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# **China's WTO Accession and Regional Economies**

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# China's WTO Accession and Regional Economies

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## Abstract

Along with the rapid economic growth since China undertook economic reform in 1978, the income gap among Chinese regions has widened. Using **CERD**, a computable general equilibrium model of the Chinese economy with regional details, this paper investigates the impact of China's accession to the World Trade Organisation on regional development and finds that, although all regions will gain from the accession, the trend of a widening gap among regions will be reinforced rather than eased. Specifically, the eastern coastal region gains more than the inland regions. The result is robust no matter whether the change in trade balance is left free or fixed, although the scenario with zero change in the trade balance generates a lower overall welfare gain and an even worse regional disparity. A retreat from WTO commitments in tariff cuts in agriculture reduces welfare gains, but could to some degree ameliorate the worsening inequality between rural and urban households and between coastal and inland regions. However, this analysis incorporates only WTO commitments on tariff cuts and does not include commitments on non-tariff barriers. Moreover, it does not model other domestic reforms that may be adopted to offset the adjustment costs of the WTO commitments.

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# China's WTO Accession and Regional Economies

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## 1 Introduction

China was admitted to the World Trade Organisation (WTO) in November 2001, after making WTO commitments which are far beyond those most member economies agreed to when they joined the WTO (Lardy 2002). The accession ended a fifteen-year long and difficult negotiation process, however, the discussion of the impact of China's accession on the domestic and world economy has only just begun.

Many studies discuss the impact of China's accession using general equilibrium models because these models enable panoramic analysis of economy-wide effects.<sup>1</sup> These studies share the view that, overall, China will achieve gains in economic efficiency but that agriculture, the auto industry and the banking system are vulnerable sectors.

Few studies have tried to investigate the impact of WTO accession on regional development. Yang and Huang (1997) and Jiang (2002a) use different types of representative households to approximate the regional impacts of trade liberalisation and WTO accession. Diao, Fan, and Zhang (2002) and Diao et al. (2002) present a general equilibrium model with partial disaggregation, i.e., distinguishing nine different regions only for the agricultural sectors. Fan and Zheng (2000, 2001) discuss the regional impact of trade liberalisation in their PRCGEM model following the top-down approach. However, their analysis is incomplete because it attributes the regional impact only to the difference in sectoral composition. One reason for this limitation is that constructing a multi-regional CGE model of the Chinese economy requires detailed regional input-output, income, consumption and trade data which are often difficult to obtain.

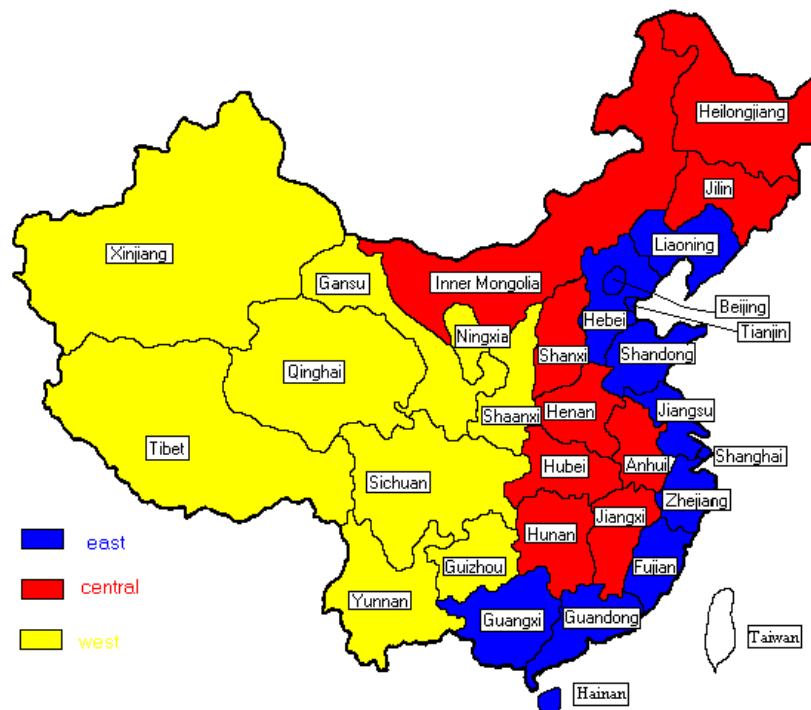
Although difficulties exist, the regional impacts of WTO accession should be paid equal attention to the sectoral impacts. It is an even more important issue in the following senses. First, China is a big country with huge regional differences in geographic and economic terms, and the regional income disparity worsened along with the economic reform and growth during the 1990s. This income disparity has become so great that the central government announced the "West Development Strategy" in 2000. Second, analysis of sectoral effects is a part of the investigation into the regional effects of WTO accession, therefore a regional analysis could provide a more comprehensive picture of the effects.

This paper discusses the impact of WTO accession on China's regional economies using a general equilibrium model of the Chinese economy with regional details, **CERD**. The paper is organised as follows. The next section discusses regional developments in China since it implemented its

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<sup>1</sup>For example, see Li et al. (1998), Wang (2000), Ianchochina and Martin (2001), Lloyd and Zhang (2001), Anderson, Huang, and Ianchochina (2002), Diao, Fan, and Zhang (2002), Diao et al. (2002), Francois and Spinanger (2002), and Yu and Frandsen (2002).

**Figure 1: Three Regions in Mainland China**



economic reform policy in 1978, to provide background for the analysis. Section 3 describes the structure of the **CERD** model. It is followed by the description and discussion of results of model simulations of tariff cuts in line with WTO commitments. Finally, some conclusions and the future direction of research are discussed.

## 2 Regional Income Disparities in China

### 2.1 Three Regions in Mainland China

It is widely accepted that mainland China can be divided into three regions according to their natural and economic conditions. The eastern coastal region includes the provinces of Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi and Hainan; the central region includes Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei and Hunan; and the western region includes the remaining six provinces, three autonomous regions and one municipality (Figure 1). The eastern region is the most populous and richest region, while the western region is the poorest region. A brief description of these regions is given in Table 1.

As observed by many authors (e.g. Wu 1999; Sun 2000; Sun and Parikh 2001), the income gap between China's coastal and inland regions has been widening since the economic reforms in 1978. Of the three regions defined, the richest eastern coastal region experienced the fastest economic growth

**Table 1: Regional Characteristics**

Indicator	Eastern		Central		Western	
	1991	2000	1991	2000	1991	2000
Land area: 1,000km <sup>2</sup>		1303.3		2848.2		5425.6
percent		13.5		29.6		56.9
Population: million		536.2		439.4		286.7
percent		42.5		34.8		22.7
GDP: billion yuan		5774.0		2626.2		1320.3
percent		59.4		27.0		13.6
Per capita GDP		10768		5978		4606
Share of SOE (%)	61.5	46.2	77.0	71.1	82.5	77.0
Share of primary sector (%)	21.5	13.8	28.6	19.6	32.0	21.1
Transportation index (km/km <sup>2</sup> )	0.42	0.57	0.22	0.28	0.13	0.17
Education index	0.39	0.56	0.35	0.51	0.25	0.36
Open index <sup>a</sup>	2.17	2.33	0	1.56	0	1.40
Marketisation index <sup>b</sup>	6.52	6.65	4.88	4.95	3.19	3.42

<sup>a</sup> Open indexes are developed by Démurger et al. (2001), according to the type and number of various special economic zones in each province. The number in 2000 is the index for 1998.

