

# **The Political Economy of Tariff Protection in China: Evidence from WTO Accession**

**Chang Hong\***

Clark University

This Draft: December 2010

## **Abstract**

This paper analyzes China's tariff rates at WTO accession using a political economy approach. A model drawing on Branstetter and Feenstra (2002) is used to derive an optimal tariff rate for each industry. The model predicts that a government would set a high tariff rate if an industry is of large state-owned enterprises (SOEs) share, multinationals share or small foreign import share. From the model we reveal Chinese government's preference to different interest groups under the binding tariff constraint from the WTO commitments. The estimated structural parameters imply that the political weights on both the SOE profits and consumer income diminish with the economic opening. But comparatively, the government still favors SOEs over consumer income. This finding is consistent with the pattern of China's economic reform.

**Key words:** Protection for sale, endogenous protection, China, WTO, tariffs, SOE.

**JEL Classification:** F13, F14

\* I am grateful to Robert Feenstra for his invaluable guidance and comments. I would like to thank Giovanni Peri, Peter Lindert, Deborah Swenson, and Wing Thyee Woo for their helpful advice. Comments and suggestions from the participants at the SEA 75<sup>th</sup> Annual Conference, WEAI 80<sup>st</sup> Annual Conference, and UC Davis Brown Bag are gratefully acknowledged. Financial support from the UCD IGA dissertation scholarship is gratefully acknowledged. All errors are my responsibility. E-mail: [chong@clarku.edu](mailto:chong@clarku.edu). Tel: (530) 574-2376.

## **I. Introduction**

On December 11, 2001, China formally entered the World Trade Organization (WTO). It took China 15 years to fulfill this wish, making it the longest accession process in WTO/GATT history. With its accession to the WTO, China has committed to take concrete steps to remove trade barriers and open its markets to foreign companies in virtually every product sector and for a wide range of services. The reductions China has promised in order to become a WTO member have and will further cause a significant impact on many aspects of its economy.

China committed to reduce both tariff and non-tariff barriers to industrial goods, agricultural products and services. Tariff reductions generally take place over a period of ten years; in almost all instances most of the reductions in China took place immediately on January 1, 2002. With its accession, China's average tariff rate slashes from average 40 percent in 1986 to 12 percent in year 2002 and 10 percent in 2005. The average tariff rate of industrial products will be lowered from a base average of 24.6 percent in 1997 to 9.1 percent in 2005; and the average tariff of agricultural products will be lowered from a 1992 average of 46.6 percent to 17 percent in 2004. In addition, tariffs on autos were to be cut from 80-100 percent to 25 percent by July 1, 2006, and tariffs on auto parts were to be reduced from a base average of 23 percent to 9.5 percent by January 1, 2006.

WTO rules bar quotas and other quantitative restrictions. China also committed to the phase-out of non-tariff barriers (NTBs), such as quotas and licenses, covering hundreds of products. Most of these NTBs must be eliminated with phase-ins limited to five years.

The whole world is watching if China can actually follow through the promised liberalization under its entry to WTO. Domestic consumers, government officials, farmers, and producers are all wondering about the future impact brought by China's WTO entry. From a research point of view, we are interested in the bargaining strength of these various groups, and in the weights given to these groups in the government's objective function. The tariff reduction commitment made by the

Chinese government provides a good opportunity to reveal the political weights on different interest groups. It is also interesting to see that for China as a non-democratic economy, how does its government preference differ from the democratic economies.

To the best of our knowledge, we are the first to analyze the political economy of China using its WTO tariff bids at the industry level. Compared with other studies, one advantage of this paper is that we use the nominal tariff rates, the direct measure requested by the “protection for sale” model. By modifying Branstetter and Feenstra (2002) model on China’s political economy, we reveal the government’s preference on different interest groups under the binding tariff constraint from WTO commitments. Contrary to the findings on the United States and other democratic economies, which grant larger weight on consumer welfare than contributions, we show that the weight on SOE is in general larger than that on the consumer income for sectors of high substitution elasticities. From 1994 to 2010, the political weights on both the SOE and consumer income diminish, with the weight on consumer income dropping faster than that on SOE. So with the trade liberalization, the Chinese government is reducing its influence on the interest groups, but relatively, it still favors the SOEs over the consumer welfare. Our results support Branstetter and Feenstra’s (2002) findings.

The structure of the paper goes as follows. Section II briefly reviews China’s tariff reform and tariff policy. Section III introduces the model and derives the optimal tariff solution for each industry. Section IV provides the econometric specification and data overview. Section V reports the empirical findings, and section VI concludes.

## **II. China’s Tariff Reform and Tariff Policy**

The brief history of China’s tariff reform is summarized in Table 1. In 1951, China initiated its first Customs Import and Export Tariff Schedule, with 939 items divided into 17 categories and

89 groups. The arithmetic average tariff rate was 52.9 percent: with 92.3 percent for agricultural products and 47.7 percent for industrial products. The guiding ideology of the first schedule was to “guarantee domestic production and protect domestic industries from competition from foreign goods.”

In 1985, the second Customs Import and Export Tariff Schedule was introduced. The major goal is to adjust the tariff structure so that it’s more compatible with the needs for economic development. Under the revised structure, the tariff rates were 27.2 percent for intermediate goods, 31.2 percent for capital goods and 62.6 percent for consumer goods. The average tariff rate was 38 percent, with a rate of 43.6 percent for agricultural products and a rate of 36.9 percent for industrial products.<sup>1</sup>

In 1986, at the commencement of the Uruguay Round of trade negotiation, China applied to resume its status as a contracting party to the GATT. From 1985 to 1992, tariff rates were adjusted regularly in small scale: about 83 items were lowered while the rates for 140 items were increased.

In 1992, the third Customs Import and Export Tariff Schedule was adopted. There are large-scale changes in product categories but little change in tariff rates. The average tariff rate was 42.5%. China has adopted the Harmonized Commodity Description and Coding System (“HS”) from January 1 1992.

From 1992-1996, China had four unilateral tariff reductions. Year 1996 witnessed the biggest slash of tariff rates since the foundation of P. R. China. More than 4900 items were affected, accounting for 76.3% of total taxable products. The new simple average tariff rate was 23% and weighted average rate was 19%. Later on, China made substantial unilateral tariff reductions to achieve the goal established by China’s trade minister – achieve the cut that reduces most levels below 15%.

