The Implications of Accession to WTO on China's Economy

Fan Zhai and Shantong Li [*]

Development Research Center
The State Council, P. R. China

Fax: (86 10) 65236060
Email: fzhai@drc.gov.cn

Paper to be presented at the
Third Annual Conference on Global Economic Analysis
Melbourne, Australia, June 27-30, 2000

May, 2000

Abstract

The presented paper aims at providing a comprehensive analysis of the impact of China's WTO accession. The analysis used a 41-sector, 10-households recursive dynamic CGE model of China. Dualistic foreign trade regimes - ordinary trade regime and processing trade regimes, which represents an important feature of China's foreign trade - is introduced in the model. A 1995 social accounting matrix is compiled to serve as the benchmark date set.

China's WTO accession includes a complex package of trade and investment liberalization. This paper quantify the impact on efficiency and equality of the following four major aspect of China's WTO accession: (1) tariff reduction in industrial products; (2) elimination of non-tariff barriers in industrial sectors; (3) agricultural trade liberalization; (4) phasing out of MFA quota on textile and clothing.

The results of simulation show that China would gain significantly in economic efficiency when China becomes a member of WTO. But the gains are not evenly distributed among either sectors or income groups. Accession to the WTO implies a relatively dramatic economic structural adjustment. Highly protected agricultural and some of the capital intensive industrial sectors would be the losers, while the labor intensive sectors such as textile and clothing would be the main beneficiaries. Since the dominant role of agricultural trade liberalization, rural households will get loss. The rural-urban disparity will enlarge, but the income distribution within rural and urban area would improve. Obviously, the role of government would be crucial to minimize the cost involved in the process of structural adjustment.

[*] This paper is based on a research project supported by Washington Center for China Studies and Ford Foundation. The authors acknowledge Wang Zhi, Xu Lin and Wang Huijiong for their works and efforts in the research project. The views expressed in the paper are those of the authors and should not be attributed to their affiliated institution.

1. INTRODUCTION

Since the beginning of economic reform and its opening to the outside world, China's economy has been growing at a rate of nearly 10 percent annually and its external trade has expanded by more than 15 percent a year. In 1999 China's trade volume reached $360.7 billion, ranking 9th in the world, with export volume reaching $195 billion. China has emerged to become an important player in world trading system. A World Trade Organization (WTO) without China as members will have difficulty in claiming to represent the global economy.

Integration of China into WTO's global trading system would significantly expand world trade, and strength the multilateral trade system's integrity and credibility. China would also benefit from the its more deep integration to the world economy. China has made great effort to make concessions and commitments in the area of market accession in terms of reduction of tariff and non-tariff barriers, reforming trade system and regulations, and trade related investment measures. As a developing country with more than 1.2 billion of population and about only 750 US dollars per capita GDP, China is still in the process of industrialization, too sharp concession in market opening may lose its domestic economic and political basis. Therefore, the political risks that Chinese government and US government are facing in negotiating on conditions for China' membership in the WTO are equivalent.

Evaluating the commitments and offers that China has already made to date in the negotiation is of practical interest for both policy makers in China and China's major trading partner countries. This paper aims at providing a comprehensive analysis of the impact of China's accession to the WTO on China's economy, based on the market access commitments that China has made to date. We try to provide some empirical evidence for policy makers to evaluate the effects of China's WTO accession from both efficiency and equality prospective. This analysis mainly uses a 41-sector, 10-representative-households recursive dynamic computable general equilibrium (CGE) model of China. It investigates the impact of China's WTO accession, quantitatively estimates the relevant benefit and cost, and help to understand the challenge and opportunities it brings about to relevant parties.

This paper is organized as follows: Section 2 of this paper outlines the basic structure of the CGE model for China and presents major assumptions. Section 3 describes the basic characteristics of the base year data, and highlights the economic structure, market openness and protection structure in China. Section 4 describes the simulation scenarios and section 5 uses simulation results to assess the impact of China's WTO accession. Section 6 concludes by drawing policy implications.

2. THE MODEL

The starting point for the model is the prototype CGE model built for the Trade and Environment Programme of the OECD Development Centre (Beghin, et al., 1994). Some significant modifications were done in this model to capture the major features of trade and tax system in current Chinese economy. First, a value-added tax and export rebate mechanism is incorporated into the model to capture the major changes in China's taxation reform in 1994 (Wang and Zhai, 1998). Second, two separate trade regimes - ordinary trade regime and processing trade regime - are introduced into the model. As pointed out by Naughton (1996), China had established two separate trading regimes by 1986-87. One is the export processing or export promotion regime, which is extremely open, most foreign-invested firms and parts of

domestic firm participate it. The other is traditional, but increasing reformed, ordinary trade regime. Since 1990s export processing has grown rapidly, which accounts for more than half of all exports. Obviously, to analysis the external trade behavior and the impact of alternative changes of trade policy in such an economy, it is very important to have an explicitly treatment of its dualistic foreign trading regimes in the model. Finally, the labor is classified by agricultural labor, production workers and professional in this model. We added the migration behavior between agricultural labor and production workers in this model to specify the partial mobility of labor force.

(1) Model Dimension

The model includes 5 production factors, 10 representative households and 41 production sectors. Among the factors, labor and capital are used by all sectors, while land is used only by agricultural activities. Labor is disaggregated into three types: agricultural laborers, production workers, and professionals. Households are grouped by region (rural and urban) and income level (low, middle-low, middle, middle-high and high). Within 41 sectors, there is 13 agricultural and food sectors, 4 mining sectors, 20 manufacturing sectors, and 4 services sectors. The detailed disaggregation of agriculture make it possible to explicitly model the quantitative restriction on agricultural commodities.

(2) Production and Factor Markets

The model assumes that there are two types of competitive firm - *ordinary firms* and *export processing firms* - that produces same product in same industry. The products of ordinary firms are assumed to be sold on the domestic market or to be exported to rest of the world by a constant elasticity of transformation (CET) function, while for the later - export processing firm, their products are exported only.

All sectors are assumed to operate under constant returns to scale and cost optimization. Production technology is represented by a nesting of constant elasticity of substitution (CES) functions. At the first level, output results from two composite goods: a composite of primary factors plus energy inputs, i.e., value-added plus the energy bundle, and aggregate non-energy intermediate input. At the second level, the split of non-energy intermediate aggregate into intermediate demand is assumed to follow the Leontief specification, i.e. there is no substitution among non-energy intermediate input. Value-added plus energy component is decomposed into aggregate labor and energy-capital bundle. Aggregate labor is further split into 3 types of labor force. And energy-capital bundles is decomposed into energy and capital-land bundles. Finally, the energy bundle is made up of 3 types of base fuel components, and capital-land is split into capital and land in agricultural sector.