<sup>b</sup> Marketisation indexes are developed by Fan and Wang (2001), based on the relationship between government and firms, development of non state-owned sectors, development of product and factor markets, and regulations. The values are respectively for years 1997 and 1999.

Source: China Statistical Yearbook, various volumes; Démurger et al. (2001); Fan and Wang (2001).

in the past two decades. The average per capita GDP in the eastern region increased seven-fold, while per capita GDP in the poorest western region increased by less than five times. Consequently, the gap in per capita GDP between the eastern and western regions increased from 380.6 yuan in 1978 to 3354.9 yuan in 2000 in real terms (Figure 2).

## 2.2 Patterns of Regional Income Disparity

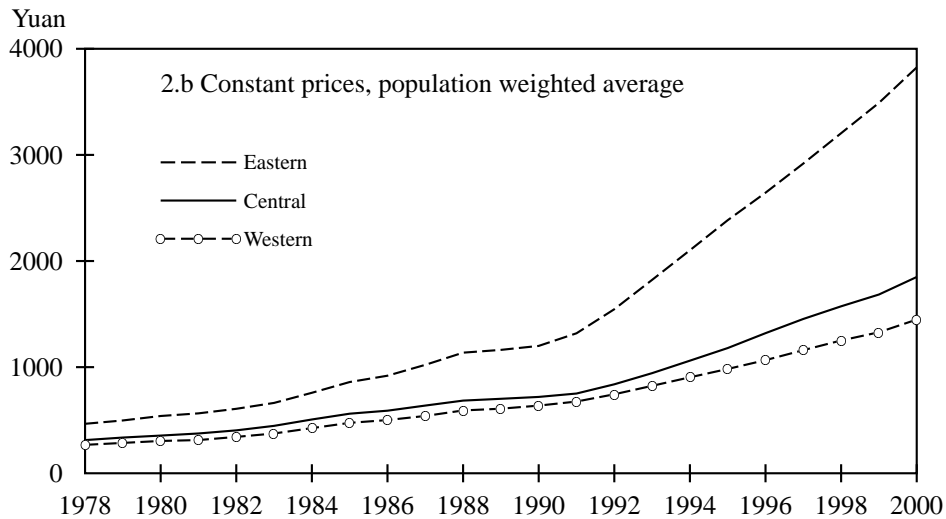
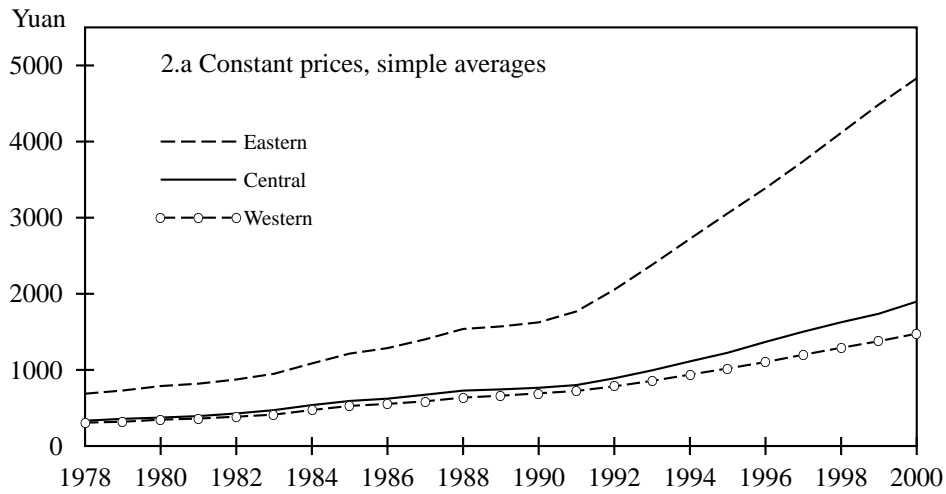
Although the gap in per capita GDP between rich and poor provinces has been widening since 1978, the values of relativity indicators (coefficient of variance, Gini coefficient and Theil index) in 2000 were more or less the same as in 1978. This suggests that regional income disparity in China is mainly driven by overall economic development.

It can be seen from Figures 3 to 5 that the disparity pattern changed significantly during the period between 1978 and 2000. During the period 1978–90 the extent of regional disparity was unchanged or even decreased for some indicators, but it increased significantly during the period 1990–2000. This observation is confirmed by the estimation of beta convergence which measures how fast the poor regions catch up to the rich ones (Table 2).<sup>2</sup> There was weak beta convergence during the period 1978 to 1990, while divergence can be observed for the period 1991 to 2000.

This pattern in regional income disparity is closely related to the economic reform and development process in China. During the first half of the first period (1978–84) China successfully implemented the agricultural reform scheme and, consequently, experienced high economic growth in the agri-

<sup>2</sup>The beta convergence can be estimated by  $\ln Y_{iT} - \ln Y_{i0} = c - (1 - e^{-\beta T}) \ln Y_{i0} + \varepsilon_i$ , where  $Y_{iT}$  and  $Y_{i0}$  are, respectively, per capita GDP at time  $T$  and time 0;  $\beta$  is the beta convergent coefficient; and  $\varepsilon$  is the error term. Clearly, a positive (negative)  $\beta$  indicates convergence (divergence).

**Figure 2: Per Capita GDP by Region**

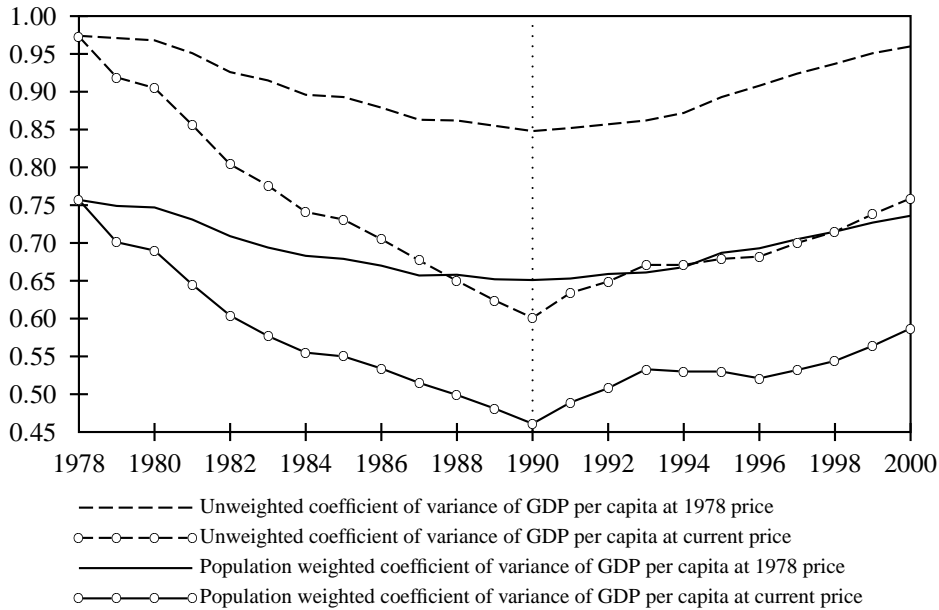


Source: Author's construction based on data from various volumes of the *China Statistical Yearbook*.

cultural sector. Because the poorer provinces have higher agricultural shares in their output than the richer provinces, the boom in agriculture helped to reduce the regional income gap. During the second half of this period, China began urban economic reform and the opening up of the coastal regions for foreign investment. But these reforms did not produce an immediate impact on regional disparity.

