

**What's Next For China and Taiwan After WTO:
A Preemptive Assessment of GATS in the post-WTO Era**

**Peter C.Y. Chow, City University of New York
Zhi Wang, Economic Research Service, USDA.**

Address for Correspondence :

Professor Peter Chow
Department of Economics
The City College and Graduate Center-CUNY
Convent Avenue and 138 Street
New York New York 10031
U.S.A.

E-mail: chowpeter@yahoo.com
Tel: (212)-650-6206
Fax: (212)-650-8287

This paper was prepared for the conference on “[WTO and World Trade III](#) : Challenge in a New Era” at the Institute for International and Regional Economic Relations, Gerhard Mercator University Duisburg, in Germany on June 29-30, 2002. The views here are authors’ own opinions. They do not represent those of their affiliations.

Abstract

On January 1, 2002, after Taiwan's membership at the World Trade Organization (WTO) became effective, both China and Taiwan have become the full members of the WTO. Global trade as well as trade between China and Taiwan were projected to increase as liberalization takes place after both of them enter the WTO. However, many previous studies were focused on merchandise trade only. As the scheduled commitments from China and Taiwan become fully implemented in the post-WTO era, not only manufactured and agricultural sectors, but also the trade in service sector will be affected too.

In 1995, trade in service accounted for 21.5% and 16.3% of total trade in Taiwan and China respectively. The value-added of service in the overall economy, which accounted for 46.3% and 33.6% of total GDP in Taiwan and China respectively, will be further enhanced after liberalization of trade in service sector speeds up in the post WTO era. Trade in services worldwide, which accounted for more than \$ 2.2 trillion annually in 2000, will be further accelerated after the ongoing negotiations of the General Agreement on Trade in Service (GATS) are fully implemented after the completion of the next round of world trade liberalization. Hence, to project the world trade after China's and Taiwan's accessions to the WTO, and the trade flows across the Taiwan Strait, under which Taiwanese direct investment has grown steadily parallel to their merchandise trades, one has to integrate the trade in services.

Having been constrained by data availability on trade in service sectors, many previous studies on the impacts of China and Taiwan's WTO accessions on trade across the Taiwan Strait (as well as its impacts on the world trade) were limited at merchandise only. Hence, the relevance of policy implications from previous studies was undermined by leaving out the growing service sector. This study will use the GTAP database to further examine the impacts of

trade liberalization, due to China and Taiwan's WTO memberships, on trade in merchandise as well as service sectors between China and Taiwan in the post-WTO era.

To examine the effects of trade liberalization in the post-WTO era, this paper expands the scope of studies to include not only trade in manufactured and agricultural sectors, but also six major sectors in service industry ; (1) trade and transportation, (2) telecommunication, (3) financial services, banking and insurance, (4) other traded service, (5) utilities, and (6) housing and construction .The study further integrates China and Taiwan's final commitments to the WTO through appropriate quantifications in the model simulations and is expected to carry out more comprehensive assessments and more realistic projections on the impacts of China and Taiwan's WTO memberships on the trade and investment flows across the Taiwan Strait . By using a multi-sector, multi-region general equilibrium (CGE) model simulations, this study will assess the impacts of trade liberalization on production, trade and investment flows on the world economies, and to further investigate the trade and investment flows between China and Taiwan in the post-WTO era. It will also illustrate the impacts of WTO memberships for China and Taiwan on their social welfare, economic growth, trade and investment in other neighborhood countries too. Results from this study will provide more realistic policy implications for the economic and trade relationship across the Taiwan Strait in the post WTO era. Findings from this study will be more relevant to policy implications.

outline

- I. Introduction**
 - II. Specification of the Global Recursive Dynamic CGE Model**
 - III. Simulation Design**
 - IV. Results of Model Simulations**
 - V. Summary and Conclusions**
- Tables and Appendix**

I. Introduction

Both China and Taiwan were eventually admitted to the World Trade Organization (WTO) during the ministerial meetings of the WTO held in Doha, Qatar in November 2001.¹ Having formally included China and Taiwan in the world trade system, which had been ranked among the top 15th largest trading partners in the world, the WTO with 144 members by January 2002, will include more than 90% of global trade flows.

Global trade flows as well as trade between China and Taiwan were projected to increase as both of them enter the WTO.² However, after the scheduled commitments of trade liberalization from China and Taiwan have been fully implemented, global trade, not only manufactured and agricultural sectors, but also the trade in service sector, will be affected in the post-WTO era. Moreover, as the ongoing multilateral trade negotiations of the General Agreements on Trade in Service (GATS) is fully implemented after the completion of the next round of world trade liberalization, then trade in services world-wide will be further accelerated. Hence, to project the impacts of China's and Taiwan's WTO accessions on the global trade as well as trade flows across the Taiwan Strait, under which Taiwanese direct investment has grown steadily parallel to their merchandise trades,³ one has to integrate the trade in services in any model simulations.

In 1995, trade in service accounted for 21.5% and 16.3% of total trade in Taiwan and

¹ Taiwan applied to join the WTO as an effective customs territory under the title of "Taiwan, Penghu, Kinmen and Matsu".

² Chow, Tuan and Wang, "The Impacts of WTO Membership on Economic/Trade Relations Among The Three Chinese Economies: China, Hong Kong and Taiwan" *Pacific Economic Review*, vol.6, no.3 2001pp.419-444.

³ It was estimated that more 40% of Taiwan's outward investment was destined to China. The figures of cumulated Taiwanese capital stocks in China were ranged from \$ 40 billions to \$ 100 billions based on different estimates. In November 2001, Taiwan liberalized its investment policies toward China by abandoning the "Be patient, no haste" policy and adopting the so-called "Active openness with effective management", under which the prior approval on the ceiling of \$ 50 millions of investment destined to China will be lifted, and adopting a liberal admission policy on all investment over \$ 20 millions.

China respectively. The value-added of service sector in the overall economy, which accounted more than two thirds in the OECD countries, reached 46.3% and 33.6% of total GDP in Taiwan and China respectively in 1995. These ratios, though below the levels in the OECD countries, will be further enhanced in both China and Taiwan after liberalization of trade in service sector takes place in the post- WTO era. It will be further accelerated after the GATS are fully implemented in the near future. Many previous studies on the impacts of China's and Taiwan's WTO accessions on trade across the Taiwan Strait (as well as its impacts on the world trade) were limited to the merchandise trade only, without covering trade in services, due to constraint of data availability on trade in service sector.

By integrating China and Taiwan's final commitments to liberalize their trade in all sectors including agriculture, manufactures and services, this study will use the updated database from Global Trade Analysis Project (GTAP version 5) to further examine the impacts of WTO memberships on trade in merchandise as well as service sectors between China and Taiwan in the post-WTO era. In order to achieve that objective, this study expands the scope of model simulations to include not only trade in manufactured and agricultural sectors, but also in six major sectors in service industry; (1) trade and transportation, a portion of which is allocated to international shipping (2) telecommunication, (3) financial services, banking and insurance, (4) other traded service, (5) utilities, and (6) housing and construction. Moreover, this study further integrates China and Taiwan's scheduled commitments to the WTO, including those in the service sectors, into the model simulations through appropriate quantifications. It is expected to carry out more comprehensive assessments and more accurate projections on the impacts of China's and Taiwan's WTO memberships on the trade and investment flows across the Taiwan Strait. Therefore, results from this study could serve as a preemptive assessment on the GATS, and to provide some empirical ground for policy assessments in evaluating the probable outcomes of the GATS on the economic and trade relations in the future.

The organization of the paper is in the following order; descriptions of the multi-sector, multi-region general equilibrium (CGE) model simulations are presented in Section II. Simulation design is reported in Section III. The assessments of the impacts of trade liberalization on production, trade and investment flows on the world economies, and between China and Taiwan in the post-WTO era are presented in Section IV. The final section will summarize the results of simulation and policy implications for the economic and trade relationship across the Taiwan Strait in the post WTO era.

II. Specification of the Global Recursive Dynamic CGE Model

The model underlying in this paper is an extension of the computable general equilibrium (CGE) models used in the China's WTO accession study by Wang (1997, 1999) with import embodied technology transfer and trade policy induced total factor productivity (TFP) growth. It is part of the series of models widely adopted by economist to analyze the impact of global trade liberalization and structural adjustment programs. It incorporates considerably details on sectoral output and trade flows, both bilateral and global, with emphases are on the real side of the world economy.

However, one of its legacies is that the structural detail is obtained at the expense of sacrificing explicit modeling on financial markets, interest rates, and inflation. While not designed to generate short-term macroeconomic forecasts, the model could be linked to a macro economic model including asset flows and generating macro scenarios. Given a macro scenario, however, this model could then be used to determine the resulting real trade flows and sectoral structural adjustments for each economy in a recursive dynamic framework. Under assumptions on a likely path of future world economic growth, it generates the pattern of production and trade resulting from world economic adjustment to the shocks specified in the alternative macro scenarios.

IIA) Description of the model

In this study, 18 fully endogenized countries (regions) and 26 production sectors in each region are specified to represent the world economy. The 18 countries (regions) include: four groups of industrialized countries; (1) the United States, (2) Japan, (3) 15 countries of European Union and (4) other OECD, three groups of developing countries; (5) Latin America (6) India, (7) China, two groups of newly industrialized countries (economies)-NICs (8) Hong Kong, (9) Korea, (10), Singapore and (11) Taiwan.; the ASEAN countries; (12) Indonesia , (13) Malaysia, (14) the Philippines , (15) Thailand, (16) Viet Nam,⁴ one group of emerging market economies ; (17) the former Soviet block -FSU, and (18) Rest of the World. Factor endowments, resources intensities and the relative size of the economies in model simulations for the 18 countries (regions) in 1997 are summarized in Table 1.

The 26 sectors include five major product categories;

1) food and agricultural products, which include three sub-sectors:

(a) Land-intensive crops, (b) other primary agricultural products, and (c) processed agricultural products,

2) natural resource based products, which include four sub-sectors:

(a) forestry and fishery, (b) oil and natural gas, (c) other mining, and (d) paper & wood products,

3) labor-intensive products, which include 4 sub-sectors of manufacturing sectors in

(a) textiles, (b) wearing apparel, (c) leather, shoes and sporting goods, (d) other light manufactures,

4) capital-intensive products, which include 9 sub-sectors in

(a) chemical rubber plastic products ,(b)petroleum coal products, (c) metals, (d) other mineral products, (e) metal products, (f) motor vehicles and parts, (g)

⁴ With the exception of Viet Nam, these countries are usually labeled as the next-tier of the NICs.

other transport equipment, (h) electronic equipment, (i) machinery and equipment,

- 5) service sectors, which include: (a) trade and transportation, a portion of which is allocated to international shipping (b) communication services, (c) financial services, banking and insurance, (d) other traded service, (e) utilities, and (g) housing and construction.

The correspondence between sectors in the model, GTAP and ISIC are listed in Appendix A. The initial net trade patterns, defined as total export minus total import, for each of the 18 countries (regions) in the 26 sectors in the base year of 1997 are reported in Table 2. A positive sign in Table 2 means that the country is a “ net exporter “ whereas a negative sign means a “ net importer” in that sector. To some extent, it also indicates the “ comparative advantage “ versus “ comparative disadvantage” in that sector. Looking at the first and the second columns on Table 2, one can find that both China and Taiwan are “ net importer” of resources-based products and services. But they are “ net exporters “ in labor-intensive sectors. However, while China is a “ net exporter “ of food and agricultural products, but a “ net importer” of capital-intensive products, Taiwan is a “ net importer” of food and agricultural products, but a “ net exporter” of capital-intensive products.

There are six primary factors of production: agricultural land, natural resources, capital, agricultural labor, unskilled-labor, and skilled-labor. Skilled- and unskilled-labor have basic education in common, with skilled-labor having more advanced training. Agricultural labor has little or no education and works only in the farm sector. Natural resources are sector specific, while other primary factors are assumed to be mobile across sectors, but immobile across regions. Land and agricultural labor are only employed in agricultural sectors. The intra-period

See Bradford (1987), and chapter 10 of Chow and Kellman (1993).

equilibrium structure and inter-period linkages are similar with what is described in Wang (1999).⁵

In general, one can capture three types of gains from trade liberalization from the model simulations adopted in this study;

- (1) The gains from more efficient utilization of resources, which lead to a one-time permanent increase in GDP and social welfare.
- (2) More rapid physical capital accumulation from a "medium-run growth bonus" which compounds the efficiency gain from trade liberalization and leads to higher saving and investment.
- (3) The model incorporates a capital and intermediate goods imports embodied technology transfer among regions, which links sector specific TFP growth with each region's imports of capital and technology intensive products.

The technology transfer is assumed to flow in one direction -- from more developed regions to less developed regions. Empirical evidences suggest that there is strong positive feedback between trade expansion and productivity growth.⁶ Trade liberalization increases the prevalence of technology transfer as trade barriers are reduced. Firms in the liberalized regions will import more capital and technology intensive goods as both investment and intermediate inputs from abroad at cheaper prices. Those goods are usually embodied with advanced technology from other countries, thus stimulating productivity growth for all production factors.

Accumulation patterns for capital stock in the model depend upon depreciation and gross real investment rates, the latter set exogenously based on forecasts from the Oxford world macroeconomic model (Oxford Economic Forecasting, 1999). However, household savings, government surplus (deficit), and foreign capital inflows (foreign savings) are assumed to be

⁵ A detailed algebraic specification of the model is available from the authors upon request.

⁶ For example, export growth could boost the productivity not only on export sector, but also in

perfect substitutes and collectively constitute the source of gross investment in each region. It means that changes in the trade balance, which directly affect foreign savings, are assumed to have only a partial effect on aggregate real investment in the region. Instead, they lead to an equilibrium adjustment in the domestic savings rate, which partially offsets the change in foreign savings.

Government surplus (deficit) is the difference between government tax revenues and its expenditures, the latter fixed as a percentage of each region's real GDP based on forecasts from the Oxford model. Foreign capital inflows or outflows are determined by the accumulation of the balance of trade, which is also fixed as a percentage of GDP in each region based on the Oxford model's projections except for the United States.

There are an economy-wide and a set of sector specific TFP growth variables for each region in the model. The economy-wide TFP variable is solved endogenously in the baseline calibration to match a pre-specified path of real GDP growth in each region based on forecasts from the Oxford model. Then the economy-wide TFP variable is fixed when alternative scenarios are simulated, in such a case, the growth rate of real GDP and the sector-specific TFP variables that link productivity growth and imports are solved endogenously.

Similar to Hertel et. al (1995), the multi-fiber agreement (MFA) quota rents are assumed to be captured by exporting countries as export taxes, and these export tax rates are adjusted endogenously to equate with the quotas. Such a treatment assumes that all quotas are binding constraints at equilibrium. Consistent with this modeling practice, we divide developing countries, subject to MFA quota restrictions, into quota binding and non-binding regions

non-export sector of the economy. See Feder (1982).

based on historical trade statistics.⁷ Quantity constraints only apply to those regions with binding quotas.

II B) Algebraic Specification of the Model

This section provides a detailed mathematical specification of the 18-region, 26 sector recursive dynamic CGE model for world production and trade used in this report.

Notation:

Regions are defined in set R and indexed by r or s ;

Sectors are defined in set I and indexed by i or j ;

Agricultural sectors are defined as a subset of I : $IAG(I)$;

Natural Resource based sectors are defined as a subset of I : $RES(I)$;

Primary factors are defined in set F and indexed by f ;

Conventions:

Uppercase English letter indicates variables, unless they have a bar on top, in which case that variable always set exogenously. Greek letter or lower English letter refers to parameters, which need to be calibrated or supplied from exogenous sources. When multiple subscripts of a variable or parameter come from the same set, the first one represents the region or sector supplying goods; the next one represents the region or sector purchasing goods.

Price Equations

Equations 1-11 are price equations in the model. Equations 1 and 2 define the relationship between border (world) prices and internal prices, while equations 3, 4, 6, 7, and 8

⁷ There are 14 developing regions in the model, 10 of which are subject to binding MFA quotas. They are Korea, Taiwan, Hong Kong, Singapore, China, Malaysia, Thailand, Philippines, Indonesia, India, While Vie Nam, Latin America, Former FSU block, and the rest of the world are modeled as MFA quota non-binding countries.

define price indices for aggregate imported goods, Arminton goods, composite value-added, and the firm's output with and without production taxes, respectively. In equations 3, 4, 6, and 7, the price indices are the unit cost functions, while in equation 8 they are unit revenue functions, all of which are dual to the corresponding unit quantity aggregator functions. For example, equation 7 is the result of cost minimization by the representative firm in each sector with respect to its aggregate factor and inputs, subject to a constant elasticity of substitution (CES) production function. Since CES functions are used as the building blocks of the basic model, and this quantity aggregator function is homogeneous of degree one, the total costs can be written as total quantity multiplied by unit cost (Varian, 1984, p28). This implies that the average cost, under cost minimization, is independent of the number of units produced or purchased. Thus, the unit cost function also stands for the price of the composed commodity. Equation 5 defines the unit price for aggregate inputs, which is the IO coefficient weighted sum of all the value of its contents. Equation 9 states the domestic consumer price is the Arminton goods price plus sales taxes. Equation 10 specifies an economy-wide consumer price index, which is used as price of household savings. Equation 11 defines the numeraire in the model.

$$PWM_{isr} = (1 + trs_{isr}) \times PWE_{isr} \quad (1)$$

$$PWE_{isr} = (1 + te_{isr}) \times \left(\frac{1}{ER_r}\right) \times PE_{ir} \quad (2)$$

$$PM_{ir} = \frac{1}{\mu_{ir}} \times \left\{ \sum_{s \in R} \xi_{irs}^{\sigma_i} \times [(1 + tm_{irs} + tn_{irs}) \times ER_r \times PWM_{irs}]^{1-\sigma_i} \right\}^{\frac{1}{1-\sigma_i}} \quad (3)$$

$$PX_{ir} = \frac{1}{\Gamma_{ir}} \times \left\{ \sum \alpha_{ir}^{\sigma_i} \times PD_{ir}^{1-\sigma_i} + (1 - \alpha_{ir})^{\sigma_i} \times PM_{ir}^{1-\sigma_i} \right\}^{\frac{1}{1-\sigma_i}} \quad (4)$$

$$PN_{jr} = \sum_{i \in I} io_{ijr} \times PX_{ir}$$

(5)

(6)

(7)

$$PV_{ir} = \frac{1}{\Lambda_{ir} \times tfp_r \times ITFP_{ir}} \times \left\{ \sum_{f \in F} \delta_{fir}^{\sigma_{v_i}} \times PF_{fr}^{1-\sigma_{v_i}} \right\}^{\frac{1}{1-\sigma_{v_i}}}$$

$$P_{ir} = \frac{1}{\lambda_{ir}} \times \{ \kappa_{ir}^{\sigma_{e_i}} \times PD_{ir}^{1-\sigma_{e_i}} + (1 - \kappa_{ir})^{\sigma_{e_i}} \times PE_{ir}^{1-\sigma_{e_i}} \}^{\frac{1}{1-\sigma_{e_i}}}$$

$$PC_{ir} = (1 + tc_{ir}) \times PX_{ir}$$

$$PP_{ir} = \frac{1}{A_{ir}} \times \{ \lambda_{ir}^{\sigma_{p_i}} \times PN_{ir}^{1-\sigma_{p_i}} + (1 - \lambda_{ir})^{\sigma_{p_i}} \times PV_{ir}^{1-\sigma_{p_i}} \}^{\frac{1}{1-\sigma_{p_i}}}$$

(8)

(9)

(10)

$$CPI_r = \frac{\sum_{i \in I} PC_{ir} \times C_{ir}}{\sum_{i \in I} PCO_{ir} \times C_{ir}}$$

$$PID_r = \prod_{i \in I} PC_{ir}^{\beta_{ir}} \times CPI_r^{mps_r}$$

(11)

Factor Demand and Firms' Supply Equations

Equation 12 and 13 specify the demand functions for aggregate factor and intermediate inputs, while equation 14 gives demand functions of each primary factor. They equal unit demand function multiplied by the quantities of total output, and the unit demand functions are obtained by taking partial derivatives of the unit cost functions (equation 6 and 7) with respect to the relevant factor prices, according to Shephard's lemma.

$$NX_{ir} = \left(\frac{1}{A_{ir}}\right)^{1-\sigma_i} \times (\lambda_{ir} \times \frac{PP_{ir}}{PN_{ir}})^{\sigma_i} \times Q_{ir}$$

(12)

$$VA_{ir} = \left(\frac{1}{A_{ir}}\right)^{1-\sigma_i} \times [(1 - \lambda_{ir}) \times \frac{PP_{ir}}{PV_{ir}}]^{\sigma_i} \times Q_{ir}$$

(13)

(14)

$$DF_{fir} = \left(\frac{1}{\Lambda_{ir} \times tfp_r \times ITFP_{ir}}\right)^{1-\sigma_i} \times (\delta_{fir} \times \frac{PV_{ir}}{PF_{fr}})^{\sigma_i} \times VA_{ir} \quad \sum_{f \in F} \delta_{fir} = 1$$

Equations 15-18 are the domestic and export supply functions corresponding to the constant elasticity of transformation (CET) function commonly used in today's CGE models. They are derived from revenue maximization, subject to the CET function, in a way similar to the derivation of factor demand functions. Equation 19 aggregates exports by the representative firm in each region, which implies that producers only differentiate output sold in domestic and foreign markets, but do not differentiate exports by destination (foreign markets are perfect substitutes). Equations 15-18 can be partially or entirely turn off in the model, in such case, $PD_{ir} = PE_{ir} = P_{ir}$ will be enforced and exports and domestic sales become perfect substitutes in the model.

$$DX_{ir} = \left(\frac{1}{\chi_{ir}}\right)^{1-\sigma_i} \times \left(\kappa_{ir} \times \frac{P_{ir}}{PD_{ir}}\right)^{\sigma_{sv}} \times Q_{ir}$$

for $s \neq sv$ (15)

$$DX_{sv,r} = \left(\frac{1}{\chi_{sv,r}}\right)^{1-\sigma_{sv}} \times \left(\kappa_{sv,r} \times \frac{P_{sv,r}}{PD_{sv,r}}\right)^{\sigma_{sv}} \times (Q_{sv,r} - TRQS_r)$$

(16)

$$EX_{ir} = \left(\frac{1}{\chi_{ir}}\right)^{1-\sigma_i} \times \left\{(1 - \kappa_{ir}) \times \frac{P_{ir}}{PE_{ir}}\right\}^{\sigma_i} \times Q_{ir}$$

for $s \neq sv$ (17)

$$EX_{sv,r} = \left(\frac{1}{\chi_{sv,r}}\right)^{1-\sigma_{sv}} \times \left\{(1 - \kappa_{sv,r}) \times \frac{P_{sv,r}}{PE_{sv,r}}\right\}^{\sigma_{sv}} \times (Q_{sv,r} - TRQS_r)$$

(18)

$$EX_{ir} = \frac{1}{PE_{ir}} \times \sum_{s \in R} \frac{ER_r}{(1 + te_{irs})} \times PWE_{irs} \times X_{irs}$$

(19)

Trade and Final demand Equations

Trade and final demand equations are listed in equations 20-26. Equation 20 is the consumer demand function, which is the Extended Linear Expenditure System derived from maximizing a Stone-Geary utility function subject to household disposable income, which is specified in equation 31. Equation 21 defines household supernumerary income, which is

disposal income less total expenditure on the subsistence minimum. Equations 22 and 23 give government and investment demands. Equations 24-26 are demand functions for domestic goods, for aggregate imported goods, and for imported goods by source, respectively. They describe the cost-minimizing choice of domestic and import purchases, as well as import sources. They are derived from corresponding cost functions according to Shephard's lemma in a way similar to the derivation of factor demand functions (taking partial derivatives of the cost function with respect to the relevant component prices). Because of the linear homogeneity of the CES function, the cost function that is dual to the commodity aggregator can be represented by its unit cost function (equations 3 and 4) multiplied by total quantity demanded.

