find that this modified trade balance assumption does not change the overall pattern of our main findings. In particular, the South's share in global trade still almost doubles, from 12.7% in 2004 to 25.2% in 2030 (compared with 26.5% in our core baseline that does not constrain trade imbalances).

Second, we have aggregated the model into just 26 sectors/product groups. This leads to gross underestimation not only of the gains from trade reform but also of the extent to which firms can take advantage of intra-industry trade by exploiting the increasing opportunities to lower costs through fragmentation of the production process into ever-more pieces whose location is footloose (Hanson, Mataloni, and Slaughter 2005).

Third, we have ignored possible changes in transport costs. If they decline over time, those countries that have been trading little and in only a few products because they are small, remote, or have poor transport infrastructure will be able to trade more and thus would gain doubly if governmental barriers were to be lowered at the same time as transport costs fall (Venables 2004).

Fourth, we have assumed constant returns to scale and perfect competition rather than allowing firms to enjoy increasing returns and some degree of monopoly power for their differentiated product. This too leads to underestimates of the welfare gains from trade reform (Krugman 2009). The fact that opening an economy exposes monopolistic firms to greater competition generates gains from trade reform that could be quite substantial in terms of reducing firm mark-ups, according to numerous country case studies (see, for example, Krishna and Mitra 1998 on India, Pavcnik 2002 on Chile).

Fifth, where consumers (including firms importing intermediate inputs) value a greater variety of goods, or a greater range of qualities, intra-industry trade can grow as a result of both economic growth and trade policy reform, but that too is not taken into account in the above analysis.

Sixth, in the trade reform scenarios, we have not allowed domestic policies also to be reformed (apart from agricultural subsidies), even though it is typical for trade reforms—including in the context of signing regional trade agreements—to be part of a broader program of microeconomic policy reform. Recent studies show, for example, that when labor markets are freed up at the same time as trade, they can have very different welfare and bilateral trade effects than if those factor markets remain inflexible (Helpman, Marin, and Verdier 2008; Helpman and Itskhoki 2010). That is true also when financial market reforms are considered, not least because the inclusion of financial markets

allows an additional set of influences on real exchange rates (see, for example, McKibbin and Stegman 2005). Hoxha, Kalemli-Ozcan, and Vollrath (2009) examine gains from financial integration and find that a move from autarky to full integration of financial markets globally could boost real consumption by 7.5% permanently, even assuming no accompanying productivity gains. National case studies of reform to services trade more generally also find gains several times those from goods trade reform (Dee, Hanslow, and Pham 2003; Konan and Maskus 2006; Rutherford and Tarr 2008). However, estimating the extent of and effects of globally removing barriers to services and factor flows between countries is far less developed than methodologies applied to trade in goods (Francois and Hoekman 2010).

Seventh, the savings in bureaucratic costs of administering trade barriers, in traders' costs of circumventing barriers, and in lobbyists' costs of rent seeking to secure or maintain trade-distorting policies, are all nontrivial but are not captured in the above modelling.

Eighth, the standard GTAP model used here is comparative static. It therefore does not measure the additional dynamic gains from trade reform. Dynamic gains arise in numerous ways. One of the more important is through encouragement of the more efficient firms to take over from the less efficient in each country (Melitz 2003, Trefler 2004, Bernard et al. 2007, Melitz and Ottaviano 2008). Another way is through multinational firms sharing technologies and knowledge across countries within the firm (Markusen 2002). Offshoring is yet another mechanism through which heterogeneous firms are affected by trade liberalization, including via relocating from small to larger nations (Baldwin and Okuba 2011). The greater competition that accompanies trade reform also can stimulate more innovation (Aghion and Griffith 2005), leading to higher rates of capital accumulation and productivity growth (Lumenga-Neso, Olarreaga, and Schiff 2005).

In short, the aggregate welfare gains from freeing up trade are likely to be far bigger than the estimates reported here suggest, but their distribution, and the estimated bilateral patterns of global trade and relative GDPs of nations, also may be somewhat different if an empirical model with all of the above features had been available and used here.¹⁰ We also note that in the current modelling, we are not able to explicitly explore implications for poverty alleviation or environmental outcomes and their consequent impact on economies.

¹⁰ For more on the challenges of enhancing standard global economywide models in these ways, see Francois and Martin (2010).

VII. Conclusions

Should relatively rapid economic growth in Asia, and to a lesser extent, in other developing countries, continue to characterize world economic development to the extent suggested above, the South's share of global GDP and trade will continue to rise steeply over the next 2 decades. More particularly, the share of South–South trade in global trade is projected to double in the core projection, from 13% to 26.5%—or to 29% if GDP and capital growth in the North were to be one-sixth slower than in the core projection (or if ASEAN+6 opened up or all goods trade were to be freed globally), and to 27.1% if there were to be a 1 percentage point slowdown in annual productivity growth in the world's primary industries. Table 12 summarizes the contribution of high-income and developing countries to global exports, with the developing country share increasing from 33% in 2004 to 55% in 2030 under our core set of assumptions, and further increasing with slower growth in the North or with trade liberalization.

Table 12: Shares of Bilateral Trade of High-income and Developing Countries in Global Trade, 2004 Base and 2030 Core and Slower Growth and Trade Reform Scenarios (percent)

	2004 Base	2030 Core	2030 Slower HIC Growth	2030 Slower Primary Growth	ASEAN +6 no ag.	ASEAN +6	ASEAN +6 MFN	Global MFN	Partial South– South
High-income	67.0	44.8	41.1	45.4	43.3	43.2	42.8	42.1	41.3
Developing	33.0	55.1	58.9	54.5	56.7	56.8	57.2	57.9	58.7
<i>of which: Asia</i>	<i>20.8</i>	<i>39.7</i>	<i>42.5</i>	<i>37.5</i>	<i>41.9</i>	<i>42.1</i>	<i>42.6</i>	<i>41.9</i>	<i>42.4</i>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

HIC = high-income countries, MFN = most favored nation.

Source: Derived from the authors' GTAP Model results.

Our results suggest that a slowdown in economic growth in the North need not damage Developing Asia and other developing economies so long as the latter can keep growing. One important way to immunize developing economy growth from a slowdown in the North is through greater openness to South–South trade. We find that lowering barriers to South–South trade, even to just the levels prevailing in South–North trade, could bring three quarters of the gains to developing countries as would flow from a freeing of all countries' goods trade. Table 13 summarizes the effects on welfare, relative to that which is possible from full global removal of tariffs, for each of the trade liberalization scenarios modelled.