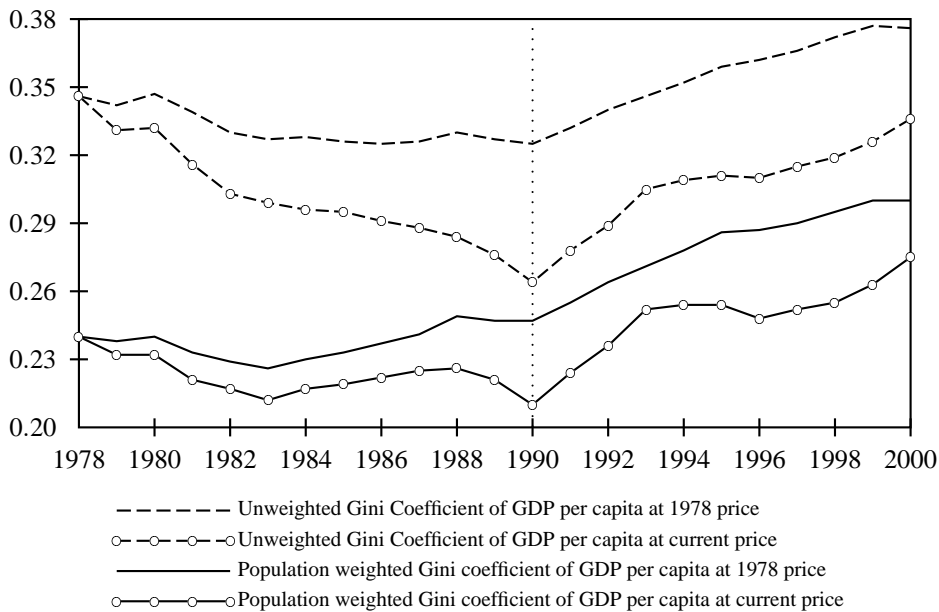
During the second period (1991–2000) the urban reforms initiated in the late 1980s were broadened and the reform effects have become evident. The most important effect is the decline of the state-owned economy. Because the central and western regions have a higher share of state-owned enterprises in their economy, their growth was hindered. On the other hand the eastern region benefited from the rapid growth of foreign investment and non-state-owned sectors.

**Figure 3: Coefficient of Variance of Regional Per Capita GDP**



Source: Jiang (2002a, Figure 4.1, p.46).

**Figure 4: Gini Coefficients**

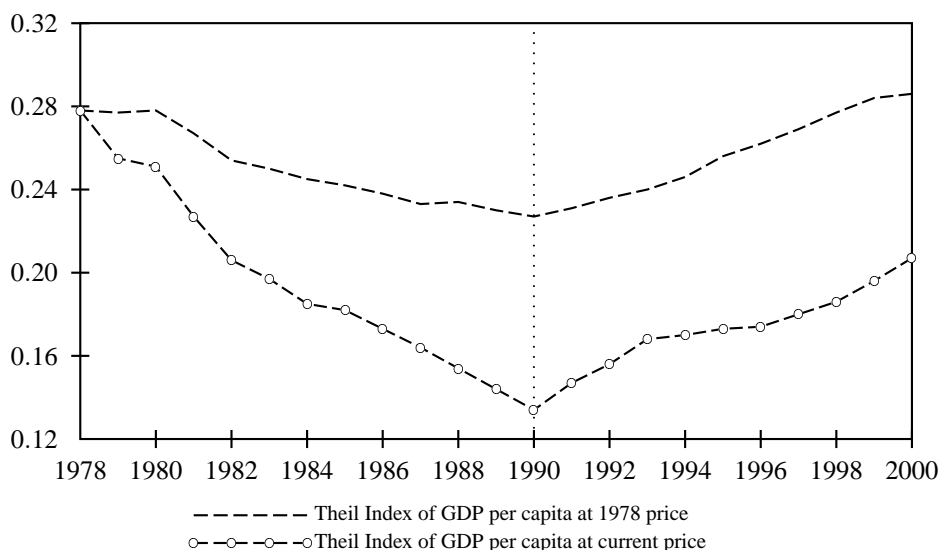


Source: Jiang (2002a, Figure 4.2, p.46).

Another feature of regional income disparity is that the degree of disparity decreases within each of these regions while it increases between the regions, as shown in Figures 6 and 7. This outcome is not only because these three regions have significant differences in their natural and economic conditions, but also because of the differentiated economic policies implemented in these regions.



**Figure 5: Theil Index of Regional Disparity in China**



Source: Jiang (2002a, Figure 4.3, p.47).

**Table 2: Beta Convergence of per capita GDP in China, by regions, 1978–2000<sup>a</sup>**

Period	National		Eastern region	Central region	Western region
	without dummy <sup>b</sup>	with dummy <sup>b</sup>			
1978–2000	0.254 (0.589)	1.077 (0.002)	0.882 (0.107)	2.122 (0.006)	1.786 (0.030)
1978–1990	0.690 (0.131)	1.242 (0.008)	1.077 (0.133)	1.739 (0.084)	2.270 (0.066)
1978–1984	0.956 (0.103)	1.493 (0.018)	1.136 (0.190)	2.637 (0.100)	3.649 (0.064)
1985–1990	0.330 (0.609)	1.079 (0.125)	0.907 (0.287)	1.023 (0.429)	3.158 (0.335)
1991–2000	-0.935 (0.177)	0.845 (0.089)	0.506 (0.428)	3.452 (0.020)	1.945 (0.225)
1991–1995	-1.239 (0.273)	1.896 (0.016)	1.595 (0.141)	5.496 (0.012)	1.714 (0.510)
1995–2000	-0.723 (0.072)	-0.378 (0.477)	-0.709 (0.307)	1.648 (0.402)	1.936 (0.253)

<sup>a</sup> The beta convergence ratio is in percentage terms; numbers in parenthesis are p-values.

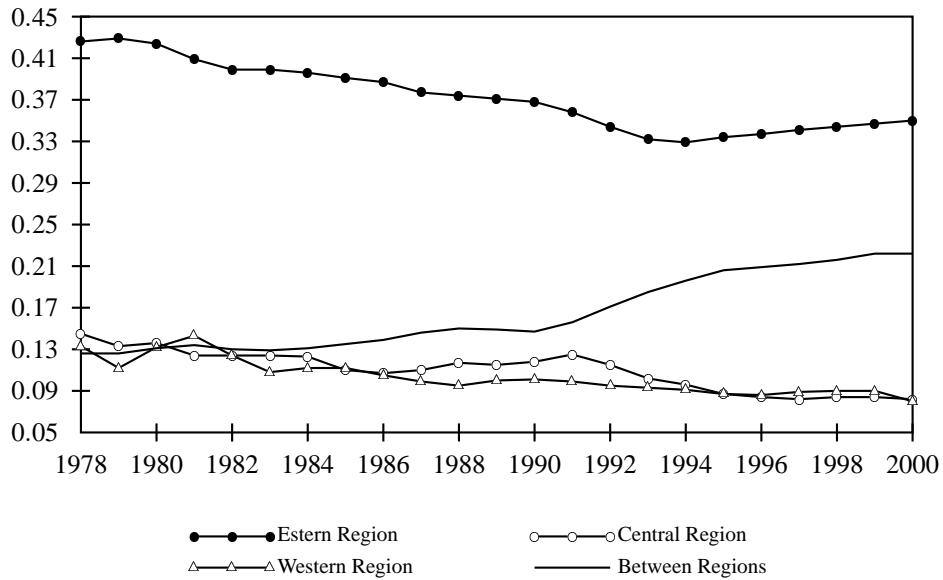
<sup>b</sup> These are dummies included for the central and western regions.