---

<sup>1</sup> The average rates in 1985 are from Woo and Ren (2000)

Then China speed up its tariff reductions in order to join WTO. In 2000, one year before China's WTO accession, the arithmetic mean of China's import duties was 16.4%. In 2001, at the WTO accession, China's simple average tariff rate was 13.66%. And in 2010, at the end of WTO transition period, the arithmetic mean of China's ultimate import duties will be as low as 9.87%. The detailed tariff structures during the above three years are summarized in Table 2. For high-end tariff ranges, the number of tariff items drops significantly after the WTO accession, which will drag down the average tariff rate substantially.

Tariff rates were fixed by the State Council. Partial adjustment to the duty rates was subject to deliberation and final decision by the State Council Tariff Commission. Tariff structures are designed to promote economic reform and opening of the imported goods which were needed for the national economy and the people's livelihood but not produced sufficiently domestically: 1) duty-free or low duty rates were applied to imported goods which were needed for the national economy and the people's livelihood but which were not produced sufficiently domestically. 2) Import duty rates on raw materials were generally lower than those on semi-manufactured or manufactured products. 3) For parts or components of machinery, equipment and instruments which were not produced domestically, or at a sufficiently high standard, the import duty was lower than the duty on finished products. 4) Higher duty rates were applied to products which were produced domestically or which were considered non-essential for the national economy and the people's livelihood. 5) A higher duty was applied to imported products, the equivalent of which were produced domestically and the local manufacturer of which needed protection.

Tariff revenue is also an important source of government finance. From Table 3, we can see that the tariff revenue on average occupies about one-fourth of Chinese government's fiscal income from 1992 to 1996.

As clearly summarized by the representative of China in the WTO negotiation: "The purpose

of levying tariffs was twofold: (a) to regulate imports so as to promote and support domestic production; and (b) to serve as an important source of revenue for the treasury of the central government”.<sup>2</sup> We will attempt to incorporate both these goals into our political economy model.

### **III. Model**

In the past decades, many empirical studies such as John Cheh (1976) and Bale (1977) studied the United States tariff reductions in the Kennedy Round or Tokyo Round to search for the political economy determinants of trade protection. Readers are referred to Baldwin (1985) for a detailed review of the early studies. Then Grossman and Helpman (1994, G-H henceforth) developed the seminal “protection for sale” model to analyze the equilibrium formation of trade protection in a democracy country, where the government designs its trade policy so as to maximize a weighted sum of total political contributions by lobbies and aggregate social welfare. The model predicts that the tariff rate assigned to an organized industry is negatively correlated with the import penetration ratio and the absolute value of the import demand elasticity; whereas the protection to an unorganized industry is positively related to these two variables. Later Grossman and Helpman (1996) introduced foreign direct investment (FDI) into this model, by making the number of multinationals endogenous to the tariff rates.

Goldberg and Maggi (1999, G-M henceforth) and Gawande and Bandyopadhyay (2000, G-B henceforth) empirically test the G-H (1994) model using the non-tariff barriers at the industry level in the United States. Both papers find that the weight on welfare in the U.S. government’s objective function is at least 50 to 100 times higher than the weight on the political contributions. Other than the tests on the United States, McCalman (2003) provides support for G-H (1994) model from

---

<sup>2</sup> Source: The legal Instruments on China’s Accession to the World Trade Organization”, 2001, China Legal Publishing House, pp.745 Compiled by the Legislative Affairs Office of the State Council.

Australian trade liberalization experience. Grether, de Melo, and Olarrega (2002) check the manufacturing tariff protections in Mexico and find that FDI plays a significant role on the trade policies. Using Turkish industry level data, Mitra, Thomakos, and Ulubasoglu (2002) conclude that the political weight on welfare is higher than contributions, and is generally higher for the democratic regime than for the dictatorship.

While the “protection for sale” model formulates the democratic economy, Branstetter and Feenstra (2002, B-F henceforth) theoretically extend it to a non-democratic economy – China. In their framework, the interest groups no longer take the form of the lobby group as in the U.S., but rather, include the state-owned enterprises (SOEs) and the foreign firms. They analyze the corporate tax rates at the provincial level and find that the political weight on consumer welfare is between one-seventh and one-quarter of the weight on the profit of SOE.

We modify the B-F Model (2002) to the analysis of tariff rates at the industry level and add a tariff binding constraint. The model considers three players: consumers, firms, and the government.

### **Consumers:**

There are  $L$  individuals. Each consumer maximizes their utility from a consumption bundle  $(X_0, X_1, \dots, X_n)$ , where  $X_0$  is the numaire good and  $X_i$  is a Dixit-Stiglitz “love of variety” CES aggregate consumption index for each industry  $i$ . They have the identical quasi-linear utility:

$$Max U = X_0 + \sum_{i=1}^n \frac{\theta_i}{\theta_i - 1} X_i^{\frac{\theta_i - 1}{\theta_i}} \quad (1)$$

When  $\theta \rightarrow 1$ , the utility function can be simplified from CES in Branstetter and Feenstra (2002) to Cobb-Douglas form<sup>3</sup>:

---

<sup>3</sup> We let  $\theta \rightarrow 1$  so as to decrease the number of unknowns in the estimation equation

$$\max U = X_0 + \sum_{i=1}^n \alpha_i \ln X_i \quad (2)$$

The aggregate consumption index  $X_i$  takes the CES form:

$$X_i = \left[ n_{di} x_{di}^{\frac{\varepsilon_i-1}{\varepsilon_i}} + (n_{fi} - m) x_{fi}^{\frac{\varepsilon_i-1}{\varepsilon_i}} + m_i x_{mi}^{\frac{\varepsilon_i-1}{\varepsilon_i}} \right]^{\frac{\varepsilon_i}{\varepsilon_i-1}}, \quad \varepsilon_i > 1 \quad (3)$$

where  $x_{ji}$  represents consumption of differentiated varieties produced by three types of firms:  $j=d$  (domestic firm),  $m$  (multinationals), and  $f$  (imported) in each industry  $i$ . There are  $n_d$  and  $n_f$  number of domestic and foreign firms respectively. Among the  $n_f$  foreign firms,  $m$  of them are multinationals and  $n_f - m$  are foreign firms who export to the home country.