The model distinguishes between *old* and *new* capital goods. This assumption of vintage capital allows the substitute elasticity in production function to differ according to the vintage of capital. The model also includes adjustment rigidities in capital market. It is assumed that new capital goods are homogeneous and old capital good supplied second-hand markets. The installed old capital in a sector can disinvest when this sector is in decline. The supply curve of old capital is a simple constant elasticity function of the relative rental rates. The higher the rental rate on old capital, the higher the supply of old capital. But the rental rate on old capital is not allowed to exceed the rental rate on new capital. Within sector, the capital is fully mobile among ordinary firms and export processing firm.

Each type of labor force is assumed by be full mobile across sectors and across the two types of firms. The agricultural laborers work only in agricultural sectors and production workers work only in non-farm sectors. There is no substitute between agricultural laborer and production worker in production function. In China, although it is increasing reformed, there are still large barriers for rural labor forces to migrate to urban. These barriers include household registration regime, discrimination in employment, education and social security, etc. This segmented labor market is modeled by incorporating partially mobility between agricultural laborer and production worker. We assumed agricultural laborer and production worker could be converted from one to another. A CET function is used here to capture this specification, i.e., this transfer is determined by the relative wage of agricultural labor and production worker, as well as the constant elasticity of transformation.

(3) Trade

The rest of the world supplies imports and demands exports. Given China's small trade share in the world, import prices are exogenous in foreign currency (an infinite price-elasticity), i.e. the local consumption of imports does not affect the border price of imports. Exports are demanded according to constant-elasticity demand curves, the price-elasticities of which are high but less than infinite (Pomfret, 1997).

The ordinary firms allocate their output between export and domestic sales to maximize profits, subject to imperfect transformation between the two alternatives. All the output of export processing firms is sold to overseas market. We assume the export by ordinary firms and export processing firms are heterogeneous, a CES aggregation function with relative high substitute elasticities is employed to form the composite export. In other words, we assume the buyers of rest of the world choose a mix between the two types of export to minimize their cost.

Three types of import are differentiated in the model. The first one is ordinary trade import, which is operated under the ordinary trade regime, subjected to import tariff and nontariff barriers. The second one is duty-free import of raw materials and components into processing trade export. Most of these imports are used as intermediate input of export processing firms. But part of them is transferred to domestic market. The third one is duty-free import of investment goods for foreign invested enterprises and export processing enterprises.

Agents are assumed to consider products from domestic supply and imports as imperfect substitutes, i.e., the Armington assumption. A two-level nesting CES aggregation function is specified for each Armington composite commodity. At the top level, agents choose an optimal combination of the domestic good and an import aggregate, which is determined by a set of relative prices and the degree of substitutability. At the second level of the nest, the import aggregate is further split into ordinary import, duty-free import of investment and the import of processing trade which is transferred into domestic market, again as a function of the relative import prices and the degree of substitution across different import types. Note that the import prices are specific by import type because of the duty-free for the last two types of import.

We establish the difference between domestic price and world price in two part, i.e. the tariff rate and non-tariff barriers. NTB is modeled as the tariff equivalent, which create a pure rent to households. The quantitative restriction on agricultural products is modeled explicitly through a Leontief specification, where imports cannot exceed the quota allocation. The rates of agricultural quota rent are solved endogenously.

In the textile and apparel sectors, China faces the MFA quota in the markets of USA, Canada, EU and other countries. In our model, we treat this VER quota as an export tax equivalent that is added to the domestic export price. The quota premium is assumed to be obtained by households. In the simulations, the MFA quotas are exogenous, with export tax rates adjusted endogenously.

(4) Income distribution and demands

Factor income is distributed to four major institutions: enterprises, households, the government and extra-budget public sector.

Household income derives from capital, labor and land income. Additionally, households receive distributed enterprise profits, transfers from the government and rest of the world. All kinds of import and export quota rent are also allocoated to households. Assume the rural households earn all the land returns. Rural households earn their labor income from both agricultural laborers and production workers, while urban households obtain their wages from both production and professional workers. When transformation between agricultural laborer and production worker occurs, if some agricultural laborers transferred to non-agricultural sector and became production workers, their labor income would be allocated to rural households. Vice versa, if production workers transferred to agricultural sector and became agricultural labor, their wages are still distributed to urban and rural households according to the distribution share of production worker's wages.

Capital revenues are distributed among households and enterprises. Enterprise earnings equal a share of gross capital revenue minus corporate income taxes. A part of enterprise earnings is allocated to households as distributed profits based on fixed shares, which are the assumed shares of capital ownership by households. Another part of net company income is allocated to extra-budget public sectors as fee. Retained earnings, i.e. corporate savings for new investment and capital depreciation replacement, equals a residual of after-tax enterprise income minus the distributed profits and fee.

Household disposable income is allocated to goods, services, and savings. Households maximize utility using the extended linear expenditure system (ELES) which is an extension of the familiar Stone-Geary demand system. Saving enters the utility function, which is evaluated using the consumer price index. Social consumption and investment final demand follow a fixed share expenditure function.

Stock change is assumed as a demand for domestic products. The intermediate inputs for ordinary firms are provided by the Armington composite goods. While the intermediate inputs for export processing firms are composed by composite goods and duty-free import of raw materials and components into processing trade export through a CES function. The intermediate inputs for ordinary firms, the domestic part of intermediate input for export processing firms, household consumption, and other final demands constitute the total demand

for the same Armington composite of domestic products and imported goods from the rest of the world.

(5) Government and Extra-budget Public Sector

The government collects taxes from the producers, households and foreign sector, transfer money to the household sector, and purchases public goods. It derives revenues from direct corporate and household income taxes, import tariffs, and various types of indirect taxes. Subsidies and export tax rebates enter as negative receipts. There are two types of indirect taxes in the model. The value-added tax, which is the most important part of indirect tax in China after 1994 tax reform, is treated as a tax levied on production factors. Its revenues equal total sector value-added multiplied by a tax rate. The value-added tax is also levied on imports while firms obtain rebates when they export. The other indirect tax, including various agricultural taxes, and business taxes on construction and services, is treated as a production tax levied on sectoral outputs.

Extra-budget public sectors collect fees from enterprise and households. Their income are allocated to consumption and saving. The consumption of extra-budget public sectors and government spending compose a type of final demand, i.e. the social consumption.

(6) Macro Closure

Macro closure determines the manner in which the following three accounts are brought into balance: (i) the government budget; (ii) aggregate savings and investment; and (iii) the balance of payments. Real government spending is exogenous in the model. All tax rates and transfers are fixed, while real government savings is endogenous. The total value of investment expenditure must equals total resources allocated to the investment sector: retained corporate earnings, total household savings, government savings, extra-budget saving and foreign capital flows. In this model, the aggregate investment is the endogenous sum of the separate saving components. This specification corresponds to the “neoclassical” macroeconomic closure in CGE literature.

