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The Impacts of WTO Membership on Economic/Trade Relations Among the Three Chinese Economies: China, Hong Kong and Taiwan

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Abstract. Based on CGE model simulations, the present study examines the impacts on the growth of GDP, social welfare, the terms of trade, the volume of trade and trade dependence, under alternative scenarios of a WTO with and without the membership of China and Taiwan. In general, the three Chinese economies, China, Hong Kong and Taiwan, will be benefited by China and Taiwan's WTO memberships. The world trade will increase by more than \$ 130 billions in real terms (\$ 63.6 billions of export and \$ 66.5 billions of import). Among them, more than 60 percent will be shared by China, and 10 percent shared by Taiwan. The intermediate role of Hong Kong in trade and investment relations across the Taiwan Strait will diminish, Taiwan's trade dependence on China will increase, but China's trade dependence on Taiwan will decrease. However, trade flows across the Taiwan Strait will focus more on intra-industry trade.

I. Introduction

Since the Uruguay Round of trade negotiation, the world trade system has been substantially liberalized. The World Trade Organization (WTO), which replaced the General Agreement on Tariffs and Trade (GATT) in 1995, has become the formal international organization to implement trade agreements under the Uruguay Round. However, a freer trade system has not been universally applied to all countries in the world. By the end of 1999, both China (People's Republic of China) and Taiwan have not officially been admitted to the WTO, despite the fact that China and Taiwan have been ranked as one of the top 15 largest trading countries in the world since 1990. Much speculation was focused on when and how China will be admitted to the WTO,¹ but not so much on how the world trade would operate with or without China and Taiwan's accession to the world trading body.

To fulfill their membership requirements at the world trade body, both China and Taiwan have undertaken their respective drives of trade liberalization since the 1980's. During the APEC summit in 1995, China pledged to cut its average rate of tariffs by 30 percent. As a result, the average tariff rate in China had been reduced to 22 percent by April 1996. In 1998, China undertook a dramatic unilateral tariff reduction in anticipating for being admitted to the WTO. In addition, China also tried to reduce other non-tariff trade barriers so as to make its trade system more compatible with the WTO trading framework established under the Uruguay Round.

Taiwan has been undertaking its trade liberalization since the 1980's. Taiwan has completed most trade negotiations with its partners, and has liberalized its trade sectors to be compatible with the WTO framework so as to fulfill its membership requirements at this international organization.

¹ When the GATT was established in the post war era, China, under civil war between the Nationalist (Kuomintang) and the Communist, was represented by the Nationalist government of the Republic of China (ROC) . In 1950's, ROC (Taiwan) withdrew from GATT. But, the People's Republic of China (PRC) applied for membership at the GATT --- the former body of the WTO. Meanwhile, the government of the ROC re-applied for its membership at the WTO under " custom territory" of " Taiwan, Penghu, Kinmen and Matsu". By August 1999, Taiwan completed trade negotiations with all its partners except for Hong Kong and Canada. The government of the PRC insists that PRC must be admitted first before Taiwan is allowed to join the WTO.

Moreover, Taiwan has pushed for its ambitious drive to be the Asia-Pacific Regional Operation Center (APROC) which will further liberalize its trade sectors by more than what are required for its WTO membership.

By the end of 1998, China's export and import values totaled \$183.6 billions and \$140.3 billions respectively, whereas the counter parts in Taiwan were \$ 121 billions and \$ 114 billions respectively. The combined value of total exports and imports in China, Hong Kong and Taiwan is more than half of that in the U.S. and has exceeded that of Japan since 1995. It is fair to argue that both China and Taiwan are too significant to be ignored in the world economic community. So, if the WTO would not shut its door to these two large trading economies forever, it is interesting to assess what would be the impacts of China and Taiwan's WTO membership status on the world economy in general, and on the trilateral economic /trade relations among the three Chinese economies in particular.