(20)

(21)

$$GC_{ir} = \frac{\theta_{ir}}{PC_{ir}} \times GSP_r$$

$$SY_r = HDI_r - \sum_{j \in I} PC_{jr} \times \gamma_{jr}$$

(22)

$$ID_{ir} = \frac{kio_{ir}}{PC_{ir}} \times INV_r$$

(23)

$$DX_{ir} = \left(\frac{1}{\Gamma_{ir}}\right)^{1-\sigma_{m_i}} \times \left(\alpha_{ir} \times \frac{PX_{ir}}{PD_{ir}}\right)^{\sigma_{m_i}} \times TX_{ir}$$

(24)

$$MX_{ir} = \left(\frac{1}{\Gamma_{ir}}\right)^{1-\sigma_{m_i}} \times \left\{(1-\alpha_{ir}) \times \frac{PX_{ir}}{PM_{ir}}\right\}^{\sigma_{m_i}} \times TX_{ir}$$

(25)

for $s \neq r$ (26)

$$X_{isr} = \left(\frac{1}{\mu_{ir}}\right)^{1-\sigma_i} \times \left\{\xi_{isr} \times \left(\frac{PM_{ir}}{(1+tm_{isr} + tn_{irs}) \times ER_r \times PWM_{isr}} \sum_{s \in R} \xi_{isr}^{isr} \times MX_{ir}\right)^{\sigma_i}\right\}$$

$$SY_r = HDI_r - \sum_{j \in I} PC_{jr} \times \gamma_{jr}$$

$$X_{isr} = \left(\frac{1}{\mu_{ir}}\right)^{1-\sigma_i} \times \{\xi_{isr}\} \times \left(\frac{PM_{ir}}{(1 + tm_{isr} + tn_{irs}) \times ER_r \times PWM_{isr}}\right)^{\sigma_i} \times MX_{ir}$$

International Shipping Equations

Equations 27-30 describe international shipping industry in the model. Equations 27 and 28 describe the supply side of the international shipping industry. Equation 27 states that at equilibrium, the returns from shipping activity must cover its cost. Like other industries in the model, it also earns zero profit. Equation 28 describes the demand for each region's service sector exports to the international shipping industry, which is generated by the assumed Cobb-Douglas technology in this industry. The next two equations (29 and 30), refer to the demand side of the international shipping industry. The demand for shipping services associated with commodity i in region r is generated by a fixed proportion input requirement (Leontief) coefficient $tr_{s_{isr}}$, which is routine/commodity specific (equation 29). In equilibrium, the total demand of shipping service must equal its total supply (equation 30).

$$C_{ir} = \gamma_{ir} + \frac{\beta_{ir}}{PC_{ir}} \times SY_r$$

$$TRQ = \frac{1}{PTR} \times \sum_{r \in R} \frac{P_{sv,r}}{ER_r} \times TRQS_r \quad (27)$$

$$TRQ = \sum_{r \in R} \sum_{i \in I} TRQD_{ir} \quad (28)$$

$$TRQS_r = \frac{\tau_r \times ER_r}{P_{sv,r}} \times PTR \times TRQ \quad (29)$$

$$TRQD_{ir} = \frac{1}{PRT} \times \left(\sum_{s \in R} trs_{isr} \times PWE_{isr} \times X_{isr} \right) \quad (30)$$

Income and Saving Equations

Equations 31-39 are income and saving equations in the model. Equations 31 and 32 define household disposal income and savings. Equations 33-37 determine government revenue from production taxes, consumption taxes, tariffs and export taxes (its negative equals a subsidy), respectively, while equations 38-39 define government transfer to household and the balance of trade (foreign savings) in each region.

$$HDI_r = \sum_{f \in F} PF_{fr} \times \overline{FS}_{fr} - dk_r \times \overline{FS}_{KAr} + GTRANS_r \quad (31)$$

$$GR_r = PTAX_r + CTAX_r + TARRIF_r + ETAX_r \quad (32)$$

$$SAV_r = \frac{HDI_r \times \sum_{i \in I} PC_{ir} \times C_{ir}}{CPI_r} \quad (33)$$

$$PTAX_r = \sum_{i \in I} tp_{ir} \times P_{ir} \times Q_{ir} \quad (34)$$

$$CTAX_r = \sum_{i \in I} tc_{ir} \times PX_{ir} (C_{ir} + GC_{ir} + ID_{ir}) \quad (35)$$

$$TARRIF_r = \sum_{s \in R} \sum_{i \in I} (tm_{isr} + tn_{irs}) \times ER_r \times PWM_{isr} \times X_{isr}$$

(36)

(37)

(38)

$$ETAX_s = \sum_{r \in R} \sum_{i \in I} te_{isr} \times PE_{is} \times X_{isr}$$

$$GTRANS_r = GR_r - GSP_r - GSVAr$$

$$BOT_r = \sum_{s \in R} \sum_{i \in I} PWE_{irs} X_{irs} + \frac{P_{sv,r}}{ER_r} \times TRQS_r - \sum_{s \in R} \sum_{i \in I} PWM_{isr} \times X_{isr}$$

(39)

General Equilibrium Conditions

Equations 40-43 define general equilibrium conditions of the model, which are system constraints that the model economy must satisfy. For every sector in each region, the supply of the composite goods must equal total demand (equation 40), which is the sum of household consumption (C_{ir}), government purchases (GC_{ir}), investment (ID_{ir}) and the firm's intermediate demand. Similarly, the demand for each factor in every region must equal the exogenously fixed supply (equation 41). In this dual formulation, output in each region is determined by demand. Sectoral equilibrium is determined in equation 42, unit output price equals average cost, which is also the zero profit condition. Equation 43 describes the macroeconomic equilibrium identity in each region, which is also the budget constraint for the investor. Since all agents in each region (households, government, investor, and firms) satisfy their respective budget constraints, it is well known that the sum of the excess demand for all goods is zero; that is, Walras's law holds for each region. Therefore, there is a functional dependence among the equations of the model. One equation is redundant in each region and thus can be dropped.

$$TX_{ir} = C_{ir} + GC_{ir} + ID_{ir} + \sum_{j \in I} io_{ijr} \times NX_{jr} \quad (40)$$

$$\sum_{i \in I} DF_{fir} = \overline{FS}_{fr} \quad (41)$$

$$P_{ir} = \frac{PN_{ir} \times NX_{ir} + PV_{ir} \times VA_{ir} + tp_{ir} \times P_{ir} \times Q_{ir}}{Q_{ir}} \quad (42)$$

$$INV_r = dr_r \times \overline{FS}_{k,r} + CPI_r \times (SAV_r + GSAV_r) - ER_r \times BOT_r \quad (43)$$

There are 35,552 equations and 35,714 variables in the inter-period block of the model. Since the 108 factor endowment variables (FS_t) are determined by initial stock and inter-period linkage equations, three additional sets of variables (54) have to be set exogenously as macro closures in order to make the model fully determinate. They are chosen from following variables for alternative closures: (1) gross investment or government transfer (INV_t or $GTRANS_t$), (2) balance of trade or exchange rate (BOT_t or ER_t), (3) government spending or surplus (deficit) (GSP_t or $GSAV_t$).

Inter-period and Trade-productivity Linkages

Equations 44-48 define the recursive structure of the five types of factor endowment (natural resource are sector specific and held constant, it can be modified if more reliable data become available) in the modeled economy. For instance, capital stock in each region at period t equals last period's capital stock plus the region's gross investment minus depreciation. While unskilled labor equals last period's employment multiply by population growth rate, plus rural-urban migration, MIG_{rt} , minus the increase of skilled labor SK_{rt} (set exogenously).

$$FS_{KA_r,t} = (1 - dk_r) \times FS_{KA_r,t-1} + INV_{rt} \quad (44)$$

$$FS_{RL_r,t} = (1 + n_{rt}) \times FS_{RL_r,t-1} + MIG_{rt} \quad (45)$$

$$FS_{UL_r,t} = (1 + n_{rt}) \times FS_{UL_r,t-1} + MIG_{rt} - ds_r \times \overline{\nabla SK}_{rt} \quad (46)$$

$$FS_{SL_r,t} = (1 + n_{rt}) \times FS_{SL_r,t-1} + ds_r \times \overline{\nabla SK}_{rt} \quad (47)$$

$$FS_{LD_r,t} = (1 - dl_t) \times FS_{LD_r,t-1} \quad (48)$$

Equation 49 specifies the wage differential between agricultural labor and unskilled manufacturing labor, which drives the rural-urban migration endogenously and approach to one over time. Equation 50 links import embodied technology transfer (via imports of capital goods and intermediate inputs) and total factor productivity. Where $X0_{isr}$ is the base year real trade flows, IM is a subset of I, including those products embodied with advanced technology. It operates through share parameter and elastic ties. An elasticity (ip_{ir}) of 0.1 implies that a 10 percent increase in real imports of capital and technology intensive goods would result a non more than 1 percent increase in total factor productivity in that sector depending the share of intermediate inputs in the sector's total imports. As pointed by Lewis, Robinson and Wang (1995), while there is fairly widespread agreement that linkage between imports of intermediate inputs and productivity gains do exist, there is less evidence of the size of the feedback. In our simulation exercises, the elastic ties used for developed countries are at least less than half the values used for the developing countries.

$$\frac{PF_{AL_r,t}}{PF_{UL_r,t}} = wdf_r^{\exp^{-i\varphi_r}} \quad (49)$$

$$ITFP_{ir} = 1 + ims_{ir} \times \left\{ \frac{NX_{ir}}{NX_{ir} + VA_{ir}} \times \left[\frac{\sum_{j \in IM} \sum_{s \in R} x_{jsr}}{\sum_{j \in IM} \sum_{s \in R} xO_{jsr}} \right]^{\sigma_{ip_{ir}}} + \frac{VX_{ir}}{NX_{ir} + VA_{ir}} - 1 \right\} \quad (50)$$

The model is implemented by the General Algebraic Modeling system (GAMS; Brooke, et. al. 1988) and solved in levels. Readers who are interested in the computer code and related data files may contact the author. Definitions of variables and parameters are list in tables A.1 and A.2. The correspondence between sectors in our model, GTAP database and ISIC are listed in Table-A.3.

Welfare Measure

We measure the change in welfare induced by trade liberalization in each period by the Hicksian equivalent variation (EV), with changes in government consumption and investment spending valued according to private household's preference and play the same weight in the regional utility function. The regional spending represents future consumption for household and government in the region, which equal the sum of household, government, and foreign savings (balance of trade in current model).

$$EV_r = (HDI_r - CPI_r \times SAV_r) \prod_{i \in I} \left(\frac{PC_{0ir}}{PC_{ir}} \right)^{\beta_{ir}} - (HDI_{0r} - SAV_{0r}) \\ + GSP_r \prod_{i \in I} \left(\frac{PC_{0ir}}{PC_{ir}} \right)^{\theta_{ir}} - GSP_{0r} + INV_r \prod_{i \in I} \left(\frac{PC_{0ir}}{PC_{ir}} \right)^{kio_{ir}} - INV_{0r} \quad (51)$$

III. Simulation Design

There is a complex package of trade and investment liberalization measures on both China's and Taiwan's market accession commitments for their WTO memberships. In this paper, however, only the following five aspects are considered: (1) tariff reduction in both agricultural and manufacturing products (China and Taiwan); (2) elimination of non-tariff barriers in manufacturing sectors (China and Taiwan); (3) reduction of non-tariff barriers in agricultural commodities and liberalization of import quotas on major agricultural products (China and Taiwan); (4) opening of major service sectors in China and further liberalization of traded service in Taiwan (via reduction of non-tariff barriers); and (5) the phase out of MFA quotas on textiles and clothing (China and Taiwan). After China and Taiwan become members of the WTO, their exports in textiles and apparel to North American and European markets will be subject to accelerated MFA quota growth from 2001–2004 similar to conditions applied to other developing countries that are WTO members. The remaining quota restrictions will be eliminated in the year 2005 according to the Agreement on Textiles and Clothing (ATC).⁸

Because both China's and Taiwan's market accession commitments to WTO entry will be phased in over a transition period, a baseline from 1998–2011 is established first as Scenario I (the Uruguay Round Case) under a set of assumptions. It generates a reference growth path of the world economy with the implementation of the Uruguay Round trade liberalization, but without China's and Taiwan's participation. This calibrated 'benchmark' will serve as a basis of comparison for counter-factual simulation conducted in Scenario II.

Table 3a summarizes the major macroeconomic assumptions and results from the baseline calibration. It uses the economy-wide TFP variable in each region as a residual and adjustment mechanism to match the pre-specified real GDP growth rate under assumptions on the three major macroeconomic variables (gross investment, government spending, and balance of

trade) in the model. Moreover, it incorporates the impact of the recent Asian financial crisis by imposing actual negative GDP growth during 1998–99 and current account surplus of the affected regions. All the three macro-variables from 2002–2011 are specified as percentages of GDP and are based on forecasts by the Oxford model. China’s imports of rice, wheat, other grains and plant-based fiber and Taiwan’s imports of rice are subject to tariff rate quota (TRQ) controls. Because China and Taiwan are excluded from the WTO under this scenario, their exports in textiles and clothing are subjected to a constant growth in MFA quotas and the quantity restriction continues after 2005. All other MFA quota restricted regions are subject to accelerated quota growth and the termination of the quota system in 2005. The base quota growth rates are calculated from bilateral data provided by the International Textiles and Clothing Bureau in Geneva. The annual quota growth rate is 25 per cent higher for WTO members during 1998–2001 than quota growth rate in 1995–97, then an additional 27 per cent is applied to the last three years of ATC implementation.

In Scenario II (the Accession Case), all the macroeconomic assumptions and exogenous growth factors are the same as in Scenario I, but with both China and Taiwan joining the global trade liberalization process. The extent of China’s tariff reduction is aggregated from the Harmonized Commodity Description and Coding System (HS) tariff schedules at the 6-digit level based on China’s final official offer (November, 2001) and weighted by 2000 import data from the World Bank. Taiwan’s tariff reduction is based on Taiwan’s official WTO offer download from WTO website. It is also aggregated from the 6–digit HS tariff schedules and weighted by Taiwan’s import data during 1998–2000 from the World Bank. The import quotas for agricultural commodities under TRQ control are assumed to grow at a 5 per cent annual rate, 3 percent higher than the baseline, and the above quota tariff rates are reduced according to China and Taiwan’s final official offers. All non-tariff barriers of manufacturing products in both China and Taiwan are

⁸ On January 1, 1995, the ATC entered into force and replaced the old Multi Fibre Arrangements (MFA). The ATC provides for the elimination of the quotas and the complete integration of textiles and apparel into the WTO regime over a 10-year transition period ending on January 1,

reduced by 20 per cent each year from 2002 and set to zero in 2006, while non-tariff barriers of agricultural commodities are reduced 10 per cent a year and eliminated to zero in 2011. A 50 per cent cut in protection on the traded service sector is also implemented to represent the opening of major service sectors in China's WTO offer and further liberalization of traded services in Taiwan's offer. The base year service sector protection rate in China and Taiwan were adopted from Hertel, Walmsley and Itakura (2001). Both China's and Taiwan's tariff rates for all sectors each year in the simulation period and China and Taiwan's initial and final NTB rates are listed in Tables 3b and 3c. Because China and Taiwan both become WTO members under this scenario, their exports of textiles and apparel are subjected to the same treatment as other developing countries.

It is well known that China's tariff collection is significantly below its normal tariff level because of a large volume of processed trade and extensive import duty exemptions. By 1998, about 49 per cent of all imports in China were inputs used in production of exports and exempted from tariff collections. This implies that the Chinese economy is more open than it seems and the existing import restriction by tariff measures has been largely lifted prior to China's WTO accession. Several studies have shown that failing to account for the presence of duty exemptions in China's trade regime leads to a serious overestimate of the impact of China's WTO entry at both aggregate and sectoral levels (Ianchovichina, Martin and Fukase, 2000; Lejour, 2000). By using China's 1998 Custom Statistics, we incorporated China's processing trade and duty exemption pattern by sectors and by import sources into the simulation design, which scales down the tariff level by routine-specific information. The tariff rates in the lower panel of Table 3b are the tariff levels that take duty exemption into consideration, which are substantially lower than the normal tariff (listed in the up panel of Table 3b) and is much closer to China's actual tariff collect rate at the aggregate level (about 4 percent in 2000).

For each of the two scenarios, the CGE model generates results regarding the effects on social welfare, terms of trade, the volume of trade, output, consumption, the real wages paid to each factor, and changes in prices and resource allocation. The differences in results generated by the two simulation scenarios provide estimates of the impact of China's and Taiwan's accession to the WTO. However, those estimates should be regarded as outcomes from conditional projections rather than as forecasts. In reality, actual trade and output patterns are affected by many more factors than just trade liberalization, such as domestic macroeconomic and income policy changes.

IV. Results of Model Simulations

The aggregate economic indicators in each country (region) due to China and Taiwan's WTO accessions are summarized in Table 4. For the sake of brevity, discussions in the section will mainly be focused in China and Taiwan whereas the impacts of China's and Taiwan's WTO memberships on the world economy will be highlighted by addressing on the growth rates of real GDP, exports and change in equivalent variation as a measurement of social welfare. Readers interested in specific country (region) are referred to Table 4.

The First Decade of WTO after admitting China and Taiwan , 2002-2011

The accumulated growth of the GDP of the world economy will increase addition 0.19% in the first decade after China and Taiwan join in the WTO. Real export and import of the world will increase 1.87% and 1.73% respectively during 2002-2011. Capital stock and TFP of the world will increase 0.10% and will increase 0.07 % during the 2002-2011 period. The cumulated social welfare of the world as measured by equivalent variation will increase \$ 616.6 billions in real terms based on 1997 U.S. \$. China's and Taiwan's accessions to the WTO will also cause some structural transformation too; agricultural labor force migration of the world will increase

1.94 million era in the next decade during 2002 –2011 period. But, most developing countries will suffer from a deterioration of their terms of trade, though no change on the terms of trade in the world economy as a whole.