Source: Jiang (2002a, Table 4.1, p.48).

As shown in Table 1 the loss-making state-owned enterprises (SOEs) and low value-added primary sectors are dominant in the central and western regions, and their shares in the economy did not decline as much as in the eastern region. The infrastructure in these regions, as represented by the transportation index in Table 1, is relatively poor and did not improve very much during the past decade.

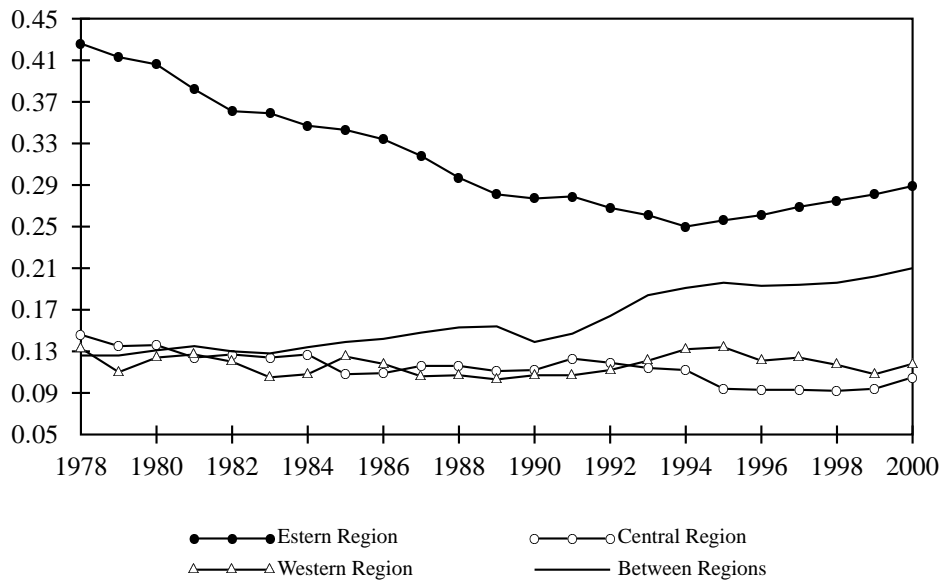
As regards economic policy, it is often claimed that the central government has given “preferential and favourable” policies to the coastal region, e.g., tax deductions and exemptions, and higher investment in infrastructure and production facilities. This is true, but it is not the complete story. The special policies implemented in the coastal region also included policies that were aimed at increasing economic efficiency, such as reducing the support to SOEs, opening up to external competition, encouraging the development of more dynamic private sectors, etc. These policies lead the eastern

**Figure 6: Gini Coefficient within and between Regions**  
(per capita GDP at 1978 prices)



Source: Jiang (2002a, Figure 4.4, p.49).

**Figure 7: Gini Coefficient within and between Regions**  
(per capita GDP at current prices)



Source: Jiang (2002a, Figure 4.5, p.50).

region to be more open than the other regions, as indicated by the open and marketisation indices in Table 1.

The regional differences in economic structure, technology and openness imply that WTO accession will have different impacts on regional economies. It was suggested that countries with a more open policy tend to attract more foreign direct investment and have higher economic growth (Bhagawati 1978; Balasubramanyam, Salisu, and Sapsford 1996). This also applies to different provinces in China. WTO accession means that domestic firms will receive less protection and be exposed to more competition. The above discussion suggests that the WTO accession may have more severe impacts on the inland regions than on the coastal region because the former regions have an unfavourable economic structure and are not so ready to face competition from the outside world. This hypothesis will be examined using a general equilibrium model of the Chinese economy in the following sections.

### **3 CERD: A General Equilibrium Model of the Chinese Economy with Regional Dimensions**

This section gives a brief introduction to the model of the Chinese economy used in the analysis. For more details about the model, see Jiang (2002b).

#### **3.1 Overview of CERD**

As **CERD** suggests, it is a multi-regional model of the Chinese economy. In this study a simple version of **CERD** is used, wherein Chinese provinces are grouped into three regions as described in the previous section.<sup>3</sup> Traditionally, a multi-regional model follows the so-called “top-down” approach where a central model is solved and then a regional distribution is done using the shares of the different regions. For example, the PRCGEM model (Fan and Zheng 2001) classifies sectors into local and national sectors. Local sectors produce products which are not tradable between regions. Although national sectors produce tradable products, it is assumed that the same percentage change in sectoral output applies to all regions. Therefore, the differences in regions’ responses to the liberalisation are purely the structural effect, i.e., coming from the difference in the composition of sectors in the regional economy.

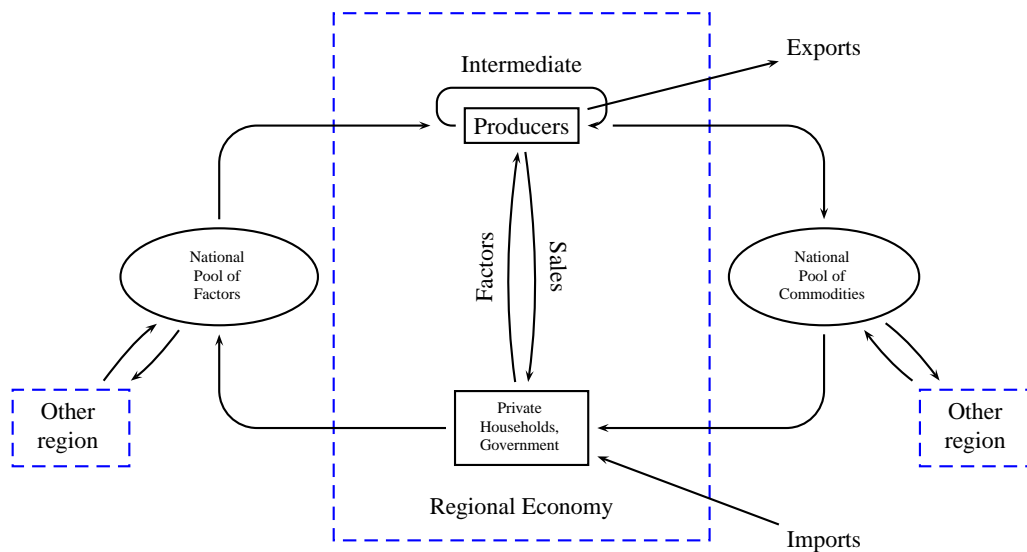
By contrast, **CERD** uses the “bottom-up” approach. Each region in **CERD** is treated as an open economy with its own agents and behavioural functions. As shown in Figure 8, agents in each region make their decisions on the demand for and supply of commodities and primary factors, and regional economies are linked through commodity and factor flows.

It can be seen from the diagram that **CERD** mimics a global model of multiple regions like GTAP (Hertel 1997). However, it has some peculiar features. First of all, regional links in **CERD** are more intensive than in a global model, especially for the movement of primary factors. For example,

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<sup>3</sup>The detailed version of the **CERD** model identifies 28 regions, which correspond to one province, autonomous region or municipality directly under the central government in mainland China, with exceptions where Hainan, Ninxia and Tibet are included in, respectively, Guangdong, Gansu and Qinghai.