At present, trade across the Taiwan Strait, at least in principle, is still highly regulated, with indirect trade through Hong Kong. But, the current trading pattern between China and Taiwan will be subjected to change after China and Taiwan join the WTO. It is interesting to assess to what extent their WTO membership status will affect the trilateral economic and trade relationships among China, Hong Kong and Taiwan.

This study applies a multi-sector, multi-region Computable General Equilibrium (CGE) model to analyze the economic and trade relations among the three Chinese economies - China, Hong Kong and Taiwan - under alternative scenarios of the world trade system with or without China and Taiwan's memberships at the WTO. Based on CGE model simulations, the present study examines the impacts on the growth of GDP, social welfare, the terms of trade, the volume of trade and the trade dependence of China and Taiwan for 14 countries (regions) under the alternative scenarios of a WTO with and without China and Taiwan. In general, after China and Taiwan join the WTO, the overall trade in the world will increase by \$130.1 billions with \$ 63.6 billions of exports and \$ 66.5 billions of

imports at 1995 current prices under steady-state capital market closure, which will be defined later. China will get 60 percent of additional export growth in the world because of its WTO membership, while Taiwan will get 10.4 percent. Real export in Hong Kong, which has been serving as the entrepot and liaison stations for Taiwanese firms in their trade and investments with China, will also increase too.² Industrialized countries such as the U.S., Japan, and Western Europe are to be benefited from China and Taiwan's WTO membership.

After China and Taiwan join the WTO, the intermediate role of Hong Kong in trade and investment flows across the Taiwan Strait will diminish. Taiwan's trade dependence on China will increase, but China's trade dependence on Taiwan will decrease whereas its trade dependence on industrialized countries will increase. Trade flows across the Taiwan Strait will focus more on intra-industry trade.

The paper is organized as follows: the second section will briefly discuss the model structure, including the coverage of multi-sector, multi-country and alternative assumptions under various scenarios. The third section will discuss the simulation results on macroeconomic indicators. In Section IV, summary results of the aggregate and sectoral trade flows will be reported. The changing trilateral economic and trade relationship among China, Hong Kong and Taiwan is analyzed in Section V. The last section concludes and summarizes.

II. Structure of A Multi-Sector, Multi-Region CGE Model

In literature, several studies based on multi-country CGE model have been conducted to assess the probable impacts of economic integration, trade liberalization, and the contagion effect of Asian

² Taiwan has officially maintained no direct trade with and investment in China due to political considerations. Hence, Taiwanese traders and investors have to go through Hong Kong in their dealing with China. It was recently reported that direct trade between Taiwan and China has improved. Meanwhile, many Taiwanese firms set up their subsidiaries in Hong Kong merely for the purpose of investing in China.

financial crisis. Among them, Wang (1994) applied a CGE model to the economic integration among Taiwan, Hong Kong and China. Tuan and Wang (1996) used a similar method to analyze the impact of China and Taiwan's WTO entry on world trade. While both are interesting analyses, they bear less significant policy implications. The former dealt with economic integration among these three Chinese economies under strong political barriers³, whereas the latter focused only on agricultural commodities. Other recent studies on China's WTO accession are focused on welfare effects (Bach and Martin, 1996), unemployment issues (Xu and Chang, 2000) or structural adjustment in China (Yang, 1996). Only a limited effort has been made in evaluating its impact on structural changes of other countries in the world (Wang, 1997b, 1999).

The model in this study expands the general equilibrium model of de Melo and Tarr (1992) to a multi-country and multi-sector model (Whalley, 1985) under the macro closure specification discussed by Devarajan et al (1990). Each country (region) has three economic agents, e.g. government, resident and investor. Each sector of the economy has a competitive market with firms maximizing their profits. Detailed descriptions of interactions among the economic agents, factor endowments, production and demand conditions could be found in Wang and Slagle (1996) as well as Wang (1997a).