The elasticity of substitution between varieties within an industry is a constant  $\varepsilon_i$ , as defined by the CES form. The elasticity of substitution between industries is unity. We assume  $\varepsilon_i > 1$  to guarantee that a price increase in one brand will make consumers switch to another brand.

Each consumer maximizes (5) subject to the budget constraint:

$$X_0 + \sum [n_{di} p_{di} x_{di} + (n_{fi} - m_i) p_{fi} x_{fi} + m_i p_{mi} x_{mi}] \leq I \quad (4)$$

where  $p_j$  is the price charged by each type of firm  $j$  and  $q_i$  is the aggregate price index for each industry, which is defined as:

$$q_i = \left[ n_{di} p_{di}^{1-\varepsilon_i} + (n_{fi} - m_i) p_{fi}^{1-\varepsilon_i} + m_i p_{mi}^{1-\varepsilon_i} \right]^{\frac{1}{1-\varepsilon_i}} \quad (5)$$

We can solve the demand for each variety as:

$$x_{ji} = \alpha_i p_{ji}^{-\varepsilon_i} q_i^{\varepsilon_i-1}, \quad j = d, f, m \text{ and} \quad (6)$$

$$X_i = \frac{\alpha_i}{q_i} \quad (7)$$

and easily derive that the expenditure for each industry is  $\alpha_i$ ,

$$\alpha_i = q_i X_i = n_{di} p_{di} x_{di} + (n_{fi} - m_i) p_{fi} x_{fi} + m_i p_{mi} x_{mi} \quad (8)$$

We also define the expenditure shares for each variety as:

$$S_j = \frac{n_j^* p_j x_j}{n_{di} p_{di} x_{di} + (n_{fi} - m_i) p_{fi} x_{fi} + m_i p_{mi} x_{mi}} = \frac{n_j^* p_j x_j}{\alpha_i} = \frac{n_j^* p_j^{1-\varepsilon_i}}{q_i^{1-\varepsilon_i}} \quad (9)$$

where  $n_d^* = n_d$ ,  $n_m^* = n_m$ ,  $n_f^* = n_f - m$ .

### Firms:

Within each industry, there are three types of producers: domestic firms, multinationals, and foreign firms exporting to the domestic market. They each produce a brand of the differentiated product and compete monopolistically. The production costs are  $c_d$ ,  $c_m$ , and  $c_f$  respectively.

Furthermore, imported goods are subject to a specific tariff of  $\tau_i$  for each industry  $i$ . So the profit functions of three types of firms are:

$$\pi_j = (p_j - c_j) x_j, \quad j = d, m \quad (10a)$$

$$\pi_f = [p_f - (c_f + \tau)] x_f \quad (10b)$$

The price they charge is a constant markup over the marginal cost:

$$p_j = \left( \frac{\varepsilon}{\varepsilon - 1} \right) c_j, \quad j = h, m \quad (11a)$$

$$p_f = \left( \frac{\varepsilon}{\varepsilon - 1} \right) (c_f + \tau) \quad (11b)$$

Solving the profit maximization problem and we get the maximized profit:

$$\pi_j^* = \frac{p_j x_j}{\varepsilon}, \quad j = d, f, m \quad (12)$$

The specific tariff levied by the domestic country introduces a wedge between domestic price and world price.

### **Government Objective Function:**

For the time being we assume that the government considers only one policy instrument: the tariff rate  $\tau_i$ , to protect domestic economy and get desired amount of imports. Levying tariffs hurts foreign exporters, curbs domestic consumption, and indirectly subsidizes those inefficient domestic firms. Part of consumers' welfare loss also transfers to profits of multinationals. Hence the central government's objective is to choose an optimal tariff so as to maximize the weighted sum of consumer welfare, profits of SOEs, profits of multinationals, and tariff revenues from foreign exporting firms across all the industries. The government assigns consumer welfare a weight  $\gamma$ , SOE profit a weight  $\beta$ , and a unity weight to multinational profit and tariff revenue each.

SOE has been the pillar of China's economy. It contributes two-thirds of the government revenue and absorbs one third of urban labor force. Under government intervention, SOEs lack competition. In 1985, the government spent 50.7 billion yuan subsidizing the deficit SOEs. In 1997, the subsidy was still as high as 36.9 billion yuan. But the percentage of SOEs making losses increased from 23.9% in 1978 to 43.9% in 1997<sup>4</sup>. Based on its typical importance to the Chinese economy, we expect that the SOEs will be assigned a larger weight than consumer welfare ( $\beta > \gamma$ ). We also think that the government will consider MNC profit when designing policies. As the world's second largest recipient of foreign direct investment (FDI), China adopted all kinds of special treatment policies to attract foreign investment such as special economic zone, profit taxes

---

<sup>4</sup> China Fiscal Year Book 1998, p. 482. China Fiscal Magazine Publisher, 1998.

policy and intermediate-inputs import tariff remission. The capital inflow also contributes greatly to China economy in terms of technology transfer and job creation.

The government objective is expressed as a function of the tariff rates:

$$\begin{aligned}
\max_{(\tau_i)} G &= \sum G_i(\tau_i) \\
&= \gamma \sum_{j=1}^L V_j + \beta \sum_i n_{di} \pi_{di} + \sum_i m_i \pi_{mi} + \sum_i (n_{fi} - m_i) \tau_i x_{fi} \\
s.t. \quad \sum_{i=1}^n \omega_i \left( \frac{\tau_i}{p_{fi}} \right) &\leq \frac{\tau_0}{p_0}, \text{ and } \omega_i = \frac{(n_{fi} - m_i) x_{fi}}{\sum (n_{fi} - m_i) x_{fi}}
\end{aligned} \tag{13}$$

where  $V = \sum_j V_j$  is the sum of indirect utility across all the individual  $j$ , and  $i$  stands for industry.

The constraint is added to capture the commitments China made on tariff cuts. It means that the

weighted average *ad valorem* tariff across all the industries is bounded by a threshold rate  $\frac{\tau_0}{p_0}$ . The

weight  $\omega_i$  is the import quantity share for each industry and is assumed to be exogenous to the choice of tariff rates.