The results also suggest developing countries need not wait for a multilateral trade agreement to benefit from freer trade: an agreement by members of the prospective ASEAN+6 bloc to free their trade on an MFN basis could generate for Asia almost half what is estimated to flow if the whole world so liberalized. Since Doha is likely to generate only a tiny fraction of the global gains from full trade reform (Anderson and Martin 2006; Laborde, Martin, and van der Mensbrugghe 2011), the region's governments have the potential to gain even more than from Doha by freeing up under a regional agreement.

Table 13: Summary Effects on Welfare of Liberalizing Trade, Relative to the Total Gains from Global Trade Liberalization, 2030 (percent)

	ASEAN+6 no ag.	ASEAN+6	ASEAN+6 MFN	Global MFN	Partial South-South
High-income	1.0	8.4	20.6	41.4	-16.1
Developing	4.4	10.8	25.5	58.6	43.9
<i>of which: Asia</i>	5.2	11.4	16.9	39.1	28.5
Total	5.4	19.2	46.1	100.0	27.8

ASEAN = Association of Southeast Asian Nations, MFN = most favored nation.

Source: Derived from the authors' GTAP Model results.

Appendix

Appendix Table 1: Aggregations of Regions in the GTAP Model

Aggregations of Regions	Modelled Regions	Description	Original GTAP Regions
Western Europe	Western Europe	EU27 and EFTA	AUT BEL CYP CZE DNK EST FIN FRA DEU GRC HUN IRL ITA LVA LTU LUX MLT NLD POL PRT SVK SVN ESP SWE GBR CHE NOR XEF BGR ROU
Eastern Europe	Russia	Russia	RUS
	Rest of Eastern Europe	Other Europe	ALB BLR HRV UKR XEE XER TUR
United States and Canada	USC	USC	USC
	Canada	Canada	CAN
Australia and New Zealand	Australia	Australia	AUS
	New Zealand	New Zealand	NZL
Japan	Japan	Japan	JPN
China, People's Rep. of	PRC	PRC	PRC
ASEAN	Singapore	Singapore	SGP
	Indonesia	Indonesia	IDN
	Malaysia	Malaysia	MYS
	Philippines	Philippines	PHL
	Thailand	Thailand	THA
	Viet Nam	Viet Nam	VNM
	Rest of Southeast Asia	Cambodia, Lao PDR, Brunei Darussalam, Myanmar, Timor Leste	KHM LAO XSE
Pacific Islands	Pacific Islands	Pacific Countries	XOC
Rest of East Asia	Hong Kong, China	Hong Kong, China	HKG
	Korea, Rep. of	Korea, Rep. of	KOR
	Taipei, China	Taipei, China	TAP
	Rest of North East Asia	Democratic People's Republic of Korea; Macau, China; Mongolia	XEA
South Asia	India	India	IND
	Pakistan	Pakistan	PAK
	Bangladesh	Bangladesh	BGD
	Rest of South Asia	Afganistan, Bhutan, Maldives, Nepal, Sri Lanka	LKA XSA

continued.

Appendix Table 1: *continued.*

Aggregations of Regions	Modelled Regions	Description	Original GTAP Regions
Central Asia	Central Asia	Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan	KAZ KGZ XSU ARM AZE GEO
Latin America	Mexico	Mexico	MEX
	Argentina	Argentina	ARG
	Brazil	Brazil	BRA
	Rest of Latin America	Other Latin America	XNA BOL CHL COL ECU PRY PER URY VEN XSM CRI GTM NIC PAN XCA XCB
Middle East and Africa	ME_NAfrica	Middle East and North Africa	IRN XWS EGY MAR TUN XNF
	South Africa	South Africa	ZAF
	Rest of Sub-Saharan Africa	Sub-Saharan Africa	NGA SEN XWF XCF XAC ETH MDG MWI MUS MOZ TZA UGA ZMB ZWE XEC BWA XSC

Note: High-income countries (the "North") are defined as the first five country groups in the table (i.e., the regions of Western Europe, Eastern Europe, United States and Canada, Australia and New Zealand, and Japan). The rest are defined as developing countries (the "South") of which ASEAN, Central Asia, the People's Republic of China, Rest of East Asia, Pacific Islands, and South Asia make up "Developing Asia" in our analysis.

The acronyms in the column "Original GTAP Regions" follow the convention of GTAP, not of ADB. The description of modelled regions follows the convention of ADB and GTAP.

Source: Authors' compilation from www.gtap.org.

Appendix Table 2: Aggregations of Sectors in the GTAP Model

Aggregations of Commodities	Modelled Commodities	Description	Original GTAP Sectors
Agriculture (Food)	Rice	Paddy and processed rice	pdr pcr
	Wheat	Wheat	wht
	Fruit_Veg	Vegetables, fruit, nuts	v_f
	Oilseeds	Oil seeds	osd
	Sugar	Raw and processed sugar	c_b sgr
	Cotton	Plant-based fibres	pfb
	Grains	Other cereal grains	gro
	OtherCrops	Other crops	ocr
	Beef_Sheep	Beef and sheep	ctl wol cmt
	Pork_Chicken	Pork and chicken	oap omt
Other Primary	Dairy	Dairy products	rmk mil
	OtherFood	Other processed food	vol ofd b_t
	Fish_Forest	Forestry and fishing	frs fsh
	Coal	Coal	coa
	Oil	Oil	oil
Manufactures	Gas	Gas	gas
	OthMinerals	Other minerals	omn
	Text_App_Lea	Textiles, apparel, and leather	tex wap lea
	MotorVehicle	Motor vehicles and parts	mvh
	Electronics	Electronic equipment	ele
Services	OtherLtMan	Other light manufacturing	lum ppp fmp otn omf
	HeavyManuf	Heavy manufacturing	p_c crp nmm i_s nfm ome
	Utiliti_Cons	Utilities and construction	wtr cns
	Elect_Gas	Electricity and gas distribution	ely gdt
	Trade_transp	Trade and transport	trd otp wtp atp
	OthServices	Other services	cmn ofi isr obs ros osg dwe

Source: Authors' compilation from www.gtap.org.