To carry out this task, a 14-region (country), 20-sector, 5-factor social accounting matrix (SAM) estimated for the year of 1995 was constructed. The SAM starts with multi-sector input-output matrix that provides information regarding the circular flows of income among several economic actors. The substitution elasticity estimates for sectoral production functions as well as sectoral import and export functions for each country are drawn from various sources described in the Global Trade Analysis Project Data Base (GTAP version 4). Unless otherwise specified, all parameters used in this study represent point estimates from the 1995 base year.

³ For the obstacles and barriers of formal integration among these three Chinese economies, see Chow (1993 pp. 99-118).

Since our purpose is to compare the probable impacts of China and Taiwan's WTO memberships on production patterns and trade flows in the three Chinese economies, the fourteen regions (country groups) selected were based on their respective significance in trading with the these three economies. They include:

- a) Five groups of OECD countries: the U.S., Canada, Japan, Western Europe, and Australia/New Zealand;
- b) Three Newly Industrializing Countries: Korea, Taiwan and Hong Kong. And,
- c) Six groups of developing countries: ASEAN (Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam), China, South Asia (India, Bangladesh, Nepal, Pakistan, and Sri Lanka), Mexico, Central America and Caribbean, and the Rest of the World.

The twenty sectors of industries include the following:

- a) Eight agricultural sectors: (1) paddy rice, (2) wheat, (3) feed grains, (4) planted fiber, (5) non-grain crops, (6) livestock, (7) dairy and meat products, and (8) processed food ;
- b) Three resource sectors: (9) forestry and fishery, (10) energy, and (11) mines ;
- c) Seven manufactured sectors: (12) textiles, (13) clothing, (14) other light manufactures, (15) manufacture, intermediates (16) motor vehicle and parts (17) electronics, and (18) machinery ; and
- d) Two non-manufacturing sectors: (19) housing and construction, and (20) other services including international transport.

The five factors of production are arable land, agricultural labor, unskilled labor, skilled labor and capital. Factors of production are free to flow across sectors within the country (region) but not across the country boundary. Arable land is transferable only within the agricultural sectors but not among agricultural, manufacturing and services sectors.

Two counterfactual analyses based on two alternative scenarios of WTO with or without

China and Taiwan are conducted. The first scenario adopts the trade parameters under the Uruguay Round trade regime, but with China and Taiwan excluded from the WTO. The second counterfactual scenario is to include both China and Taiwan in the WTO. If China joins the WTO and abides by the rules of game in world trade, then additional 35 percent cut on top of its unilateral tariffs reduction in 1998 (Table I below) is necessary. For Taiwan, a 36 percent reduction of tariffs on non-agricultural commodities will be implemented. The average tariff rate would be 14.2 percent in China and 8.8 percent in Taiwan under this scenario. Moreover, their exports of textiles/clothing products will not be restricted by the current Multi-Fiber Arrangement (MFA).

Each of these two scenarios is further examined under two sets of assumptions of capital market: The first one is a static capital market closure and the second one is steady-state capital market closure. A static capital closure is identical to the comparative static analysis of gains from trade liberalization. The steady-state capital market closure assumes that the return to capital is held constant while the stock of capital is endogenously determined. It assumes that each region's aggregate capital stock is at its steady-state level in the benchmark equilibrium, and trade liberalization will increase capital returns due to more efficient allocation of resources. In a dynamic sense, this will lead to a higher savings and investment rate. More capital stock in the economy will drive down the marginal productivity of capital, thus decreasing the return of capital until its initial level. Although it cannot provide information about the transition path of how the capital price in each region returns to its steady-state equilibrium after an external shock, it can shed some light on the approximate size of the accumulation effect from trade liberalization-induced investment growth in a classical Solow-type growth model at almost no additional implementation cost. The theoretical underpinnings of this closure are based on the concept of invariant capital stock equilibrium proposed by Hansen and Koopmans (1972), and it was introduced into CGE analysis to estimate the accumulation effects of