The value of imports, at world prices, must equal the value of exports at border prices, i.e., inclusive of export taxes and subsidies, plus the sum of net transfers and factor payments and net capital inflows. An exchange rate is specified to convert world prices, e.g., in dollars, into domestic prices. Either this exchange rate or total foreign capital inflow can be fixed while the other is allowed to adjust providing alternative closure rules. With foreign saving set exogenously, the equilibrium would be achieved through changing the relative price of tradables to nontradables, or the real exchange rate.

Since the purpose of this paper is to estimate the impact of trade liberalization, we keep the trade balance fixed at foreign currency term. Thus, any changes in real absorption do not result from changes from lending to, or borrowing from, overseas. This makes it easy to compare the efficiency impacts of different simulations.

(7) Recursive Dynamics

The current version of the China's CGE model has a simple recursive dynamic structure as agents are assumed to be myopic and to base their decision on static expectations about prices

and quantities. Dynamic in the model originate from accumulation of productive factor and productivity changes

The within-period, static model is solved for several single-period equilibrium from 1995-2010. Between the static model solutions, selected parameters are updated in the dynamic (between-period) module, either using lagged endogenous variables (form solution in previous periods) or exogenously (on the basis of trend).

The growth rate of population, labor forces, labor productivity and an autonomous energy efficiency improvement in energy use (known as the AEEI factor) are exogenous. The growth of capital is endogenously determined by the saving/investment relation. In the aggregate, the basic capital accumulation function equates the current capital stock to the depreciated stock inherited from the previous period plus gross investment. At the sectoral level, the specific accumulation functions may differ because the demand for (old and new) capital can be less than the depreciated stock of old capital. We assume the producer decides the optimal way to divide production of total output across vintages. If sectoral demand exceeds what can be produced with the sectoral installed old capital, the producer will demand new capital. Otherwise, the producer will disinvest some the installed capital.

In defining the reference simulation, a single economy-wide Hicks neutral efficiency factor (TFP) and sector specific agricultural productivity are determined endogenously to get a pre-specified growth path of real GDP and agricultural output. When alternative scenarios are simulated, the TFP growth rate is exogenous, and the growth rate of real GDP is endogenous.

(8) DATA

The model is calibrated to the 1995 Chinese SAM developed from the 1995 Input-Output table (Zhai, 1998). The SAM provides a consistent framework to organize the relevant flow of value statistics for China's economy to satisfy the requirements of a benchmark data set for CGE modeling. Some key parameters of the model – essentially substitution and income elasticities – were derived from a literature search. All other parameters – mainly shift and share parameters – are calibrated in the base year using the key parameters and the base data.

3. CHINA'S ECONOMIC STRUCTURE AND MARKET OPENNESS

The section outlines the basic features of industrial structure and market openness of Chinese economy in 1995 based upon the SAM.

Table 1 summarizes the sectoral structure and market openness of Chinese economy in the base year based on our single country Chinese SAM. For each of the 41 sectors, the base year data for shares of output, employment, imports, exports, trade dependence, and the share of ordinary trade are reported. Columns 9 through 12 give information about the degree of import protection. As may be seen in columns 1 through 4, the data are notably asymmetric among the shares of output, employment, and trade. For example, the crop sectors (sector 1-5) account for more than 45 percent of China's labor employment but only produce 7 percent of its output and account 2 percent of China's total trade. While textile, apparel and leather industries employ less than 3 percent of China's labor force, but produce 8.7 percent of its total output and account for more than 27 percent of the country's total exports.

Export dependency is high for the apparel, leather and electronic sectors as more than 30 percent of their products depend on foreign markets. Textile and other light consumption goods (sawmills & furniture, and paper & social articles) are the other export-oriented sectors in which almost 20 percent of the output are sold on international markets. The sectors with the largest shares in imports are machinery and chemicals as they account for 20 and 15 percent of China's total imports, respectively. The wool, instruments, electronics and machinery and two raw materials sector (crude oils and metal mining) have higher market penetration ratio. The electronics has both high export and import dependency, reflecting the fact that a large percentage of production in this sector represents processing and assembling products from abroad, i.e. processing trade.

The trade balances by industry in column 13 reflect China's comparative advantage. China is a net exporter of labor-intensive manufactures and a net importer of capital-intensive manufactures. The largest share of the trade surplus in China comes from apparel and textile. In agricultural sector, China is net importer of grain, but has trade surplus of other agricultural products.

Processing trade is the most rapid expanding portion of China's foreign trade. It accounted for 45 percent China's total exports and 54 percent of China's total imports in 1995. It was more important for finished goods than primary and intermediates products. For instance, nearly 80 percent of China's other transport equipment, electrical machinery, electronics and instruments exports, and more than two thirds of China's leather and machinery exports were processing exports. It also constitutes a significant portion of China's exports on apparel, basic metals, and paper products. The high shares of processing exports in these sectors require a large volume of raw materials, components, and semi-processed products imported from abroad as their inputs. Column 8 in Table 1 shows that in the sectors of textiles, apparel, leather and other industries, the ordinary imports were only about 5 percent of their total imports. Almost all those imports were used for the production of processing exports. Most imports on paper products, build materials, chemicals, basic metal and metal products, machinery and electronics were also used by foreign or joint-venture companies as intermediate inputs to produce processing exports.

Another notable feature of the base year data is the significant differences between China's nominal tariff rate and the actual collected rate. It is well known that China's tariff collection is significantly below its nominal tariff level because of a large share of processed trade, extensive import duty exemptions and smuggling activities. (World Bank, 1994; Bach *et al*, 1996) The final three columns of Table 1 provide the nominal tariff rate, actual collected rate for total import and collected rates for ordinary trade import. It indicates the dramatic variation of the nominal/actual tariff rate ratio among sectors as this statistic ranges from 92 in apparel industries to around 3.1 in other transportation equipment industries. It also indicates that in some sectors, such as textile and apparel, the share of ordinary trade import is very small, less than 10 percent. In general, the more export-oriented sectors have the higher nominal/actual rate gaps because of the tariff exemptions applied to their imports of intermediate inputs and processed trade.