Appendix Table 3: Average Annual GDP and Endowment Growth Rates, 2004–2030

	GDP Growth	Population Growth	Unskilled Labor	Skilled Labor	Capital	Oil	Gas	Coal	Other Minerals
Western Europe	1.72	0.12	-0.03	-0.68	1.80	2.81	0.77	-2.51	2.07
Eastern Europe	3.52	-0.34	0.18	0.66	4.04	2.64	0.12	-1.86	2.07
US and Canada	2.34	0.83	0.77	-0.20	2.54	1.00	-0.14	0.19	2.07
ANZ	2.89	0.98	0.83	-0.17	3.32	1.49	6.10	3.55	2.07
Japan	1.04	-0.44	-0.71	-1.38	1.30	0.00	0.00	-9.34	2.07
PRC	6.63	0.29	0.49	2.35	8.00	-0.40	4.85	5.62	2.07
ASEAN	4.60	1.04	1.06	2.82	4.67	1.31	1.48	11.71	2.07
Pacific Islands	3.61	1.53	1.98	3.54	3.60	1.54	1.21	0.15	2.07
Rest of East Asia	3.69	0.38	-0.14	1.62	4.09	0.00	0.00	-1.59	2.07
South Asia	6.22	1.27	1.66	3.05	7.41	0.24	-0.47	4.83	2.07
Central Asia	4.53	0.73	0.52	0.59	4.50	2.81	0.77	-2.51	2.07
Latin America	3.99	1.01	1.33	2.76	4.11	3.29	-0.34	5.15	2.07
Middle East and Africa	4.34	2.03	1.89	2.09	4.33	1.27	3.64	1.89	2.07
High-income	1.95	0.15	0.25	-0.51	2.08	2.07	0.40	-0.26	2.07
Developing	4.83	1.10	1.03	2.36	5.52	1.48	2.24	5.57	2.07
<i>of which Asia:</i>	<i>5.40</i>	<i>0.83</i>	<i>0.66</i>	<i>2.24</i>	<i>6.41</i>	<i>0.72</i>	<i>0.93</i>	<i>5.93</i>	<i>2.07</i>
Total	2.54	0.91	0.38	-0.19	2.97	1.67	1.23	2.50	2.07

ANZ = Australia and New Zealand, ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China.
Source: Authors' assumptions (see text for details).

Appendix Table 4: Implied Annual Growth in Total Factor Productivity for Nonprimary Sectors,^a 2004–2030 (percent, using 2004 national GDP values as weights)

	Core 2030 Simulation	Slower Growth HICs	Slower Primary TFP Growth
Western Europe	1.08	0.81	1.13
Eastern Europe	1.17	0.76	1.60
US and Canada	1.30	0.87	1.37
ANZ	1.14	0.74	1.27
Japan	1.04	0.89	1.06
PRC	1.25	1.25	1.66
ASEAN	1.28	1.28	1.63
Pacific Islands	0.51	0.52	0.69
Rest of East Asia	1.39	1.39	1.45
South Asia	1.69	1.69	2.35
Central Asia	1.98	1.96	2.87
Latin America	1.06	1.06	1.38
Middle East and Africa	1.12	1.12	1.79
High-income	1.17	0.84	1.23
Developing	1.25	1.25	1.66
<i>of which Asia:</i>	<i>1.38</i>	<i>1.38</i>	<i>1.74</i>
Total World	1.18	0.92	1.32

^a The above TFP growth rates are those implied for the nonprimary sectors by the GDP and factor growth rates in Appendix Table 3 and the following assumptions about primary sector TFP growth. Primary sector TFP rates were exogenously set higher than those for the nonprimary sectors to the following extent in the core projection for all countries, with the aim of ensuring slow growth in international relative prices for those products (shown in Appendix Table 5): 1% for agriculture and lightly processed food; 0% for fossil fuels; and 2% for forestry, fishing, and other minerals. In the slower primary TFP growth scenario, the increment for forestry, fishing, and other minerals is halved from the previous 2% per annum, and the increment for agriculture and lightly processed foods, along with fossil fuels, is reduced by the same amount. For the trade reform scenarios, the core projection's TFP growth assumptions are maintained.

Source: Derived from the GTAP Model, based on authors' assumptions (see text for details).

Appendix Table 5: Cumulative Changes in International Prices, 2004–2030
(price relative to global average output price change across all sectors, percent)

	Core 2030 Sim	Slower Growth HICs	Slower TFP Growth	ASEAN+6 No Agri- culture	ASEAN+6 with Agri- culture	ASEAN+6 MFN	Global MFN	South–South Liberalization
Rice	9.9	10.1	27.8	0.4	0.8	-3.0	-2.4	-0.6
Wheat	16.4	17.7	51.6	-0.3	-0.1	-2.4	-2.7	-2.8
CoarseGrains	17.3	18.4	62.6	0.0	-0.8	-1.7	0.5	-0.2
Fruit_Veg	40.0	42.4	93.5	0.3	-1.5	-5.7	-4.7	-1.3
Oilseeds	27.3	29.4	71.6	-0.2	-4.2	-8.0	-3.4	-3.9
Sugar	-2.2	-2.4	6.8	-0.1	-1.9	-3.6	-3.3	-0.7
Cotton	22.9	24.4	59.4	-1.1	-1.9	-3.0	1.3	-1.2
OtherCrops	7.6	8.0	45.6	0.0	-1.1	-2.7	-2.1	-1.6
Beef_Sheep	-1.4	-1.1	10.3	-0.1	-0.1	-0.5	-0.1	-0.5
Pork_Chicken	8.2	9.1	22.2	0.1	-0.6	-2.0	-2.9	-0.3
Dairy	-4.7	-4.8	4.8	-0.2	-0.7	-0.4	0.9	-0.5
OtherFood	2.4	3.0	7.2	0.1	-0.6	-1.5	-2.0	-0.4
Forest_Fish	30.4	32.4	86.5	-0.1	0.2	0.0	-0.7	1.1
Coal	-8.2	-10.6	115.0	-0.4	0.1	-0.8	0.2	0.1
Oil	13.5	10.9	121.9	0.2	0.4	2.5	1.2	2.5
Gas	13.6	1.9	126.0	-0.8	-0.2	0.1	-0.8	-2.1
OthMinerals	-8.8	-9.1	7.7	0.0	0.3	-0.5	-0.2	1.1
Text_App_Lea	-3.3	-3.9	-5.9	-0.6	-1.0	-2.1	-2.4	-0.2
MotorVehicle	-0.4	-0.8	-3.6	-0.2	-0.1	-0.2	-0.8	-0.4
Electronics	-4.9	-5.9	-11.1	-0.2	0.0	-0.3	0.5	0.5
OtherLtMan	-1.0	-1.4	-3.5	-0.1	-0.1	-0.2	-0.2	-0.1
HeavyManuf	-1.5	-2.3	7.4	-0.1	0.0	-0.1	-0.1	0.2
Utiliti_Cons	0.2	0.1	-3.9	0.1	0.2	0.3	0.2	-0.1
Elect_Gas	-5.8	-6.2	8.3	-0.1	0.0	0.2	0.2	-0.2
Trade_transp	-1.6	-1.4	-7.7	0.1	0.1	0.4	0.3	0.0
OthServices	0.4	0.9	-7.5	0.1	0.1	0.4	0.5	0.0
Aggregate Prices:								
Agriculture (Food)	6.7	7.4	22.4	0.1	-0.8	-2.3	-2.0	-0.7
Other Primary	10.0	7.7	94.6	0.0	0.3	1.0	0.3	1.4
Manufactures	-1.8	-2.4	1.1	-0.1	-0.1	-0.3	-0.3	0.1
Services	-0.3	0.0	-6.6	0.1	0.1	0.4	0.4	0.0