trade liberalization by Harrison, et al. (1995).⁴

Table 1 reports the percentage reduction of import protection rates from the 1995 base level for all sectors in the 14 countries (regions) under study. They are aggregated from Version 3 of the GTAP database.⁵ The average reduction of domestic agricultural subsidies is 18 percent for developed countries and 13 percent for developing countries. For the reductions of export subsidies, they are 36 percent for developed countries and 24 percent for developing countries. To simulate the termination of the MFA quota system, the quota rent equivalent of export taxes are eliminated for all developing countries except for China and Taiwan which are not members of the WTO. Under the scenario of a WTO without China and Taiwan, the quota restriction on textiles/clothing products under MFA from China and Taiwan will continue, but it will be phased out after both of them join the WTO. Other information on the data sources is reported at the bottom of Table 1.

(Insert Table 1: Simulation Design: Reduction of import protection by sectors and regions).

III. Macro Indicators from Model Simulation Results

Simulation results from these two scenarios under two alternative capital market closures are voluminous. Table 2 below only summarizes the differences between a WTO with and without China and Taiwan under both static and steady state of capital market closures.⁶ The numbers reported in Table 2 show the differences of simulation results for each of the 14 countries (regions) under alternative conditions of whether WTO includes China and Taiwan or not. A positive number indicates an increase after China and Taiwan join the WTO. Our discussion will focus on the

⁴The increased capital stock from simulations under such a capital market closure may be interpreted as trade liberalization induced additional capital stock accumulation over a medium term.

⁵ At the time of this study, the tariff schedule before and after Uruguay Round in GTAP version 4 was not released. This study use the tariff schedules of version 3 of GTAP by calculating the percentage change of import protection of Uruguay Round trade liberalization as reported in Table 1.

economic conditions and the trilateral trade relations among the three Chinese economies. Readers interested in the impacts of China and Taiwan's WTO memberships on other countries (regions) are referred to the appropriate columns.

(Insert Table 2 here)

From Table 2, one could find that under the static capital market closure, the total social welfare in the world measured by Hicksian equivalent variation will gain by \$17 billions after China and Taiwan join the WTO. China alone will gain more than half of it, or \$8.6 billions, which is 1.21 percent of its GDP at the 1995 level. But, the gain of social welfare is even larger under the steady-state capital market closure: The total social welfare of the world will increase \$38.1 billions, with 61 percent (\$23.5 billions) of it goes to China. Hence, China's social welfare will increase by 3.3 percent of its GDP at the 1995 level. As for Hong Kong and Taiwan, social welfare will increase by 0.08 percent and 0.45 percent of their GDP at the 1995 level respectively under the static capital market closure, but will increase by 0.58 percent and 1.40 percent respectively under steady-state capital market closure. The gains are larger under steady-state closure because of the induced investment growth from trade liberalization.

The international terms of trade in the three Chinese economies will improve by various degrees under both static and steady state capital market closures after China and Taiwan join the WTO. It is noteworthy that while the terms of trade will improve in most OECD countries, it will deteriorate in South Asia, Mexico, Central America and the rest of developing countries. This is because China's exports are mainly labor-intensive products that are close substitutes with those from developing countries. Hence, China's accession to the WTO will increase competition of those "similar product groups" and bid down their prices in the world market. In contrast, China will increase its imports of capital and technology-intensive products from OECD countries. Hence,

⁶ Simulation results under other scenarios are available from the authors upon request.

international terms of trade in those industrialized countries will be improved from China's WTO membership.

As for trade flows, China and Taiwan will be benefited from their accessions to the WTO. Under the static capital market closure, China alone will increase its total trade (exports plus imports) by \$78.7 billions, Taiwan will boost its total trade by \$10.5 billions, but Hong Kong will decrease its total trade slightly by \$0.03 billions. China's trade surplus will further increase but Taiwan's trade surplus will decrease because Taiwan's imports will increase more than its exports.

Under the steady state capital market closure, the trade flows in all three Chinese economies will be enhanced by China and Taiwan's accession to the WTO; China's trade will increase by \$87.2 billions, while those of Hong Kong and Taiwan will increase by \$1 billions and \$12.2 billions respectively. However, Taiwan's trade surplus will reduce while that of China will increase after both economies join the WTO. The trade account of Hong Kong will be marginally affected by WTO memberships of China and Taiwan.