**Figure 8: Structure of CERD**



in GTAP labour is immobile across countries, while **CERD** allows partial mobility across regions within China. **CERD** assumes perfect mobility of capital across domestic regions and sectors.

As labour and capital can move across regional boundaries, it is important to distinguish between the usage and ownership of these factors to better calculate regional household income and consumption. This makes **CERD** superior to some CGE models.

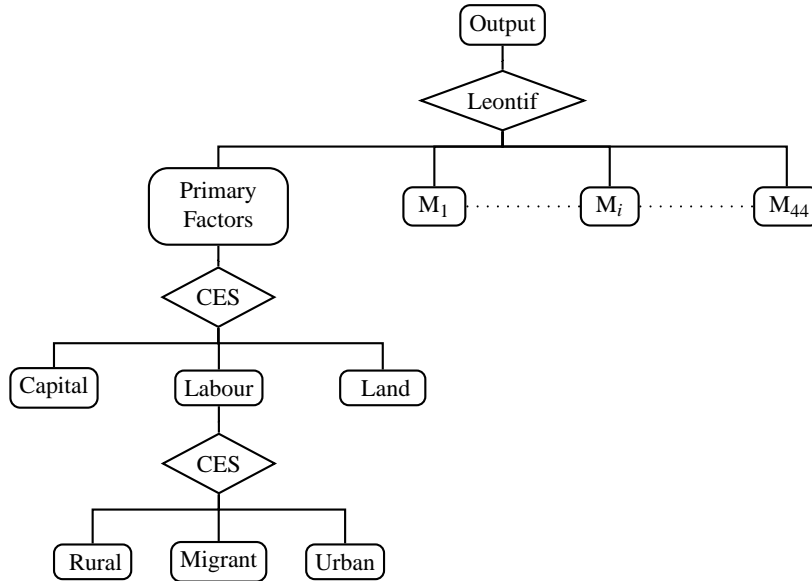
Another feature of **CERD** is that rural and urban households are distinguished in each region according to their possession of primary factors. This is very important and appropriate for the analysis of the Chinese economy where rural and urban areas are still separated to some degree because of various restrictions, although significant improvements have been made. For example, the household registration system, which identifies a person as a rural or urban resident, is still in effect and prevents people from freely moving across regions, especially from the countryside to cities.

Another difference between **CERD** and global models is its treatment of regional links. Ideally, inter-regional flows of commodities and factors would be presented in the model, however, such information is not available as there are no “customs” in each province to register “imports” from and “exports” to other provinces. In order to avoid arbitrary decisions in creating the database, **CERD** models inter-regional trade indirectly via a national pool of commodities and factors. Each region sells its excess supply to and buys excess demand from the national pool (Figure 8).

**CERD** also distinguishes between regional and national governments, which allows for the analysis of transfer payments.

Finally, **CERD** has a fairly detailed representation of commodities. There are 44 sectors in the model, among which are 5 agricultural sectors, 25 industrial sectors, one construction sector, and 13 service sectors (see Table A.1).

**Figure 9: Production Nesting**



## 3.2 Primary Factor Markets

### 3.2.1 Demand for Primary Factors

Each sector in each region is represented by a firm producing a single commodity. Perfect competition and constant returns to scale are assumed for all firms. The production is modelled by a nest of technologies (Figure 9).

At the first tier of the nest the technology is Leontif, that is, the production of a good requires fixed proportions of aggregated primary factors, or value added, and intermediate inputs. At the second tier, the value added is an aggregation of labour, capital, and land with a constant elasticity of substitution (CES). At the third tier, demand for different types of labour are determined. The labour demand by non-agricultural sectors is a CES aggregation of rural, urban and migrant labour, while agricultural sectors demand only rural labour. Therefore, there are four types of labour in the demand side: “*agri*” labour which is rural labour used in agricultural sectors; and “*rural*”, “*urban*” and “*migrant*” labour which are used in non-agricultural sectors (see Figure 10).

### 3.2.2 Supply of Primary Factors

Each household owns an endowment of primary factors,  $QFAH(v, h, r)$ , and allocates the endowment to different uses according to a constant elasticity of transformation (CET) process.

Labour is divided into rural and urban labour. Labour supplied by rural households can be used in all sectors in their own region as well as in other regions, i.e., as migrant labour. By contrast, labour supplied by urban households can be used only in non-agricultural sectors in their own region (Figure 11). These assumptions are made based on the fact that currently there is a huge amount

**Figure 10: Demand for Different Types of Labour**

Agricultural sectors	Non-agricultural sectors	
$qf("labour", j, r)$ $ql("agri", r)$ $plu("agri", r)$	$qldr("rural", j, r)$ $ql("rural", r)$ $plu("rural", r)$	Rural
	$qldr("urban", j, r)$ $ql("urban", r)$ $plu("urban", r)$	Urban
	$qldr("migrant", j, r)$ $ql("migrant", r)$ $plu("migrant", r)$	Migrant

**Figure 11: Supply of Different Types of Labour**

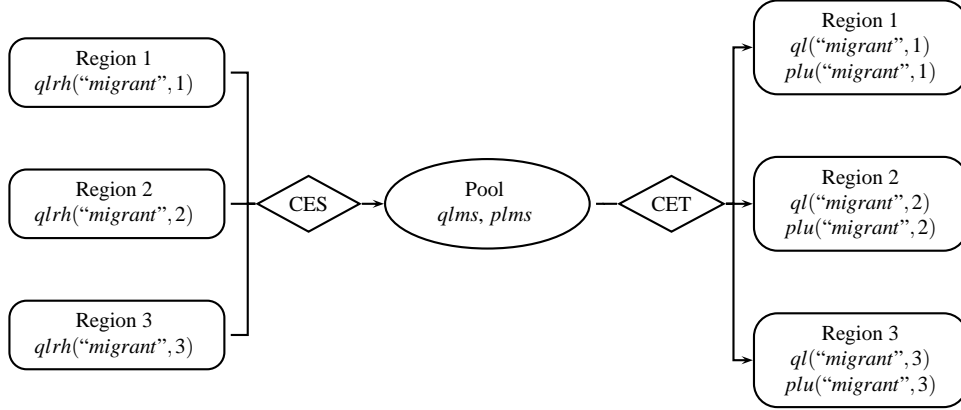
	Rural Household	Urban Household
	$qfah("labour", "rural", r)$ $plr(r)$	
	↓	↓
Agricultural sectors	$qlrh("agri", r)$ $pl("agri", r)$	
Non-agricultural sectors	$qlrh("nagr", r)$ $pl("nagr", r)$	$qfah("labour", "urban", r)$ $pl("urban", r)$
Other: Migrant	$qlrh("migrant", r)$ $pl("migrant", r)$	

of surplus labour in rural areas and that urban households are not willing to engage in agricultural activities. The supply of each type of labour is determined by the household's endowment of labour, the relative price of each type of labour, and the elasticity of transformation.

It is assumed that capital is perfectly mobile across regions and sectors, and there is no difference between capital owned by rural households and that owned by urban households. Therefore, there is no specific transformation function governing the supply of capital to each sector in each region. Only a summation equation is needed to calculate the total supply of capital which will be equal to total demand set by the market-clearing condition, and capital in every region has the same price.