Each individual's indirect utility,  $V_j$ , can be calculated from (2), (7), and (8) as:

$$\begin{aligned}
V_j &= I_j - \sum_i \alpha_{ij} + \sum_i \alpha_{ij} \ln X_{ij} \\
&= I_j - \sum_i \alpha_{ij} + \sum_i \alpha_{ij} \ln \frac{\alpha_{ij}}{q_i}
\end{aligned} \tag{14}$$

where  $I_j$  is the labor income of individual  $j$ , and the last two terms on the second line gives

consumer surplus. Each individual owns one unit of labor and there is no unemployment, so total

labor supply is  $L$ . Assuming labor is the only input of production and one unit of labor produces one

unit of numaire goods, then the equilibrium wage rate is unity. Multinational firms typically pay a

wage premium over the unity wage in order to attract skilled labor. Let the wage premium be  $w_i - 1$ .

Suppose each industry hires  $L_i$  workers and there are  $a_{mi}$  workers per unit output, then the marginal

cost is  $w_i a_{mi} = \frac{p_{mi}(\varepsilon_i - 1)}{\varepsilon_i}$ . Therefore the total wage premium for each industry is  $a_{mi} m_i x_{mi} (w - 1)$ ,

which can be written as  $\frac{p_{mi}(\varepsilon_i - 1)}{\varepsilon_i w} m_i x_{mi} (w - 1)$ .

We also ignore the intermediate inputs and assume there are no inter-industry linkages. Thus there is no counter-lobbying for lower tariffs from intermediate input importers. Each industry is distinctively additive and produces final goods. Then the government can maximize its objective function simply by choosing the optimal tariff rate over each industry. By substituting in the labor income and wage premiums, we can write the government objective function for each industry as:

$$G_i(\tau_i) = \gamma \mathcal{L}_i + \gamma \frac{(\varepsilon_i - 1)(w_i - 1)}{\varepsilon_i w_i} m_i p_{mi} x_{mi} + \gamma \alpha_i (\ln \alpha_i - 1) - \gamma \alpha_i \ln q_i$$

$$+ \frac{\beta}{\varepsilon_i} n_{di} p_{di} x_{di} + \frac{1}{\varepsilon_i} m_i p_{mi} x_{mi} + \frac{\tau_i}{p_{fi}} (n_{fi} - m_i) p_{fi} x_{fi} \quad (15)$$

Then the equilibrium tariff for each industry is solved from the first order solution to

$\frac{dG_i}{d\tau_i} = 0$ , which is set when the marginal benefit of getting support from domestic firms and

multinationals equals the marginal loss of decreased support from consumers and foreign exporting firms. The first order condition yields the optimal tariff solution as:

$$\frac{\tau_i}{p_i} \varepsilon_i \left( \frac{\varepsilon_i}{\varepsilon_i - 1} - s_{fi} \right) = 2 - \tilde{\mu} + (\beta - 1) s_{di} - s_{fi} + \gamma (\varepsilon_i - 1) \frac{(w_i - 1)}{w_i} s_{mi} - \gamma \frac{\varepsilon_i}{\varepsilon_i - 1} \quad (16)$$

where  $\frac{\tau_i}{p_i}$  is the *ad-valorem* tariff for industry  $i$ ,

$s_{di}$  denotes an industry's aggregate consumption share of domestic products,

$s_{mi}$  denotes an industry's aggregate consumption share of MNC products,

$s_{fi}$  denotes an industry's aggregate consumption share of foreign imports,

and  $\tilde{\mu}$  is a transformation of the Lagrange multiplier for the tariff reduction constraint.

The term  $\frac{\varepsilon_i}{\varepsilon_i - 1} - s_{fi}$  is positive since  $\varepsilon_i > 1$  and  $0 < s_{fi} < 1$ . This term is also monotonically

increasing if  $\varepsilon_i > 2$ . When  $\varepsilon_i > 2$ , tariff rate is negatively correlated with  $\varepsilon_i$ . This is similar to the Ramsey price rule, that high elasticity causes larger dead weight loss and the government is unwilling to distort the economy.

The first two terms  $2 - \tilde{\mu}$  form the constant to be estimated. The third term is the share of apparent consumption accounted for SOE. How much the government views the SOE in its objective function can be obtained from the coefficient estimate  $\beta - 1$ . When  $\beta$  exceeds unity, a larger government weight on SOE or consumption share of domestic products will lead to greater protection.

The next term  $s_{fi}$  is share of spending on imported products. Holding other things constant,

$\frac{d\tau}{ds_f} < 0$ , meaning that sectors with a small import share  $s_{fi}$  will have a high tariff protection.

Probably low import volume doesn't incur huge enough social cost for consumers to oppose protection in that industry. Noticing that this term is correlated with the term  $-\varepsilon_i \cdot s_{fi}$  on the left hand side, we let its coefficient to differ from unity in the estimation and assign the term a coefficient  $\delta$  instead.

The last two terms  $\gamma(\varepsilon_i - 1) \frac{(w_i - 1)}{w_i} s_{mi} - \gamma \frac{\varepsilon_i}{\varepsilon_i - 1}$  measure the impact on the consumer

welfare due to the tariff change. This impact can be interpreted as: (i) the impact on workers' wage

premium or income  $\gamma(\varepsilon_i - 1) \frac{(w_i - 1)}{w_i} s_{mi}$ ; and (ii) the effect on consumer surplus due to the price

change  $-\gamma \frac{\varepsilon_i}{\varepsilon_i - 1}$ . These two effects work in an opposite direction: raising tariff is beneficial to

worker income since fewer workers lose jobs due to the protection and more MNCs enter the home country and boost the wage premium; whereas raising tariff reduces the consumer surplus due to the rise of domestic price level.

In sum, tariff levels are determined by the competing groups' pressure. Groups with more political power will win the rent seeking competition. All else equal, industries with high  $s_{di}$  and  $s_{mi}$ , low  $s_{fi}$ , or unresponsive demand elasticities will have larger *ad-valorem* deviations from free trade. We can think of industries with SOE as organized and thus compare our equation with G-H (1994) model's prediction on organized industry. There is close matching between the two equations. Increased proportion of organized industries or lower import penetration in G-H model maps to a large  $s_{di}$  or a low  $s_{fi}$  in our model. Also, raising import demand elasticity in G-H model mirrors increasing the CES elasticity of substitution in our model. Thus we can conclude that two model's predictions are consistent.

#### **IV. Data and Econometric Specification**

The data to be collected are: tariff rates, elasticity, wage premium, and aggregate consumption shares of SOE products, MNC products, and imported products. Table 4 reports the summary statistics of the data.