Except for Latin America whose real export will increase by \$ 4.7 billion, the growth of real exports in most developing countries will be adversely affected by China's and Taiwan's WTO accessions in the next 10 years during 2002-2011 period; exports from all ASEAN countries will decline in Indonesia (-\$4.9 billions), the Philippines (- \$ 3.6 billions), Malaysia (-0.3 billion), Thailand (-\$0.7 billion), and in Viet Nam (- \$ 2.2 billions) whereas India will lose the most (- \$24.9 billions). Real export in the emerging market economy in the former Soviet bloc deteriorates too (- \$ 9.0 billions). But there are mixed results in the industrial countries, real export from the U.S. and Japan will increase \$ 2.1 billions and \$14.2 billions respectively whereas EU 15 will lose \$ 50.4 billions and the rest of other OECD will lose \$11.4 billions in the first decade after China's and Taiwan's WTO accessions . However, real export from the NICs will increase ; real export will increase \$ 0.6 billions in Hong Kong, \$ 3.9 billions in Singapore and \$ 7.7 billions in Korea during the 2002-2011 period. It is fair to conclude that the world economy will benefit from China's and Taiwan's accessions to the WTO, real export from the NICs will increase too, but , with the exception of Latin America, most developing countries and emerging market economies will be adversely affected. Among the OECD countries, real export from the U.S. and Japan will increase , but not the rest of all others.

Economic and Trade Relations between China and Taiwan in the first decade of post-WTO era

The cumulated GDP growth from 2002 to 2011 will increase 1.33 % and 0.91% with an annual average rate of 0.07% and 0.06% respectively for China and Taiwan in the first decade of post-WTO era. Cumulated growth rates of real export and import are projected to be 45.69% and 27.82% respectively in China over the 10 –year period between 2002 And 2011. The

cumulated increase of real export and import owing to China's accession to the WTO will be \$889.8 billions and \$ 523.5 billions (based on 1997 U.S. \$) respectively during the 2002-2011 period. For Taiwan, the cumulated growth rates of real export and import are 5.8% and 8.22% respectively in the same period whereas the respective dollar amount for real export and import increase will be \$ 63.1 billion and \$ 67.8 billion in the first decade of post-WTO. It means that China will capture more than 100% of the real export increase in the world trade (\$ 864.1 billion, last column on Table 4) whereas Taiwan will capture only 7.4% out it during the first decade after they were admitted to the WTO. But, China will absorb 51.8% of the increase of world import whereas Taiwan can only absorb 6.71% of the increase in world import. This is due to the relative size of the two economies.

In terms of social welfare, China as well as Taiwan will gain \$243.6 billions and \$33.8 billions respectively in the 2001-2011 period. Cumulated growth of TFP and capital stock for China are 1.24% and 0.97% respectively, whereas the counterparts for Taiwan are 0.15% and 0.85% only. China's nominal trade balance deteriorates at an annual amount of \$ 0.1 billions whereas Taiwan will further increase by \$ 0.4 billions.⁹

Net Trade position In China and Taiwan during the 2002-2011 period

If one can use the changing net trade position (NTP) as a proxy measurement of the impacts of WTO accessions on trade sectors in China and Taiwan, then one can find from Table 5 that NTP in China will gain a total of \$ 488 billions whereas Taiwan will have a negative gain of \$ 1.8 billions. Among the 26 product groups, China will have net import in food and agricultural products as well as in the resources-based products in the next 10 years; land-intensive agriculture (-\$38.3 billion), processed agriculture (-\$34.0 billions), paper and wood products (-

⁹ Taiwan's trade balance has been maintaining surplus for decades before its WTO accession. Hence, it implies that Taiwan's trade surplus will be shrinking in its post-WTO era.

\$2.9 billions), other mineral products (-\$ 0.3 billions) and forestry and fishery (-0.1 billions). But, except for except for textile product (-\$ 8.6 billions), China will gain much on the labor-intensive product sector: wearing apparel (\$368.4 billions), leather, shoes and sport goods (\$ 43.5 billions) and other light manufactures (\$ 40.8 billions). There are mixed results on the net trade patterns in capital-intensive product sectors; the five product groups that China will have positive net trade are electronic equipment (\$86.6 billions), other machinery (\$ 66.3 billions), other transport equipment (\$16.4 billions) metals (\$15 billions) and other mineral products (\$4.4 billions). The rest of capital intensive products, China will have negative NTP in chemical rubber and plastic products (-\$28.5 billions), petroleum products (-\$3.9 billions), metals (-\$17.8 billions) and motor vehicle and parts (-\$16.6 billions). For service sector, China will have positive NTP in trade and transportation services (\$ 2.0 billions), communication (\$ 0.2 billions) , and utility (\$ 0.1 billion), but its NTP will be negative in financial service (-\$ 1.3 billion), other traded services (\$ -0.9 billions) and housing and construction (-\$ 2.7 billions).

Similar to China, Taiwan will have negative net trade patterns in food and agricultural product as well as resource-based product sectors. Except for textile (\$20.1 billion) and leather et al (\$ 0.6 billion), Taiwan will have negative NTP in the rest of other labor –intensive products such as wearing apparel (- \$11.4 billion), and other light manufactures (-\$ 0.7 billions). From the asymmetrical results of the net trade patterns in labor-intensive sectors, one can find the economic rationales for horizontal division between China and Taiwan in the post-WTO era : China (Taiwan) can pick the sector in the world market which Taiwan (China) will lose its competitive advantage. In capital-intensive sector, the horizontal division of labor between China and Taiwan is not quite clear ; similar to China, Taiwan will have positive NTP in electronic equipment (\$4.4 billions), other machinery (\$5.5 billions), and other transport equipment (\$ 2.1 billions), but negative NTP in motor vehicle and parts (-\$ 5.0 billions), metals (-\$ 0.9 billions) and petroleum products (\$ 0.4 billions). The asymmetric net trade patterns occur in chemical

rubber and plastic product which Taiwan has positive sign (\$ 3.8 billions) whereas China has negative NTP as reported above . In the sectors of metals as well as in other mineral products which Taiwan has negative signs of its NTP (-\$0.3 billions and -\$ 0.1 billions respectively) whereas China has positive signs as reported above. Since both China and Taiwan have positive NTP in electronic equipment, other transport equipment and other machinery on the global market, they are competitive rivals on the global markets in these three sectors.

For the service sector, Taiwan will have negative NTP in all the six sectors as reported in Table 5. In summary, the NTP for food/ agricultural products and resource based products are negative for both China and Taiwan. China will have negative NTP in textile but positive one in wearing apparel, whereas Taiwan will have just opposite signs. This finding is consistent with the differences of factor intensity in these two sectors; whereas textile is considered as capital-intensive industry, apparel is relatively more labor –intensive than that of textile. Therefore, trade liberalization will have different impacts on these two industries in China and Taiwan.

Bilateral Trade between China and Taiwan by sectors

Table 6 reports the impacts of China's WTO accession on its trade with the rest of other 17 countries (regions) in the next 10 years in the 2002-2011 period. China's export to Taiwan will increase \$ 19 billions whereas its import from Taiwan will increase \$ 82.3 billions during the 2002-2011 period. Therefore, China will continue to run trade deficits from its trade with Taiwan in the post- WTO era, even after Taiwan liberalizes its trade relations with China under the WTO trading framework. The most significant increase of China's exports to Taiwan is the product category of " other machinery " (\$ 5.6. billions), followed by " electronic equipment " (\$ 4.0 billions), " other transport equipment " (\$ 1.1 billions) and " metals" (\$ 1.1 billions). The most significant increase of China's import from Taiwan is textile (\$ 28.1 billion) , followed by other machinery (\$ 16.2 billions) and chemical rubber plastic products (\$ 11.6 billions). Results

from model simulation from China's aspect have shown that there is a significant amount of intra-industry trade in the product categories of "other machinery", which accounts for 29.5 % of China's export to and 19.7% of its import from Taiwan. It also shows that Taiwan has a competitive advantage on the product category of "other machinery" in trading with China. The growth of trade in service sector is not significant in either direction of China's trade with Taiwan. The bottom part of Table 6 also reports the percentage change of bilateral trade by sectors between China and Taiwan from the base.

Table 7 reports Taiwan's trade with the rest of other 17 countries (regions) after Taiwan joins in the WTO. Due to its accession to the WTO, Taiwan's export to China will increase by \$ 72.3 billions in the 2002-2011 period. Among them, textile (\$23.5. billions) has the most significant gain, followed by other machinery (\$ 14.4 billions), chemical rubber plastic (\$ 10.2 billions), electronic equipment (\$ 6.5 .billions) and metals (\$ 5.0 billions). Meanwhile, Taiwan's import from China will increase \$ 20.8 billions in the same period .¹⁰The most significant imports from China is other machinery (\$ 6.4 billions), electronic equipment (\$ 4.2 billions), other light manufactures and other transport equipment (both are \$ 1.1 billions). Again, simulation results from Taiwan's export to and import from China also confirm that there is a significant amount of intrad-industry trade in electronic equipment , chemic rubber plastic product and other machinery. Intra-industry trade accounted for 43% and 56% respectively of Taiwan's total export to and import from China. Taiwan has the competitive advantage as evidenced by its net exports in these three sectors.

It is noted that there is also no significant export to and import from China in the service sector. Several rationales behind this findings; the first one is that the base for trade in service

¹⁰ It is noted that exports are based on "fob" whereas imports are based on "cif". Therefore, while Taiwan's exports to China increases by \$ 74.1 billions, China's imports from Taiwan increases by \$ 84.2 billions. By the same token, Taiwan imports from China increases by \$ 22.4 billions, but China's exports to Taiwan increases by \$ 20.4 billions only. In addition to the standard statistical discrepancies in reporting exports and imports, the lack of "direct link" between

sector is relatively small on the cross Taiwan Strait trade flows. The second reason is because our model is based on a 50% reductions on the NTB, rather than complete liberalization of trade in service across the Taiwan Strait. The third rationale is because under the multilateral trading framework with “ national treatment”, both China and Taiwan probably will engage in their trade in service sectors with the most advanced countries in OECD. Further studies on trade in services are needed to assess the impacts of GATS on the trade across te Taiwan Strait.

The Impacts of WTO Membership on Production from the baseline In China and Taiwan

How would the accession of WTO affect the production structures ? On the top of Table 8, it shows that China’s total production will increase 3.4 % in the final year from the baseline in 2011 . From the bottom of Table 8, it also shoes the 10-year average rate of change in total production is 2.2%. The increase of production will mostly occur in the labor-intensive sectors such as wearing apparel (37.5 %), textile (14.5%), leather, shoes & sports goods (11.2%) . In spite of the conventional wisdom that China has a relatively abundant land resources, China’s land-intensive agricultural products will reduce in the post WTO era (-2.2 %). This finding is consistent with the Rybczynski theorem (1955) under which the output of the sector using the accumulating factor intensively will increase whereas the output of the other good will decline in absolute amount. Service sector in China will also grow moderately over the baseline in 2011; trade and transport services and utility –both are growing 2.6%, communication and financial services- both are growing 2.2%, in other traded services (0.6%) and in housing and construction (0.1%). .

In Taiwan, total production will increase by 1.2% from the baseline in 2011. The most significant change of production structure in Taiwan is the reduction of processed agriculture(- 2.7%) , other agriculture (-1.9 %) and forestry and fishery (-1.4 %). The growth rates of labor-

China and Taiwan could possibly aggravate these discrepancies too.

intensive products will also decline in wearing apparel (-7.5%) and other light manufactures (-0.4%), but will increase textile (13.1%) and leather et al (3.1%). However, except for motor vehicle and part, which will have negative growth of 4%, all other capital-intensive sector will have positive growth in the post-WTO era with chemical and other transport equipment take the lead. On the other hand, there is moderate growth in the service sectors; utility (1.9%), financial service (0.7%), trade and transportation services (0.5%), housing and construction (0.2%), communication services (0.2%), and other traded services (0.1%). WTO membership has a positive effects on service industry in both China and Taiwan. But, most of the growth in service sector are for domestic consumption rather than for trade. This finding is also consistent with the phenomenon that service sector in both China and Taiwan are relatively backward by comparisons with those in OECD countries. The growth of service sectors, though inevitable after their accessions to the WTO, are primarily limited in domestic consumption rather than for export.

V. Summary and Conclusions

Real export and import in the world market will increase by \$ 854.1 billions and \$ 1009.8 billions respectively in the next decade during 2002 –2011 period. Real GDP of the world will also increase by 0.19% in the same period. Cumulated social welfare of the world will increase \$ 616.6 billions in the same period with an average annual increase of \$ 61.7 billions due to China's and Taiwan's WTO accessions. China will benefit from its WTO accession by capturing more than 100% of the increase in world export in the next 10 years. By comparison, Taiwan will only benefit relatively moderate by absorbing 7.4 % of the increase in world export in the same period. On the other hand, China will absorb 51.8% whereas Taiwan will absorb only 6.7% of the increase of world import due to the relative market sizes. The “win-win” game for both China and Taiwan to join the WTO further strengthens the argument that economic

coordination between China and Taiwan would be mutually beneficial for both of them. China will gain much more from its WTO accession than what Taiwan does. Moreover, China's and Taiwan's WTO accession will also be beneficial to the world economy as shown by the improvement of equivalent variation of the world.

Except for Latin America, most developing countries will be adversely affected by China's and Taiwan's WTO accessions as shown by the declines of their real exports in the next 10 years. The same phenomenon of declining exports will occur in the former Soviet bloc and in the rest of the world too. However, in terms of export performances, the U.S. and Japan will benefit by, but EU 15 as well as other OECD will suffer from, China's and Taiwan's WTO's accessions. Real exports from all other East Asian NICs after the WTO admitted China and Taiwan.

Simulation models in this study are somewhat different from those by Chow, Tuan and Wang (2001) in several aspects; the first one is to integrate the impacts of the 1997 Asian financial crisis on the growth rates of GDP and export in this study. Hence, simulation results from the conditional projections in this study are relatively more moderate than those in the previous study. The second one is that this study integrates the scheduled commitments of China's and Taiwan's market accession commitments to the WTO, which are absent from the previous study. The third aspect is that trade in services were left out whereas there are six service sectors in this studies. Finally, this study used the updated version of GATP version 5, whereas much of the simulations undertaken in previous studies are the older ones

Having recognized the differences in the model simulations, one can conclude that impacts of WTO have positive effects on both economies in China and Taiwan under the present study. The WTO membership will add additional 0.07% and 0.06% of GDP growth rates annually for China and Taiwan in the first decade after their WTO accessions. It is noted that in Chow, Tuan and Wang (2001), the GDP growth rates were projected at 1.21% and 0.45% respectively for

China and Taiwan under static capital market closure and 3.3% and 1.4% respectively in China and Taiwan under steady-state capital market closure (1995 base line) . ¹¹ For the growth rate of real export (import) , the annual growth rate is projected to be 2.44% (1.56%) for China, and 0.43% (0.56 %) for Taiwan respectively in this study . By comparison, the counterparts were projected as 21.25% (20.34%) for China, and 3.76% (5.15%) for Taiwan under static capital market closure, and 23.47% (22.58%) for China as well as 4.47% (5.92%) for Taiwan respectively under steady-state capital market closure . One reason for the much more moderate growth projected in this study is because it integrates the economic conditions in many of their trading partners in the post -1997 financial crisis.

However, the trade flows across the Taiwan Strait were projected to be dominated by intra-industry in this study as well as in the previous one. It means that trade flows between China and Taiwan will enhance their mutual interdependence. The consistent finding of ever increasing trade within the same sector (but at different magnitudes) in the post WTO era would enhance the the sustainability and stability od trade between China and Taiwan. It could possibly contribute to reduce political tensions between Beijing and Taipei. Therefore, the policy implication is that trade liberalization will generate more stable economic relations between Beijing and Taipei, in spite of their disputes on the political sovereignty. An optimistic scenario that common interests between the two politically rival regimes would restrain the probable crisis due to economic reality. However, the missile crisis on Taiwan Strait in 1995-96 means that this hypothesis is yet to be proved in the future.

Taiwan will maintain its trade surplus against China and its over all trade with the world in its post WTO era. In spite of trade liberalization undertaken by Taiwan, and its scheduled commitments to the WTO, Taiwan's trade sector will keep surplus after its WTO accession. This

¹¹ See Chow, Tuan and Wang (2001) Table 2 .

finding will enhance Taiwan's holding of foreign exchange reserves and increase its leverage in dealing with external shock in the post WTO era. Both are conducive for Taipei to adopt a more liberal policy on outward foreign direct investment and its ongoing drive for globalization.

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Table 3b Tariff and Non-tariff Protection Rates in China for its WTO Accession (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010-2011	Rate of Reduction	Initial NTBs	Final NTBs
	Normal Tariff												
Land-intensive agriculture	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	0	91.51	26.73
Other agriculture	17.17	13.51	12.04	10.57	10.50	10.50	10.50	10.50	10.50	10.50	-38.87	1.18	0.00
Processed agriculture	30.73	18.90	16.57	14.67	13.24	12.03	12.03	12.03	12.03	12.03	-60.85	9.55	0.00
Forestry & fishery	3.47	2.31	2.16	2.07	2.03	2.03	2.03	2.03	2.03	2.03	-41.52	1.12	0.00
Oil and natural gas	0.12	0.10	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	-37.50	0.00	0.00
Other mineral products	8.89	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.54	-26.40	2.64	0.00
Textile	1.48	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	-29.47	7.52	0.00
Wearing apparel	20.46	15.77	13.06	10.49	8.81	8.81	8.81	8.81	8.81	8.81	-56.95	5.60	0.00
Leather, shoes & sports goods	23.76	21.20	18.90	16.67	14.90	14.90	14.90	14.90	14.90	14.90	-37.28	4.36	0.00
Other light manufactures	11.63	8.53	8.27	8.00	7.98	7.98	7.98	7.98	7.98	7.98	-31.42	4.08	0.00
Paper & wood products	19.49	17.00	16.10	15.34	14.70	14.70	14.70	14.70	14.70	14.70	-24.59	4.09	0.00
Chemical rubber plastic products	9.30	5.50	4.40	3.48	3.27	3.34	3.34	3.34	3.34	3.34	-64.06	4.85	0.00
Petroleum products	14.03	9.61	8.86	8.19	7.78	7.44	7.12	6.77	6.77	6.77	-51.73	11.36	0.00
Metals	8.03	5.19	4.96	4.77	4.77	4.77	4.77	4.77	4.77	4.77	-40.53	9.60	0.00
Other mineral products	14.44	11.89	11.55	11.29	11.20	11.20	11.20	11.20	11.20	11.20	-22.42	2.77	0.00
Metal products	9.69	7.94	7.61	7.38	7.38	7.38	7.38	7.38	7.38	7.38	-23.87	3.43	0.00
Motor vehicles and parts	31.32	21.86	19.27	17.41	15.69	14.80	14.07	14.07	14.07	14.07	-55.07	21.04	0.00
Other transport equipment	5.04	3.96	3.77	3.60	3.59	3.59	3.59	3.59	3.59	3.59	-28.63	9.88	0.00
Electronic equipment	10.59	3.06	2.42	2.30	2.29	2.29	2.29	2.29	2.29	2.29	-78.38	6.24	0.00
Other machinery	13.4	8.44	7.27	6.69	6.59	6.59	6.59	6.59	6.59	6.59	-51.07	4.08	0.00

	7													
Trade & transportation services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	na	15.60	6.24
Communication services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	na	15.60	6.24
Financial service	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	na	15.60	6.24
Other traded services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	na	15.60	6.24
Utility	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	na	32.88	13.15
Housing & construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	na	0.00	0.00
Average	13.2	8.50	7.47	6.72	6.33	6.19	6.11	6.04	6.02	6.00	-54.89	8.42	0.95	
	7													
	Tariff after taking processing trade and duty exemption into account													
Land-intensive agriculture	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.00	62.43	18.04
Other agriculture	8.06	6.34	5.65	4.96	4.93	4.93	4.93	4.93	4.93	4.93	-38.87	8.36	0.00	
Processed agriculture	20.0	12.3	10.8	9.57	8.64	7.85	7.85	7.85	7.85	7.85	-60.85	18.14	0.00	
Forestry& fishery	2.50	1.67	1.56	1.49	1.46	1.46	1.46	1.46	1.46	1.46	-41.53	1.41	0.00	
Oil and natural gas	0.10	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-37.50	0.00	0.00	
Other mineral products	0.72	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	-29.40	2.69	0.00	
Textile	0.71	0.55	0.45	0.36	0.31	0.31	0.31	0.31	0.31	0.31	-56.98	7.52	0.00	
Wearing apparel	0.45	0.41	0.36	0.32	0.29	0.29	0.29	0.29	0.29	0.29	-37.22	19.43	0.00	
Leather, shoes & sports goods	0.20	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	-31.34	25.26	0.00	
Other light manufactures	1.38	1.20	1.14	1.09	1.04	1.04	1.04	1.04	1.04	1.04	-24.55	9.59	0.00	
Paper & wood products	3.73	2.20	1.76	1.39	1.31	1.34	1.34	1.34	1.34	1.34	-64.05	15.62	0.00	
Chemical rubber plastic products	4.68	3.21	2.96	2.73	2.60	2.48	2.38	2.26	2.26	2.26	-51.72	7.74	0.00	
Petroleum products	6.41	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72	-26.40	11.45	0.00	
Metals	2.31	1.49	1.43	1.38	1.38	1.38	1.38	1.38	1.38	1.38	-40.55	9.60	0.00	
Other mineral products	3.79	3.12	3.03	2.96	2.94	2.94	2.94	2.94	2.94	2.94	-22.40	11.60	0.00	
Metal products	2.71	2.22	2.13	2.06	2.06	2.06	2.06	2.06	2.06	2.06	-23.87	8.83	0.00	
Motor vehicles and parts	23.4	16.3	14.4	13.0	11.7	11.0	10.5	10.5	10.5	10.5	-55.07	21.07	0.00	
Other transport equipment	4.32	3.40	3.23	3.09	3.08	3.08	3.08	3.08	3.08	3.08	-28.63	10.18	0.00	
Electronic equipment	3.00	0.87	0.68	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-78.40	8.22	0.00	
Other machinery	3.96	2.48	2.14	1.96	1.94	1.94	1.94	1.94	1.94	1.94	-51.06	7.89	0.00	
Trade & transportation services	0	0	0	0	0	0	0	0	0	0	na	15.60	6.24	
Communication services	0	0	0	0	0	0	0	0	0	0	na	15.60	6.24	
Financial service	0	0	0	0	0	0	0	0	0	0	na	15.60	6.24	
Other traded services	0	0	0	0	0	0	0	0	0	0	na	15.60	6.24	
Utility	0	0	0	0	0	0	0	0	0	0	na	32.88	13.15	
Housing & construction	0	0	0	0	0	0	0	0	0	0	na	0.00	0.00	
Average	4.21	2.63	2.34	2.14	2.04	1.98	1.96	1.93	1.93	4.21	-54.1	11.70	0.86	

Data Source: China's tariff cut is aggregated by the author from 6 digit Harmonized Commodity Description and Coding System (HS) tariff schedules based on US-China agreement (November, 1999) and weighted by 1998 import data from China's Customs. China's non-tariff barrier (NTB is the difference between import protection rate in version 5 GTAP database and China's tariff after adjustment for duty exemptions. Industrial products are modified on additional information from Zhang et al. (1998) and Li et al. (1998). Detailed data on processing trade and duty exemption are kindly provided by Dr. Shunli Yao based on the China trade database maintained at the University of California-Davis (Yao, Shunli and Robert Feenstra, 1999). The base year service sector protection rate was adopted from Hoekman (1995) and they are tariff equivalent of no-tariff barriers.