ASEAN = Association of Southeast Asian Nations, HIC = high-income countries, MFN = most favored nation, Sim = simulation.

Source: Derived from the authors' GTAP Model results.

Appendix Table 6: Sectoral Shares of Value Added, 2004 Base and 2030 Core and Slower Growth Scenarios (percent)

	Agriculture (Food)	Other Primary	Manufactures	Services	Total
2004 Base					
Western Europe	4.8	1.3	18.1	75.8	100
Eastern Europe	10.8	10.2	14.1	64.9	100
US and Canada	3.0	1.4	14.3	81.3	100
ANZ	6.3	4.6	12.1	77.0	100
Japan	3.3	0.4	16.9	79.4	100
PRC	12.0	6.4	34.4	47.3	100
ASEAN	12.6	10.0	26.4	51.0	100
Pacific Islands	5.9	8.8	12.8	72.6	100
Rest of East Asia	3.5	1.1	25.0	70.3	100
South Asia	26.0	4.9	12.9	56.2	100
Central Asia	14.2	21.2	9.0	55.5	100
Latin America	11.8	5.4	19.9	62.9	100
Middle East and Africa	11.6	26.3	9.9	52.3	100
High-income	4.1	1.5	16.2	78.2	100
Developing	12.1	9.8	21.7	56.5	100
<i>of which Asia:</i>	<i>12.4</i>	<i>5.7</i>	<i>26.4</i>	<i>55.5</i>	<i>100</i>
Total	5.7	3.2	17.3	73.9	100
2030 Core Simulation					
Western Europe	4.7	1.8	16.2	77.3	100
Eastern Europe	8.6	13.0	13.4	65.0	100
US and Canada	3.1	1.7	13.0	82.2	100
ANZ	6.4	5.5	10.3	77.8	100
Japan	2.9	0.3	14.2	82.6	100
PRC	14.3	9.3	35.2	41.1	100
ASEAN	12.0	12.8	24.9	50.3	100
Pacific Islands	4.5	11.3	12.3	72.0	100
Rest of East Asia	3.0	1.2	24.6	71.3	100
South Asia	26.8	6.9	12.2	54.1	100
Central Asia	13.4	26.9	7.8	51.8	100
Latin America	9.7	8.3	18.1	64.0	100
Middle East and Africa	10.9	26.7	9.9	52.5	100
High-income	4.0	2.2	14.3	79.6	100
Developing	13.1	11.5	22.4	53.0	100
<i>of which Asia:</i>	<i>14.7</i>	<i>8.2</i>	<i>27.0</i>	<i>50.1</i>	<i>100</i>
Total	7.0	5.2	16.9	70.9	100

continued.

Appendix Table 6: *continued.*

	Agriculture (Food)	Other Primary	Manufactures	Services	Total
2030 Slower GDP Growth					
Western Europe	4.9	1.8	15.7	77.7	100
Eastern Europe	9.1	12.7	12.5	65.7	100
US and Canada	3.2	1.5	12.6	82.7	100
ANZ	6.7	5.2	9.6	78.4	100
Japan	3.0	0.3	14.0	82.7	100
PRC	14.5	9.5	35.1	40.9	100
ASEAN	12.3	12.5	24.9	50.4	100
Pacific Islands	4.6	11.2	12.3	71.9	100
Rest of East Asia	3.0	1.2	24.7	71.1	100
South Asia	26.9	6.9	12.3	54.0	100
Central Asia	13.7	24.6	8.8	53.0	100
Latin America	9.8	7.9	18.2	64.1	100
Middle East and Africa	11.2	25.8	10.2	52.9	100
High-income	4.1	2.0	13.9	80.0	100
Developing	13.3	11.2	22.5	53.0	100
<i>of which Asia:</i>	<i>14.9</i>	<i>8.2</i>	<i>26.9</i>	<i>50.1</i>	<i>100</i>
Total	7.4	5.3	16.9	70.4	100
2030 Slower Primary TFP Growth					
Western Europe	5.8	3.4	18.1	72.8	100
Eastern Europe	11.0	27.6	9.0	52.3	100
US and Canada	4.3	4.1	12.9	78.8	100
ANZ	8.0	11.9	8.4	71.7	100
Japan	3.4	0.6	15.3	80.7	100
PRC	19.4	22.0	26.6	32.0	100
ASEAN	14.3	27.5	17.3	41.0	100
Pacific Islands	5.2	18.0	13.4	63.4	100
Rest of East Asia	4.3	2.8	24.6	68.4	100
South Asia	33.6	10.2	6.8	49.5	100
Central Asia	15.2	54.9	1.4	28.5	100
Latin America	12.0	18.2	13.7	56.2	100
Middle East and Africa	12.2	42.0	5.4	40.3	100
High-income	5.2	4.8	14.8	75.3	100
Developing	16.2	23.5	15.7	44.5	100
<i>of which Asia:</i>	<i>19.1</i>	<i>18.1</i>	<i>20.3</i>	<i>42.5</i>	<i>100</i>
Total	8.9	11.1	15.1	64.9	100

Source: Derived from the authors' GTAP Model results.