##### **Tariff**

Tariffs of four years (1994, 1998, 2001, and 2010) are obtained from the Chinese Customs. China entered WTO on January 1, 2001, and the tariff rates are subject to a 10-year phase-in period.

So the tariffs in 2001 are the “initial bound rate” at the WTO accession, and the 2010 tariffs are the “final bound rate”. The data comes at the Harmonized System. To aggregate each product’s tariff into an industry’s tariff rate, we have two alternatives: simple average and weighted average using imports as weights. Since weighted average method has the well-known defect of underestimating the weights: imports for a high tariff item would typically be lower than normal, we choose to use the simple average method to obtain the tariffs by industry. From the summary statistics in Table 4, we find that the mean, standard deviation, and the maximum number of the tariffs of different years drop over time, indicating that not only the tariff levels are slashed down but also the tariff structures are more compressed.

### **Consumption shares and wage premium:**

Three consumption shares are expected to be nonnegative and sum up to one. They are calculated using the formula:

$$s_{ji} = \begin{cases} \frac{\text{Output}_j - \text{Export}_j}{\text{Total Output} - \text{Exports} + \text{Ordinary Imports}} & \text{for } j=d, m \\ \frac{\text{Ordinary Imports}_j}{\text{Total Output} - \text{Exports} + \text{Ordinary Imports}} & \text{for } j=f \end{cases} \quad (17)$$

Wage premium is calculated as:

$$\text{Wage Premium}_i = \frac{\text{Multinationals wage}_i - \text{Domestic firm wage}_i}{\text{Multinationals wage}_i} \quad (18)$$

We use the wage paid by town and village enterprises (TVE) to proxy domestic firm wage.

To calculate these variables, we obtained firm outputs, the number of firms, and employment data from “The Third Industrial Census of China in 1995”, which is the latest and most widespread census conducted across China’s manufacturing sectors. These data are collected under the

GB/T4754-1994 system (Classification and Codes of China's Economic Industries). Trade data of the same year 1995 is provided by the Center for International Data at UC Davis and is classified in a 6-digit HS system. The Center collects annual data (1988 – 2002) from the Chinese Customs General Administration as a result of the project described in Feenstra, Hai, Woo and Yao (1999). We also built a customized ISIC (CISIC) classification based on the standard ISIC version 3. Then the output, trade, and tariff data are all converted into this CISIC classification.

### Elasticity

Currently there's no available official data for demand elasticities by industry. Estimates of elasticity from empirical literature always have measurement errors. So instead of using estimates of elasticity, in each regression we experiment with different values, but common across all the industries.

### Specification

Following G-M (1999) method of handling the elasticity, we keep the term  $\varepsilon_i \cdot \left(\frac{\varepsilon_i}{\varepsilon_i - 1} - s_{fi}\right)$  on the left hand side of the equation to avoid the possible endogeneity problem between tariff and elasticity. Then we add on the errors that are assumed to follow a normal distribution  $u_i \sim N(0, \Omega)$ .

Since we treat elasticity as a constant across all the industries, the term  $\gamma \frac{\varepsilon_i}{\varepsilon_i - 1}$  only affects the estimate of constant but not the estimation of coefficient  $\gamma$ . So we group this term to the constant. Correspondingly, the estimate of  $\gamma$  now measures only the political weight on consumer income or the wage premium brought by the MNC. Then our empirical specification is

$$\frac{\tau_i}{p_i} \varepsilon_i \left( \frac{\varepsilon_i}{\varepsilon_i - 1} - s_{fi} \right) = \phi + (\beta - 1)s_{di} - \delta \cdot s_{fi} + \gamma(\varepsilon_i - 1) \frac{(w_i - 1)}{w_i} s_{mi} + u_i \quad (19)$$

In this equation, dependant variable is  $\frac{\tau_i}{p_i} \left( \frac{\varepsilon_i^2}{\varepsilon_i - 1} - \varepsilon_i s_{fi} \right)$ , and independent variables

are  $s_{di}$ ,  $s_{fi}$ , and  $\frac{(w_i - 1)}{w_i} (\varepsilon_i - 1) s_{mi}$ ; parameters to be estimated are the constant term

$\phi = \left[ 2 - \tilde{\mu} - \gamma \frac{\varepsilon_i}{\varepsilon_i - 1} \right]$ ,  $\beta$ ,  $\delta$ , and  $\gamma$  correspondingly. To test whether the data supports the model

prediction, we conduct three exercises: First, examine the hypothesis from the theory: (a)  $\beta > 0$ , (b)  $\gamma > 0$  and (c)  $\beta > \gamma$ . Second, detect the reasonable range of  $\gamma$  and  $\beta$  for different values of the elasticity. Third, observe the time patterns of the political weights.

## V. Empirical Results

Basic OLS method is used in the regression. Since heteroskedasticity is common for cross-section data, we report the White's standard error that gives consistent estimates. Elasticity and consumption shares may be endogenous to tariff, so putting them on the right hand side of the equation might cause endogeneity problem. However, noticing that we use year 1994, 1998, 2001 and 2010's tariff rate on the left hand side and 1995's output and trade data on the right hand side, endogeneity problem won't be severe since explanatory variables are predetermined to the dependant variables. We also attempt the regressions with different elasticity values so as to have a good sense of the direction in which protection changes with the elasticity.

In Table 5, we report the benchmark regression results of Equation (19), using an elasticity value of 5. Each of the five columns uses tariffs of a different year. White's standard errors are reported in the parentheses. An estimate of the parameter  $\beta$ , the political weight on SOE profit, is derived from the regression coefficient  $\beta - 1$  on the state-owned consumption share. It is significantly positive across all the years, and larger than unity, though not significantly so.

Estimate of  $\gamma$ , the weight applied by the government on the consumer income or the MNC wage premium is directly obtained from the coefficient. It is significantly positive in all the years except for 2010, in which we can't reject that it differs from zero. Estimates of  $\delta$  are significantly larger than zero, but not significantly differ from unity for the latter three years. Though  $\beta$  is larger than  $\gamma$  for all the years, F tests indicate that the difference is only significant in 2010. Another feature is: both  $\beta$  and  $\gamma$  drops all the way from 1994 to 2010, indicating that the government's weights on the two decrease with the economic opening.