Table 3c Tariff Rates in Taiwan for its WTO Accession (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Rate of Reduction	Initial NTBs	Final NTBs
Land-intensive agriculture	1.25	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	-39.70	0.56	0.00
Other agriculture	12.47	7.47	7.03	6.89	6.77	6.65	6.65	6.65	6.65	6.65	6.65	-46.72	3.57	0.00
Processed agriculture	18.21	13.67	12.53	12.27	12.17	12.07	12.07	12.07	12.07	12.07	12.07	-33.71	9.45	0.00
Forestry& fishery	13.84	10.76	8.64	8.28	7.96	7.89	7.89	7.89	7.89	7.89	7.89	-42.97	6.56	0.00
Oil and natural gas	6.73	5.58	5.50	5.42	5.35	5.35	5.35	5.35	5.35	5.36	5.36	-20.37	0.38	0.37
Other mineral products	7.86	6.92	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	-24.05	0.00	0.00
Textile	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-9.80	0.03	0.00
Wearing apparel	6.09	5.79	5.54	5.44	5.43	5.43	5.43	5.43	5.43	5.43	5.43	-10.80	0.81	0.00
Leather, shoes & sports goods	13.29	12.37	11.47	11.27	11.27	11.27	11.27	11.27	11.27	11.27	11.27	-15.23	0.03	0.00
Other light manufactures	4.36	4.16	3.99	3.83	3.67	3.67	3.67	3.67	3.67	3.67	3.67	-15.82	0.61	0.00
Paper & wood products	3.85	2.99	2.17	2.12	2.07	2.07	2.07	2.07	2.07	2.07	2.07	-46.19	0.78	0.00
Chemical rubber plastic products	3.49	2.10	0.77	0.76	0.75	0.75	0.75	0.75	0.75	0.75	0.75	-78.40	0.40	0.00
Petroleum products	3.59	2.98	2.38	2.36	2.35	2.35	2.35	2.35	2.35	2.35	2.35	-34.53	0.12	0.00
Metals	2.57	1.60	0.64	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	-75.69	1.17	0.00
Other mineral products	6.28	5.73	5.20	5.04	4.95	4.95	4.95	4.95	4.95	4.95	4.95	-21.22	0.84	0.00
Metal products	7.42	6.57	5.72	5.63	5.55	5.55	5.55	5.55	5.55	5.55	5.55	-25.24	0.61	0.00
Motor vehicles and parts	23.45	21.11	18.97	17.89	17.28	16.69	16.09	15.57	15.05	14.53	14.53	-38.05	2.11	0.00
Other transport equipment	1.54	1.38	1.23	1.19	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-24.79	1.27	0.00
Electronic equipment	0.43	0.27	0.22	0.22	0.21	0.21	0.22	0.21	0.21	0.21	0.21	-50.58	2.03	0.00
Other machinery	3.35	2.85	2.43	2.41	2.39	2.39	2.39	2.39	2.39	2.39	2.39	-28.86	1.31	0.00
Trade & transportation services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		5.68	2.27
Communication services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		5.68	2.27
Financial service	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		5.68	2.27
Other traded services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		5.68	2.27
Utility	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		22.80	9.12
Housing & construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
Average	4.39	3.60	3.09	3.03	2.96	2.92	2.88	2.85	2.82	2.79	2.77	-36.83	1.90	0.25

Data Source: Taiwan's tariff cut is aggregated by the author from 6 digit Harmonized Commodity Description and Coding System (HS) tariff schedules based on Taiwan's official WTO offer provided by Council for Agriculture, Taiwan and weighted by its import data from 1998-2000 from World Trade Atlas. The weights of each year are 0.2, 0.3, and 0.5 respectively. Taiwan's non-tariff barrier (NTB) is the difference between import protection rate in version 5 GTAP database.

Appendix

Appendix A — Sectors in the Global model and their GTAP-ISIC concordance

Sectors in the Model	GTAP ^a 5 Sector Number and Description	ISIC ^b Rev. 3 CODE
1. Land-intensive crops	1. Paddy rice, 2. Wheat 3. Cereal grains nec , 5 Oil seeds, 7. Plant-based fibers	01111, 01301, 01401, 3116(p), 01112, 01302, 01402, 01113, 01303, 01403, 01116, 01307, 01407
2. Other agriculture	4. Vegetables fruit nuts6. Sugar cane sugar beet , 8. Crops nec., 9 Bovine cattle, sheep and goats, houses, 10 Animal products, n.e.c. 11 Raw milk, 12 Wool, silk-worn cocoons	01121, , 01112,, 01114, 01305, 01405, 01204, 01404, 01117, 01115, 01306, 01406, 01122, 1132, 01308, 01408, 01211, 01212, 01213,0122, 01309, 013010, 013011, 013012, 01409, 014010, 014011, 014012 , 15311
3. Processed Food	18. processed rice , 19 Bovine cattle, sheep and goats, houses meat products, 20 Meat products, n.e.c. 22 Dairy products, 21 Vegetable oils and fats, 24. Sugar, 25 Food products n.e.c. , 26 Beverages & tobacco	3111, 3112,3113,3114,3115,3116(p),3117, 3118, 3119,3121,3122,31313132,3133,3134,3140
4. Forestry and fishery	13. Forestry, 14. Fishing	02 Forestry, logging and related service activities; 015 Hunting, trapping and game propagation including related service fish activities; 05 Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing
5. Crude Oil and natural gas	16 Oil, 17 Gas	111 Extraction of crude petroleum and natural gas; 112 Service activities incidental to oil and gas extraction excluding surveying
6. Other Mining	15 Coal, 18 Minerals n.e.c,	101 Mining and agglomeration of hard coal; 102 Mining and agglomeration of lignite; 103 Mining

		and agglomeration of peat; 12 Mining of uranium and thorium ores; 13 Mining of metal ores; 14 Other mining and quarrying 17 Manufacture of textiles; 243 Manufacture of man-made fibers
7. Textile	27 Textiles	18 Manufacture of wearing apparel; dressing and dyeing of fur
8. Apparel	28 Wearing apparel.	19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
9. Leather & shoes	29 Leather products, footwear & travel goods	36 Manufacturing n.e.c.
10. Other light manufactures	42 manufactures n.e.c	
11. Wood & paper products	30 wood products, 31 paper products, publishing,	20 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; 361 Manufacture of furniture; 21 Manufacture of paper and paper products; 2211 Publishing of books, brochures, musical books and other publications; 2212 Publishing of newspapers, journals and periodicals; 2219 Other publishing (photos, engravings, postcards, timetables, forms, posters, art reproductions, etc.. 222 Printing and service activities related to printing
12. Petroleum coal products	32. Petroleum coal products	231 Manufacture of coke oven products; 232 Manufacture of refined petroleum products
13. Chemical rubber plastic products	33. Chemical rubber plastic products	233 Processing of nuclear fuel; 241 Manufacture of basic chemicals; 242 Manufacture of other chemical products; 25 Manufacture of rubber and plastics products
14. Mineral products nec	34. mineral products, n.e.c	26 Manufacture of other non- metallic mineral products
15. Metals	36. metals n.e.c.,	271 Manufacture of basic iron and steel; 2731 Casting of iron and steel; 272 Manufacture of basic precious and

16. Metal products	37 Metal products	non-ferrous metals;2732 Casting of non-ferrous metals 28 Manufacture of fabricated metal products, except machinery and equipment
17. Motor Vehicle and Parts	38 Motor vehicles and parts	34 Manufacture of motor vehicles, trailers and semi-trailers
18. Other transport equipment	39 Transport equipment n.e.c.	35 Manufacture of other transport equipment
19. Electronic equipment	40 Electronic equipment	30 Manufacture of office, accounting and computing machinery ; 32 Manufacture of radio, television and communication equipment and apparatus
20. Other machinery	41 Machinery and equipment n.e.c.	2213 Publishing of recorded media; 223 Reproduction of recorded media; 29 Manufacture of machinery and equipment ; 31 Manufacture of electrical machinery and apparatus n.e.c. 33 Manufacture of medical, precision and optical instruments, watches and clocks
21. Trade and transportation	47 Trade, 48. other transportation, , 48. Water transportation, 49. Air transportation	521 Non-specialized retail trade in stores; 522 Retail sale of food, beverages and tobacco in specialized stores; 523 Other retail trade of new goods in specialized stores; 524 Retail sale of second-hand goods in stores; 525 Retail trade not in stores; 60 Land transport; transport via pipelines; 61 Water transport; 62 Air transport; Description51 Wholesale trade and commission trade, except of motor vehicles and motorcycles
22. Telecommunication	51. Communication	64 Post and telecommunications
23. Financial services banking and insurance	52. financial service, 53, Insurance	65 Financial intermediation, except insurance and pension funding; 66 Insurance and pension funding, except compulsory social security; 67 Activities auxiliary to financial

		intermediation; 70 Real estate activities
24. other traded service	54. business service, 55. recreational and other services, 56. Public administration and defense education health	37 Recycling; 55 Hotels and restaurants; 63 Supporting and auxiliary transport activities; activities of travel agencies; 711 Renting of transport equipment; 526 Repair of personal and household goods; 712 Renting of other machinery and equipment; 713 Renting of personal and household goods n.e.c. 72 Computer and related activities; 74 Other business activities; 92 Recreational, cultural and sporting activities; 93 Other service activities; 95 Private households with employed persons; 73 Research and development ; 75 Public administration and defence compulsory social security; 80 Education; 85 Health and social work; 91 Activities of membership organizations n.e.c.; 99 Extra-territorial organizations and bodies
25. Utility	43 Electricity, 44 gas manufacture, distribution, 45 Water	401 Production, collection and distribution of electricity ; 402 Manufacture of gas; distribution of gaseous fuels through mains; 403 Steam and hot water supply; 41 Collection, purification and distribution of water
26. Housing, and Construction	46 Construction, 57 dwellings	45 construction; 90 Sewage and refuse disposal, sanitation and similar activities

a. Global Trade Analysis Project, version 5 (Hertel, 1997).

b. International Standard Industry Classification.

Table B.1--Definitions of variables

Variable	Definition	No. of variables
PWE_{isr}	World f.o.b. price for goods from region s to region r s r	$I \times R(R-1)$ (7,956)
PWM_{isr}	World c. i.f. price for goods from region s to region r s r	$I \times R(R-1)$ (7,956)

PM_{ir}	Price of aggregate imported goods in region r	$I \times R$ (468)
PX_{ir}	Price of composite goods in region r	$I \times R$ (468)
PD_{ir}	Price of domestic products sold at domestic market in region r	$I \times R$ (468)
PE_{ir}	Price of domestic goods for exports in region r	$I \times R$ (468)
PC_{ir}	Domestic consumer price in region r	$I \times R$ (468)
PP_{ir}	Average output price before production tax in region r	$I \times R$ (468)
P_{ir}	Average output price after production tax in region r	$I \times R$ (468)
PF_{fr}	Factor price in region r	$F \times R$ (108)
PV_{ir}	Price of value added in region r	$I \times R$ (468)
PN_{ir}	Price of aggregate intermediate inputs in region r	$I \times R$ (468)
CPI_r	Price of savings in region r (consumer price index)	R (18)
ER_r	Exchange rate of region r	R (18)
PID_r	Price index in region r	R (18)
Q_{ir}	Sector output in region r	$I \times R$ (468)
VA_{ir}	Variable sector production cost in region r	$I \times R$ (468)
NX_{ir}	Aggregate sector intermediate input in region r	$I \times R$ (468)
DF_{fir}	Sector factor demand in region r	$(F-3) \times I \times R + (IAG + RES) \times R$ (1,409)
DX_{ir}	Sector domestic sales in region r	$I \times R$ (468)
EX_{ir}	Domestic goods for exports in region r	$I \times R$ (468)
C_{ir}	Household consumption in region r	$I \times R$ (468)
GC_{ir}	Government spending in region r	$I \times R$ (468)
ID_{ir}	Investment demand in region r	$I \times R$ (468)
TX_{ir}	Composite goods demand (supply) in region r	$I \times R$ (468)
MX_{ir}	Sector composite goods imports in region r	$I \times R$ (468)
X_{isr}	Trade flows from region s to region r s r	$I \times R$ (R-1) (7,956)
TRQ	Total international transportation supply	1
PTR	Price of international shipping service	1
$TRQD_{ir}$	International shipping demand by region r	$I \times R$ (468)
$TRQS_r$	International shipping service supply by region r	R (18)
HDI_r	Household disposable income in region r	R (18)
SY_r	Household supernumerary income in region r	R (18)
GR_r	Total government revenue in region r	R (18)
GSP_r	Total government spending in region r	R (18)
$TARRIF_r$	Total tariff revenue in region r	R (18)

$ETAX_r$	Total export tax revenue (subsidy expenditure) in region r	R (18)
$PTAX_r$	Total production tax revenue in region r	R (18)
$CTAX_r$	Total consumer sale tax in region r	R (18)
SAV_r	Household savings in region r	R (18)
$GSAV_r$	Government saving (deficit) in region r	R (18)
$GTRNS_r$	Government transfer in region r	R (18)
BOT_r	Balance of trade in region r (net capital inflow)	R (18)
INV_r	Gross investment by region r	R (18)
$ITFP_{ir}$	Import embodied TFP shifter by sector in region r	$I \times R$ (468)
FS_{fr}	Factor endowment by region r	$F \times R$ (108)
Total number of variables:		
$17 \times R + (2 \times F + IAG + RES) \times R + 21 \times I \times R + 3 \times I \times R(R-1) + (F-3) \times I \times R + 2$ (35,714)		

Table B.2--Definitions of parameters

Parameter	Definition
te_{isr}	Sector export tax (subsidy) rate for goods to region r from region s
tm_{isr}	Sector tariff rate for goods from region s in region r
tn_{isr}	Sector NTB for goods from region s in region r
tp_{ir}	Sector indirect tax rate in region r
tc_{ir}	Consumer sale tax rate in region r
trc_{isr}	International transportation cost margin as percent value of f.o.b.
io_{ijr}	Input/output coefficients for region r
ki_{ir}	Sector share of total investment in region r
dk_r	Depreciation rate of capital stock in region r
τ_r	Regional share of international shipping service supply
Γ_{ir}	Unit coefficients in first level Arminton aggregation function
μ_{ir}	Unit coefficients in second level Arminton aggregation function of region r
α_{ir}	Share parameters in the first level Arminton aggregation function of region r
ξ_{ir}	Share parameters in the second level Arminton aggregation function of region r
σ_{mi}	Substitution elasticities between domestic and import goods
σ_i	Substitution elasticities among import goods from different regions
χ_{ir}	Unit coefficients in CET function of region r
κ_{ir}	Share parameters in CET function of region r
σ_{ei}	Elasticities of transformation between domestic sales and exports

A_{ir}	Unit parameter in aggregate cost function
λ_{ir}	Intermediate input share in aggregate cost function
$\sigma_{p_{ir}}$	Elasticities of substitution between aggregate factor and intermediate input
Λ_{ir}	Unit parameter in value added function
δ_{fir}	Factor share in value added function
$\sigma_{v_{ir}}$	Elasticities of substitution among primary factors in value added
γ_{ir}	Sector minimum subsistence requirements for private households in region r
β_{ir}	Marginal propensity to consume for private households in region r
Mps_r	Marginal propensity to savings for private households in region r
θ_{ir}	Sector share of government spending in region r
Tfp_r	General TFP shifter in region r
Ims_{ir}	The share of of intermediate inputs in sector's total imports
$\sigma_{ip_{ir}}$	Elasticity between intermediate goods import growth with TFP growth
dl_r	Land depletion rate in region r
DS_r	Share of additional tertiary education stock go to skilled labor force at each period
$t\phi_r$	Parameter that control the speed of wage convergence between agr. and unskilled labor
N_{rt}	population growth rate in region r at period t
Wdf_r	Wage ratio of agricultural labor and unskilled-labor in region r at base year

b.