Appendix Table 7: Factorial Shares of Value Added, 2004 and 2030 (percent)

	Land	Other Natural Resources	Unskilled Labor	Skilled Labor	Capital	Total
2004 Base						
Western Europe	0.3	0.3	33.6	24.4	41.4	100
Eastern Europe	1.6	3.6	31.2	13.8	49.8	100
US and Canada	0.3	0.4	40.4	30.7	28.2	100
ANZ	0.6	1.3	34.7	24.1	39.3	100
Japan	0.2	0.1	36.7	22.6	40.4	100
PRC	2.4	2.0	27.2	8.8	59.6	100
ASEAN	3.9	2.8	29.9	10.5	52.9	100
Pacific Islands	1.1	2.4	31.0	16.9	48.6	100
Rest of East Asia	1.0	0.4	33.6	18.6	46.4	100
South Asia	8.5	1.2	34.9	11.2	44.2	100
Central Asia	2.9	8.7	33.7	11.3	43.4	100
Latin America	1.8	1.7	33.2	17.1	46.2	100
Middle East and Africa	1.0	7.9	26.4	12.9	51.8	100
High-income	0.3	0.5	36.7	26.3	36.2	100
Developing	2.5	3.0	30.4	13.3	50.8	100
<i>of which Asia:</i>	<i>3.4</i>	<i>1.7</i>	<i>30.7</i>	<i>12.0</i>	<i>52.2</i>	<i>100</i>
Total	0.8	0.9	35.5	23.7	39.1	100
2030 Core Simulation						
Western Europe	0.3	0.8	32.0	22.5	44.4	100
Eastern Europe	1.5	7.4	27.3	13.6	50.2	100
US and Canada	0.5	0.7	39.7	28.6	30.5	100
ANZ	1.1	1.9	33.0	21.7	42.3	100
Japan	0.1	0.1	35.6	21.0	43.2	100
PRC	7.0	5.5	20.8	6.7	60.0	100
ASEAN	5.0	6.2	25.1	10.1	53.6	100
Pacific Islands	1.3	6.7	27.6	17.0	47.4	100
Rest of East Asia	0.8	0.6	29.0	17.8	51.8	100
South Asia	16.0	4.9	26.0	9.9	43.2	100
Central Asia	4.2	17.1	27.2	9.8	41.7	100
Latin America	2.3	3.7	29.9	17.3	46.8	100
Middle East and Africa	2.6	15.0	23.2	12.2	47.0	100
High-income	0.5	0.9	35.6	24.6	38.4	100
Developing	5.7	6.5	24.8	11.5	51.5	100
<i>of which Asia:</i>	<i>7.5</i>	<i>4.8</i>	<i>23.9</i>	<i>9.7</i>	<i>54.1</i>	<i>100</i>
Total	2.2	2.7	32.1	20.3	42.7	100

Source: Derived from the authors' GTAP Model results.

Appendix Table 8: Shares of Bilateral Trade in Global Trade, 2004 Base and Alternative 2030 Simulations (percent)

		2004 Base											2030 Core Simulation															
Importer: Exporter:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Middle East and Africa	Total	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Middle East and Africa	Total
	Western Europe	28.46	1.66	4.29	0.38	0.88	0.95	0.96	0.04	0.76	0.46	0.13	1.02	2.33	42.31	15.82	1.37	2.35	0.26	0.43	1.52	0.71	0.03	0.53	0.54	0.10	0.79	1.84
Eastern Europe	1.87	0.61	0.27	0.01	0.07	0.13	0.07	0.00	0.09	0.04	0.10	0.07	0.24	3.56	1.39	0.74	0.21	0.01	0.05	0.76	0.09	0.00	0.09	0.08	0.10	0.09	0.31	3.93
US and Canada	3.37	0.18	4.35	0.24	0.92	0.55	0.58	0.01	0.81	0.15	0.03	1.86	0.65	13.70	1.94	0.16	3.39	0.17	0.46	1.24	0.48	0.01	0.57	0.21	0.03	1.59	0.54	10.79
ANZ	0.22	0.01	0.18	0.11	0.22	0.10	0.12	0.02	0.16	0.06	0.00	0.03	0.08	1.33	0.11	0.02	0.13	0.07	0.10	0.38	0.12	0.02	0.11	0.13	0.00	0.02	0.06	1.27
Japan	1.18	0.08	1.46	0.15	0.00	0.92	0.70	0.01	1.06	0.07	0.01	0.18	0.28	6.11	0.40	0.05	0.48	0.07	0.00	0.54	0.29	0.01	0.42	0.05	0.01	0.09	0.15	2.55
PRC	1.73	0.12	1.96	0.14	0.88	0.00	0.50	0.00	0.68	0.12	0.04	0.24	0.32	6.72	5.32	0.38	5.52	0.40	1.68	0.00	1.88	0.02	1.93	0.43	0.10	0.88	1.09	19.63
ASEAN	1.27	0.06	0.98	0.17	0.65	0.70	1.09	0.01	0.51	0.16	0.01	0.12	0.25	5.97	1.41	0.13	0.82	0.20	0.56	2.04	1.57	0.02	0.62	0.28	0.02	0.18	0.33	8.18
Pacific Islands	0.02	0.00	0.01	0.02	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.08	0.02	0.00	0.01	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Rest of East Asia	1.12	0.09	1.19	0.10	0.54	1.70	0.56	0.01	0.40	0.10	0.01	0.20	0.28	6.30	0.92	0.13	0.84	0.10	0.38	2.83	0.61	0.01	0.36	0.12	0.02	0.22	0.33	6.87
South Asia	0.46	0.03	0.30	0.02	0.04	0.06	0.08	0.00	0.05	0.07	0.00	0.04	0.20	1.36	1.36	0.13	0.74	0.07	0.12	0.31	0.32	0.00	0.18	0.22	0.01	0.18	0.79	4.43
Central Asia	0.17	0.11	0.02	0.00	0.01	0.02	0.00	0.00	0.01	0.01	0.03	0.01	0.02	0.40	0.15	0.10	0.02	0.00	0.01	0.13	0.03	0.00	0.01	0.02	0.04	0.01	0.03	0.55
Latin America	1.05	0.07	2.66	0.02	0.15	0.18	0.09	0.00	0.13	0.04	0.01	0.79	0.19	5.39	0.83	0.08	2.71	0.03	0.11	0.90	0.14	0.00	0.29	0.12	0.02	1.12	0.24	6.58
Middle East and Africa	1.97	0.16	1.16	0.06	0.71	0.32	0.36	0.00	0.57	0.46	0.02	0.15	0.84	6.77	1.76	0.32	0.79	0.08	0.45	1.19	0.51	0.00	0.60	1.63	0.04	0.22	1.25	8.84
Total	42.90	3.18	18.83	1.41	5.08	5.63	5.12	0.11	5.23	1.72	0.39	4.71	5.68	100.00	31.42	3.61	17.99	1.49	4.34	11.86	6.77	0.12	5.71	3.83	0.49	5.39	6.98	100.00