As for factor returns, China will benefit the most in all of its returns on land, capital, skilled and unskilled labor. The returns on land in Taiwan and unskilled labor in Hong Kong will deteriorate. This finding reflects the difference of factor endowment between Taiwan and Hong Kong and is consistent with the Stolper-Samuelson theorem in that factors of production used intensively in the export sector will be benefited, whereas those used intensively in the import-substituting sectors will be adversely affected from trade expansion. Unskilled labor in Hong Kong will be challenged by China's huge surplus labor whereas scarcity of Taiwan's land which are used more intensively in domestic agricultural productions will be negatively affected by trade expansion after its accession to WTO.

IV. Changes of Trade Flows at Aggregate and Sectoral Levels

What will be the difference of trade volume between a WTO with and without China and

Taiwan's membership? Table 3 compares the differences of trade flows by sectors in each country (region) under alternative scenarios. Results from this table are from simulations at current prices under the steady state capital market closure. A positive number indicates that there is an increase in exports / imports from China and Taiwan when they join the WTO.

(Insert Table 3 here)

The last column on Table 3 indicates that the total exports of the world will increase by \$63.6 billions (top panel) whereas the total import of the world will increase by \$66.5 billions (bottom panel). More than 60 percent of the increase in world exports will be from China. The bulk of China's \$38.5 billions increase in exports will come from clothing (\$29.2 billions), light manufactures (\$3 billions), machinery (\$2.4 billions) and electronics (\$2.1 billions). But, China's export of food and agriculture will decrease by \$1.4 billions with a decrease of \$543 millions in non-grain crops, \$360 millions in processed food, and \$284 millions in livestock. This result is in direct contrast with the US: Column 1 on Table 3 shows that US exports of food and agricultural commodities will increase by \$1.6 billions after China and Taiwan join the WTO. It further illustrates that U.S. has strong comparative advantage in agricultural commodities whereas China's comparative advantage lies in textiles/clothing and light manufactures. This finding is quite consistent with the standard trade theory in that trade expansion due to its accession to the WTO will mandate China to relocate its resources from less competitive sectors such as food and agriculture to more competitive sectors such as labor-intensive light manufactured sectors.

Taiwan will also be benefited from its WTO membership by increasing \$6.6 billions of its exports to the world. At the sectoral level, Taiwan's exports of textiles (\$3.5 billions), manufacture intermediates (\$2 billions), and light manufactures (\$1.3 billions) will increase but its exports of electronics (-\$653 millions), clothing (-\$289 millions), and other services (-\$317 millions) will decrease.

As for Hong Kong, the most significant results will be the drop of its export of clothing by \$2.7 billions, mainly because of increasing competition from China. But, Hong Kong's exports of light manufacture, manufacture intermediates and machinery will increase after China and Taiwan join the WTO. The overall export from Hong Kong to the world will still increase by \$872 millions.

The world imports will increase by \$66.5 billions after China and Taiwan join the QWTO. China alone will increase its imports from the world by \$38.6 billions with most increase of its imports on food and agriculture (\$4.2 billions), textiles (\$9.9 billions), machinery (\$5.8 billions), manufacture intermediates (\$5.3 billions). Taiwan will also increase its import from the world by \$6.6 billions with imports of manufacture intermediates (\$1.8 billions), other services (\$12.5 billions) and machinery (\$671 millions) as the major items of rising imports after Taiwan joins the WTO.

As for Hong Kong, its imports from the world will increase by \$8.9 billions from the change of China and Taiwan membership status at the WTO. Hong Kong will cut its import of textiles (-\$698 millions.) and planted fiber (-\$67 millions). There are no significant changes on Hong Kong's trade of agricultural commodities for obvious reasons.