Figure 1 Structure of Production

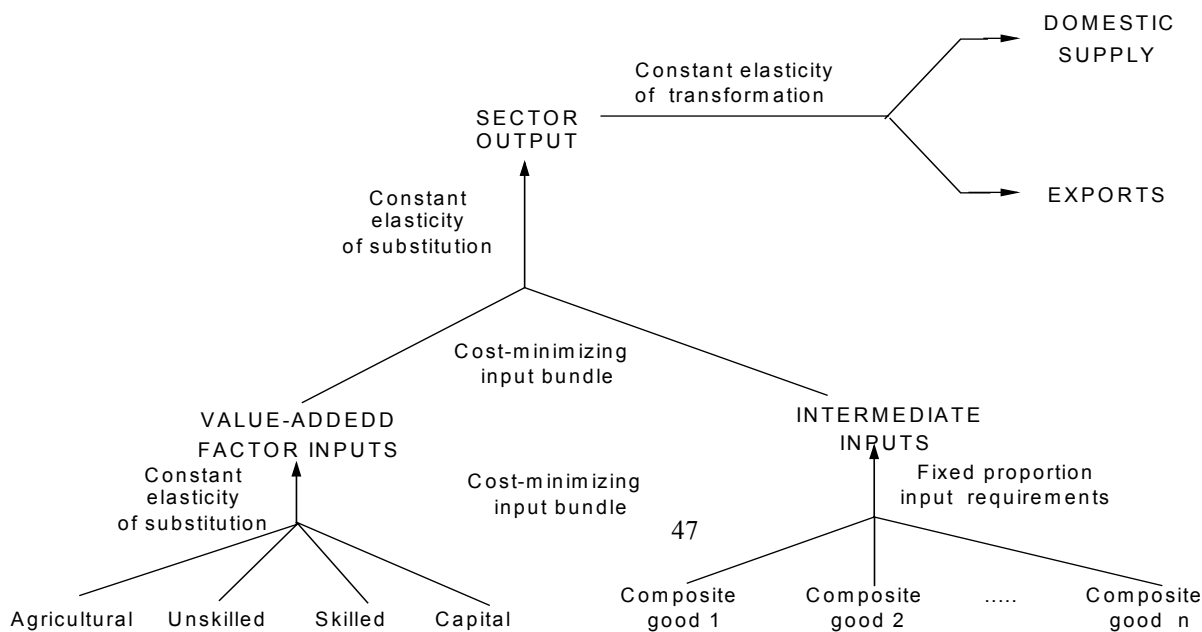


Figure 2 Structure of Demand

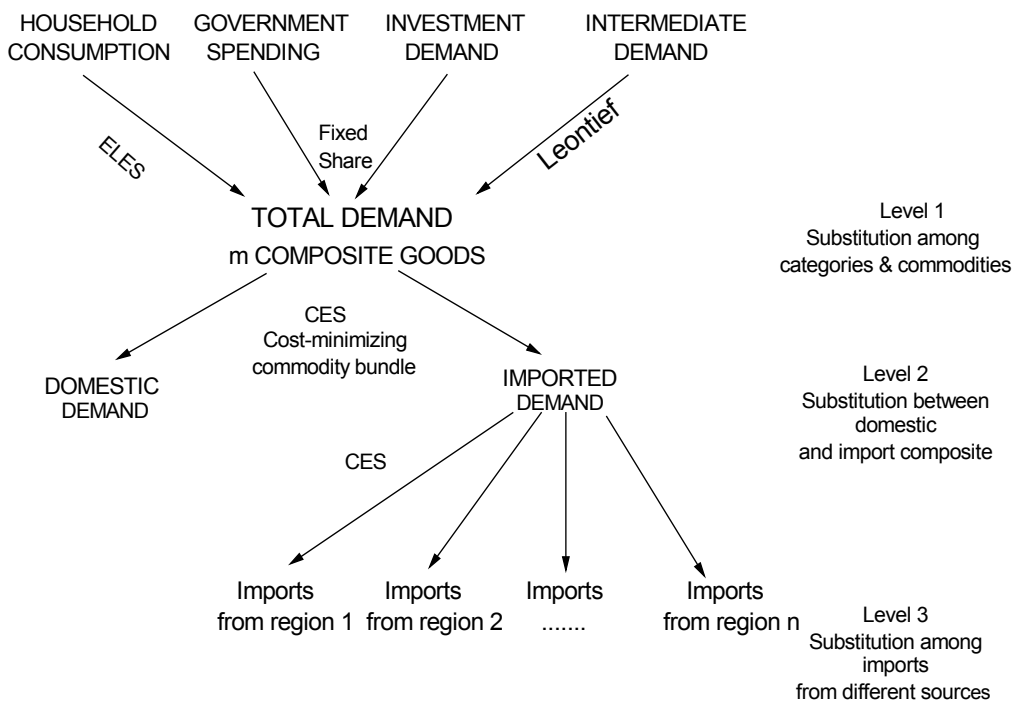


Figure 3 Price system in the model

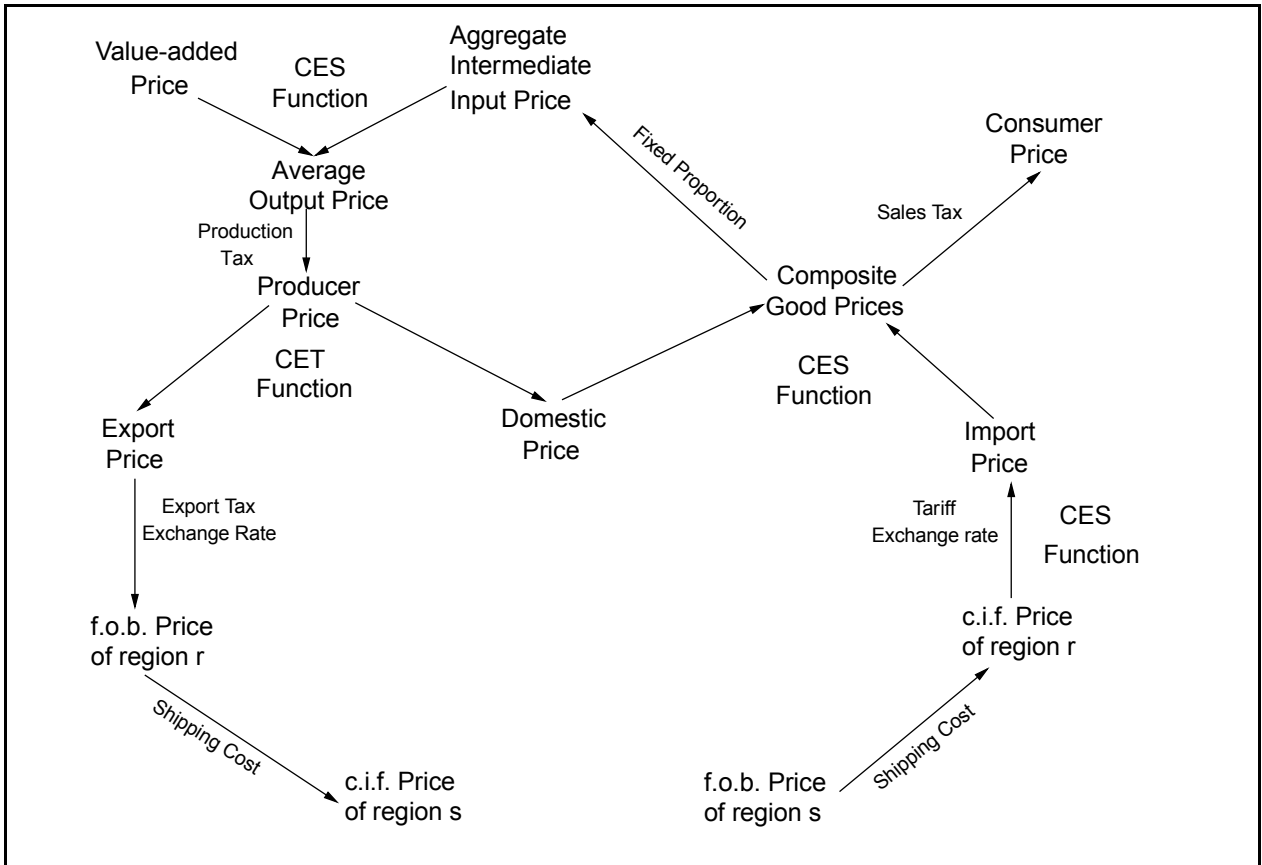


Table 1 -- Factor Endowment, Intensity, and Relative Size of Model Regions, 1997

	Hong				Philippin							United			Other		Latin	Rest of
	China	Kong	Taiwan	Korea	Singapore	Malaysia	Thailand e	Indonesia	India	Vie Nam	Japan	States	EU 15	OECD	FSU	America	World	
GDP & Trade Flows																		
GDP	855	140	300	446	80	106	158	78	209	400	22	4256	7945	7958	1502	883	1975	1670
Exports	239	53	136	149	126	95	71	41	57	45	9	490	853	2360	473	255	322	422
Imports	215	94	111	159	136	88	69	54	57	49	12	418	1023	2362	442	287	361	473
Relative size in the World																		
	<i>Percent</i>																	
GDP	3.0	0.5	1.0	1.5	0.3	0.4	0.5	0.3	0.7	1.4	0.1	14.7	27.4	27.5	5.2	3.1	6.8	5.8
Exports	3.9	0.9	2.2	2.4	2.0	1.5	1.1	0.7	0.9	0.7	0.2	7.9	13.8	38.1	7.6	4.1	5.2	6.8
Imports	3.4	1.5	1.7	2.5	2.1	1.4	1.1	0.8	0.9	0.8	0.2	6.5	16.0	36.9	6.9	4.5	5.6	7.4
Trade dependence																		
	<i>Percent</i>																	
Exports/output	28.0	38.2	45.5	33.5	157.6	89.6	44.8	52.3	27.2	11.3	41.7	11.5	10.7	29.7	31.5	28.8	16.3	25.3
Imports/Absorption	25.2	67.2	37.1	35.6	169.8	82.6	43.7	68.4	27.3	12.3	56.4	9.8	12.9	29.7	29.4	32.4	18.3	28.3
Share of factor endowment																		
	<i>Percent</i>																	
Land	9.0	0.0	0.1	0.1	0.0	0.1	1.2	0.4	1.3	11.8	0.4	0.3	12.9	5.5	7.4	18.3	9.7	21.6
Agricultural labor	39.3	0.0	0.1	0.2	0.0	0.1	1.6	1.0	3.7	19.8	2.1	0.3	0.3	0.7	0.1	2.4	3.4	25.0
Unskilled labor	14.4	0.2	0.6	1.5	0.1	0.5	1.1	1.4	3.5	10.6	0.9	4.5	7.7	10.2	1.9	10.5	11.7	18.9
Skilled labor	17.5	0.2	0.4	0.8	0.1	0.4	0.7	0.7	1.1	12.8	0.3	3.4	13.4	14.4	3.2	12.0	7.3	11.2
Total labor	26.2	0.1	0.3	0.8	0.1	0.3	1.3	1.1	3.4	15.1	1.4	2.4	4.9	6.3	1.2	7.0	7.4	20.8
Capital	2.6	0.6	0.7	1.6	0.3	0.3	0.6	0.3	0.6	1.1	0.1	18.5	22.1	28.8	5.0	3.9	6.5	6.5
Factor share in value-added																		
	<i>Percent</i>																	
Land	5.3	0.3	0.9	2.4	0.5	5.0	3.4	6.6	8.3	12.3	6.1	0.3	0.6	0.8	0.7	1.4	2.5	2.7
Agricultural labor	12.5	0.4	1.5	2.1	0.4	4.7	3.2	10.2	7.4	11.4	6.0	0.8	0.5	1.6	1.5	2.7	3.9	6.7
Unskilled labor	33.1	25.6	34.0	36.4	32.7	23.3	9.0	22.7	28.0	21.4	28.1	36.4	35.7	31.4	36.5	38.5	27.7	29.5
Skilled labor	10.6	19.7	25.0	16.0	18.4	9.2	4.2	11.5	6.9	6.9	9.8	22.9	25.7	21.9	21.3	17.4	13.5	13.6
Total labor	56.2	45.6	60.5	54.4	51.6	37.2	16.4	44.4	42.3	39.6	43.8	60.1	61.9	54.9	59.3	58.5	45.1	49.9
Capital	38.5	54.1	38.6	43.1	48.0	57.8	80.2	49.0	49.5	48.0	50.1	39.6	37.6	44.2	40.0	40.0	52.5	47.4
Skill distribution of labor force																		
	<i>Percent</i>																	
Agricultural labor	69.1	0.6	9.3	11.8	0.2	21.4	57.4	39.8	51.2	60.5	70.5	4.8	2.3	4.8	4.0	16.0	21.4	55.3
Unskilled labor	23.4	80.9	77.2	77.5	73.8	65.7	37.0	52.7	44.9	29.9	27.2	79.3	66.9	69.2	66.2	64.5	67.4	38.6
Skilled labor	7.5	18.6	13.5	10.7	26.0	12.9	5.6	7.5	3.8	9.6	2.3	16.0	30.8	26.0	29.8	19.5	11.2	6.1
Capital (land) intensity																		
	<i>Ratio</i>																	
Capital/labor	2.9	141.8	56.7	57.0	181.2	32.7	14.1	7.1	4.9	2.1	1.6	222.7	131.7	134.4	122.4	16.2	25.9	9.2
Land/labor	0.17	0.00	0.09	0.07	0.00	0.21	0.47	0.17	0.19	0.38	0.15	0.06	1.28	0.43	3.02	1.29	0.64	0.51
Relative factor price																		
Rental/wage	23.6	0.8	1.1	1.4	0.5	4.8	34.7	15.6	24.0	57.2	73.3	0.3	0.5	0.6	0.6	4.2	4.5	10.3
Land rent/wage	55.9	441.5	16.6	59.7	1386.2	63.6	44.6	89.5	102.8	81.4	94.3	7.8	0.7	3.6	0.4	1.9	8.4	10.7
Capital/land rent	0.42	0.00	0.07	0.02	0.00	0.07	0.78	0.17	0.23	0.70	0.78	0.04	0.64	0.17	1.47	2.23	0.53	0.97

Data Source: Calculated from the 1997 multi-regional SAM estimated by the authors from Version 5 GTAP Database and additional factor endowment data collected by the authors. Land and total labor (economic endowment data are from the FAO Statistical Year Book, 1998. Factor returns are calculated as value-added data from GTAP divided by their endowments. The disaggregation between skilled and unskilled labor is from the International Labor Office Year Book of Labor Statistics, 1998, and various statistical publications from various countries.

Table 2 Net trade patterns in Asia and the World, 1997 Billions of U.S. dollars

	Hong		Taiwan	Korea	Singapore	Malaysia	Thailand	Philippine	Indonesia	India	Vie Nam	Japan	United States		Other		Latin America	Rest of World
	China	Kong											States	EU 15	OECD	FSU		
Land-intensive agriculture	-1.4	-0.2	-1.8	-2.6	-0.1	-0.8	-0.7	-0.7	-2.1	0.6	0.0	-7.0	20.1	-5.3	8.3	1.6	-1.3	-6.8
Other agriculture	2.1	-2.1	-0.8	-1.5	-0.8	0.0	0.4	0.1	1.2	1.1	0.8	-5.9	-3.1	-17.3	3.0	-2.5	17.2	8.2
Processed agriculture	0.4	-4.7	-1.7	-2.1	-1.7	2.8	5.3	-0.7	1.9	3.3	0.6	-26.8	3.2	17.3	13.2	-10.2	15.8	-15.9
Food & agricultural product total	1.1	-7.1	-4.3	-6.2	-2.6	2.0	5.0	-1.3	1.1	4.9	1.4	-39.7	20.3	-5.2	24.5	-11.1	31.7	-14.4
Forestry & fishery	-0.1	-0.8	-0.2	-0.5	0.0	0.8	0.2	0.0	0.3	-0.3	0.1	-5.1	1.1	-2.9	2.0	1.7	0.8	2.8
Oil and Natural Gas	-1.5	-0.2	-4.4	-16.2	-6.8	3.7	-4.1	-2.2	7.6	-3.9	1.2	-33.4	-61.8	-68.9	31.7	14.9	20.3	124.0
Other mineral products	-0.4	-0.3	-1.7	-3.4	-0.1	-0.2	-0.3	-0.3	2.7	0.3	0.1	-11.8	2.5	-14.1	12.7	1.1	6.8	6.3
Paper & wood products	-1.5	-1.4	0.4	-1.3	-0.6	3.5	0.3	-0.2	6.5	-0.5	0.1	-13.2	-12.2	8.2	19.2	1.5	-0.7	-8.1
Resource based product total	-3.6	-2.7	-5.9	-21.3	-7.4	7.8	-3.8	-2.6	17.1	-4.4	1.5	-63.5	-70.5	-77.7	65.6	19.2	27.2	125.1
Textile	4.0	-3.5	9.6	10.1	-1.2	0.4	1.4	-0.9	2.0	5.6	-1.0	-2.0	-9.1	-1.7	-3.7	-5.0	-2.0	-3.1
Wearing apparel	24.8	3.0	1.3	1.3	-0.6	1.1	2.6	2.0	3.4	4.2	1.0	-10.7	-29.4	-20.3	-5.0	2.2	4.4	14.6
Leather, shoes & sports goods	18.6	-0.7	1.6	1.4	-0.4	-0.1	1.6	0.2	2.8	1.2	1.3	-5.0	-17.7	-2.4	-2.7	-1.3	2.4	-0.8
Other light manufactures	20.2	-2.3	3.3	0.5	-0.7	0.4	1.7	0.2	0.5	2.0	0.0	-1.4	-25.5	1.2	-0.2	0.2	-1.7	1.7
Labor-intensive product total	67.7	-3.5	15.8	13.3	-3.0	1.9	7.3	1.5	8.6	13.0	1.4	-19.1	-81.7	-23.2	-11.5	-3.9	3.1	12.3
Chemical rubber plastic products	-11.4	-4.3	1.1	0.9	-1.6	0.5	-0.9	-2.9	-1.2	-1.8	-1.8	15.6	18.0	49.0	-1.1	-10.2	-25.6	-22.2
Petroleum products	-3.3	-1.6	-0.9	0.7	2.5	-0.6	0.4	-0.1	-1.1	-2.8	-1.2	-6.5	-1.5	-1.5	0.4	6.5	1.3	9.5
Metals	-7.6	-8.2	-2.7	-6.5	-3.5	-3.8	-3.8	-1.1	-2.2	-4.3	-0.5	5.5	-16.7	-0.6	19.0	23.8	11.0	2.2
Other mineral products	2.4	-1.5	-0.2	-1.5	-0.8	-0.4	0.3	-0.5	-0.3	0.0	-0.2	1.8	-0.9	11.2	-2.8	-0.4	-0.9	-5.2
Metal products	4.2	-0.6	4.7	1.2	-1.1	-0.4	-0.6	-0.6	-0.9	0.7	-0.3	3.4	-2.7	7.5	-2.7	-1.4	-4.0	-6.3
Motor vehicles and parts	-2.1	-3.8	-1.8	8.6	-1.5	-2.0	-2.1	-1.2	-2.3	-0.1	-0.4	64.0	-52.2	39.8	-7.4	-8.6	-4.6	-22.4
Other transport equipment	-1.1	-1.2	-0.2	3.4	-4.0	-2.8	-1.2	-1.9	-1.7	-0.4	-0.3	11.2	28.1	4.4	-5.6	-0.5	-11.5	-14.8
Electronic equipment	4.6	-14.3	22.6	20.2	15.1	16.8	6.8	2.9	0.3	-1.5	-0.5	66.5	-42.3	-40.3	-19.9	-8.6	-14.8	-13.7
Other machinery	-7.5	-9.0	0.9	-9.0	-8.7	-8.1	-6.1	-4.8	-9.7	-4.5	-1.9	91.1	12.7	98.1	-15.2	-23.1	-30.8	-64.2
Capital-intensive product total	-21.9	-44.5	23.5	18.0	-3.6	-0.8	-7.2	-10.4	-19.0	-14.7	-7.1	252.4	-57.3	167.7	-35.5	-22.5	-80.0	-137.2
Trade & transportation services	2.5	20.4	0.6	-5.0	3.6	1.5	4.6	0.0	1.2	-0.2	0.1	-18.6	6.4	-24.0	0.8	4.2	2.1	-0.1
Communication services	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.0	-0.5	-3.0	0.5	0.3	0.9	1.3	0.5
Financial service	-1.1	0.0	-0.1	0.5	-0.1	0.0	-0.6	-0.1	-0.3	-0.3	0.0	-5.1	4.1	7.9	0.7	-0.6	-3.5	-1.5
Other traded services	-2.3	-0.4	-0.5	-1.1	8.3	-1.9	-0.7	2.8	-6.7	0.1	0.0	-12.0	44.2	11.6	-6.2	-6.2	-8.2	-20.8
Utility	0.2	-0.2	0.0	-0.1	-0.1	0.0	0.0	0.0	0.2	-0.1	0.0	-0.3	-1.6	-0.7	3.1	0.1	-0.6	0.3
Housing & construction	-1.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.6	0.0	0.0	0.0	-0.3	2.8	-0.9	0.0	-1.2	-0.2	1.8
Services total	-1.7	19.7	-0.1	-5.7	11.6	-0.3	3.1	2.2	-5.5	-0.5	0.0	-36.8	52.8	-5.7	-1.3	-2.8	-9.1	-19.8
Total	41.6	-38.1	28.9	-1.9	-5.1	10.5	4.4	-10.7	2.3	-1.7	-2.8	93.3	-136.4	56.0	41.8	-21.2	-27.1	-34.0

Table 3 Major Assumption for Baseline Calibration in the Global Model

	China	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonesia	Viet Nam	Japan	Korea	USA	Taiwan	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Average
<i>Average annual growth rate, %, 2002-2011</i>																			
Real GDP	6.9	4.5	5.1	5.6	5.3	4.0	5.7	6.2	1.2	4.9	3.0	4.6	7.4	2.5	3.1	3.1	3.9	5.9	3.2
Labor Force	0.8	0.2	0.3	2.7	0.8	2.4	2.0	1.9	-0.2	1.1	0.8	0.8	2.0	-0.1	0.7	0.5	2.0	2.9	1.6
Skill Labor	7.9	3.7	3.8	9.1	4.9	5.8	5.8	5.5	3.6	5.6	3.6	5.5	5.2	3.5	3.8	2.4	5.2	6.4	5.2
TFP	3.3	0.6	2.9	1.5	3.6	1.5	1.9	2.1	0.0	2.3	0.8	1.4	3.2	1.0	1.3	1.6	1.0	2.0	1.3
Capital Stock	9.7	4.5	4.8	6.9	2.6	3.3	5.6	7.3	2.1	4.6	4.4	5.0	7.2	2.9	3.3	2.5	3.2	3.7	3.7
Gross Investment	8.1	5.0	4.7	7.2	5.3	4.4	6.7	6.7	0.9	4.1	3.7	4.0	8.1	3.1	3.3	6.0	3.9	6.2	3.9
Government Spending	8.5	2.4	3.0	3.9	3.1	4.2	5.6	6.5	1.5	1.7	2.5	3.6	5.7	1.5	3.2	2.8	4.3	6.5	2.8
Exports	6.2	1.9	5.0	6.2	6.3	4.4	6.0	6.8	1.9	6.0	4.2	4.4	12.3	2.7	2.5	2.6	3.5	2.5	3.5
Imports	5.9	4.1	4.8	5.7	4.8	4.0	5.5	5.5	2.0	4.6	2.7	4.0	6.0	2.5	3.2	3.1	3.7	7.0	3.5
HH. Consump	5.7	5.6	6.0	5.4	5.3	4.1	5.4	5.6	1.1	5.3	2.7	5.0	6.9	2.4	3.1	2.2	3.8	6.9	3.2
Total Absorp.	7.1	5.1	5.0	5.9	5.0	4.1	5.7	6.0	1.1	4.6	2.8	4.6	7.0	2.4	3.1	3.1	3.9	6.7	3.3
<i>Average annual agricultural labor force migration, 1000 persons, 2002-2011</i>																			
Rural labor migration	2588	0	0	36	91	161	506	89	-4	47	4	7	2267	23	3	196	456	4937	11409
<i>Labor composition, %, 2001</i>																			
Agricultural labor	69.6	0.7	0.2	20.5	58.7	39.6	52.8	69.3	4.5	11.1	2.2	9.2	60.0	4.8	3.9	15.6	21.7	53.5	46.1
Unskilled labor	20.6	78.1	70.0	63.1	34.7	51.8	42.8	28.1	76.0	76.2	61.9	74.6	29.2	64.0	60.6	62.9	65.6	39.5	40.8
Skilled labor	9.9	21.3	29.8	16.5	6.6	8.6	4.4	2.7	19.6	12.8	35.9	16.2	10.9	31.2	35.5	21.5	12.7	7.0	13.1
<i>Labor composition, %, 2011</i>																			
Agricultural labor	66.6	0.6	0.2	17.5	56.6	35.7	48.6	67.3	4.5	9.4	2.2	8.3	55.7	4.7	3.8	14.8	19.8	47.4	43.4
Unskilled labor	14.0	69.4	57.7	52.5	33.6	52.5	45.1	29.0	67.0	70.8	50.5	66.0	29.6	51.1	47.9	59.1	63.0	42.8	38.0
Skilled labor	19.4	30.0	42.1	30.0	9.8	11.8	6.4	3.7	28.6	19.8	47.3	25.7	14.7	44.3	48.3	26.1	17.1	9.8	18.7
<i>Gross investment as % of GDP</i>																			
2002	38.8	30.4	34.1	29.8	19.5	20.1	23.8	33.7	25.7	26.5	21.6	20.4	23.3	20.3	19.2	16.3	19.8	20.3	
2011	43.6	32.0	32.9	34.6	19.6	20.9	26.2	35.1	25.0	24.7	23.1	19.2	24.9	21.5	19.5	21.5	20.0	20.9	
<i>Government spending as % of GDP</i>																			
2002	13.2	8.6	12.2	12.5	9.9	7.7	7.9	9.8	16.5	8.9	14.0	12.3	13.8	19.4	17.6	19.4	12.6	16.1	
2011	15.4	7.0	10.0	10.6	8.0	7.9	7.8	10.1	16.9	6.5	13.3	11.2	11.9	17.5	17.7	18.7	13.1	17.0	
<i>Balance of trade as % of GDP</i>																			
2002	1.8	4.7	15.3	11.6	16.2	-5.4	3.6	-13.4	1.7	14.4	-4.4	6.1	0.3	2.4	3.1	5.6	-1.8	-7.2	
2011	-0.2	-1.0	14.5	9.7	18.1	-7.2	3.5	-11.6	2.4	16.3	-3.2	6.0	3.5	3.6	3.3	5.8	-1.8	-16.3	

Data in boldface are set exogenously. Most of them are forecasting from Oxford Macro Economic model.