Then we attempt estimating equation (19) again with different elasticity values so as to have a good sense of the range of  $\beta$  and  $\gamma$  estimates. Feenstra (1994) obtained a CES aggregate of import prices allowing new product varieties and quality change. He found that the estimated elasticity of substitution ranges from 2.96 to 8.38 for differentiated goods and is as high as 27 and 43 for the perfectly homogeneous goods gold and silver. So we used four different elasticity values:  $\epsilon_i = 2, 3, 8, \text{ and } 20$  respectively in the regressions and report the results in Table 6. Each panel of the table documents the regression results of a single elasticity value. Our findings are: first, no matter how the elasticity changes,  $\beta$  and  $\gamma$  are always positive and significant most of the time, supporting our hypotheses 1) and 2).  $\beta$  is larger than unity in absolute value, which strongly suggests that SOE profit figures prominently in the government's objective function.  $\gamma$  is highly significant except in 2010, meaning that at the end of the WTO transition, consumer income is no longer important in government's objective function.

Second, for the hypothesis that  $\beta > \gamma$ , we find that it is related to the elasticity. If values of the elasticity is as small as 2,  $\beta$  is smaller than  $\gamma$  in 1994, 1998 and 2001. But as higher elasticity are used, the weight on SOE profit increases, and the weight on consumer income drops. When the elasticity passes 5,  $\beta$  is always larger than  $\gamma$  in absolute value. The way these estimates change

indicates that as the elasticity increases, the government's preference shifts towards SOEs away from the consumers. On the whole, the regression results are sensitive to the elasticity that is picked. Estimates of  $\beta$  and  $\gamma$  take a whole range of values from 1.27 – 5.64 and 0.19 – 4.39 respectively, depending on the particular elasticity. Without the exact industry elasticity, we can't pin down the political weights on SOE and consumer welfare.

Third, keeping the elasticity value unchanged, both  $\beta$  and  $\gamma$  drop over time from 1994 to 2010, indicating that the government's protection over SOE and consumer decrease with the integration to the global economy. To see how the government's protection level changes over time, we plot the point estimates of political weights  $\beta$  and  $\gamma$  as a function of time in Figure 1. The three panels 1A, 1B, and 1C each illustrates the estimates of  $\beta$ ,  $\gamma$ , and the ratio of  $\beta/\gamma$  as the vertical axis and year as the horizontal axis. Now the relationship is clear. Keeping the value of elasticity unchanged, both  $\beta$  and  $\gamma$  drop over time from 1994 to 2010, indicating that the government's protection over SOE and consumer income decrease with the integration to the global economy. Then figure 1C shows a monotonically increasing pattern of the ratio of  $\beta/\gamma$  over the time. Together with figure 1A and 1B, this implies that  $\gamma$  drops at a faster speed than  $\beta$ . We further calculate the year-by-year drop for  $\beta$  and  $\gamma$ . As presented in Table 7, holding the elasticity value constant,  $\beta$  always reduces at a greater percentage point than  $\gamma$  does during the same period.

To summarize the time pattern, we find that both  $\beta$  and  $\gamma$  decrease from 1994 to 2001, and comparatively,  $\gamma$  is dropping at a faster speed than  $\beta$ . Hence we can draw two conclusions. First, both the political weights on SOE profit and consumer income diminish with the trade liberalization. Second, comparatively, SOEs are still favored more by the government than is consumer income.

The pattern that  $\beta$  reduces over time easily matches the reality. Decreasing government's interference with SOE management has been a main focus throughout China's economic reform. In

the WTO negotiation, China further committed that “the Government of China would not influence, directly or indirectly, commercial decisions on the part of state-owned or state-invested enterprises, including on the quantity, value or country of origin of any goods purchased or sold, except in a manner consistent with the WTO Agreement.”<sup>5</sup> In addition to the need to improve their efficiency, the SOEs now have more incentives to reform the ownership to avoid unfair treatment of “non-market-economy” and painful default dumping charges.

Then why does  $\gamma$  drop over time and even faster than  $\beta$ ? Since  $\gamma$  is the coefficient of wage premium in equation (19), this indicates that the government cares less about the wage income than SOE profit. We believe this finding is consistent with the fact that Chinese government is favoring the SOE reform at the expense of the increasing unemployment and income inequality. As pointed out in a recent World Bank country report, widening income inequality is one of the most serious threats to China’s future prosperity<sup>6</sup>. The economic reform started 20 years ago represents the fundamental guideline change – from Mao’s egalitarianism to Deng’s famous saying of “allow some people to get rich first”. As long as the country’s living standard rises, widening income gaps were viewed as inevitable. To guarantee the success of the SOE reform, the government is even willing to sacrifice the rising unemployment. With the approval of the socialist market economy at the 15<sup>th</sup> Party Assembly, the lifetime employment was no longer held as a norm. As released in the White Paper of “China’s Employment Situation and Policies”<sup>7</sup>, by the end of 2003, the registered unemployment rate in the nation’s urban areas was 4.3 percent, or 8 million. But if we count the

---

<sup>5</sup> The legal instruments on China’s accession to the WTO, p.736

<sup>6</sup> World Bank, 2003. “China: Promoting Growth with Equity.” Country Economic Memorandum, Poverty Reduction and Economic Management Unit, East Asia and Pacific Region, Report No. 24169-CHA.

<sup>7</sup> The Information Office of the Chinese State Council, <http://www.washtimes.com/upi-breaking/20040426-095943-1594r.htm>

number of laid-off workers that receive money from their former employers, the unemployment figure jumps to 7 percent<sup>8</sup>. More importantly, the unemployed workers mainly come from the urban state-run industrial enterprises. For example, China's largest oil producer, PetroChina, has cut about 63,000 jobs since 2000. China Petroleum has cut 22 percent of its workforce.

Meanwhile, the opening of access of domestic market to foreign production also brings in competition in factor markets and enlarges income inequality. Many studies found that in the 1980s China's urban wage structure was extremely compressed, but then FDI brought in a large premium over SOEs and the rise of skill premium paralleled the growth of FDI in China (Zhao 2001)<sup>9</sup>.

In summary, even though the widening income inequality may have been caused by natural endowment or geographical reasons, its severity suggests that another fundamental cause lies in the government's political preference – protecting the SOE by trading off the income disparity.