Land is owned only by rural households. It is not mobile across regions but is partly mobile across agricultural sectors. The imperfect mobility of land reflects both natural and policy restrictions on land uses. For simplicity, it is assumed that land is not a production factor in non-agricultural sectors. The supply of land to each (agricultural) sector is determined by a CET process, depending on the household's endowment of land, the relative price of land in each sector, and the elasticity of

**Figure 12: National Migrant Labour Market**



transformation.

### 3.2.3 Factor Market Clearing

As shown in Figure 10, there are four types of labour on the demand side: rural labour used in agricultural sectors; and rural, urban and migrant labour used in non-agricultural sectors. There are also four types of labour on the supply side as shown in Figure 11: agricultural and non-agricultural labour supplied by rural households; labour supplied by urban households; and migrant labour supplied by rural households. The markets for the first three types of labour on each side can be cleared within one region, while migrant labour market clearing involves all regions.

As illustrated in Figure 12 migrant labour in the national pool is a CES aggregation of migrant labour supplied by each region; then they are allocated to each region to meet the demand according to a CET process.

Because capital is perfectly mobile across regions and sectors the market-clearing condition simply equates the total demand and supply. On the other hand, land is partly mobile across agricultural sectors within each region, and therefore its supply and demand should be matched for each (agricultural) sector in each region.

## 3.3 Commodity Markets

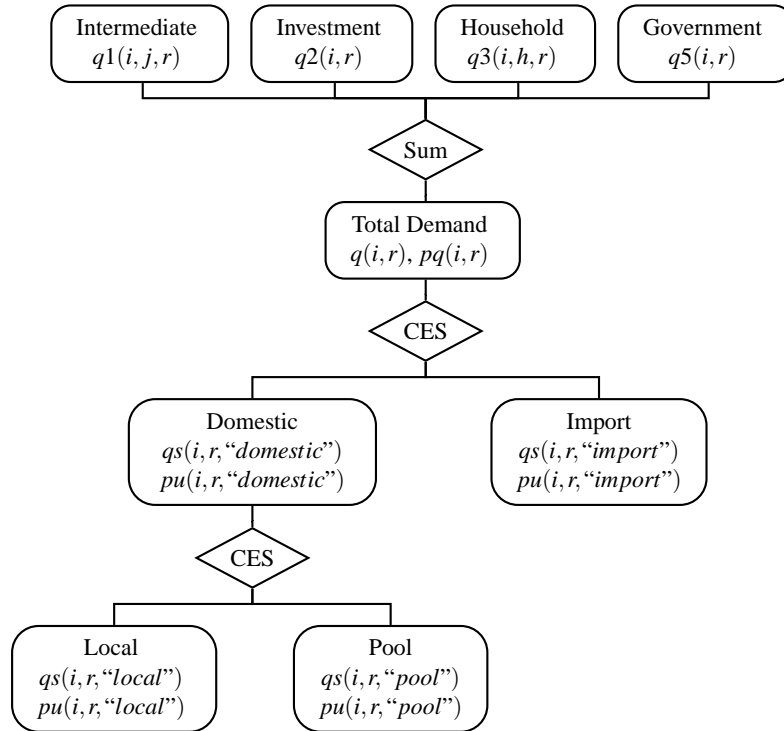
### 3.3.1 Demand for Commodities

As shown in Figure 13, regional demand for a commodity,  $Q(i, r)$ , is the sum of each firm's demand for intermediate goods,  $Q1(i, j, r)$ , investment demand,  $Q2(i, r)$ , and consumption demand of households and government,  $Q3(i, h, r)$  and  $Q5(i, r)$ :

$$Q(i, r) = \sum_{j \in IND} Q1(i, j, r) + Q2(i, r) + \sum_{h \in HHD} Q3(i, h, r) + Q5(i, r)$$

The total demand is a CES aggregation of demand for imported and domestically produced goods,

**Figure 13: Regional Commodity Demand**



and the latter is in turn a CES aggregation of goods produced locally, i.e., in its own region, and those from other regions (the national pool). This type of demand nesting has some advantages. Firstly, it allows for different elasticities of substitution between domestic and imported goods and between goods from different domestic regions. This reflects people’s perception that the domestic market is more integrated than the global market. Secondly, as almost all models distinguish between domestic and foreign products, this nesting permits the use of parameters in other models.

As introduced above, intermediate demand is proportional to the output level.

Each private household allocates its disposable income, which is the sum of returns to primary factors net of income tax and government transfer payments,<sup>4</sup> into savings and consumption. Savings is a fixed proportion of disposable income, determined by the propensity to save. The remaining disposable income is for consumption. The household’s consumption is modelled by a constant dif-

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<sup>4</sup>It should be noted that each household’s income is calculated according to its possession rather than its use of primary factors. This is necessary for the accuracy of regional income calculations because of the mobility of labour and capital. It might lead, however, to some bias in the calculation because of migrant labour. Specifically, it may underestimate (overestimate) income, and thus the consumption, of regions with net inflows (outflows) of migrant labour. However, most migrant labour is seasonal, and migrants send most of their earnings back to their households. In this sense, the current approach is more accurate than that based on the use of factors. If it is found that more migrants choose to reside in their work place permanently the calculation could be adjusted by changing each household’s factor endowment in the current framework.



ference in elasticity (CDE) system. The CDE is more flexible than the CES function for modelling consumer behaviour, and is used by the GTAP model (Hertel and Tsigas 1997; Huff et al. 1997).

There are two levels of government: regional and central government. To simplify the treatment, it is assumed that tax collections (except import tariffs and export taxes), government saving and consumption are made by regional governments, while the central government serves only to transfer payments to regional governments.<sup>5</sup> Therefore, each regional government's revenue is the regional tax revenues plus transfers from the central government.

The regional government's saving and consumption behaviour is similar to that of private households. First, a fixed proportion of total government revenues is saved, according to the government's propensity to save. The remaining revenues are allocated to consumption, or transferred to individual private households in the region. Once the expenditure on consumption is determined, the government's demand for individual commodities is determined according to a Cobb-Douglas utility function.

Regional aggregated real investment is determined by the prices of capital returns relative to the price of investment goods, and the elasticity of investment. It is assumed that the production of this aggregate investment is a Cobb-Douglas function of individual commodities.

### **3.3.2 Sales of Products**

Commodities produced by firms are sold to three destinations: local (regional) markets, other regions in China, or overseas (export). The sales to each destination are modeled as a process with a constant elasticity of transformation (CET). The sales to a destination are determined by the total output of the commodity, the relative price of the commodity in each destination, and the elasticity of transformation.

### **3.3.3 Commodity Market Clearing**

The demand for local products is met by the sales of local firms. Demand for imported commodities is supplied by the rest of the world, depending on the world market price and the elasticity of import supply. The demand for products produced in other domestic regions is met in a way similar to the migrant labour market illustrated by Figure 12. Each region's sales to other regions enters a national "pool", and then is transformed to individual regions according to a CET process.

## **3.4 Closure**

Endowments of primary factors are exogenous. There are labour slack variables to allow unemployment. But in the simulations described below these slack variables are set to be zero, leaving

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<sup>5</sup>If the central government was allowed to consume, in addition to the amount of goods it could consume, it should also make decisions about where the commodities are bought and sold. This would unnecessarily increase the burden of computation as this can be embodied in the decision making process of individual regional governments.

wages to adjust for full employment.<sup>6</sup>

All tax rates including tariff rates and technological shifters are set exogenously. Exogenous tax rates imply that government revenues will change along with changes in production, income and trade after shocks. It differs from a closure where tax rates are adjusted so as to raise a fixed amount of revenues. The current closure is chosen because we want to identify the impact of WTO accession from other policy changes. The share of transfer payments from central government to regional governments does not change, i.e., payments to each region change at the same rate.