Table 4 Impact of WTO Accession: Aggregated Economic Indicators by Region

	China	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonesia	Vie Nam	Japan	Korea	USA
Accumulated Growth from 2002-2011, percentage point change from baseline, accumulated Changes											
Real GDP	1.33	1.75	1.40	0.17	0.00	-0.29	-0.43	-0.93	0.17	0.79	0.19
Real Export	45.69	0.28	0.37	-0.43	-0.43	-1.05	-1.71	-3.45	0.42	0.56	0.09
Real Import	27.82	2.96	1.33	0.14	0.09	-0.89	-1.51	-2.06	2.22	2.57	1.55
TFP	1.24	0.06	-0.11	-0.11	-0.02	-0.05	-0.06	-0.15	0.00	-0.02	0.00
Capital Stock	0.97	0.62	0.60	0.18	0.08	-0.07	-0.19	-0.52	0.07	0.28	0.09
Annual growth rate, percentage point change from baseline											
Real GDP	0.07	0.12	0.09	0.01	0.00	-0.02	-0.03	-0.05	0.02	0.05	0.01
Export	2.44	0.03	0.03	-0.02	-0.02	-0.07	-0.10	-0.19	0.05	0.05	0.01
Import	1.56	0.21	0.09	0.01	0.01	-0.06	-0.09	-0.13	0.18	0.17	0.12
TFP	0.09	0.01	-0.01	-0.01	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00
Capital Stock	0.04	0.04	0.04	0.01	0.01	-0.01	-0.01	-0.03	0.01	0.02	0.01
Agricultural Labor Force Migration, 2001-2011, 1000 persons, accumulated changes											
Accumulated	2763	0	0	0	-93	-29	-72	-70	4	5	-17
Annual average	276	0	0	0	-9	-3	-7	-7	0	1	-2
Change of Equivalent variation, Billion 1997 US\$, annual average											
Accumulated	243.6	19.1	12.0	5.5	2.2	-0.8	-5.6	-2.0	61.9	35.6	99.3
Annual average	24.4	1.9	1.2	0.6	0.2	-0.1	-0.6	-0.2	6.2	3.6	9.9
Real Exports, Change from baseline, 2001-2011, Billion 1997 US\$ in fob price, annual average											
Accumulated	889.8	0.6	3.9	-0.3	-0.7	-3.6	-4.9	-2.2	14.2	7.7	2.1
Annual average	89.0	0.1	0.4	0.0	-0.1	-0.4	-0.5	-0.2	1.4	0.8	0.2
Real imports, Change from baseline, 2001-2011, Billion 1997 US\$ in fob price, annual average											
Accumulated	523.5	16.2	14.0	0.6	0.2	-3.1	-5.6	-1.8	68.2	27.2	193.2
Annual average	52.4	1.6	1.4	0.1	0.0	-0.3	-0.6	-0.2	6.8	2.7	19.3
Nominal trade balance, Change from baseline, Billion US\$, annual average											
Accumulated	-1.0	0.4	1.2	0.0	-0.4	0.3	-0.5	0.3	3.5	7.1	-1.1
Annual average	-0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	0.4	0.7	-0.1
Term of trade, Change from baseline at 2011, percent											
2005	-2.95	0.70	0.39	0.10	0.09	-0.22	-0.27	-0.07	0.69	0.86	0.30
2011	-4.08	1.53	0.57	0.19	0.28	-0.05	-0.21	0.06	1.00	1.28	0.52

Taiwan	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Average
0.91	-1.18	0.13	0.26	0.08	-0.04	0.10	0.19
5.80	-8.03	-0.28	-0.33	-0.45	-0.40	-1.02	1.87
8.22	-3.81	0.36	0.54	0.18	-0.07	0.56	1.73
0.15	-0.13	0.00	0.00	-0.01	-0.03	-0.07	0.07
0.85	-0.50	0.05	0.09	0.03	0.01	0.05	0.10
0.06	-0.06	0.01	0.02	0.01	0.00	0.01	0.01
0.43	-0.29	-0.02	-0.02	-0.03	-0.03	-0.08	0.16
0.56	-0.23	0.03	0.04	0.01	0.00	0.03	0.13
0.01	-0.01	0.00	0.00	0.00	0.00	-0.01	0.01
0.05	-0.03	0.00	0.01	0.00	0.00	0.00	0.01
18	-269	-23	-10	-25	-117	-127	1938
2	-27	-2	-1	-2	-12	-13	194
33.8	-35.9	83.8	31.1	6.6	1.1	25.2	616.6
3.4	-3.6	8.4	3.1	0.7	0.1	2.5	61.7
63.1	-24.9	-50.4	-11.4	-9.0	4.7	-24.6	854.1
6.3	-2.5	-5.0	-1.1	-0.9	0.5	-2.5	85.4
67.8	-12.3	80.3	26.0	2.8	-7.1	19.7	1009.8
6.8	-1.2	8.0	2.6	0.3	-0.7	2.0	101.0
0.4	-3.0	-0.6	0.6	-0.2	1.5	-8.5	0.0
0.0	-0.3	-0.1	0.1	0.0	0.2	-0.9	0.0
0.33	-1.21	0.10	0.32	0.11	-0.03	0.01	
0.32	-1.39	0.21	0.49	0.25	0.08	0.27	

Table 5 Differences between a WTO with and without China and Taiwan: Accumulated Sectoral Net Trade by Region during 2

	China	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonesia	Vie Nam	Billion
Lnad-intensive agriculture	-38.3	0.0	-0.1	0.0	-0.2	0.2	0.6	0.0	
Other agriculture	1.6	-0.1	-0.2	0.0	-0.3	0.3	0.3	0.1	
Prpcessed agriculture	-34.0	1.0	3.2	-0.1	4.9	0.2	0.5	0.2	
Forestry& fishery	-0.1	-0.1	0.0	-0.2	0.0	0.1	0.0	0.0	
Oil and Natral Gas	-0.3	-0.1	-1.8	0.1	0.0	0.0	0.6	0.1	
Other mineral products	-1.5	-0.2	0.0	0.0	0.0	0.0	0.3	0.1	
Paper & wood products	-2.9	0.9	-0.4	0.6	0.5	0.1	2.4	0.2	
Textile	-8.6	4.7	-0.8	1.7	-0.5	2.0	1.1	1.1	
Wearing apparel	368.4	-14.6	-0.9	-3.4	-10.4	-6.8	-10.5	-2.4	
Leather, shoes & sports goods	43.5	-0.4	-0.3	0.1	-2.7	-0.4	-3.5	-1.3	
Other light manufactures	40.8	1.6	-0.4	-0.5	-0.8	-0.1	0.0	0.1	
Chemical rubber plastic products	-28.5	0.9	0.1	1.0	3.9	0.4	2.3	0.4	
Petroleum products	-3.9	-0.1	1.3	0.1	0.1	0.0	0.2	0.1	
Metals	-17.8	-2.0	-0.5	-0.1	0.2	0.2	0.4	0.0	
Other mineral products	4.4	-0.1	-0.3	0.0	0.8	0.2	0.4	0.1	
Metal products	15.0	0.4	-0.5	0.0	0.0	0.0	0.2	0.1	
Motor vehicles and parts	-16.6	-1.3	-0.3	0.1	0.4	0.1	0.8	0.0	
Other transport equipment	16.4	-0.3	-0.2	0.1	0.1	0.0	0.4	0.0	
Electronic equipment	86.6	0.1	-1.6	-2.6	0.4	-0.6	0.7	0.2	
Other machinery	66.3	4.7	-1.8	1.0	1.1	0.3	0.2	0.2	
Trade & transpotation services	2.0	-10.4	-1.3	0.7	1.1	0.8	1.6	0.2	
Communication services	0.2	-0.1	0.0	0.0	0.0	0.0	0.1	0.0	
Financial service	-1.3	-0.4	-0.3	0.0	0.1	0.0	0.1	0.0	
Other traded services	-0.9	-1.5	-2.7	0.4	0.5	2.5	1.0	0.2	
Utility	0.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	
Housing & construction	-2.7	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	
Total	488.0	-17.5	-9.7	-0.9	-1.0	-0.4	0.3	-0.5	

2002 - 2011

Japan	Korea	USA	Taiwan	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World total
1997 U.S. dollars										
-0.1	-1.7	13.4	0.7	1.3	1.6	13.6	1.6	5.0	2.5	0.0
-0.8	0.1	-2.5	-1.0	3.0	0.2	-4.0	-0.4	2.5	1.3	0.0
-2.0	2.1	2.9	-5.5	3.3	21.6	-4.3	0.2	5.9	-0.1	0.0
0.0	-0.1	0.0	-0.4	0.4	0.2	0.4	-0.1	0.2	-0.4	0.0
-0.5	-2.2	-0.3	-1.1	1.0	-0.3	0.4	0.1	1.4	2.8	0.0
-0.6	-0.5	-0.1	-0.6	0.8	0.1	0.7	-0.1	1.1	0.5	0.0
-0.8	2.6	-2.1	-0.3	0.7	-1.2	-2.1	0.1	1.9	-0.1	0.0
8.4	17.3	-15.0	20.1	-1.1	-19.0	-3.7	-1.0	-1.5	-5.3	0.0
-11.7	-8.5	-81.6	-11.4	-66.5	-57.1	-8.6	-14.8	-28.2	-31.2	0.0
-1.9	1.8	-7.3	0.6	0.7	-16.4	-0.9	-2.2	-4.7	-4.6	0.0
-3.8	-0.6	-8.4	-0.7	4.2	-20.6	-3.2	-1.1	-1.8	-4.9	0.0
2.6	4.8	1.0	3.8	4.2	0.4	-1.4	2.1	2.9	-0.8	0.0
-0.2	0.4	0.1	-0.4	0.7	0.1	-0.2	0.4	0.5	0.6	0.0
5.0	1.7	-0.2	-0.9	4.0	2.4	-0.9	3.9	4.2	0.2	0.0
-2.2	-0.3	-2.0	-0.1	1.7	-0.2	-0.7	-0.4	0.4	-1.5	0.0
-1.9	-0.6	-4.3	-0.3	1.9	-6.2	-1.5	-0.6	0.0	-1.8	0.0
-2.0	-9.6	1.6	-5.0	4.1	19.2	-1.3	0.9	9.2	-0.1	0.0
-4.8	-7.0	-5.1	2.1	2.9	-1.8	-2.6	-0.2	1.5	-1.4	0.0
-15.0	-8.8	-26.5	4.4	1.3	-28.2	-4.1	-1.4	-1.2	-3.6	0.0
-12.4	-3.0	-28.5	5.5	5.1	-25.4	-8.7	-2.1	2.9	-5.4	0.0
-5.9	-3.2	1.0	-4.6	4.6	4.1	-0.9	0.9	5.3	4.1	0.0
-0.3	-0.4	-0.1	-0.4	0.1	0.3	-0.1	0.1	0.5	0.1	0.0
-0.9	-0.4	0.3	-0.9	0.6	1.5	0.0	0.2	1.0	0.2	0.0
-2.9	-3.7	0.0	-4.8	4.8	3.9	-1.1	0.4	2.9	0.9	0.0
0.0	0.0	0.0	-0.1	0.0	0.1	-0.2	-0.1	0.3	0.0	0.0
-0.2	0.0	0.5	-0.7	0.1	2.3	0.0	0.2	0.1	0.3	0.0
-55.0	-20.0	-163.3	-1.8	-16.1	-118.2	-35.3	-13.5	12.4	-47.6	0.0

Table 6 Differences between a WTO with and without China and Taiwan: Accumulated Sectoral Trade during 2002 - 2011:(

	Billion 1997 U.S. dollars							
	Taiwan	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonesia	Vie Nam
Exports								
Lnad-intensive agriculture	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0
Other agriculture	0.2	0.5	0.3	0.3	0.1	0.1	0.2	0.1
Prpcessed agriculture	0.1	1.2	0.3	0.3	0.1	0.2	0.0	0.1
Forestry& fishery	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Oil and Natral Gas	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Other mineral products	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Paper & wood products	0.6	0.5	0.2	0.1	0.0	0.1	0.0	0.0
Textile	0.6	3.0	0.6	0.2	0.3	0.1	0.2	0.4
Wearing apparel	0.6	2.8	0.7	0.2	0.1	0.1	0.1	0.1
Leather, shoes & sports goods	0.6	0.0	0.3	0.2	0.1	0.2	0.0	0.1
Other light manufactures	1.0	0.0	0.5	0.2	0.1	0.1	0.2	0.0
Chemical rubber plastic products	1.0	0.8	0.6	0.3	0.4	0.2	0.4	0.3
Petroleum products	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Metals	1.1	1.4	1.2	0.4	0.4	0.2	0.3	0.2
Other mineral products	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.1
Metal products	0.7	0.2	0.4	0.2	0.2	0.2	0.2	0.0
Motor vehicles and parts	0.4	1.5	0.3	0.1	0.1	0.1	0.0	0.1
Other transport equipment	1.1	0.3	1.2	0.8	0.1	0.3	0.2	0.1
Electronic equipment	4.0	0.0	8.2	3.3	1.2	1.2	0.6	0.1
Other machinery	5.6	0.0	3.9	2.0	0.9	1.1	1.4	0.5
Trade & transpotation services	0.3	0.1	0.4	0.4	0.2	0.1	0.3	0.0
Comunication services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial service	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other traded services	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Utility	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Housing & construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	19.0	12.9	19.6	9.4	4.4	4.3	4.5	2.2
Imports								
Lnad-intensive agriculture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other agriculture	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Prpcessed agriculture	0.5	1.9	4.2	0.1	5.7	0.0	-0.1	0.1
Forestry& fishery	0.1	0.0	0.0	-0.1	0.1	0.1	0.1	0.0
Oil and Natral Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Other mineral products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paper & wood products	2.5	1.7	0.3	0.3	0.3	0.0	1.3	0.0
Textile	28.1	9.2	0.2	1.3	0.9	0.1	1.1	0.1
Wearing apparel	0.2	14.6	0.0	0.0	0.0	0.0	0.0	0.0
Leather, shoes & sports goods	1.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0
Other light manufactures	1.5	2.8	0.1	0.0	0.0	0.0	0.1	0.0
Chemical rubber plastic products	11.6	2.2	1.9	0.9	3.0	0.1	0.6	0.1
Petroleum products	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0
Metals	5.4	0.7	0.4	0.1	0.2	0.2	0.1	0.0
Other mineral products	1.5	0.4	0.3	0.1	0.7	0.2	0.2	0.0
Metal products	1.6	0.8	0.2	0.1	0.0	0.0	0.0	0.0
Motor vehicles and parts	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.0

:China

Japan	Korea	USA	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Total
0.8	2.5	0.0	0.0	0.2	0.0	0.0	0.0	0.2	4.3
1.2	0.3	0.4	0.0	0.8	0.1	0.1	0.2	0.7	5.6
3.8	0.7	0.8	0.0	1.1	0.3	0.3	0.1	1.2	10.5
0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5
0.7	0.7	0.2	0.0	0.2	0.0	0.1	0.0	0.1	2.5
1.9	0.4	3.3	0.0	1.4	0.4	0.1	0.1	0.5	9.6
5.2	2.9	21.9	0.2	20.8	6.8	0.7	1.5	6.2	71.6
16.3	1.5	185.6	0.0	88.6	21.8	3.7	4.1	8.5	334.6
4.0	0.7	18.6	0.0	8.9	2.2	1.6	2.4	6.0	45.7
4.0	0.6	14.5	0.2	12.4	2.2	0.5	2.2	3.6	42.1
2.7	1.3	6.1	0.5	5.6	1.4	0.4	0.9	3.1	25.7
0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.5
2.2	4.3	1.1	0.2	0.8	0.2	0.0	0.1	0.9	14.9
1.6	0.6	2.4	0.1	1.8	0.5	0.2	0.4	2.1	11.1
1.3	0.4	4.8	0.0	4.5	1.0	0.1	0.8	2.8	17.7
1.0	1.7	2.6	0.1	1.0	0.3	0.0	0.1	1.5	10.9
1.6	0.3	4.5	0.0	2.8	3.2	0.3	1.5	4.4	22.5
14.1	4.0	41.1	0.3	30.5	4.4	1.1	4.0	6.7	124.8
13.0	2.7	33.6	0.5	25.2	4.8	0.9	4.2	12.8	113.0
1.0	0.4	2.2	0.1	7.5	0.9	0.5	0.8	1.3	16.5
0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.1	0.6
0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.6
0.2	0.1	0.4	0.0	0.9	0.3	0.1	0.1	0.6	3.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.5
76.8	26.1	344.5	2.3	215.6	50.8	10.7	23.6	63.2	889.8
0.0	0.0	17.2	0.1	0.9	18.6	1.3	3.4	0.4	41.9
-0.1	0.3	1.9	0.0	0.7	0.5	-0.3	0.2	0.6	4.1
1.1	2.1	6.1	0.0	19.6	0.2	0.4	3.2	0.3	45.3
0.2	0.2	0.1	0.0	0.2	0.0	-0.2	0.1	-0.3	0.6
0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.7
0.0	0.0	0.1	0.6	0.2	1.8	0.1	0.8	0.6	4.4
1.5	3.6	1.0	0.0	0.8	0.2	0.2	0.1	0.0	13.7
13.3	32.6	-0.1	0.3	1.9	0.0	-0.1	-0.1	1.0	89.8
1.3	1.2	0.1	0.3	0.3	0.1	0.0	0.0	0.0	18.4
0.1	5.1	0.6	0.2	0.5	0.0	0.0	0.1	0.1	8.2
1.8	1.5	0.5	0.2	-0.6	0.1	0.0	0.0	0.1	8.1
7.6	10.2	6.1	0.3	5.9	1.5	2.5	0.3	1.2	56.0
0.1	0.9	0.1	0.0	0.1	0.0	0.4	0.0	0.6	4.5
7.3	5.6	1.1	0.5	2.7	1.4	4.9	0.9	0.8	32.5
0.1	0.6	0.4	0.3	3.7	0.1	0.0	0.1	0.1	8.8
0.6	1.3	0.3	0.0	0.6	0.1	-0.1	0.0	0.1	5.6
13.4	2.8	1.2	0.1	8.5	0.1	0.4	0.3	0.0	27.3