V. Structural Changes in the Three Chinese Economies

Table 4 reports the simulation results of percentage changes of production, consumption, exports and imports under the scenario of steady-state capital market closure. Since changes in the exports and imports for each of these three Chinese economies were discussed before, this section will only concentrate on changes of production structures, consumption patterns and trade dependence due to China and Taiwan's WTO membership status.

(Insert Table 4 here)

From Table 4, highlights of changes in China's economy are a 80 percent increase in the production of clothing, 14.1 percent increase in textiles, but a 30 percent reduction of production in motor vehicle, reflecting its comparative advantage in textiles and clothing. Overall, China's

consumption will increase by 7 percent with concentration in motor vehicle (15.2 percent) electronics (11.2 percent), light manufactures (10.2 percent), machinery (10.2 percent), textiles/clothing (9.1 percent and 9.3 percent), housing construction (8.1 percent), and other services (7.4 percent) than in food and agricultural commodities (6.4 percent).

These simulation results also reveal some salient features on the changing consumption pattern as the economy develops. As China's per capita income continues to increase, China's consumption will gradually shift more and more to consumer durable goods and services while the growth rate of its consumption on food grains will decelerate.

The change of production structures and consumption pattern in Taiwan is less pronounced than that in China. There will be a reduction in production of Taiwan's wheat (-5.5 percent), feed grain (-38.7 percent), motor vehicles and parts (-5.0 percent), and electronics (-2.7 percent). But, Taiwan's production in textiles and light manufactures will increase by 20 percent and 4.3 percent, respectively. For consumption, the sectors that have above average increases are motor vehicle (3.8 percent); machinery (3.5 percent), and manufacture intermediates (3.0 percent), light manufactures (3.1 percent). An interesting result from Table 4 is Taiwan's increase of feed grain consumption of 4.8 percent. Reconciling its decrease in feed grain production (-38.7 percent), Taiwan's increased feed grain consumption has to come from an increase in imports (13.1 percent) and reduction in exports (-79.7 percent).

Among the three Chinese economies, the production and consumption patterns in Hong Kong will have the least changes. The large changes are the reduction in production of clothing (-14.1 percent) and planted fiber (-12.5 percent), and the increase in production of light manufactures (11.6 percent), manufacture intermediates (9.1 percent) and processed food (8.7 percent). However, there are no significant changes of consumption structures in Hong Kong.

As for the economic and trade relations among the three Chinese economies, Taiwan's export to China will increase by \$9.2 billions while its imports from China will increase by \$658 millions

(see table 5). With a reduction of trade barriers across the Taiwan Strait, exports from Taiwan to China will increase, in textiles (\$3852 millions), in manufacture intermediates (\$2189 millions), in other light manufactures (\$1715 millions), and in machinery (\$1067 millions). Taiwan's imports from China will also increase, in manufacture intermediates (\$176 millions), in machinery (\$142 millions), and in light manufactures (\$108 millions). The relatively smaller increase of Taiwan's import from China comes from Taiwan's current highly restrictive imports from China, on which our model simulation is based (Taiwan's import restrictions on China's exports is less liberal than China's import restrictions on Taiwan's export). But, even under current restrictive trade, trade flows will increase substantially after both join the WTO.

The increased trade within the *same* sector between China and Taiwan is an indication of a burgeoning intra-industry trade between China and Taiwan. In general, an increase in intra-industry trade will have less cost in structural adjustments and will enhance mutual interdependence between the trading partners. It will further contribute to the stability of trade flows between nations. This tendency will also carry important policy implications for the bilateral relations across the Taiwan Strait.

After China and Taiwan join the WTO, Taiwan's exports to Hong Kong will decrease by \$ 182 millions but its imports from Hong Kong will increase by \$ 152 millions. The most significant drop of Taiwan's exports to Hong Kong are textiles (-\$141 millions), clothing (-\$22 millions) and other services (-\$20 millions). But, Taiwan will increase its imports of service (\$94 millions), clothing (\$19 millions) and light manufactures (\$11 millions) from Hong Kong.