Table 1 Economic Structure and Market Openness in China, 1995 (%)

	Output	Labor force	Imports	Exports	Import/ Domestic Use	Export/ Outputs	Ordinary Exports/ Total Exports	Ordinary Imports/ Total Imports	Nominal Tariff Rate	Collection Tariff Rate for Total Imports	Collection Tariff Rate for Ordinary Imports	Tariff Equivalent of NTBs	Net Export (bn. Yuan)
Rice	1.82	11.79	0.12	0.01	0.6	0.0	100	88	0.3	0.1	0.3		-1.4
Wheat	0.94	6.09	0.85	0.00	7.2	0.0	100	92	0.3	0.1	0.2		-10.3
Other grain	1.39	9.03	0.30	0.26	2.0	1.6	100	89	0.3	0.1	0.4		-0.1
Cotton	0.43	2.79	0.69	0.03	11.8	0.6	100	62	6.8	1.4	3.1		-7.9
Other non-grain crops	2.47	16.05	0.18	1.46	0.6	5.1	100	67	6.8	1.4	2.2		17.7
Forestry	0.45	0.72	0.34	0.06	5.8	1.1	100	26	29.3	2.0	7.7		-3.4
Wool	0.02	0.02	0.39	0.01	56.9	2.9	100	20	15.8	0.7	3.7		-4.6
Other livestock production	3.84	3.42	0.07	0.64	0.2	1.5	100	22	15.8	0.7	3.0		7.9
Other agriculture	0.53	2.09	0.01	0.01	0.2	0.2	100	70	25.1	6.5	9.4		0.0
Fishing	1.09	0.92	0.07	0.62	0.5	4.9	70	39	11.9	1.7	4.2		7.7
Coal mining	0.85	0.78	0.05	0.62	0.7	6.7	91	81	12.0	3.0	3.7	45.7	7.8
Crude oil and natural gas	0.96	0.16	1.63	1.37	17.9	13.9	91	81	1.5	0.4	0.5	45.7	-1.1
Metal mining	0.47	0.16	1.36	0.25	19.9	5.6	97	46	0.1	0.0	0.0	3.3	-13.1
Other mining	1.20	0.45	0.48	0.60	3.3	4.1	83	35	6.0	0.6	1.8	5.7	2.3
Grain mill & vegetable oil	1.56	0.35	1.16	0.31	6.2	1.6	27	53	18.3	3.3	9.1	2.7	-9.8
Sugar	0.32	0.18	0.30	0.12	8.1	3.0	21	38	30.5	4.4	24.0	2.7	-1.9
Processed food	4.96	0.81	1.61	5.07	2.9	9.0	81	55	58.3	4.0	7.3	2.7	49.6
Textiles	5.12	1.68	7.90	12.87	13.5	21.0	64	7	58.7	1.1	16.7	24.3	80.0
Apparel	2.20	0.69	0.22	9.18	1.18	33.76	42	3	64.5	0.7	20.9	18.4	122.65
Leather	1.39	0.39	1.51	5.23	11.39	33.33	34	4	30.8	0.5	10.4	18.4	53.09
Sawmills and furniture	1.03	0.43	0.89	2.35	9.1	16.9	68	50	23.0	3.4	6.8	32.5	21.3
Paper and social articles	2.78	0.87	3.12	6.34	10.4	21.8	37	28	24.6	1.9	6.7	0.0	48.7
Electricity	1.87	0.33	0.02	0.24	0.1	1.0	91	81	3.0	0.7	0.9		3.0
Petroleum refineries	1.44	0.16	1.60	0.63	9.7	3.4	88	80	9.5	2.3	2.9	15.0	-10.7
Cooking and coal	0.28	0.03	0.00	0.44	0.2	14.6	91	81	6.1	1.5	1.9		5.9
Chemicals	7.72	1.89	14.47	9.48	14.7	10.6	59	42	16.1	2.0	4.7	3.3	-45.9
Build materials	3.97	2.30	1.21	2.83	2.6	5.6	70	37	32.3	3.8	10.4	0.0	24.0
Basic metals	5.12	0.97	7.27	4.21	11.5	7.0	42	38	12.0	1.3	3.5	15.9	-30.6
Metal products	2.23	0.72	1.41	3.25	5.7	11.8	60	42	29.7	4.5	10.8		27.3
Machinery	4.90	1.70	20.50	7.35	29.3	15.3	32	37	21.0	2.9	7.7	5.1	-148.0
Road vehicles	1.54	0.43	1.56	0.38	11.1	2.4	46	86	78.1	24.1	27.9	26.3	-13.7
Other-transport equipment	1.05	0.37	1.91	1.45	15.2	13.2	23	85	8.8	2.8	3.2	0.0	-3.3

	Output	Labor force	Imports	Exports	Import/ Domestic Use	Export/ Outputs	Ordinary Exports/ Total Exports	Ordinary Imports/ Total Imports	Nominal Tariff Rate	Collection Tariff Rate for Total Imports	Collection Tariff Rate for Ordinary Imports	Tariff Equivalent of NTBs	Net Export (bn. Yuan)
Electrical machinery	2.55	0.65	3.76	4.06	12.8	14.6	21	36	26.9	3.5	9.8	7.8	9.9
Electronics	2.40	0.38	9.82	8.54	33.2	30.8	23	36	25.1	3.3	9.2	5.6	-2.5
Instruments	0.23	0.19	1.38	0.41	37.9	15.8	23	49	12.7	2.3	4.7	5.6	-11.2
Machinery repairing	0.32	0.18	0.00	0.00	0.0	0.0	100	0					0.0
Other industries	0.26	0.57	0.32	0.27	9.7	8.0	60	6	68.9	1.6	26.5		-0.2
Construction	8.56	5.32	0.55	0.47	0.5	0.5	100	100					-0.3
Infrastructure	2.74	3.27	0.77	2.72	2.3	8.7	100	100					22.4
Commerce	6.06	7.99	2.92	0.22	3.6	0.3	100	100					-22.7
Services	0.94	1.46	0.35	1.01	3.1	9.4	100	100					-15.3
Total/Average	100.0	100.00	100.00	100.00	8.4	8.7	55	46	20.2	2.6	6.5		153.2

Note: 1) Imports/Domestic use and Exports/output are at domestic price. The sectoral share of imports and exports are at world price.

2) The imports of rice, wheat, other grain, cotton, wool, grain mill & vegetable oil, and sugar are average of 1993-97.

3) The collected tariff rate is estimated by authors based on sectoral import by duty concession category.

Source: Chinese Social Accounting Matrix, 1995, Development Research Center of the State Council

The sectoral actual tariff rates for ordinary imports indicate that China's tariff structure is typical of that of developing countries, i.e. providing high protection for manufacturing sector, especially the capital-intensive manufacture and final consumption goods sectors. But in the aggregated level, China's actual tariff rate is moderate. Automobile subjects to the highest tariff rate of 28%. The tariff rates in other manufactures, sugar, textile and apparel sector are also relatively high, but their effects are limited because the share of duty imports (ordinary imports) is very small.

This SAM-based data analysis provides an overview of the characteristics of economy structure and market openness in China. It has important implications for the impact of trade liberalization and facilitates the understanding of simulation results reported later in this paper.