Other transport equipment	4.3	0.0	0.2	0.1	0.1	0.0	0.3	0.0
Electronic equipment	7.0	4.2	4.0	2.0	1.3	0.1	0.3	0.1
Other machinery	16.2	9.1	2.5	1.2	0.8	0.1	0.2	0.0
Trade & transpotation services	0.1	0.3	0.9	0.4	0.4	0.1	0.2	0.0
Comunication services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial service	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other traded services	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0
Utility	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Housing & construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	82.3	48.1	17.6	6.7	13.8	1.2	4.5	0.5

Percent change from base

	Hong							
	Taiwan	Kong	Singapore	Malaysia	Thailand	Philippine	Indonisia	Vie Nam
Exports								
Lnad-intensive agriculture	30.2	14.0	18.8	14.5	17.0	15.1	15.0	15.1
Other agriculture	17.7	14.5	14.9	15.2	17.5	15.3	14.5	11.5
Prpcessed agriculture	11.8	10.6	12.4	11.4	12.0	10.9	11.0	10.8
Forestry& fishery	25.4	6.8	7.0	7.3	7.1	6.9	7.6	7.3
Oil and Natral Gas	-1.8	1.2	2.8	1.3	1.4	1.2	0.9 na	
Other mineral products	11.6	13.9	12.1	11.0	10.8	10.4	10.1	8.5
Paper & wood products	12.6	10.4	9.9	9.7	9.5	9.3	9.3	8.8
Textile	18.0	6.1	9.1	5.4	6.3	1.3	5.1	7.5
Wearing apparel	26.6	8.6	15.9	17.0	21.0	19.4	16.1	3.0
Leather, shoes & sports goods	15.6	25.7	15.6	15.4	18.0	12.8	17.6	18.3
Other light manufactures	16.8	13.8	9.9	11.0	10.1	6.7	8.4	10.9
Chemical rubber plastic products	13.5	10.4	9.9	9.6	8.9	8.7	8.1	8.3
Petroleum products	4.4	2.6	2.8	2.2	2.1	1.9	1.7	1.0
Metals	14.4	13.9	12.0	12.8	12.5	12.2	12.0	10.1
Other mineral products	12.2	12.2	11.2	10.6	10.9	10.1	9.8	8.5
Metal products	19.6	13.8	12.7	11.9	12.1	11.2	11.1	12.5
Motor vehicles and parts	33.0	26.4	28.0	28.5	28.1	28.4	26.7	27.1
Other transport equipment	57.2	22.5	21.8	21.4	21.6	20.9	21.3	21.1
Electronic equipment	23.9	20.7	18.6	19.0	19.1	19.0	18.3	18.6
Other machinery	22.7	18.0	15.2	15.3	15.7	14.6	15.3	14.1
Trade & transpotation services	11.5	8.4	7.7	6.3	6.2	6.0	5.5	5.7
Comunication services	11.1	7.8	6.7	6.0	5.9	5.7	5.2	4.9
Financial service	10.8	7.4	6.4	5.3	5.2	5.0	4.5	4.3
Other traded services	12.1	9.1	8.2	7.4	7.3	7.1	6.8	6.4
Utility	31.6	7.3	8.8	8.1	7.8	7.2	7.0	6.7
Housing & construction	21.4	9.2	8.5	7.8	7.7	7.3	7.1	6.6
Total	19.4	9.3	14.6	14.3	12.6	11.8	10.9	7.3
Imports								
Lnad-intensive agriculture	80.0	69.0	69.5	69.4	64.9	70.7	71.0	70.5
Other agriculture	2.5	-8.0	14.2	2.0	2.1	6.1	2.1	7.2
Prpcessed agriculture	41.9	75.7	63.2	0.7	86.0	-2.9	-2.6	14.0
Forestry& fishery	29.8	26.1	29.3	-3.5	12.3	53.1	12.7	13.2
Oil and Natral Gas	na	na	-1.2	0.6	0.4	1.2	0.7	0.6
Other mineral products	5.9	1.5	6.2	7.5	7.8	8.1	8.7	9.6

0.6	0.4	1.5	0.1	2.0	0.1	0.3	0.0	0.0	9.8
18.6	12.3	2.8	0.0	2.3	0.3	0.1	0.1	0.1	55.5
16.7	8.4	2.8	0.0	6.8	-0.1	-0.2	0.1	0.0	64.5
0.4	0.4	1.5	0.4	6.8	0.6	0.7	0.8	1.0	15.0
0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.4
0.1	0.0	0.3	0.0	0.9	0.1	0.1	0.1	0.1	1.8
0.1	0.1	0.9	0.1	1.7	0.2	0.2	0.1	0.4	4.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.5	0.0	0.3	0.0	1.6	0.0	0.2	0.0	0.2	2.8
85.5	89.5	46.9	3.7	68.2	25.9	11.0	10.6	7.6	523.5

Japan	Korea	USA	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Total
16.1	7.0	17.1	13.7	15.6	17.0	14.8	15.8	15.9	9.0
15.5	15.6	16.6	13.2	16.0	17.0	15.5	15.9	15.7	15.5
11.7	11.1	11.9	9.7	11.9	12.1	11.8	11.5	12.0	11.6
7.1	8.2	7.0	4.4	6.9	7.1	6.8	6.4	7.0	8.3
1.3	2.0	1.2	0.3	1.3	1.3	1.3	0.9	1.3	1.5
10.3	10.5	10.4	10.7	10.6	10.7	10.9	10.8	10.9	10.7
9.4	10.4	9.3	7.6	9.5	9.6	9.5	9.0	9.7	9.6
9.6	12.0	84.9	8.6	95.9	46.4	11.6	10.5	11.3	23.9
15.4	18.3	226.5	15.6	181.4	90.6	18.7	21.0	19.8	84.8
15.6	19.3	11.8	18.1	17.6	16.3	17.8	15.3	16.5	14.3
10.2	11.4	8.0	10.1	10.5	10.6	11.2	9.3	11.3	9.5
9.4	10.7	9.1	7.6	9.2	9.4	9.3	8.9	9.4	9.4
2.3	2.8	2.0	1.0	2.1	2.1	2.1	1.8	2.1	1.8
12.4	12.0	12.3	11.6	12.4	12.3	12.7	12.0	12.4	12.4
10.0	11.2	10.2	8.4	10.9	10.8	11.0	10.1	10.4	10.5
11.5	12.6	11.4	10.3	12.1	12.2	12.6	11.6	11.7	12.0
28.3	25.7	27.9	22.8	27.8	28.0	28.2	27.2	28.5	27.5
21.0	22.0	21.0	17.7	21.7	21.0	21.5	22.1	21.5	22.0
18.1	18.9	18.0	16.9	18.7	18.9	19.5	18.6	18.7	18.5
14.2	16.1	14.6	13.3	15.3	15.4	15.8	15.1	15.4	15.2
7.1	7.6	6.7	4.5	6.5	6.8	6.5	6.1	7.0	6.7
6.6	7.2	6.1	4.0	6.1	6.2	6.1	5.6	6.1	6.3
6.0	6.7	5.6	3.2	5.5	5.7	5.4	4.9	5.5	5.8
8.0	8.5	7.5	5.4	7.5	7.6	7.5	7.1	7.6	7.9
8.9	9.7	8.2	5.9	8.1	8.3	8.5	7.5	8.3	7.6
8.1	8.7	7.8	5.9	7.7	7.8	7.8	7.3	7.8	8.2
13.2	12.3	29.4	8.2	24.6	25.1	14.6	13.8	14.1	20.5
67.3	68.9	65.5	77.5	68.9	64.9	69.2	69.7	69.5	65.8
-5.1	17.8	19.5	7.1	14.4	3.8	-8.6	6.9	22.9	8.7
42.0	41.5	25.6	-0.2	79.0	2.0	10.6	9.5	18.6	31.8
28.3	39.2	5.5	32.8	11.5	2.5	-3.8	39.5	-3.3	2.6
na	na	6.1	2.9	6.1	0.7	0.7	1.2	0.7	0.8
7.0	6.7	7.9	9.5	8.0	7.6	7.8	8.4	7.8	8.0

Paper & wood products	18.5	10.9	15.0	3.7	10.3	2.9	7.9	2.9
Textile	31.4	25.6	21.4	29.7	19.3	30.4	22.0	24.9
Wearing apparel	42.5	41.6	40.6	39.9	8.1	45.2	23.0	46.9
Leather, shoes & sports goods	18.8	11.7	3.2	15.8	1.6	16.5	23.1	37.8
Other light manufactures	17.6	28.5	37.6	4.0	0.1	26.3	26.3	8.9
Chemical rubber plastic products	10.2	8.5	9.7	10.4	16.7	10.9	11.6	11.2
Petroleum products	7.1	4.2	4.6	4.6	4.8	4.7	4.9 na	
Metals	11.8	8.0	10.7	11.4	12.3	12.0	13.2	13.8
Other mineral products	14.3	13.9	8.2	21.3	30.5	28.1	25.3	17.1
Metal products	16.6	13.5	13.8	18.0	15.1	15.8	15.4	27.3
Motor vehicles and parts	71.1	48.5	60.1	63.8	64.3	61.7	69.1	64.2
Other transport equipment	72.4	3.2	9.2	40.7	70.5	90.2	62.6	70.8
Electronic equipment	10.5	8.4	8.7	9.8	12.1	8.0	30.5	28.7
Other machinery	17.9	14.0	11.8	19.1	12.4	17.7	19.0	20.0
Trade & transpotation services	5.4	5.1	6.6	7.8	7.8	8.3	8.9	8.6
Communication services	5.2	4.9	7.1	8.0	8.0	8.5	9.4	9.1
Financial service	5.6	4.8	6.8	8.4	8.4	9.0	9.7	9.9
Other traded services	3.5	2.9	4.6	5.8	5.8	6.3	7.1	7.0
Utility	22.9	18.5	23.4	24.0	25.8	25.4	26.3	28.0
Housing & construction	12.6	10.6	12.8	13.7	13.8	14.3	14.6	15.5
Total	17.6	18.0	10.2	9.1	20.9	10.2	8.9	6.7

14.1	13.0	4.2	16.0	4.1	1.8	2.0	3.0	2.2	8.5
31.8	30.8	-1.1	7.2	16.9	-0.5	-4.4	-2.1	9.3	26.9
44.2	35.9	32.7	60.8	27.5	28.0	20.6	-7.3	8.1	40.4
11.3	13.7	20.3	22.4	11.2	4.3	5.9	5.0	8.6	14.0
28.0	27.7	17.3	26.5	-10.8	22.9	-12.2	5.8	5.1	19.0
9.1	9.0	10.1	12.9	10.1	10.0	10.0	10.9	10.1	9.9
4.4	4.5	4.8	5.8	4.7	4.7	4.7	5.1	5.6	4.7
9.7	10.2	11.1	16.3	11.1	10.7	10.9	12.5	11.2	10.7
1.0	10.3	5.5	37.8	19.0	10.4	9.4	27.9	18.6	13.5
7.1	14.2	3.9	25.3	4.6	5.9	-5.8	9.1	9.5	9.6
55.9	59.2	60.6	155.4	59.4	59.2	59.2	63.7	59.9	57.9
10.0	6.7	9.0	18.2	9.1	8.8	9.0	10.9	9.4	15.3
11.4	15.6	4.5	23.6	4.5	4.4	6.9	8.9	4.7	9.9
8.3	11.3	3.2	5.2	3.3	-0.4	-2.1	8.6	-1.8	8.1
6.1	5.7	7.1	11.4	7.2	6.9	7.2	8.2	7.2	7.1
6.1	5.7	7.3	12.0	7.3	7.0	7.3	8.5	7.3	7.2
6.5	6.0	7.7	12.6	7.7	7.4	7.7	8.9	7.7	7.6
4.1	3.9	5.2	9.4	5.2	5.0	5.2	6.2	5.3	5.1
22.5	22.6	25.0	32.1	24.6	24.3	23.2	26.0	23.3	23.1
11.9	11.7	13.2	17.7	13.1	12.9	13.0	14.2	13.0	12.8
13.0	15.9	11.7	12.5	10.6	14.8	8.1	12.3	5.0	13.2

Table 7 Differences between a WTO with and without China and Taiwan: Accumulated Sectoral Trade during 2002 - 201

	China	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonesia	Vie Nam
Billion 1997 U.S. dollars								
Exports								
<i>Lnad-intensive agriculture</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other agriculture</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Prpcessed agriculture</i>	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Forestry& fishery</i>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil and Natral Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other mineral products</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Paper & wood products</i>	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Textile</i>	23.5	-0.3	-0.1	-0.3	-0.3	-0.6	-0.3	-0.4
<i>Wearing apparel</i>	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Leather, shoes & sports goods</i>	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other light manufactures</i>	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Chemical rubber plastic products</i>	10.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
<i>Petroleum products</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Metals</i>	5.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other mineral products</i>	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Metal products</i>	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Motor vehicles and parts</i>	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0
<i>Other transport equipment</i>	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Electronic equipment</i>	6.5	0.9	0.5	0.3	0.2	0.1	0.0	0.0
<i>Other machinery</i>	14.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0
<i>Trade & transpotation services</i>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Comunication services</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Financial service</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other traded services</i>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Utility</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Housing & construction</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	72.3	1.1	0.5	0.1	-0.1	-0.5	-0.3	-0.4
Imports								
<i>Lnad-intensive agriculture</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other agriculture</i>	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Prpcessed agriculture</i>	0.2	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
<i>Forestry& fishery</i>	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Oil and Natral Gas	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0
<i>Other mineral products</i>	0.4	0.0	0.0	0.0	0.0	0.0	0.1	0.0
<i>Paper & wood products</i>	0.6	0.0	0.0	0.1	0.0	0.0	0.2	0.1
<i>Textile</i>	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0
<i>Wearing apparel</i>	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1
<i>Leather, shoes & sports goods</i>	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other light manufactures</i>	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Chemical rubber plastic products</i>	1.0	0.0	0.5	0.1	0.1	0.0	0.1	0.0
<i>Petroleum products</i>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Metals</i>	1.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
<i>Other mineral products</i>	0.4	0.0	0.1	0.0	0.1	0.0	0.0	0.0
<i>Metal products</i>	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.0
<i>Motor vehicles and parts</i>	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0

11: Taiwan

Japan	Korea	USA	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Total
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4
0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.0
-0.2	-0.1	-1.3	0.0	-0.4	-0.8	0.0	-0.2	-0.3	18.2
-0.1	0.0	-8.5	0.0	-1.3	-0.4	0.0	0.0	0.0	-10.2
0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0
-0.1	0.0	-0.4	0.0	-0.1	0.0	0.0	-0.1	0.0	0.4
0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	10.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2
0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1
0.0	0.0	-0.3	0.0	-0.1	0.0	0.0	0.0	0.0	0.9
0.1	0.0	0.5	0.0	0.1	0.1	0.0	0.1	0.1	1.5
0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	4.1
0.4	0.3	1.9	0.0	1.8	0.5	0.1	0.2	0.1	13.6
0.0	0.1	0.1	0.0	0.3	0.1	0.0	0.0	0.0	15.3
-0.1	0.0	-0.3	0.0	-0.3	-0.1	0.0	-0.1	-0.1	-0.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
-0.1	0.0	-0.2	0.0	-0.2	-0.1	0.0	-0.1	-0.1	-0.7
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	0.3	-8.6	-0.2	-0.3	-0.8	0.0	-0.2	-0.3	63.1
0.0	0.0	-0.9	0.0	0.0	0.0	0.0	0.2	0.0	-0.7
0.0	0.1	1.0	0.0	0.0	0.0	0.0	0.1	0.0	1.4
1.4	0.1	0.8	0.0	4.1	-0.2	0.0	-0.2	0.0	6.1
0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.7
0.0	0.0	0.1	0.0	0.0	0.6	0.0	-0.1	0.2	1.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
0.2	0.2	0.2	0.0	0.4	0.1	0.0	0.1	0.0	2.3
0.0	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
1.4	0.4	1.2	0.1	1.5	0.3	0.0	0.1	0.0	6.9
0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4
2.4	0.5	0.1	0.1	1.2	0.2	0.1	0.3	0.1	6.3
0.0	0.0	0.2	0.0	0.4	0.0	0.0	0.0	0.0	1.3
0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	1.1
0.3	0.1	1.1	0.0	3.8	0.0	0.0	0.0	0.0	5.9

<i>Other transport equipment</i>	1.1	0.0	0.6	0.3	0.0	0.0	0.0	0.0
<i>Electronic equipment</i>	4.2	0.1	1.8	1.2	0.7	0.2	0.1	0.0
<i>Other machinery</i>	6.4	0.1	0.2	0.2	0.2	0.0	0.0	0.0
<i>Trade & transpotation services</i>	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Comunication services</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Financial service</i>	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Other traded services</i>	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Utility</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Housing & construction</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	20.8	0.4	3.3	2.2	1.2	0.5	0.8	0.4

Percentage change from base

	China	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonisia	Vie Nam
Exports								
<i>Lnad-intensive agriculture</i>	80.0	5.4	10.2	6.0	8.7	6.6	6.4	6.7
<i>Other agriculture</i>	2.5	7.3	7.5	7.7	10.2	7.9	7.1	4.2
<i>Prpcessed agriculture</i>	41.9	2.2	3.9	2.8	3.4	2.4	2.5	2.3
<i>Forestry& fishery</i>	29.8	7.2	7.3	7.6	7.2	7.1	7.9	7.5
Oil and Natral Gas	na	na	3.1	na	na	na	na	na
<i>Other mineral products</i>	5.9	0.5	-0.8	-1.7	-1.7	-2.0	-2.5	-3.6
<i>Paper & wood products</i>	18.5	0.2	-0.3	-0.4	-0.6	-0.8	-0.8	-1.2
<i>Textile</i>	31.4	-7.5	-4.8	-8.2	-7.3	-11.4	-8.6	-6.5
<i>Wearing apparel</i>	42.5	-14.2	-8.6	-8.0	-4.9	-6.2	-8.7	-17.6
<i>Leather, shoes & sports goods</i>	18.8	5.1	-2.7	-3.0	-0.5	-5.1	-1.2	-0.8
<i>Other light manufactures</i>	17.6	1.2	-2.1	-1.4	-2.0	-4.8	-3.5	-1.4
<i>Chemical rubber plastic products</i>	10.2	0.8	0.3	0.1	-0.6	-0.7	-1.2	-1.2
<i>Petroleum products</i>	7.1	2.8	3.0	2.4	2.3	2.1	1.9	1.2
<i>Metals</i>	11.8	1.8	-0.1	0.6	0.3	0.3	0.0	-1.6
<i>Other mineral products</i>	14.3	-0.4	-1.0	-1.6	-1.4	-1.9	-2.3	-3.2
<i>Metal products</i>	16.6	0.8	0.0	-0.8	-0.6	-1.3	-1.4	-0.2
<i>Motor vehicles and parts</i>	71.1	5.1	6.4	6.7	6.6	6.9	7.0	5.8
<i>Other transport equipment</i>	72.4	0.9	0.6	0.1	0.6	-0.2	0.1	0.0
<i>Electronic equipment</i>	10.5	3.0	1.3	1.4	1.5	1.6	0.9	1.2
<i>Other machinery</i>	17.9	2.8	0.4	0.4	0.8	0.0	0.4	-0.4
<i>Trade & transpotation services</i>	5.4	-0.2	-0.8	-2.0	-2.1	-2.2	-2.7	-2.5
<i>Comunication services</i>	5.2	-0.7	-1.5	-2.1	-2.2	-2.4	-2.9	-3.0
<i>Financial service</i>	5.6	-0.4	-1.2	-2.1	-2.3	-2.4	-2.9	-3.0
<i>Other traded services</i>	3.5	-0.4	-1.1	-1.7	-1.8	-2.0	-2.4	-2.7
<i>Utility</i>	22.9	-2.2	-0.9	-1.7	-1.7	-2.2	-2.4	-2.6
<i>Housing & construction</i>	12.6	1.0	0.4	-0.3	-0.4	-0.7	-0.9	-1.2
Total	17.4	2.0	0.7	0.1	-0.2	-2.2	-1.9	-2.4
Imports								
<i>Lnad-intensive agriculture</i>	30.2	na	31.2	-3.2	-4.4	-0.8	2.5	-1.3
<i>Other agriculture</i>	17.7	1.7	1.6	13.0	38.1	20.4	18.6	2.2
<i>Prpcessed agriculture</i>	11.8	14.2	-5.9	-5.4	-6.4	3.9	-4.7	3.6
<i>Forestry& fishery</i>	25.4	-5.6	-5.3	-4.7	-5.5	29.2	-5.3	19.9
Oil and Natral Gas	-1.8	na	na	1.8	-3.2	-2.5	1.9	-3.0
<i>Other mineral products</i>	11.6	-4.6	-1.0	0.4	0.4	2.5	1.3	3.0