continued.

Appendix Table 8: continued.

2030 Slower GDP Growth in HICs													
Importer: Exporter:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Total
	14.69	1.22	2.13	0.24	0.40	1.53	0.69	0.03	0.52	0.54	0.10	0.78	24.64
Western Europe	14.69	1.22	2.13	0.24	0.40	1.53	0.69	0.03	0.52	0.54	0.10	0.78	24.64
Eastern Europe	1.09	0.59	0.16	0.01	0.04	0.80	0.08	0.00	0.08	0.07	0.08	0.07	3.35
US and Canada	1.66	0.14	2.86	0.15	0.40	1.18	0.43	0.01	0.51	0.20	0.03	1.47	9.51
ANZ	0.09	0.01	0.10	0.06	0.08	0.37	0.11	0.01	0.10	0.11	0.00	0.02	1.13
Japan	0.39	0.05	0.46	0.07	0.00	0.53	0.28	0.01	0.42	0.05	0.01	0.09	2.50
PRC	5.70	0.41	5.70	0.42	1.77	0.00	2.06	0.02	2.13	0.47	0.12	1.00	21.01
ASEAN	1.49	0.13	0.82	0.20	0.58	2.19	1.69	0.02	0.66	0.31	0.02	0.20	8.69
Pacific Islands	0.02	0.00	0.01	0.02	0.00	0.02	0.01	0.00	0.01	0.01	0.00	0.00	0.09
Rest of East Asia	0.97	0.13	0.87	0.11	0.40	3.06	0.65	0.01	0.40	0.13	0.02	0.25	7.36
South Asia	1.44	0.14	0.76	0.07	0.13	0.34	0.35	0.00	0.20	0.24	0.02	0.21	4.78
Central Asia	0.15	0.09	0.02	0.00	0.01	0.14	0.04	0.00	0.01	0.02	0.05	0.02	0.57
Latin America	0.88	0.08	2.73	0.03	0.12	1.00	0.16	0.00	0.34	0.13	0.02	1.26	7.01
Middle East and Africa	1.85	0.28	0.81	0.08	0.45	1.23	0.56	0.00	0.64	1.76	0.05	0.24	9.36
Total	30.41	3.27	17.43	1.45	4.36	12.38	7.13	0.12	6.00	4.04	0.50	5.61	100.00

2030 Slower Primary TFP Growth													
Importer: Exporter:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Total
	14.17	2.02	1.76	0.10	0.35	4.99	1.23	0.01	0.77	1.75	0.35	0.71	30.00
Western Europe	14.17	2.02	1.76	0.10	0.35	4.99	1.23	0.01	0.77	1.75	0.35	0.71	30.00
Eastern Europe	1.84	0.55	0.16	0.02	0.05	0.43	0.11	0.00	0.13	0.10	0.11	0.07	3.90
US and Canada	2.14	0.16	3.05	0.14	0.44	4.50	0.66	0.00	0.65	0.62	0.01	3.09	16.33
ANZ	0.26	0.01	0.18	0.06	0.07	0.39	0.16	0.02	0.09	0.08	0.00	0.03	1.41
Japan	0.35	0.05	0.46	0.10	0.00	1.57	0.51	0.00	0.32	0.14	0.00	0.11	4.36
PRC	1.47	1.13	1.43	0.45	0.71	0.00	2.33	0.02	2.46	0.24	0.18	1.05	14.11
ASEAN	0.63	0.07	0.50	0.11	0.39	2.08	1.13	0.01	0.53	0.20	0.02	0.12	6.15
Pacific Islands	0.02	0.00	0.01	0.01	0.01	0.02	0.01	0.00	0.02	0.00	0.00	0.00	0.11
Rest of East Asia	0.46	0.06	0.49	0.09	0.51	1.70	0.51	0.01	0.26	0.13	0.00	0.24	5.43
South Asia	0.68	0.06	0.21	0.10	0.08	0.72	0.24	0.00	0.15	0.14	0.02	0.07	3.83
Central Asia	0.18	0.07	0.04	0.00	0.01	0.17	0.01	0.00	0.02	0.03	0.06	0.04	0.66
Latin America	0.94	0.09	1.83	0.02	0.11	1.00	0.14	0.00	0.22	0.16	0.02	0.86	5.63
Middle East and Africa	2.80	0.25	0.66	0.07	0.20	1.53	0.31	0.00	0.41	0.56	0.01	0.23	8.09
Total	25.95	4.52	10.77	1.27	2.94	19.10	7.36	0.09	6.03	4.15	0.78	6.61	100.00