Table 6 shows that China's exports to Taiwan and Hong Kong will increase by \$581 millions and \$462 millions, respectively, after she joins the WTO. The most significant increase of China's exports to Taiwan are manufacture intermediates, machinery and clothing. But, China's exports of food and agricultural commodities to Taiwan will decrease due to the increase of Taiwan's imports of those items from the US, as shown on the bottom panel of Table 5. China's export to Hong Kong will

increase in sectors such as clothing (\$238 millions), machinery (\$120 millions), but its exports of food and agricultural commodities; livestock, non-grain crop and other processed food will decrease.

China's imports from Taiwan and Hong Kong will increase by \$9.4 billions and \$4.6 billions respectively. The increase of imports from Taiwan will concentrate in textiles, manufacture intermediates, light manufactures, and machinery. Among China's increased imports from Hong Kong, the major items are light manufactures (\$959 millions), clothing (\$923 millions), manufacture intermediates (\$603 millions) and textiles (\$546 millions). Again, there is an indication of an increase intra-industry trade among the three Chinese economies.

(Insert Tables 5 and 6 here)

Tables 7 and 8 present the simulation results on the changes of export dependence⁷ and import market share under the steady-state capital market closure, after China-and-Taiwan join the WTO. The top panel of Table 7 shows that Taiwan's export dependence on other countries (region) will decrease, but its export dependence on China's market will increase the most by 5.8 percentage point from the 1995 level. Given the high degree of complementarity between China and Taiwan (Chow, 1997), this finding is not surprising because trade barriers across the Taiwan Strait are mainly for non-economic reasons. It is interesting to note that Taiwan's export dependence on the Hong Kong market will also reduce by 0.4 percentage point from its 1995 level. Again, this finding is consistent with the rationale that the intermediate role of Hong Kong in China-Taiwan's trade will deteriorate after the direct links between them is established. Overall, Taiwan's export dependence on China (23.8 percent) and Hong Kong (5.6 percent) combined will reach nearly 30 percent level after it joins the WTO.⁸

(Insert Tables 7 and 8 here)

China's export dependence on U.S., Canada, and Western Europe will increase but its export

⁷ Exports to each destination country as a percentage of total exports of the exporting country.

⁸ In 1995, exports from Taiwan to China and Hong Kong accounted for 18 percent and 6 percent, respectively, of its total exports to the world.

dependence on Taiwan and Hong Kong will reduce by 0.1 percentage point and 1 percentage point, respectively. It is worthwhile to point out that China's export dependence of clothing products to the US increases by 27 percentage point, as China's export of clothing will heavily rely on the U.S. market. This is a very sensitive issue on the bilateral trade relations between the U.S. and China. The finding offers very significant policy implications for future trade negotiations between Beijing and Washington. Again, Hong Kong's role in China's export will be undermined after China joins the WTO.

Another aspect of trade interdependence is the changes of import market share under the steady-state capital market closure. Table 8 reports the change in the import shares after China-and-Taiwan join the WTO. The top panel reports other countries' market shares in Taiwan (or Taiwan's import dependence on other countries) by sector whereas the bottom panel is the counterpart for China. The figures in the column of Taiwan's (China's) own panel are the ratios of domestic production to total consumption. This can be a proxy index for self-sufficiency, the opposite of the trade dependence index of the nation.

From the top panel of Table 8, one can find that after Taiwan joins the WTO, the U.S. and China will increase their market shares in Taiwan by 0.4 and 0.3 percentage point respectively. The most significant changes in the US exports to Taiwan are the increase in motor vehicle and parts (2.4 percentage point), in livestock (2.2 percentage point) and in non-grain crops (1.4 percentage point) and the decrease in dairy and meat products. Taiwan's imports from China will increase on items such as clothing (5.6 percentage point) and electronics (0.8 percentage point), but decrease in livestock (3.4 percentage point) and forestry/fishery (0.6 percentage point). Overall, Taiwan's trade dependence on the rest of the world will increase as reflected on the decrease of the self-sufficiency index --- the ratio of domestic production on consumption decrease by 0.8 percentage point. There are no significant changes of Hong Kong's market share in Taiwan.