0.3	0.5	-0.7	0.1	-0.1	0.0	0.0	0.0	0.1	2.3
-0.5	-0.2	0.7	0.0	1.4	0.2	0.0	0.0	0.0	9.8
0.8	0.5	0.5	0.0	1.8	0.3	0.0	0.0	0.0	11.0
0.3	0.1	0.6	0.1	0.8	0.1	0.1	0.3	0.2	3.1
0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.3
0.1	0.0	0.2	0.0	0.2	0.0	0.0	0.1	0.0	0.6
0.3	0.1	0.8	0.1	1.0	0.1	0.1	0.2	0.2	3.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.1	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.6
6.9	2.4	6.0	0.8	17.2	2.3	0.5	1.2	1.0	67.8

Japan	Korea	USA	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Total
7.8	-1.3	8.6	5.0	7.2	8.5	6.5	7.3	7.3	10.7
8.4	8.4	9.4	5.5	8.7	9.6	8.2	8.6	8.0	7.8
3.3	2.6	3.5	1.2	3.4	3.6	3.3	3.1	3.2	6.0
7.6	8.8	7.4	4.1	7.4	7.6	7.2	6.7	7.1	9.9
na	na	na	na	na	na	na	na	na	3.1
-1.8	-2.1	-1.9	-2.1	-1.7	-1.7	-1.5	-1.7	-1.9	1.6
-0.4	0.3	-0.6	-2.4	-0.5	-0.4	-0.5	-1.0	-0.7	4.4
-4.3	-2.5	-8.3	-5.6	-4.2	-20.6	-2.7	-3.7	-3.3	12.0
-9.0	-7.0	-50.8	-9.7	-40.5	-44.8	-6.7	-4.9	-6.7	-43.4
-2.4	0.3	-5.5	-0.8	-0.8	-2.0	-0.7	-2.9	-2.5	5.0
-1.7	-0.9	-3.5	-2.1	-1.6	-1.5	-1.1	-2.7	-1.4	0.9
0.1	1.1	-0.2	-1.8	-0.2	0.0	-0.1	-0.5	-0.3	5.2
2.5	3.0	2.2	1.1	2.3	2.4	2.3	2.0	2.2	2.3
0.6	-0.1	0.4	-0.5	0.5	0.4	0.7	0.2	0.2	6.5
-1.8	-1.1	-1.7	-3.4	-1.2	-1.3	-1.2	-1.9	-2.1	5.2
-0.8	-0.2	-1.0	-2.2	-0.5	-0.5	-0.2	-1.0	-1.2	1.2
6.9	4.7	6.5	2.5	6.4	6.6	6.7	6.0	6.5	7.6
0.4	0.9	0.2	-2.3	0.7	0.2	0.4	0.9	0.2	8.8
1.1	1.5	0.9	-0.2	1.4	1.6	1.9	1.3	1.0	2.2
-0.1	1.2	0.1	-1.1	0.6	0.7	0.9	0.4	0.3	5.1
-1.2	-0.8	-1.5	-3.7	-1.7	-1.5	-1.7	-2.2	-1.6	-1.4
-1.4	-1.1	-1.9	-4.0	-2.0	-1.9	-2.0	-2.5	-2.2	-1.7
-1.4	-1.0	-1.8	-4.0	-1.9	-1.8	-1.9	-2.5	-2.2	-1.6
-1.1	-0.8	-1.6	-3.6	-1.6	-1.6	-1.7	-2.1	-1.8	-1.4
-0.6	-0.1	-1.2	-3.4	-1.3	-1.2	-1.2	-2.0	-1.6	-0.6
0.2	0.6	-0.1	-2.0	-0.2	-0.2	-0.2	-0.6	-0.4	0.4
0.4	0.8	-1.9	-1.9	-0.1	-1.0	0.3	-0.5	-0.6	3.5
53.3	-4.2	-4.1	7.3	2.6	-4.4	4.4	20.1	-1.8	-2.8
0.4	8.0	12.7	6.6	1.2	-1.3	1.4	61.2	12.3	9.2
31.5	4.6	11.3	-2.5	30.9	-1.7	-5.8	-5.3	11.9	13.5
-5.6	21.0	-3.0	19.1	-5.3	25.4	-5.1	13.2	-4.5	12.5
na	na	2.1	-1.0	-2.9	1.9	-2.9	-2.5	1.9	1.6
0.1	2.6	0.6	2.0	2.6	0.3	0.6	1.0	0.7	2.0

<i>Paper & wood products</i>	12.6	0.8	1.9	2.9	4.3	3.5	3.6	3.8
<i>Textile</i>	18.0	8.2	-1.6	0.3	0.2	4.7	0.9	4.4
<i>Wearing apparel</i>	26.6	0.0	3.5	0.9	0.6	2.7	2.1	4.1
<i>Leather, shoes & sports goods</i>	15.6	-4.3	5.4	12.1	-5.4	5.7	0.8	2.8
<i>Other light manufactures</i>	16.8	-2.3	-0.9	5.6	1.5	5.8	6.0	3.8
<i>Chemical rubber plastic products</i>	13.5	2.5	3.1	3.8	4.3	4.3	4.8	4.5
<i>Petroleum products</i>	4.4	0.2	2.1	2.1	2.3	2.2	2.4	na
<i>Metals</i>	14.4	-0.5	1.1	1.8	9.1	2.4	3.1	3.5
<i>Other mineral products</i>	12.2	2.2	4.9	4.3	6.9	10.9	11.4	10.6
<i>Metal products</i>	19.6	3.9	7.8	2.1	7.9	4.3	5.6	9.8
<i>Motor vehicles and parts</i>	33.0	-0.4	3.2	4.4	5.0	4.5	7.0	6.3
<i>Other transport equipment</i>	57.2	-2.7	20.1	30.6	20.0	29.0	33.9	45.2
<i>Electronic equipment</i>	23.9	1.4	3.0	3.5	6.0	1.3	12.4	10.1
<i>Other machinery</i>	22.7	1.4	1.5	6.3	7.2	1.3	4.9	6.8
<i>Trade & transportation services</i>	11.5	2.4	3.7	4.8	4.9	5.4	5.9	5.6
<i>Communication services</i>	11.1	2.3	4.2	5.0	5.1	5.6	6.3	6.0
<i>Financial service</i>	10.8	2.2	3.9	5.4	5.4	6.0	6.7	6.7
<i>Other traded services</i>	12.1	1.9	3.5	4.6	4.6	5.1	5.9	5.8
<i>Utility</i>	31.6	15.3	19.8	20.5	22.1	21.8	22.6	24.2
<i>Housing & construction</i>	21.4	9.9	12.1	13.0	13.1	13.6	13.8	14.7
<i>Total</i>	19.4	1.6	3.1	3.6	5.4	2.2	2.8	4.5

5.1	8.9	2.6	13.9	4.4	2.4	2.7	3.7	2.8	4.5
-0.9	-1.1	-0.3	3.3	3.4	-0.2	-0.5	0.3	-0.5	3.4
0.0	-1.4	2.3	6.6	1.5	1.7	-0.1	1.0	0.4	5.3
0.2	-4.9	-4.0	0.2	-0.4	-5.1	-4.0	-4.5	-5.1	5.2
1.1	1.1	0.1	3.5	-0.8	-1.0	6.7	0.2	-0.6	5.7
2.7	2.5	3.5	6.2	4.8	3.7	3.5	4.3	3.6	3.9
1.9	2.0	2.3	3.3	2.3	2.2	2.2	2.6	2.3	2.4
7.9	3.5	1.5	5.6	8.3	1.4	1.5	2.7	1.7	5.4
-0.3	-0.6	5.7	6.7	6.8	6.6	1.0	2.1	6.0	4.2
0.4	4.1	3.3	13.7	2.1	4.6	1.7	4.3	1.9	6.1
1.9	1.6	21.2	12.3	19.2	3.5	4.9	5.3	4.0	11.9
11.4	6.5	-2.8	40.1	-2.4	-2.7	8.2	0.6	9.6	4.6
-0.8	-0.6	1.5	9.0	4.2	5.5	-0.3	3.7	2.1	3.0
0.7	2.4	0.8	4.6	2.9	2.8	3.8	6.6	0.9	3.4
3.3	2.9	4.3	8.3	4.3	4.1	4.3	5.3	4.4	4.6
3.3	2.9	4.4	8.9	4.4	4.2	4.4	5.5	4.5	4.8
3.7	3.2	4.7	9.4	4.8	4.6	4.8	5.9	4.9	5.1
3.0	2.7	4.0	8.1	4.1	3.9	4.1	5.1	4.1	4.3
19.0	19.0	21.3	28.0	21.0	20.7	19.7	22.4	19.8	20.7
11.1	11.0	12.5	16.8	12.3	12.1	12.2	13.4	12.3	12.7
2.1	2.0	2.1	6.3	6.4	2.1	2.6	3.1	2.8	4.3

Table 8 Differences between a WTO with and without China and Taiwan: Change of production from baseline

	China	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonesia	Vie Nam	Japan	Korea	USA
	Percent Change from baseline in 2011										
<i>Lnad-intensive agriculture</i>	-2.2	-0.6	11.5	0.1	0.2	-0.1	0.2	0.2	0.1	-2.9	1.6
<i>Other agriculture</i>	1.6	-0.4	-0.1	0.0	0.5	0.2	-0.1	-0.1	-0.2	0.9	-0.1
<i>Prpcessed agriculture</i>	-0.3	1.7	6.7	-0.3	2.1	0.0	0.0	0.3	0.0	0.8	0.1
<i>Forestry& fishery</i>	1.3	-0.2	-0.1	0.0	0.2	0.1	0.3	0.2	0.0	0.4	0.0
Oil and Natral Gas	1.7	0.2	0.5	0.1	0.1	0.2	0.2	0.3	-0.1	0.0	0.1
<i>Other mineral products</i>	2.4	1.0	0.3	0.1	0.3	0.3	0.2	0.0	-0.4	-0.2	0.0
<i>Paper & wood products</i>	2.5	2.0	0.1	0.4	0.5	0.3	1.3	0.3	0.1	1.4	0.1
<i>Textile</i>	14.5	0.5	-5.3	-0.8	-5.3	-9.9	-4.8	-4.1	3.4	5.1	-3.5
<i>Wearing apparel</i>	37.5	-6.5	-7.4	-15.0	-9.0	-19.3	-12.2	-11.6	-2.4	-5.7	-11.5
<i>Leather, shoes & sports goods</i>	11.2	-1.5	-4.1	0.4	-5.2	-4.4	-5.1	-3.2	-2.3	1.8	-2.2
<i>Other light manufactures</i>	5.3	6.1	-1.1	-1.1	-1.8	-2.0	-0.1	-0.7	-0.4	-0.2	-1.8
<i>Chemical rubber plastic products</i>	2.3	2.9	0.8	0.7	1.8	-0.1	0.1	0.3	0.3	1.5	0.1
<i>Petroleum products</i>	1.5	3.6	1.8	0.2	0.1	-0.2	-0.3	0.0	0.1	1.0	0.1
<i>Metals</i>	2.5	3.7	0.2	0.2	1.1	0.9	0.9	0.4	0.4	0.2	-0.1
<i>Other mineral products</i>	1.4	0.2	0.0	0.1	1.3	1.7	0.8	-0.4	-0.3	0.0	-0.1
<i>Metal products</i>	3.8	2.3	0.6	0.0	0.1	-0.1	0.2	2.9	-0.2	-0.1	-0.1
<i>Motor vehicles and parts</i>	-1.6	-2.4	0.0	0.4	0.5	1.0	2.8	0.9	0.0	-1.1	0.3
<i>Other transport equipment</i>	4.9	-2.3	3.1	1.7	0.4	0.9	2.9	1.1	-1.3	-2.6	-0.2
<i>Electronic equipment</i>	11.5	2.2	0.1	-0.5	0.1	-0.5	0.4	0.6	-0.3	-0.7	-0.5
<i>Other machinery</i>	4.3	4.5	-0.1	0.3	0.6	0.2	0.6	0.6	-0.3	-0.4	-0.3
<i>Trade & transpotation services</i>	2.6	0.3	1.1	0.3	0.2	0.1	-0.1	0.0	0.2	0.6	0.1
<i>Comunication services</i>	2.2	0.6	0.6	0.2	0.2	0.1	0.0	-0.2	0.1	0.2	0.1
<i>Financial service</i>	2.2	0.5	0.4	0.1	0.0	0.0	-0.1	0.5	0.1	0.3	0.1
<i>Other traded services</i>	0.6	0.4	0.0	0.1	0.1	0.5	0.1	-0.2	0.1	0.2	0.1
<i>Utility</i>	2.6	0.1	0.2	-0.1	-0.1	-0.6	-0.6	-0.9	0.1	0.7	0.0
<i>Housing & construction</i>	0.1	0.7	0.7	0.1	0.1	-0.1	-0.2	-0.6	0.1	0.3	0.1
Total	3.4	0.5	0.4	-0.1	-0.2	-0.4	-0.4	-0.8	0.0	0.2	0.0

Taiwan	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Average
0.1	-0.2	0.6	4.1	0.7	0.6	0.2	0.2
-1.9	0.0	0.3	-1.1	-0.1	0.1	-0.1	0.3
-2.7	0.8	0.4	-0.4	0.0	0.1	0.0	0.1
-1.4	-0.1	0.1	0.2	-0.1	0.0	0.0	0.3
0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2
0.4	1.2	0.1	0.1	0.1	0.3	0.1	0.7
0.9	0.0	0.0	-0.1	0.0	0.0	0.0	0.3
13.1	-3.4	-3.9	-4.7	-3.1	-2.3	-2.9	1.8
-7.5	-15.9	-9.4	-10.5	-8.6	-4.6	-8.2	-1.3
3.1	1.5	-3.8	-2.9	-2.8	-1.9	-1.4	0.7
-0.4	0.8	-1.0	-1.8	-0.9	-0.7	-1.0	0.5
4.1	-0.4	-0.1	0.0	0.1	-0.1	-0.1	0.4
2.0	-0.6	0.1	0.2	0.2	0.0	0.1	0.3
1.8	1.5	0.0	-0.3	0.5	0.3	0.0	0.6
0.7	0.8	0.1	-0.2	-0.1	0.0	-0.1	0.4
0.5	3.1	-0.2	-0.4	-0.2	0.0	-0.2	0.4
-4.0	2.1	0.5	0.0	0.2	0.6	0.2	0.2
4.4	1.4	-0.2	-0.7	-0.1	0.4	-0.2	0.5
1.5	1.0	-0.6	-0.8	-0.4	-0.5	-0.5	0.8
2.9	0.5	-0.3	-0.8	-0.3	-0.1	-0.2	0.5
0.5	-0.3	0.3	0.3	0.4	0.0	0.1	0.3
0.2	-0.3	0.1	0.2	0.1	0.0	0.1	0.2
0.7	-0.2	0.1	0.2	0.1	0.0	0.1	0.2
0.1	-0.3	0.1	0.1	0.1	0.0	0.0	0.1
1.9	0.0	0.0	0.0	0.1	0.0	-0.1	0.2
0.2	-0.4	0.1	0.1	0.1	0.0	0.0	0.1
1.2	-0.5	0.0	0.0	0.0	-0.1	-0.1	0.3

10 year average

	China	Hong Kong	Singapore	Malaysia	Thailand	Philippine	Indonesia	Vie Nam	Japan	Korea	USA
	Percent Change from baseline in 2011										
<i>Lnad-intensive agriculture</i>	-1.9	-0.1	4.7	0.1	0.0	-0.1	0.1	0.2	0.0	-1.5	0.9
<i>Other agriculture</i>	1.1	-0.3	-0.1	0.0	0.3	0.1	0.0	-0.1	-0.1	0.4	-0.1
<i>Prpcessed agriculture</i>	-0.2	0.7	3.5	0.0	1.2	0.0	0.0	0.2	0.0	0.4	0.0
<i>Forestry& fishery</i>	0.9	-0.1	-0.1	0.0	0.1	0.1	0.2	0.2	0.0	0.2	0.0
Oil and Natral Gas	1.1	0.1	0.3	0.1	0.1	0.1	0.2	0.2	-0.1	0.0	0.1
<i>Other mineral products</i>	1.5	0.7	0.1	0.1	0.3	0.2	0.2	0.0	-0.2	-0.2	0.0
<i>Paper & wood products</i>	1.6	1.2	0.0	0.4	0.3	0.3	0.9	0.2	0.0	0.8	0.0
<i>Textile</i>	9.4	0.0	-3.6	-3.4	-4.0	-6.2	-3.5	-2.4	1.5	2.7	-1.4
<i>Wearing apparel</i>	24.6	-4.4	-4.4	-13.6	-5.8	-11.2	-8.2	-5.7	-1.2	-3.0	-3.2
<i>Leather, shoes & sports goods</i>	7.2	-1.1	-2.8	0.3	-3.3	-3.0	-3.5	-2.2	-1.3	1.0	-1.4
<i>Other light manufactures</i>	3.5	2.9	-0.7	-0.6	-1.0	-1.0	0.0	-0.3	-0.2	-0.2	-0.9
<i>Chemical rubber plastic products</i>	1.5	1.7	0.4	0.5	1.1	0.0	0.0	0.2	0.1	0.9	0.0
<i>Petroleum products</i>	1.0	2.5	1.2	0.1	0.1	-0.1	-0.1	0.0	0.1	0.6	0.0
<i>Metals</i>	1.4	2.2	0.1	0.3	0.8	0.6	0.7	0.3	0.2	0.1	0.0
<i>Other mineral products</i>	0.9	0.4	0.0	0.2	0.8	1.1	0.6	-0.2	-0.1	0.0	-0.1
<i>Metal products</i>	2.4	1.4	0.3	0.1	0.2	0.0	0.2	2.0	-0.1	-0.1	-0.1
<i>Motor vehicles and parts</i>	-2.1	-1.1	0.0	0.4	0.4	0.7	1.8	0.7	0.0	-0.7	0.1
<i>Other transport equipment</i>	2.8	-1.1	2.0	1.4	0.5	0.7	1.9	0.8	-0.6	-1.5	-0.1
<i>Electronic equipment</i>	7.7	1.2	0.1	-0.2	0.2	-0.3	0.3	0.4	-0.2	-0.5	-0.3
<i>Other machinery</i>	2.6	2.6	0.0	0.4	0.5	0.2	0.4	0.4	-0.1	-0.3	-0.1
<i>Trade & transpotation services</i>	1.8	0.2	0.6	0.2	0.1	0.1	0.0	0.0	0.1	0.4	0.1
<i>Communication services</i>	1.5	0.3	0.3	0.2	0.2	0.2	0.1	-0.1	0.1	0.1	0.1
<i>Financial service</i>	1.5	0.3	0.2	0.1	0.0	0.1	0.0	0.3	0.1	0.2	0.0
<i>Other traded services</i>	0.3	0.2	0.0	0.1	0.1	0.4	0.1	-0.1	0.0	0.1	0.0
<i>Utility</i>	1.7	0.0	0.0	-0.2	-0.1	-0.3	-0.4	-0.5	0.0	0.4	0.0
<i>Housing & construction</i>	0.0	0.4	0.4	0.1	0.1	0.0	-0.1	-0.3	0.0	0.2	0.0
Total	2.2	0.3	0.2	-0.1	-0.1	-0.2	-0.2	-0.4	0.0	0.1	0.0

Taiwan	India	EU 15	Other OECD	FSU	Latin America	Rest of World	World Average
-0.1	0.0	0.3	2.8	0.4	0.4	0.1	0.1
-1.2	0.0	0.1	-0.6	-0.1	0.1	0.0	0.1
-1.7	0.4	0.2	-0.2	0.0	0.1	0.0	0.1
-1.0	0.0	0.0	0.1	-0.1	0.0	0.0	0.1
0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
0.3	0.8	0.0	0.0	0.1	0.3	0.0	0.4
0.6	0.0	0.0	-0.1	0.0	0.1	0.0	0.1
5.8	-1.9	-1.9	-2.2	-1.8	-1.9	-1.6	0.9
-14.1	-11.1	-4.0	-4.4	-4.4	-5.0	-3.8	-0.8
2.3	0.7	-2.3	-1.8	-1.6	-1.2	-1.0	0.4
-0.1	0.5	-0.5	-1.0	-0.5	-0.3	-0.6	0.2
2.4	-0.2	-0.1	0.0	0.1	-0.1	0.0	0.2
1.0	-0.3	0.1	0.1	0.1	0.0	0.1	0.2
1.2	0.9	0.0	-0.2	0.3	0.4	0.0	0.3
0.5	0.5	0.0	-0.1	0.0	0.1	-0.1	0.2
0.6	2.0	-0.1	-0.2	-0.1	0.1	-0.1	0.2
-2.3	1.0	0.3	0.0	0.2	0.6	0.1	0.1
3.0	0.7	0.0	-0.3	0.0	0.5	0.0	0.2
1.3	0.6	-0.3	-0.5	-0.2	-0.1	-0.3	0.4
2.1	0.3	-0.1	-0.4	-0.1	0.2	-0.1	0.3
0.2	-0.1	0.2	0.1	0.2	0.0	0.1	0.2
0.1	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.4	-0.1	0.0	0.1	0.0	0.0	0.0	0.1
0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0
1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.1	-0.2	0.0	0.1	0.0	0.0	0.0	0.0
0.6	-0.2	0.0	0.0	0.0	-0.1	-0.1	0.1