Appendix Table 8: *continued.*

2030 Full ASEAN+6 Preferential Goods Trade Liberalization, No Agriculture													
Importer:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Total
Exporter:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Total
Western Europe	15.28	1.32	2.28	0.22	0.43	1.33	0.64	0.03	0.49	0.44	0.10	0.77	25.10
Eastern Europe	1.34	0.71	0.21	0.01	0.06	0.73	0.08	0.00	0.09	0.06	0.10	0.09	3.77
US and Canada	1.88	0.16	3.28	0.15	0.47	1.12	0.42	0.01	0.53	0.17	0.03	1.54	10.29
ANZ	0.11	0.01	0.12	0.06	0.11	0.42	0.12	0.02	0.12	0.20	0.00	0.02	1.36
Japan	0.32	0.04	0.39	0.09	0.00	0.92	0.36	0.00	0.43	0.07	0.00	0.07	2.82
PRC	5.02	0.36	5.25	0.52	1.81	0.00	2.60	0.02	2.24	0.86	0.10	0.83	20.64
ASEAN	1.38	0.13	0.77	0.22	0.61	2.72	1.33	0.02	0.64	0.44	0.01	0.17	8.76
Pacific Islands	0.02	0.00	0.01	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.08
Rest of East Asia	0.85	0.11	0.77	0.11	0.39	3.16	0.68	0.01	0.33	0.15	0.01	0.20	7.06
South Asia	1.38	0.14	0.78	0.07	0.13	0.48	0.36	0.00	0.20	0.20	0.02	0.19	4.79
Central Asia	0.14	0.10	0.02	0.00	0.01	0.12	0.04	0.00	0.01	0.02	0.04	0.01	0.53
Latin America	0.80	0.07	2.63	0.03	0.11	0.85	0.13	0.00	0.27	0.10	0.01	1.08	6.33
Middle East and Africa	1.70	0.31	0.78	0.07	0.45	1.14	0.54	0.00	0.56	1.46	0.04	0.21	8.48
Total	30.22	3.47	17.30	1.56	4.57	13.00	7.32	0.11	5.91	4.18	0.47	5.20	100.00
2030 Full ASEAN+6 Preferential Goods Trade Liberalization, All Merchandise Trade													
Western Europe	15.19	1.31	2.27	0.24	0.42	1.28	0.64	0.03	0.48	0.41	0.10	0.76	24.89
Eastern Europe	1.33	0.71	0.21	0.01	0.05	0.72	0.08	0.00	0.09	0.06	0.09	0.08	3.73
US and Canada	1.88	0.16	3.28	0.17	0.45	1.06	0.43	0.01	0.51	0.16	0.03	1.53	10.18
ANZ	0.08	0.01	0.09	0.05	0.17	0.50	0.11	0.01	0.17	0.20	0.00	0.02	1.48
Japan	0.32	0.04	0.39	0.10	0.00	0.97	0.40	0.01	0.43	0.08	0.00	0.07	2.94
PRC	4.98	0.36	5.20	0.56	1.82	0.00	2.58	0.02	2.25	0.87	0.10	0.82	20.57
ASEAN	1.31	0.12	0.73	0.22	0.65	2.67	1.39	0.02	0.68	0.63	0.01	0.16	8.88
Pacific Islands	0.01	0.00	0.01	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.08
Rest of East Asia	0.84	0.11	0.76	0.11	0.41	3.23	0.69	0.01	0.33	0.15	0.01	0.20	7.12
South Asia	1.41	0.15	0.80	0.08	0.13	0.50	0.38	0.00	0.21	0.20	0.02	0.19	4.93
Central Asia	0.14	0.10	0.02	0.00	0.01	0.12	0.03	0.00	0.01	0.02	0.04	0.01	0.53
Latin America	0.80	0.07	2.62	0.03	0.11	0.82	0.14	0.00	0.27	0.08	0.01	1.08	6.27
Middle East and Africa	1.69	0.31	0.77	0.08	0.45	1.13	0.52	0.00	0.56	1.46	0.04	0.21	8.41
Total	30.00	3.44	17.15	1.67	4.67	13.00	7.41	0.11	5.97	4.32	0.47	5.15	100.00

continued.

Appendix Table 8: continued.

2030 Full ASEAN+6 MFN Goods Trade Liberalization, All Merchandise Trade														
Importer: Exporter:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Middle East and Africa	Total
	Western Europe	14.46	1.26	2.11	0.25	0.43	1.85	0.70	0.02	0.55	0.60	0.10	0.72	1.61
Eastern Europe	1.26	0.68	0.19	0.01	0.06	0.75	0.19	0.00	0.08	0.10	0.09	0.08	0.27	3.75
US and Canada	1.83	0.16	3.12	0.16	0.48	1.26	0.46	0.01	0.58	0.24	0.03	1.46	0.49	10.27
ANZ	0.11	0.01	0.12	0.05	0.12	0.44	0.11	0.02	0.15	0.15	0.00	0.02	0.06	1.35
Japan	0.37	0.04	0.44	0.08	0.00	0.78	0.33	0.01	0.44	0.05	0.01	0.08	0.14	2.77
PRC	5.45	0.40	5.49	0.49	1.72	0.00	2.35	0.02	2.19	0.65	0.11	0.89	1.09	20.86
ASEAN	1.45	0.14	0.78	0.20	0.63	2.44	1.23	0.02	0.65	0.46	0.02	0.18	0.36	8.55
Pacific Islands	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.08
Rest of East Asia	0.78	0.11	0.71	0.10	0.35	3.51	0.69	0.01	0.31	0.14	0.01	0.19	0.28	7.19
South Asia	1.49	0.18	0.86	0.08	0.13	0.49	0.41	0.00	0.23	0.24	0.02	0.22	1.03	5.38
Central Asia	0.14	0.10	0.02	0.00	0.00	0.12	0.03	0.00	0.01	0.02	0.04	0.01	0.03	0.52
Latin America	0.77	0.07	2.50	0.03	0.11	0.83	0.14	0.00	0.29	0.21	0.01	1.02	0.22	6.19
Middle East and Africa	1.58	0.29	0.70	0.07	0.43	1.08	0.49	0.00	0.57	1.88	0.04	0.19	1.07	8.41
Total	29.69	3.45	17.04	1.54	4.46	13.56	7.15	0.11	6.06	4.75	0.46	5.09	6.64	100.00