4. BASE CASE PROJECTIONS AND SIMULATIONS DESIGN

The China's WTO accession includes a complex package of reform of trade and investment liberalization. This paper quantify the impact of the following four major aspects: (1) tariff reduction in industrial products; (2) elimination of non-tariff barriers in industrial sectors; (3) agricultural trade liberalization, i.e. the accelerated growth of import quota of agricultural products and foods, and elimination of import quota in 2005; (4) the phase out of MFA quota on textile and clothing which is included in Uruguay Round agreement. Once China become member of WTO, China's exports in textile and apparel in North America and EU markets will be subjected to accelerate MFA quotas growth from 1996-2004 similar with other developing countries, and the remaining export quota restrictions will be terminated in the year 2005 according to Agreement on Textiles and Clothing (ATC). Therefore, the analysis at best captures only one part of the issue. It does not take into account other major aspects of WTO membership, such as reduction of barriers in service trade and foreign investment, protection of intellectual property rights, securing market access, enforcement of commitment, and cooperation in dispute settlement.

Since China's WTO accession schedule will be phased in over a transition period of 8-10 years, we utilized the recursive dynamic model to assess the impact of China's WTO membership. The dynamic model captures the changes of industrial structure, factor composition and comparative advantage of China in the next 15 years.

The base case projection for next 15 years is established first, which determines a reference growth trajectory, in absence of trade or other reforms. Then we consider five scenarios in reference to the baseline scenario. The first scenario looks at the impact of Uruguay Round trade liberalization in absence of China's participation. The shocks in world price due to Uruguay Round, which were generated from multi-region world CGE model, is imposed on this scenario. The change in trade environment due to Uruguay Round will also be imposed on all the following WTO accession scenarios. Second, we consider the tariff reduction and NTBs elimination that China offered for the WTO accession. The average nominal tariff for industrial products will be lowed to 10 percent in the year 2005, and NTBs for industrial sectors subjected to elimination will be phased elimination in an 8-years phase-out period (1997-2005). A linear formula was used to calculate the cut in each simulation period. The third scenario focuses on the agricultural trade liberalization. The growth rate of import quota of agricultural products and foods will be increased to 5 percent from the growth rate of 3 percent in the base case, and the import quota will be eliminated in 2005, in place of 10 percent tariff. The forth scenario looks at the impact of MFA elimination. In this case,

China faces accelerated quota growth rate for its textile and clothing export, and the quantitative restriction will be terminated in 2005. The last scenario combines all the four aspects of China's WTO accession. We want to see the whole effects of China's WTO accession. All the assumptions for baseline scenario and five policy scenarios are summarized in table 2.

Table 2 Summary of Simulations Design

Experiment	*Description*
E1	Base case: - Real GDP and agricultural output exogenous - TFP growth rate endogenous - 3% growth rate of import quota of foods and agricultural products subjected to quantitative restriction (Rice, wheat, other grain, cotton, wool, grain mill and vegetable oil, sugar) - exogenous export quota growth for textile and apparel textile: 5.0% apparel: 6.2% - in 1997, tariff rates is reduced to the level of its recently applied new tariff schedules. NTBs in industrial sectors is cut 10%. - All other tax rates are fixed at its base year level. - Balance of payment gradually declines to 30% of its base year level in 2010.
E2	Uruguay Round trade liberalization excluding China - TFP growth exogenous at base case rates - World import prices and export prices shock due to Uruguay Round
E3	Tariff reduction and NTBs elimination and E2 combined - A gradually 40% cut of 1997 tariff level across all sectors from 1998-2005 - phased elimination of NTBs in the following nine sectors from 1998-2005 food, textile, petroleum refineries, chemical, machinery, automobile, electrical machinery, electronics, instruments
E4	Agricultural trade liberalization and E2 combined - 5% growth rate of import quota of foods and agricultural products from 1998-2004 - Elimination of import quota in 2005, in place of a uniform 10 percent tariff for these agricultural and food sectors
E5	Phase out of MFA and E2 combined - Acceleration of MFA quota growth rate from1998-2004 - Zero export tax of textile and apparel in 2005
E6	The whole WTO accession package - E3, E4 and E5 combined

5. MAJOR SIMULATION RESULTS

1) Aggregate Effects

Table 3 reports the main efficiency, inequality, and other macroeconomic indicators under the four scenarios of China's WTO accession. They are deviations from E2 (the case of Uruguay Round without China) in the year of 2005. The results show that China will benefit from its WTO accession in terms of real GDP and social welfare. In 2005, China's real GDP will increase 1.53 percent compared with E2. The welfare gains represented by Hicksian equivalent variations (EV), are smaller compare to GDP (1.24 percent of 2005 GDP), because of a 1.57 percent deterioration in terms of trade. Private consumption would increase 0.58 percent, indicating the benefits to consumers from the trade liberalization. Investment increases by 1.75 percent. China's trade expansion is significant when it become a member of WTO. Exports and imports would increase 26.9 percent and 25.8 percent respectively.

Table 3 Major Macroeconomic Results under China's WTO Accession Scenarios, 2005

(percentage change relative to E2, except *Grain self-sufficiency Rate* and *Gini Coefficient*)

	Whole WTO accession package (E6)	Tariff and NTBs reduction (E3)	Agricultural trade liberalization (E4)	MFA elimination (E5)
EV (% of GDP)	1.24	0.02	1.14	0.02
GDP	1.53	0.15	1.02	0.20
Absorption	0.95	0.04	0.80	0.02
Consumption	0.58	0.05	0.42	0.01
Investment	1.75	0.02	1.60	0.04
Exports	26.93	3.53	5.13	8.74
Imports	25.79	3.14	4.49	8.38
Government Revenue	3.51	-0.72	4.46	-0.01
Urban Households Income	4.56	-0.15	5.08	-0.06
Rural Households Income	-2.05	0.18	-2.67	0.05
Terms of Trade	-1.57	-0.47	-0.76	-0.58
Real Exchange Rate	1.85	2.39	3.39	-1.10
Factor Price				
Agricultural labor	2.19	0.51	0.10	0.45
Production worker	2.19	0.51	0.11	0.45
Professionals	6.05	0.52	5.52	0.11
Agricultural land	-18.38	0.58	-19.95	0.21
Capital	6.60	0.47	5.59	0.38
Grain self-sufficiency Rate	0.923	0.975	0.925	0.975
Change of Gini Coefficient	0.00531	-0.00036	0.00730	-0.00016
In urban area	-0.00105	0.00001	-0.00030	-0.00006
In rural area	-0.00445	0.00004	-0.00430	-0.00004

Source: simulation results.

Many factors are interacting to determine these general equilibrium results. Generally, the large gains in GDP results from the enhanced efficiency of resource allocation through increased specialization according to comparative advantage. But other two reasons also contribute the GDP growth: (1) Removal of high protection rates induces real depreciation, enhancing international competitiveness of China's industries; (2) Elimination of the MFA further increases competitiveness of China's textile and apparel, leading to export expansion of these sectors, while these sectors have comparative advantage in China.