## **VI. Conclusion**

This paper analyzes China's recent tariff rates using a political economy approach. A model drawing on Branstetter and Feenstra (2002) is used to derive an optimal tariff rate for each industry. The model predicts that government would set a high tariff rate if an industry is of large SOE share, MNC share or small foreign import share.

We use 1995 China's Census data, trade data in 1995, as well as China's tariff rates across four years to reveal Chinese government's preference to different interest groups under the binding tariff constraint from WTO commitments. A customized ISIC – GB 94 concordance is constructed

---

<sup>8</sup> [http://www.bizasia.com/economy\\_planning\\_/b33xw/chinese\\_unemployment\\_always.htm](http://www.bizasia.com/economy_planning_/b33xw/chinese_unemployment_always.htm)

<sup>9</sup> Earnings Differentials between State and Non-state Enterprises in Urban China No. E2001001 Yaohui Zhao  
CCER

to convert China's industrial outputs to the international industry classification. The estimated structural parameters imply that with the economic opening, government's political weights on both the SOE profit and consumer income diminish. But comparatively, the government still favors SOEs over the consumer income! This finding is consistent with the pattern of economic reform. Our results support Grossman and Helpman (1994) model and the findings in Branstetter and Feenstra (1999, 2002). Our conclusions are also of importance to the comparative economic studies.

## Reference

Baldwin, Robert E. 1985. *The Political Economy of U.S. Import Policy*. Cambridge: The M.I.T. Press.

Bale, Malcolm. 1977. United States Concessions in the Kennedy Round and Short-Run Labour Adjustment Costs: Further Evidence. *Journal of International Economics* 7: 145-148.

Bernheim, Douglas B. and Michael D. Whinston, 1986, "Menu Auctions, Resource Allocation, and Economic Influence," *Quarterly Journal of Economics*, 101, 1-31.

Branstetter, Lee and Robert Feenstra, 1999, "Trade and Foreign Direct Investment in China: A Political Economy Approach", *NBER Working Paper*, National Bureau of Economic Research.

Branstetter, Lee and Robert Feenstra, 2002, "Trade and Foreign Direct Investment in China: A Political Economy Approach," *Journal of International Economics*.

Census 1995: National Bureau of Statistics, Office of the Third Industrial Census (1997), Vol: *The Data of the Third National Industrial Census of the People's Republic of China in 1995*, China Statistics Press.

Cheh, John H. 1974. United States Concessions in the Kennedy Round and Short-Run Labor Adjustment Costs. *Journal of International Economics* 4: 323-340.

Feenstra, Robert, March 1994, "New Product Varieties and the Measurement of International Prices," *American Economic Review*, 84(1), 157-177.

Feenstra, Robert C., Wen Hai, Wing T. Woo, and Shunli Yao, 1999, "Discrepancies in International Data: An Application to China-Hong Kong Entrepôt Trade," *American Economic Review*.

Feenstra, Robert C, *Advanced International Trade: Theory and Evidence*, Princeton University Press, 2004.

Gawande, Kishore and Usree Bandyopadhyay, 2000, "Is Protection For Sale? A Test of the Grossman-Helpman Theory of Endogenous Protection," *Review of Economics and Statistics*, February, 139-152.

Goldberg, Pinelopi and Giovanni Maggi, 1999, "Protection for Sale: An Empirical Investigation," *American Economic Review*, 89(5), December, 1135-55.

Grether, Jean-Marie, Jaime de Melo, and Marcelo Olarreaga, 2001, "Who Determines Mexican Trade Policy?" *Journal of development Economics* 64: 343-70.

Grossman, Gene M. and Elhanan Helpman, 1994, "Protection for Sale," *American Economic Review*, 84, 833-850.

Grossman, Gene M. and Elhanan Helpman, 1996, "Foreign Investment with Endogenous Protection," in Robert C. Feenstra, Gene M. Grossman and Douglas A. Irwin, eds., *The Political Economy of Trade Policy: Papers in Honor of Jagdish Bhagwati*, Cambridge: MIT Press, 199-224.

Legislative Affairs Office of the State Council, 2001. "The legal Instruments on China's Accession to the World Trade Organization", *China Legal Publishing House*.

McCalman, Phillio, 2004, "Protection for Sale and Trade Liberalization: An Empirical Investigation," *Review of International Economics*, vol. 12.

Woo, Wing Thye and Ruoen Ren, 2001. "Employment, Wages and Income Inequality in the Internationalization of China's Economy", *Employment Paper 2002/39*. OECD Employment Sector.

World Bank, 2003. "China: Promoting Growth with Equity." Country Economic Memorandum, Poverty Reduction and Economic Management Unit, East Asia and Pacific Region, Report No. 24169-CHA.

Yang, Shengming et al., 1999. "*China Tariff System Reform*," Chinese Customs Policy Research Center.

Zhao, Yaohui 2001. "Earnings Differentials between State and Non-state Enterprises in Urban China," CCER Working Paper No. E2001001

**Table 1: China's Tariff Reform Process**

<b>Year</b>	<b>China Tariff Reform</b>	<b>Simple average tariff rate (%)</b>
1951	First Customs Import and Export Tariff Schedule	52.9
1985	Second Customs Import and Export Tariff Schedule	38
1986	China applied to resume status as a member of GATT	
1992	Third Customs Import and Export Tariff Schedule, adopted the HS system	42.5
1996	Biggest unilateral slash of tariff rates since China's foundation, China trade minister established the goal: reduce most levels below 15%	23
2001	Became a member of WTO	13.66
2010	The end of WTO tariff transition period	9.87

Source: China Tariff System Reform, Shengming Yang et al., 1999

**Table 2: Tariff Structure by Ranges (before and after WTO accession)**

<b>Ranges</b>	<b># of tariff headings within the range</b>	
	<b>Year 2000 (before WTO accession)</b>	<b>Year 2010 (after WTO accession)</b>
0%	N.A.	550
<5%	525	1143
5 ~ 10%	1488	3115
10 ~15%	2022	1124
>15%	3027	1072

**Table 3: Tariff Revenue as a Percentage of China's Fiscal Income**

Year	Tariff revenue (hundred million)	% of Fiscal Income
1992	381.7	23.1
1993	447.7	26.4
1994	622.6	22.9
1995	698.7	23
1996	850.7	23

Source: China Statistical Yearbook by different years.