2030 Full Global Goods Trade Liberalization														
Western Europe	12.72	1.33	2.19	0.27	0.47	2.06	0.75	0.04	0.64	0.62	0.11	0.86	1.91	23.98
Eastern Europe	1.26	0.65	0.23	0.01	0.06	0.70	0.19	0.00	0.09	0.10	0.08	0.12	0.50	3.99
US and Canada	2.08	0.18	2.86	0.18	0.51	1.32	0.49	0.01	0.63	0.23	0.03	1.17	0.44	10.13
ANZ	0.17	0.01	0.12	0.05	0.12	0.38	0.10	0.02	0.14	0.12	0.00	0.03	0.04	1.30
Japan	0.42	0.05	0.39	0.07	0.00	0.70	0.30	0.00	0.40	0.05	0.00	0.14	0.11	2.64
PRC	5.43	0.43	5.18	0.43	1.55	0.00	2.09	0.02	2.03	0.59	0.09	1.34	1.34	20.52
ASEAN	1.36	0.14	0.71	0.19	0.59	2.31	1.16	0.02	0.63	0.49	0.02	0.27	0.34	8.21
Pacific Islands	0.05	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.11
Rest of East Asia	0.81	0.11	0.67	0.09	0.33	3.37	0.67	0.01	0.31	0.13	0.02	0.28	0.29	7.10
South Asia	1.37	0.28	0.77	0.08	0.13	0.51	0.43	0.01	0.25	0.30	0.02	0.34	0.96	5.44
Central Asia	0.12	0.09	0.01	0.00	0.01	0.10	0.03	0.00	0.01	0.01	0.04	0.09	0.02	0.53
Latin America	1.29	0.11	2.67	0.03	0.11	0.86	0.13	0.00	0.29	0.19	0.01	0.89	0.28	6.88
Middle East and Africa	1.81	0.31	0.75	0.09	0.45	1.16	0.54	0.00	0.62	1.97	0.06	0.22	1.20	9.16
Total	28.89	3.69	16.57	1.49	4.33	13.48	6.90	0.14	6.04	4.81	0.47	5.75	7.42	100.00

continued.

Appendix Table 8: *continued*.

2030 Partial South-South Goods Trade Liberalization														
Importer:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Middle East and Africa	Total
Exporter:	Western Europe	Eastern Europe	US and Canada	Australia and New Zealand	Japan	PRC	ASEAN	Pacific Islands	Rest of East Asia	South Asia	Central Asia	Latin America	Middle East and Africa	Total
Western Europe	15.25	1.32	2.26	0.26	0.42	1.41	0.66	0.02	0.51	0.38	0.09	0.60	1.29	24.44
Eastern Europe	1.36	0.71	0.21	0.01	0.06	0.77	0.08	0.00	0.08	0.04	0.08	0.07	0.21	3.68
US and Canada	1.92	0.16	3.26	0.18	0.46	1.16	0.45	0.01	0.56	0.14	0.03	1.07	0.43	9.81
ANZ	0.11	0.02	0.12	0.07	0.11	0.36	0.11	0.01	0.11	0.07	0.00	0.02	0.05	1.17
Japan	0.39	0.05	0.47	0.07	0.00	0.45	0.21	0.00	0.40	0.02	0.01	0.05	0.09	2.22
PRC	4.63	0.33	4.84	0.36	1.49	0.00	2.32	0.02	2.19	0.73	0.12	1.60	1.76	20.38
ASEAN	1.29	0.12	0.73	0.18	0.51	2.44	1.34	0.02	0.67	0.52	0.02	0.28	0.41	8.53
Pacific Islands	0.01	0.00	0.01	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.10
Rest of East Asia	0.71	0.10	0.65	0.08	0.30	3.52	0.73	0.01	0.34	0.16	0.02	0.34	0.39	7.35
South Asia	1.36	0.15	0.77	0.07	0.12	0.49	0.42	0.01	0.25	0.33	0.02	0.36	1.11	5.44
Central Asia	0.11	0.09	0.02	0.00	0.00	0.10	0.03	0.00	0.01	0.02	0.04	0.10	0.03	0.55
Latin America	0.82	0.07	2.78	0.03	0.11	0.95	0.17	0.00	0.36	0.23	0.01	1.09	0.35	6.99
Middle East and Africa	1.69	0.29	0.74	0.08	0.43	1.15	0.56	0.00	0.68	2.13	0.06	0.22	1.33	9.34
Total	29.64	3.40	16.84	1.40	4.02	12.81	7.11	0.12	6.16	4.77	0.49	5.80	7.45	100.00

ASEAN = Association of Southeast Asian Nations, PRC = People's Republic of China.

Source: Derived from the authors' GTAP Model results.

Appendix Table 9: Average Tariffs by Sector and Region, 2004 (percent)

(a) Tariffs Faced by the South When Exporting to the North, to Other South Regions, and to the World			
	North	Rest of South	World
Rice	89.6	21.4	33.8
Wheat	17.3	6.1	8.1
CoarseGrains	21.0	8.5	12.0
Fruit_Veg	11.7	15.8	12.8
Oilseeds	2.7	11.5	7.5
Sugar	85.3	18.5	46.1
Cotton	0.2	3.1	2.2
OtherCrops	6.2	15.1	8.3
Beef_Sheep	51.6	7.2	29.1
Pork_Chicken	16.6	7.2	13.2
Dairy	30.1	7.7	11.9
OtherFood	6.8	16.7	11.0
Forest_Fish	2.2	5.8	3.9
Coal	0.0	3.1	1.3
Oil	0.1	3.9	1.5
Gas	0.1	0.6	0.2
OthMinerals	0.1	2.1	0.9
Text_App_Lea	8.7	13.1	10.1
MotorVehicle	2.3	13.0	5.5
Electronics	0.7	1.8	1.1
OtherLtMan	1.4	7.4	3.3
HeavyManuf	1.3	6.5	4.0
Utiliti_Cons	0.0	0.0	0.0
Elect_Gas	0.0	0.4	0.2
Trade_transp	0.0	0.0	0.0
OthServices	0.0	0.0	0.0
Total	2.5	6.1	3.9

(b) Average Tariffs Imposed by Aggregate Region				
		Importing Region		
		North	South	World
Exporting region:	North	1.04	5.68	2.14
	South	2.46	6.06	3.86
	World	1.45	5.85	2.72

Source: Derived from the authors' GTAP Model baseline.

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About the Paper

Kym Anderson and Anna Strutt project the world economy to 2030 to demonstrate the extent to which developing Asia's rapid economic growth is likely to further shift the global industrial center of gravity away from the North Atlantic to Asia, increase the importance of Asia in world trade, and boost South–South trade. In their core scenario, they project the share of South–South trade in global trade to double, from 13% to 26%—or to 29% if gross domestic product and capital growth in the North were to be one-sixth slower than in the core projection (or if ASEAN+6 opened up, or if all goods trade were to be freed globally). The South's share of world exports rises from 33% in 2004 to 55% in 2030 in their core projection, and to even more if slower growth in the North is assumed, or if global trade is liberalized.

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