This significant expansion of trade is a little surprising at first. However, it is a compounded accelerating growth effect. If compare the annual growth rate of exports between scenarios E6 and E2, the difference is only 2.5 percentage point. In fact even in the WTO accession scenario, the average annual growth rate of export is 9.1 percent. It is much lower than the average growth rate of 15.8 percent in last 18 years. As we previously stressed, processing trade accounts for more than half of China's total trade. There are high import contents in its exports. Growth of exports will result in a symmetric growth of imports, increase the pressure of real depreciation, and contribute to further growth of exports. This character partly contributed the rapid increase of China's trade dependence in last 20 years, and explains the significant trade expansion effect of China's WTO accession.

Another notable outcome is the more rapid growth of real investment than consumption. It is partly explained by the income distribution effects from trade liberalization. Although China will benefit from its WTO accession, the overall gains are distributed unevenly. The results in Table 3 show that the income of urban households increase by 4.6 percent, but the income of rural households decline by 2.1 percent at 2005. The slow growth of import quota for food and agricultural products results in high domestic cost of agricultural production, thus keep their domestic prices become higher and higher than their world market prices year by year. Elimination of quantitative restriction of import in agriculture at 2005 would sharply decrease the domestic price of agricultural products, decreasing the return of production factors in agriculture. As simulation results in Table 3 show, the wage of skilled labor and rental price of capital increase much larger than wages of agricultural labor and production workers, while rent of agricultural land decreases sharply. Obviously, rural households will loss during this process. The later the liberalization in agriculture, the higher the cost of protection, therefore the larger the welfare loss for rural households and the higher the political and budgetary cost for Chinese government. Because urban households have higher saving prosperity than rural households, and enterprise saving (which comes from capital income) is also an important source of domestic savings, total national saving will increase as a results of the relative changes in functional income distribution, inducing higher investment.

Will such agricultural trade liberalization be harmful to China's food security? Our simulation results suggest that even its agricultural imports would increase significantly, around 220 percent relative to E2, China's grain self sufficiency rate will still be very high at 92.3 percent. Obviously, China's grain dependence on world market is still low when China opens its grain market at 2005.

The decomposition of China's market accession package evaluated here helps understanding the roles of different trade reform measures. Given the scarcity of agricultural land and growing demand of food and agricultural products during China's industrialization and population growth in the next ten years, and the high import protection in its agricultural sector, it is not surprising that agricultural trade liberalization will bring significant welfare gain for China. As simulation results show, the elimination of import quota of food and agricultural products will rise China's real GDP by 130.6 billion yuan at 2005, which almost accounts two thirds of the gains that China would obtain from its WTO entry. However, agricultural trade liberalization induces adverse domestic terms of trade effect, rural households' income declines, while urban households' income increases by 5.1 percent in the agricultural trade liberalization only scenario (E4).

Due to the low actual rate of collection of tariff and relative opening policy adopted to processing trade, the gains from MFA quota elimination and reduction of tariff and non-tariff barriers are relatively small. Real GDP will increase by 25.0 billion yuan in the MFA elimination scenario, and 19.6 billion yuan in tariff reduction scenario, respectively. The welfare gains are smaller compared to real GDP due to adverse terms of trade effects. The resulted income distribution pattern is different with what observed in the case of agricultural trade liberalization. The urban households are losers in these two scenarios, while rural households' income would increase. These results are obvious if one notes that most labor-intensive manufactures such as apparel and shoe exports are produced by village and town enterprises.

2) Impact on income disparity

While the aggregate results of the WTO accession scenarios show the overall welfare gains resulting from lower price distortions and expanded trade, they reveal only part of the story. In fact, the welfare gains are rarely distributed evenly. Overall Gini coefficient would increase by 0.00531 in the experiment for whole WTO accession package, illustrating the deterioration in income equality and conflict between efficiency and equality. But in the mean time the Gini coefficients for urban and rural area both decline, indicating that the enlarged rural-urban income disparity is the major contributing factor of increasing income inequality resulting from China's WTO accession.

The patterns of changes of Gini coefficient are different across components of China's WTO accession package. Under the scenario for agricultural trade liberalization, the changes of Gini coefficients are quite similar with the scenario of whole accession package, indicating the dominant role of agricultural trade liberalization. But under the scenario for reduction of tariff and non-tariff barriers, overall income equability improves while income distribution within both rural and urban area become less equitable. Under the scenario for MFA elimination, all the Gini coefficients for overall, rural and urban decline slightly.

Table 4 presents the equivalent variation (EV) of different types of households affected by China's WTO accession. Estimation of the distribution of welfare gains among the different types of households is helpful to understand better the distributional effect of trade liberalization. The results reported in Table 5 show that the distribution of welfare gains among households at different income levels is quite different under all the experiments. Under the experiment for whole WTO accession package, the welfare of urban households increase by 4.86 percent of their disposal income in reference case, while rural households decline by 1.5 percent of their disposal income. In rural area, only the poorest household gains from the China's WTO accession. The richest rural households lose the most at around 2.6 percent of their disposal income in reference case. All urban households gain, and poorer urban households benefit more than wealthier urban households.

Table 4 Households Welfare Changes under China's WTO Accession Scenarios, 2005
(percentage change from disposable income in E2)

	Whole WTO accession package (E6)	Tariff and NTBs reduction (E3)	Agricultural trade liberalization (E4)	MFA elimination (E5)
Rural	**-1.53**	**0.16**	**-2.09**	**0.04**
Low	0.63	0.08	0.24	0.02
Medium-low	-1.17	0.19	-1.89	0.06
Medium	-1.13	0.16	-1.76	0.05
Medium-high	-1.47	0.14	-2.00	0.04
High	-2.63	0.16	-3.13	0.02
Urban	**4.86**	**-0.16**	**5.43**	**-0.06**
Low	5.37	-0.16	5.69	-0.05
Medium-low	5.13	-0.16	5.54	-0.05
Medium	4.96	-0.16	5.45	-0.05
Medium-high	4.76	-0.18	5.38	-0.06
High	4.60	-0.15	5.31	-0.08
Total	**1.51**	**0.00**	**1.49**	**-0.01**

The reason of increasing inequality from China's WTO accession is the import restriction of agricultural products and food in base case. The high import protection results in high domestic cost of agricultural production. Elimination of quantitative restriction of import in agriculture in 2005 would sharply decrease the domestic price of agricultural products, resulting in contracting effect, decreasing the return of agricultural production factors and pushing labor and capital away from it. The change in functional income distribution reported in Table 6 indicates that wage of skilled labor and rental price of capital increase much larger than wages of agricultural labor and production workers, while rent of agricultural land decreases sharply. Obviously, rural households are main losers during this process. Rural-urban disparity would increase accompanying with China's WTO accession.

As the income of wealthier rural households relies on agricultural land to a greater extent than poorer rural households, the changes of factor return tend to improve rural income distribution. But the changes of functional distribution tend to make the urban income distribution less equitable. The poorer urban households rely on income from production workers more than richer households. Because of the competition coming from migration of rural agricultural labor force, wage of production workers increase much smaller than wages of skilled labor and rental price of capital.