**Table 4: Summary Statistics For Variables In the Regression**

Variable	Obs.	Mean	Std. Dev.	Min	Max
T1994	68	0.36	0.27	0.00	1.45
T1998	68	0.20	0.14	0.00	0.65
T2001	68	0.16	0.12	0.00	0.57
T2010	68	0.11	0.08	0.00	0.45
$s_{di}$	68	0.36	0.24	0.01	0.99
$s_{mi}$	68	0.17	0.14	0.00	0.60
$s_{fi}$	68	0.07	0.10	0.00	0.54
m	68	375.46	390.98	0.00	1613.00
Wage premium	68	0.38	0.13	0.00	0.64

**Table 5: Benchmark Results for Estimation of Equation (22) ( $\varepsilon_i = 5$ )**

Dependant Variable:  $\frac{\tau_i}{p_i} \cdot \varepsilon_i \cdot \left( \frac{\varepsilon_i}{\varepsilon_i - 1} - s_{fi} \right)$

Independent variable	Coefficient	Four Protection Measures			
		T1994	T1998	T2001	T2010
constant	$\phi$	1.48*** (0.36)	0.70*** (0.19)	0.58*** (0.16)	0.54*** (0.12)
Domestic Share	$\beta$	2.74*** (1.37)	2.02*** (0.63)	1.78*** (0.55)	1.41*** (0.41)
$s_{di}$					
- import Share	$\delta$	5.34*** (1.61)	2.23*** (0.75)	1.82*** (0.59)	1.38*** (0.38)
$-s_{fi}$					
Wage Premium* elasticity*MNC Share	$\gamma$	1.60*** (0.61)	1.00*** (0.34)	0.75*** (0.28)	0.27* (0.20)
$(\varepsilon_i - 1) \frac{(w_i - 1)}{w_i} s_{mi}$					
F test: beta>gamma	F(1,64)=	0.51	1.85	2.53	5.78
R-sqr (N=68)		0.23	0.24	0.20	0.14

**Notes:**

The sample uses 1995 China Manufacturing sectors output and China's tariff rates in 1994,1998, and WTO tariff staging matrix

Only shares with positive and sum less than unity are included (N=68)

White's standard error in the parentheses

Significance level: \*\*\* 95% confidence, \*\* 90% confident, \*80% confident

Critical Values for F(1,64) test: 95% significance: 3.99, 90% significance 2.79, 85% significance: 2.12, 80% significance: 1.67, 75% significance 1.35

**Table 6: Coefficient Estimation of Equation (22)**

Value of $\varepsilon_i$	Coefficient	Four Protection Measures			
		T1994	T1998	T2001	T2010
$\varepsilon_i=2$	$\phi$	0.95*** (0.23)	0.45*** (0.12)	0.37*** (0.10)	0.34*** (0.08)
	$\beta$	2.11*** (0.88)	1.65*** (0.40)	1.50*** (0.35)	1.27*** (0.26)
	$\delta$	3.17*** (1.04)	1.27*** (0.49)	1.05*** (0.38)	0.80*** (0.25)
	$\gamma$	4.17*** (1.60)	2.59*** (0.88)	1.95*** (0.72)	0.69* (0.52)
	F test: beta=gamma	1.13	0.86	0.28	0.90
R-sqr (N=68)	0.22	0.22	0.19	0.13	
$\varepsilon_i=3$	$\phi$	1.07*** (0.26)	0.51*** (0.14)	0.42*** (0.12)	0.39*** (0.09)
	$\beta$	2.25*** (0.98)	1.73*** (0.45)	1.56*** (0.40)	1.30*** (0.30)
	$\delta$	3.72*** (1.17)	1.52*** (0.54)	1.25*** (0.42)	0.95*** (0.27)
	$\gamma$	2.32*** (0.89)	1.45*** (0.50)	1.09*** (0.40)	0.39* (0.29)
	F test: beta=gamma	0.00	0.17	0.63	4.36
R-sqr (N=68)	0.23	0.23	0.20	0.14	
$\varepsilon_i=8$	$\phi$	2.17*** (0.53)	1.03*** (0.28)	0.85*** (0.23)	0.79*** (0.17)
	$\beta$	3.54** (2.00)	2.49*** (0.92)	2.13*** (0.80)	1.60*** (0.60)
	$\delta$	7.95*** (2.35)	3.35*** (1.09)	2.73*** (0.86)	2.06*** (0.56)
	$\gamma$	1.33*** (0.51)	0.83*** (0.29)	0.63*** (0.23)	0.22* (0.17)
	F test: beta=gamma	1.06	2.78	3.06	4.64
R-sqr (N=68)	0.24	0.24	0.21	0.15	
$\varepsilon_i=20$	$\phi$	5.00*** (1.21)	2.38*** (0.65)	1.96*** (0.53)	1.82*** (0.40)
	$\beta$	6.85* (4.60)	4.42*** (2.11)	3.61*** (1.85)	2.38*** (1.38)
	$\delta$	18.64*** (5.40)	7.92*** (2.51)	6.44*** (1.97)	4.86*** (1.28)
	$\gamma$	1.13*** (0.44)	0.70*** (0.24)	0.53*** (0.20)	0.19* (0.14)
	F test: beta=gamma	1.49	2.98	2.67	2.44
R-sqr (N=68)	0.24	0.24	0.21	0.15	

Note: White's Std. Error in the parentheses

t-stat significance level: \*\*\* 95% confidence, \*\* 90% confident, \*80% confident

**Table 7: Percentage Change of  $\beta$  and  $\gamma$  Across the Years**

<b>Value of <math>\varepsilon</math></b>	<b>% change</b>	<b>1994-98</b>	<b>1998-01</b>	<b>2001-10</b>
$\varepsilon = 2$	$\beta$	-22%	-9%	-15%
	$\gamma$	-38%	-25%	-65%
$\varepsilon = 3$	$\beta$	-23%	-10%	-17%
	$\gamma$	-38%	-25%	-65%
$\varepsilon = 8$	$\beta$	-30%	-14%	-25%
	$\gamma$	-38%	-25%	-65%
$\varepsilon = 20$	$\beta$	-35%	-18%	-34%
	$\gamma$	-38%	-25%	-65%

**Figure 1: Patterns of  $\beta$ ,  $\gamma$ , and  $\beta/\gamma$  over the Years**