The bottom panel of Table 8 reports the changes of import market share in China. Taiwan's

share in China's market will increase by 1.8 percentage point, which will be mainly in light manufactures (3.7 percentage point), mines (3.3 percentage point) and manufacture intermediates (2.7 percentage point). Hong Kong's shares in China's market will also increase by 0.4 percentage point. Significant increases are in the processed food (5.2 percentage point), light manufactures (2.7 percentage point) and electronics (1.7 percentage point). Overall, China's trade dependence on the rest of the world will increase more than that in Taiwan after she joins the WTO---- China's self-sufficiency index decrease by 2.2 percentage point. This increase comes from the increase in the imports of motor vehicle and parts (20.6 percentage point), clothing (14 percentage point), textiles (7.1 percentage point) and planted fiber (3.1 percentage point). This result reflects not only the increase in intra-industry trade as discussed above, but also the probable development of product differentiation on the consumer goods in the Chinese market.

V. Summary and Conclusions

The economic structures and trade flows in China and Taiwan will undergo substantial changes after both of them join the WTO. This study has shown that both economies will be substantially benefited from their memberships at the WTO. Developing countries such as South Asia and ASEAN countries *may* be adversely affected by China and Taiwan's WTO membership because their commodity exports are highly substitute with those from China which are mainly labor intensive products⁹. But the welfare loss in those developing countries is much less than the gain in the developed countries. Hence, to integrate Taiwan and China into the global trading system is clearly a Pareto-improvement for the world economy. Taiwan's trade structures are closer to other NICs and Japan than to the developing countries (Chow (1994), Kwan (1997)). Hence, the impacts of Taiwan's membership on the developing countries are much less than those from China.

⁹ Note that these results come from the highly aggregated sectors that are specified in the model. These negative conclusions may be changed for some sub-sectors if the model is dis-aggregated into sub-sectors.

Under the static capital market closure, the real exports in China and Taiwan will increase by 21.3 percent and 3.8 percent respectively from the base year 1995, but the real exports in Hong Kong will decrease by 0.5 percent. However, if the accumulation effect under steady state capital market closure is accounted for, then all three Chinese economies will be benefited from China and Taiwan's membership at the WTO. The expansion of real exports is 49.4 percent for China, 5.8 percent for Taiwan and 0.15 percent for Hong Kong.

Under the comparative static market closure, the social welfare of Taiwan will increase by nearly 0.5 percent of its GDP, Hong Kong will increase by 0.13 percent and China will increase by 1.2 percent respectively. But, their gains from the WTO memberships will be much greater under the steady state capital market closure --- there will be an increase in social welfare of 3.3 percent, 1.4 percent and 0.6 percent respectively.

If China's trade regime could become more compatible with the new world trading system and its economic reform could be pushed further toward a market economy by joining the WTO, it would be to the interest of the World, not only to China alone, to speed up China's WTO membership application.

All macroeconomic indicators from the results of CGE simulation have shown that Taiwan's membership clearly improves her benefit. Both exports and imports in Taiwan will increase under either the static or the steady-state capital market closure. The only drawback for Taiwan is the decline of returns to farming land.

As for Hong Kong, it is interesting to point out that Hong Kong's exports will decrease under the static capital market closure, but both of its exports and imports will increase under the steady-state capital market closure. Meanwhile, the intermediate role of Hong Kong in Strait trade relations will deteriorate after China and Taiwan join the WTO.

Undoubtedly, the trade dependence on Hong Kong by China and Taiwan will be undermined after both of them join the WTO. Taiwan's trade dependence on China will increase but its trade

dependence on industrialized countries will decrease. In contrast, China's trade dependence on Taiwan will decrease but its dependence on the U.S. and West Europe will increase. On the other hand, intra-trade will dominate the increasing trade flows across the Taiwan Strait.

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