But the net effect of China's WTO accession on income distribution within both rural and urban area tends to reduce inequality. Two reasons account for it: (1) Poorer households in both rural and urban area consume more agricultural commodities, whose prices decline much more than industrial goods because of the heavy protection in agricultural sectors in pre-reform case, they benefits more than wealthier households. (2) Given our assumption that quota premium are distributed to households, and usually the households at higher income level can obtain the quota premium much more than lower income households, the replacement of import quantitative restriction with tariff is in favor of the improvement of income equality.

The distributional effects of agricultural trade liberalization are quite similar to that of whole WTO accession package. But under the scenarios for MFA elimination and reduction of tariff and non-tariff barriers, it is much different. The urban households are losers in this two case, while rural households' welfare would increase. It is easy to understand when we note that the manufacture sectors are highly protected by tariff and NTBs, and most textile and apparel exports are produced by village and town enterprises.

3) Sectoral Adjustments

Because economy-wide efficiency gains are also not distributed uniformly across sectors, and the adversely affected sectors are likely to strongly oppose trade reform. It is necessary to investigate the adjustment in sectoral output, employment and trade induced by China's market accession commitments.

Table 5 shows that change in gross output and trade vary significantly across sectors. The output of agricultural and food sectors subjected to import quota restriction would fall from 1.4 percent (rice) to 37 percent (wool). The increase of imports in these sectors are dramatic, ranging from 86 percent (wool) to 426 percent (cotton). Because the amount of rice imports is very small in baseline, the sharp increase of imports would not affect domestic production significantly. However, the wool sector is affected severely due to its high dependence on

imports. The significant increase of cotton import is driven by the expansion of textile and apparel sectors due to elimination of MFA quotas. While the highly protected agricultural sectors are contracted, the production and exports of other agricultural sectors, such as livestock products (excluding wool) and non-grain crops, which are more labor intensive and less land intensive than grain productions, would increase. However, their exports are quite marginal in absolute terms because of high domestic demand of those products.

Table 5 Changes of Sectoral Output, Employment and Trade after China's WTO Accession (E6)

	Output		Employment		Imports		Exports	
	Bn Yuan	%	10000 Person	%	Bn Yuan	%	Bn Yuan	%
Rice	-4.6	-1.4	-246.1	-2.8	5.6	300.1	0.0	12.0
Wheat	-17.2	-9.0	-540.3	-14.2	26.8	205.5	0.0	73.3
Other grain	0.3	0.1	1.6	0.0	10.4	226.1	0.0	0.2
Cotton	-11.7	-12.6	-498.2	-22.6	45.0	426.6	0.0	209.4
Other non-grain crops	11.3	1.8	151.1	1.9	0.7	10.9	0.1	1.1
Forestry	1.3	1.1	5.4	1.4	1.1	10.7	0.0	-2.2
Wool	-3.0	-37.0	-10.0	-37.5	5.1	86.6	0.0	-15.4
Other livestock	73.7	5.7	104.1	5.0	1.0	77.1	2.8	13.0
Other agriculture	7.8	5.2	57.2	5.1	0.1	19.4	0.0	4.6
Fishing	4.2	1.0	9.0	1.3	0.6	55.8	2.3	6.1
Coal mining	-2.9	-1.2	-2.2	-0.3	0.1	4.5	-0.5	-4.3
Crude oil and natural gas	-11.6	-4.8	-3.8	-2.9	2.2	4.9	-2.5	-10.0
Metal mining	-2.5	-1.7	-1.1	-0.8	0.2	0.6	-0.2	-3.9
Other mining	1.6	0.4	5.3	1.4	0.8	6.7	-0.4	-2.2
Grain mill & vegetable oil	-18.7	-5.8	-13.3	-8.0	45.8	260.2	0.3	126.6
Sugar	-1.7	-2.1	-1.5	-1.6	3.8	83.8	0.3	18.5
Processed food	74.8	5.3	31.6	5.9	8.5	16.1	24.2	31.7
Textiles	390.1	25.5	282.5	23.6	158.5	85.7	183.1	63.8
Apparel	522.3	74.0	261.0	52.3	6.3	124.4	491.6	214.1
Leather	26.8	5.9	21.9	7.6	43.0	124.1	8.8	6.6
Sawmills and furniture	-2.0	-0.6	2.1	0.6	1.3	5.6	-1.5	-2.1
Paper and social articles	10.2	1.1	14.5	2.1	9.8	13.0	1.9	1.2
Electricity	-8.4	-1.4	-0.1	0.0	0.0	5.6	-0.4	-7.2
Petroleum refineries	-16.7	-3.5	-3.1	-2.6	11.1	35.1	-1.6	-6.8
Cooking and coal	-1.5	-1.6	-0.3	-1.2	0.0	1.7	-0.6	-4.3
Chemicals	95.0	3.8	58.9	4.2	92.5	26.8	32.7	14.4
Build materials	-11.3	-0.8	5.7	0.3	0.8	2.8	-4.0	-4.2
Basic metals	-28.9	-1.7	-4.2	-0.5	3.1	1.6	-5.2	-5.7
Metal products	-3.4	-0.4	4.9	0.9	2.9	8.0	-3.5	-3.8
Machinery	-51.0	-3.1	-29.8	-2.2	49.3	10.2	-8.6	-4.4
Road vehicles	-81.2	-15.1	-49.8	-14.5	41.8	105.1	-0.9	-7.8
Other transport equipment	-0.6	-0.2	2.5	0.8	2.3	4.8	-1.6	-4.0
Electrical machinery	-28.6	-3.2	-9.7	-1.8	11.1	12.0	-5.6	-4.9
Electronics	-43.8	-4.7	-10.9	-3.3	12.9	5.2	-13.4	-5.2
Instruments	-4.5	-5.8	-7.8	-5.0	3.1	9.7	-0.7	-6.4
Machinery repairing	1.0	0.9	2.4	1.5	0.0	-	0.0	-
Other industries	1.0	1.2	9.7	2.2	4.5	60.2	0.1	1.7
Construction	33.1	1.2	92.8	2.2	0.5	3.6	0.0	-0.3
Infrastructure	2.8	0.2	41.6	1.1	2.1	3.4	-1.7	-1.3
Commerce	45.4	1.8	261.5	3.3	3.3	4.0	-0.3	-0.8
Services	-3.5	-0.1	4.9	0.1	4.9	3.8	-2.1	-2.0

Source: simulation results.

The contraction of agricultural production will divert agricultural labor forces and capital to non-agricultural sectors. Given the large share of agricultural employment in China's today, the most important adjustment will be the relocation of agricultural labor. Our simulation

results on change in employment suggest that around 9.6 million agricultural laborers will be transferred to manufacturing and service sectors after China entering the WTO. Undoubtedly, it will bring adjustment costs and challenges to both the central and local government to make such relocation possible.