The propensities to save are fixed, although they vary across households and regions. The difference between national savings and aggregate investment is the net capital inflow, which is equal to the trade deficit. There are two closures in the following simulation: no control on the trade balance and forcing the change in the trade balance to be zero. An interpretation of these two closures will be given below.

### 3.5 Data

A peculiar feature of **CERD** is that its database has been compiled based on the provincial 44-sector input-output tables for 1997. The 44-sector classification follows the 40-sector classification in the 1997 national input-output table (National Accounts Department 1999) with the agricultural sector further disaggregated into five sectors. In total there are 28 provincial tables available.<sup>7</sup> These provincial input-output data have been aggregated into the three regions.

Other data and parameters are drawn from GTAP database 5, Yang and Huang (1997) and the China Statistics Yearbook series.

## 4 Impact of WTO Accession on Regional Economies

China's WTO accession document is exceptionally long. In brief, China has made a WTO-plus commitment. It promised not only to reduce significantly tariff and non-tariff barriers but also to open up sectors such as telecommunications, banking, insurance, asset management and distribution to foreign investment. It also agreed to abide by all WTO rules. Moreover, China has been forced to accept discriminatory treatment in two important rule-based areas: safeguards and antidumping (Lardy 2002).

It is difficult to accommodate all of China's commitments in one simulation. Rather, this study investigates the impact of the most obvious and simplest commitment: the required tariff cut. Even this is not as easy as it may seem. China's import tariffs are often subject to exemption and reduction under special arrangements which make the effective tariff rates significantly different from the

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<sup>6</sup>It should be noted that the treatment here implies no change in the employment (or unemployment) level embodied in the database.

<sup>7</sup>Three provinces or autonomous regions, Hainan, Ningxia and Tibet, do not have input-output tables. These regions are small in economic scale and their input-output data were constructed according to information about neighbouring regions with similar natural and economic characteristics. Specifically, Hainan is included in Guangdong, Ningxia in Gansu, and Tibet in Qinghai.

statutory rates. For example, the average statutory tariff rate was 16.4 percent in 2000, while tariff revenue accounted for only 4.03 percent of the value of imports (National Bureau of Statistics of China 2001). However, the import and tariff data for individual products are not available to the public, so it is impossible to calculate accurate effective tariff rates.

The database of the model represents the Chinese economy in 2000, with the average tariff rate being 16.2 percent, which is close to the statutory tariff rate.<sup>8</sup> The tariff rates used in this study (Table A.2) are mainly drawn from the GTAP Database 5 with some revisions based on other studies, e.g. Wang (2000), Ianchovichina and Martin (2001) and Anderson, Huang, and Ianchovichina (2002). The WTO tariff rates are only approximately consistent with the actual commitments (*Annex 8: Schedule CLII of Protocol on the Accession of the People's Republic of China*).

As introduced above, two closures are used in the simulation:

- No control on the trade balance. In this closure, the nominal exchange rate is fixed, the trade balance is endogenous and foreign capital flows automatically match the balance.
- No change in the trade balance. In this closure, a floating exchange rate regime is assumed so that the change in the trade balance can be exogenously fixed at zero.<sup>9</sup>

One might think that the first closure is the most natural one, involving only tariff cuts in the simulation. However, it may still require some other policy changes to validate the closure. For example, it requires capital inflows to match the trade deficit at whatever level the model generates, implying that there is no control on foreign investment. This is clearly not the case. But as it is expected that foreign investment will increase after WTO accession (Chen 2001), and zero change seems too extreme, one would expect that the real situation lies somewhere between the two closures, although, perhaps, closer to the first one.

In each closure, two scenarios are simulated. The first one is the tariff cut set by China's WTO accession commitment. The second one is the same as the first one except that the tariff cuts in agricultural sectors are only half of the level in the first scenario. This scenario attempts to capture some policy reactions in China aiming at protecting agriculture after WTO accession. Many studies of China's WTO accession have projected that agriculture is one of the hardest hit sectors, so the Chinese government (and academic circles) has been worrying about this issue and adopted some measures to anticipate the detrimental outcomes.<sup>10</sup> One of the measures is to impose higher technical standards on imports.<sup>11</sup> These measures provide additional protection to agriculture, being equivalent to smaller tariff cuts in agricultural sectors.

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<sup>8</sup>Although this is higher than the effective rate, it may represent the actual protection level if considering non-tariff barriers. Moreover, the effective rate tends to underestimate the actual protection level as it is weighted by import volumes.

<sup>9</sup>It could be set at any level, but zero change is an obvious target.

<sup>10</sup>The problem of so-called *San Long* (agriculture, farmers and rural development) has been a popular topic.

<sup>11</sup>For example, the newly implemented reporting requirement for genetically modified food is interpreted as an important tool to protect China's traditional soybean growing areas in the northeastern region against competition from the US. However, it should be pointed out that these practices have been learnt from other countries. China often complains that its exports face even stricter technical barriers.

**Table 3: Macroeconomic Effects of Tariff Cuts—No Control on Trade Balance**

Indicators	WTO agreement				WTO agreement plus agricultural protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
Real GDP (%)	0.87	-0.06	0.33	0.56	0.77	-0.10	0.28	0.48
GDP deflator (%)	-1.90	-2.03	-2.79	-2.07	-1.74	-1.82	-2.53	-1.89
CPI (%)								
Rural households	-2.66	-2.50	-3.11	-2.70	-2.24	-2.12	-2.62	-2.28
Urban households	-2.56	-2.27	-2.77	-2.53	-2.23	-2.05	-2.51	-2.24
Government	-0.67	-1.30	-1.33	-0.95	-0.77	-1.39	-1.44	-1.04
Regional average	-2.61	-2.40	-2.95	-2.62	-2.24	-2.09	-2.57	-2.26
Total utility (%)								
Rural households	0.67	0.22	0.17	0.46	0.91	0.44	0.49	0.70
Urban households	1.85	1.16	1.36	1.62	1.58	0.91	1.09	1.35
Government	0.49	-1.94	-2.47	-0.37	0.24	-1.92	-2.42	-0.53
Regional average	1.19	0.30	0.48	0.86	1.10	0.33	0.44	0.81
Equivalent variation (billion yuan)								
Rural households	11.86	2.32	0.83	15.01	16.02	4.68	2.34	23.04
Urban households	38.68	7.89	9.79	56.35	33.05	6.20	7.84	47.08
Government	5.57	-6.84	-6.40	-7.67	2.67	-6.76	-6.28	-10.36
Regional sum	56.11	3.36	4.22	63.69	51.75	4.12	3.89	59.76
Savings (nominal, %)								
Rural households	-1.47	-2.03	-2.64	-1.76	-1.03	-1.59	-1.98	-1.30
Urban households	-0.14	-1.07	-1.04	-0.48	-0.30	-1.19	-1.19	-0.64
Government	-3.45	-3.26	-3.78	-3.44	-3.59	-3.32	-3.84	-3.58
Regional average	-1.02	-1.66	-1.41	-1.22	-0.97	-1.46	-1.38	-1.14
Nominal exchange rate				0				0
Change in trade balance (billion yuan)				-42.55				-34.42
Terms of trade (%)				-0.46				-0.42

Simulation results of the tariff cut can be found in Tables 3 to 6 and A.3 to A.8. Tables 3 and 5 report the macroeconomic effects of tariff cuts under different closures, and Tables 4 and 6 report the impact of tariff cuts on regional output, imports and exports of aggregated commodities or sectors, while the disaggregated sectoral results are reported in Tables A.3 to A.8.