The elimination of MFA quota enhances China's export competitiveness in textile and clothing significantly. Exports of textile would increase 63.8 percent, while apparel exports would increase more than 2 times. The much greater export expansion in apparel industry reflects higher restrictions of MFA and its more labor-intensive nature of production. The production of textile and apparel would increase by 25.5 percent and 74.0 percent respectively, thus create about 5.4 million new jobs in these two sectors.

Other labor-intensive and export-oriented sectors, such as leather and fur products, would also increase of their output and exports. Processing food industry would also benefit from reduction of cost of imported agricultural intermediate inputs. However, those sectors with high protection, such as automobile industry, would experience a sharp increase in import. The lower import prices induce consumers to substitute imports for domestic products, resulting in dramatic decline in outputs.

The removal of tariff and non-tariff barriers is only one factor that contributes to the significant surge in imports after China joining the WTO, the export growth due to further realization of China's comparative advantage in labor-intensive products also contributes to the increase of imports. The expansion of labor-intensive production drive up the demand for capital and technology intensive equipment on one hand, and increase the demand for semi-processed products and intermediate inputs on the other hand. As we pointed earlier, there is a large proportion of processing exports in China's total exports. This structure feature in China's foreign trade sector make export growth particularly important in China's import growth. Its effects are shown clearly from the sharp increase of import of textile, apparel, leather and other manufacturing sectors, since processing imports account for more than 90 percent of total imports in those industries.

All capital-intensive sectors, even those are not highly protected, such as electric machine, electronics and instruments, would experience relatively large contract of production because of higher capital cost. The rapid expansion of labor-intensive sectors, especially textile and apparel, bid capital away from other manufacturing industries, and the large amount of labor released from previously highly protected agricultural sectors jointly push up the rental price of capital relative to labor. While chemical industry would expand, because the rapid growth of textile sector increase the intermediate demand for chemical goods, such as chemical fiber.

7. CONCLUSION AND POLICY IMPLICATIONS

This paper analyzes the national and provincial impacts of China's WTO accession. The results of simulation show that China would gain significantly in economic efficiency when China becomes a member of WTO. If China enters the WTO and fully implements its commitment on market access at 2005, its real GDP and welfare measured in Hicks equivalent variations (EV) would be increased by 195.5 billion yuan and 159.5 billion yuan (1995 price, or 1.5% and 1.2% of real GDP of 2005) respectively. The large gains in real GDP mainly results from the enhanced efficiency of resource allocation through increased specialization in

accordance with China's comparative advantage. If the gains to TFP improvement and economic growth from trade liberalization are taken into account, China's efficiency gain will be even larger.

But the gains are not evenly distributed among either sectors or provinces. Access to the WTO also implies a relatively dramatic economic structural adjustment. Output of highly protected agricultural and some of the capital intensive industrial sectors such as automobile, instruments, cotton, wheat, etc., would contract significantly, while the labor intensive sectors such as textile and clothing would be the main beneficiaries.

Structural adjustment involves adjustment cost. Structural employment may rise following China's accession to the WTO. Millions of farmers would have to transfer to non-agricultural sector. Although expansion of the textile and service sectors should open up a large number of positions for rural migrants, the transition could be painful in the short term. Undoubtedly, the role of government would be crucial in the process of structural adjustment.

These results have an important implication for China's WTO accession. First, accession to the WTO is one challenge to China, but it also means a great opportunity. Shortage of arable land and capital and existence of large amount of unskilled labor force are the basic national condition of China. This situation can not be changed fundamentally within the near future. This basic national condition will be the major decisive factor in the identification and choice of China's development strategy. Joining WTO will integrate China into the world economy more deeply. China will be benefited from its participation of the international division. Therefore, China should actively pursue negotiation with major WTO contracting parties and try to bring its long match to WTO accession to a closure.

Second, the overall income distribution would deteriorate after China entering WTO. But the rise of income disparity is due largely to the food self-sufficiency policy that would continue in the future, rather than to trade liberalization. Protection in agriculture can improve the farmer's income temporally, but not sustainablely. The cost of agricultural protection will grow during China's industrialization. The later the reform, the larger distortion and the more serious the problem on income distribution. The appropriate strategy for China's WTO accession is to open its agricultural and food market to exchange the developed countries to lift their limits on labor-intensive products from China, phase in cutting the protection of manufacturing sectors over a period of time, and create necessary economic and social conditions for the shift of agricultural labor force.

Third, it is urgent for China to create a social security system that will facilitate a smooth transition of labor force. The State Council issued a series of directives in the 1990s that aim to establish a national-wide three-pillar social security system. However, the current social security system is far from ready for the structural change in employment that would be brought about by WTO accession. (World Bank, 1997)

Forth, the domestic taxation policy should perform a stronger function on redistribution of income to reduce the impact of income inequality resulted from the accession to WTO. One of our previous studies has investigated the welfare and distributional effects of tariff reduction under alternative tax replacement assumptions (Wang and Zhai, 1998). It suggested that imposing a progressive households income tax seems to be an appropriate policy choice to

replace the lost tariff revenue, it reduces the Gini coefficient and retains most of the efficiency gains.

References:

Bach, C., W. Martin and J. Stevens (1996) "China and the WTO: Tariff Offers, Exemptions and Welfare Implications", *Weltwirtschaftliches Archiv* Vol.132(3):409-31

Beghin, John, Sébastien Dessus, David Roland-Holst and Dominique van der Mensbrugghe (1994) "Prototype CGE Model for the Trade and the Environment Programme-Technical Specification", OECD Development Centre, Paris.

Development Research Center (1998), *The Global and Domestic Impact of China Joining the World Trade Organization*, Research Paper, Development Research Center of the State Council, PRC, Beijing

Naughton, Barry (1996), "China's Emergence and Prospects as a Trading Nation", *Brookings Paper on Economic Activity* 2:1996

Pomfret, Richard (1997), *Is China a "Large Country"? - China's Influence on World Markets*, OECD Development Centre, Paris

Wang, Zhi (1997), The Impact of China and Taiwan Joining the World Trade Organization on US an World Agricultural Trade - A Computable General Equilibrium Analysis, Technical Bulletin, No. 1858, USDA, Economic Research Service.

Wang, Zhi and Fan Zhai (1998), "Tariff Reduction, Tax Replacement and Implication for Income Distribution in China", *Journal of Comparative Economics*, Vol. 26, June

World Bank, (1994) "China Foreign Trade Reform" A World Bank Country Study, The World Bank, Washington, DC.

World Bank, (1997) "Old Age Security: Pension Reform in China", A World Bank Country Study, The World Bank, Washington, DC.

Zhai, Fan (1998), "A Social Accounting Matrix of China, 1995", paper presented at the Sixth Inforum World Conference, Sept. 13-20, 1998, El Escorial, Spain