## 4.1 No Control on Trade Balance

### 4.1.1 Effects of tariff cuts implied by the WTO accession agreement

It can be seen from Table 3 that China has a net gain from the WTO accession. By cutting the tariff rates as listed in Table A.2, China's real GDP increases by 0.56 percent, utility increases by 0.86 percent, and the equivalent variation, a welfare indicator, reaches 63.69 billion yuan. Higher welfare comes from higher real incomes, thus higher real consumption and saving. But the tariff cut has an adverse impact on the trade balance and the terms of trade. China's trade balance declines by 42.55 billion yuan because imports increase more than exports, and the terms of trade decreases by 0.46 percent. This is because the tariff cut does not affect the import price (CIF). However, Chinese exports become cheaper because tariff cuts help to lower production costs.

The simulation also confirms the perception that the impact will not be evenly distributed. The motor vehicle and other transport equipment sector is the biggest loser, with output declining by 16.37 percent. It is followed by food and tobacco processing, chemicals and machinery sectors, with output declining more than 3 percent. The impact on the agricultural sectors is not as severe as some studies have suggested. Crops output decreases by 1.2 percent and total agricultural output

**Table 4: Impact of Tariff Cuts on Regional Output, Exports, Imports and Demand for Products from Other Regions—No Control on Trade Balance**

Sectors <sup>a</sup>	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
Output								
agri	0.00	-0.13	-0.08	-0.06	0.00	-0.06	-0.05	-0.03
mine	-1.73	1.24	2.60	-0.03	-1.49	1.24	2.78	0.12
fprc	-4.20	-1.71	-5.35	-3.59	-5.33	-1.80	-5.41	-4.24
lind	7.68	0.04	2.79	5.86	7.35	-0.22	1.34	5.47
chem	-2.02	-0.96	-0.75	-1.63	-1.92	-0.95	-0.75	-1.57
motr	-17.88	-14.87	-11.54	-16.37	-17.62	-14.71	-11.12	-16.10
mche	-3.86	-0.95	0.29	-2.76	-3.61	-0.90	0.49	-2.56
elen	5.72	-0.85	3.10	4.98	6.43	-0.79	3.49	5.61
cnst	0.46	1.09	1.18	0.72	0.44	1.04	1.16	0.69
svce	0.82	-0.13	0.15	0.52	0.75	-0.13	0.14	0.48
Exports								
agri	17.19	15.07	17.41	16.56	11.45	10.88	12.57	11.39
mine	1.73	8.15	9.24	4.74	2.63	8.55	10.06	5.48
fprc	9.58	9.67	6.92	9.19	5.25	7.75	5.08	5.86
lind	21.70	8.87	19.21	20.03	20.99	8.12	14.57	19.14
chem	4.89	5.97	6.65	5.15	5.25	6.29	6.89	5.50
motr	-10.31	-5.47	0.80	-7.86	-9.64	-4.95	1.71	-7.17
mche	1.20	5.82	7.47	2.60	1.92	6.32	8.21	3.29
elen	14.94	5.68	12.77	14.39	16.33	6.14	13.80	15.72
cnst	2.53	5.26	5.37	3.04	2.85	5.50	5.67	3.35
svce	2.83	4.06	4.90	3.32	3.05	4.29	5.17	3.54
Imports								
agri	47.47	39.20	63.54	47.97	15.25	11.36	20.17	15.21
mine	-4.45	-4.95	-4.38	-4.53	-4.86	-5.37	-4.76	-4.93
fprc	155.48	173.44	158.17	158.30	161.79	177.93	162.41	163.94
lind	22.54	11.02	5.03	19.02	22.54	11.45	5.62	19.15
chem	22.45	19.27	20.82	21.75	22.27	19.05	20.63	21.57
motr	110.89	107.67	87.98	106.08	109.31	106.26	86.76	104.61
mche	12.55	13.41	12.59	12.69	12.11	12.86	12.06	12.22
elen	6.63	3.88	4.39	5.93	6.33	3.31	3.88	5.57
cnst	-2.19	-4.06	-4.03	-3.17	-2.64	-4.44	-4.45	-3.60
svce	-2.18	-4.93	-5.14	-3.44	-2.54	-5.21	-5.45	-3.77

<sup>a</sup> sector code:

agri: agriculture; mine: mining; fprc: food processing; lind: light industry; chem: chemicals; motr: motor vehicle and other transportation equipment; mche: machinery and equipment; elen: electronics and electric equipment; cnst: construction; svce: services.

decreases by less than 0.1 percent. This is in line with that in Ianchovichina and Martin (2001). The smaller decline in agricultural output may be partly due to the smaller extent of the tariff cuts. It may be also partly attributed to the aggregation of agricultural sectors. If the crop sector could be disaggregated to individual crops, it may be that the output of some crops decreases significantly.

The sector which has the highest growth is the apparel sector, with a more than 14 percent increase in output. It is followed by electronics (9.93 percent), textiles (6.34 percent) and instruments and cultural and office machinery (3.95 percent).

The changes in imports and exports are consistent with the changes in output. Imports of other agri-

cultural products, food and tobacco processing, motor vehicles and other transportation equipment are more than doubled after WTO accession and crops imports increase by about 88 percent.<sup>12</sup> On the other hand, the increases in exports of apparel, textiles and electronics are of a smaller magnitude. In general, these changes reflect the comparative advantage and disadvantage of Chinese industries.

The simulation results also confirm the conjecture that the eastern coastal region gains more from the WTO accession than the inland regions. The order of increase in total utility and equivalent variation is eastern, central and western. This suggests that regional income disparity will worsen after the accession, although all regions may gain. For the reason discussed in Section 2, the eastern region gains most of the benefit from the expanding sectors. For example, apparel output in the eastern region increases by over 17 percent, while this sector's outputs in the central and western regions increase by only 0.3 percent and 1.5 percent, respectively. Similarly, textile output in the eastern region increases the most, while it decreases in the central region.

The results show that the output level in the central region may decline after WTO accession, as indicated by the negative change in real GDP. This result seems surprising because it is generally perceived that the western region is the least developed region and thus it should be affected the most. However, the result may be justified in the following way. First, the western region has the cheapest labour, which helps in the development of labour-intensive sectors. Second, the western region has relatively abundant resource endowments which lead to its comparative advantage in resource-intensive products. Finally, the industrial base in the western region may not be as poor as people think. The Chinese government has made huge investments in the so-called "third line" program which brought about development in some sectors.

Although the western region has a higher increase in output than the central region, its welfare gains are smaller. This is because government revenues in the western region decline after WTO accession. Therefore, private households in the region receive lower transfers from the government, although their real revenues from returns to factors increase.

It is also found that WTO accession will worsen rural-urban income inequality. This is a feature common to all regions where rural households have a smaller increase in utility and welfare; which is understandable because rural households receive part of their income from agricultural sectors which decline in all regions after WTO accession.

#### **4.1.2 Reduced tariff cuts in agricultural sectors**

This scenario differs from the previous one in the extent of the tariff cuts in agricultural sectors, being half of the previous level. The scenario is designed to capture some of China's possible countermeasures after WTO accession. The results are reported in the columns under "WTO agreement plus agricultural protection" in Tables 3 and 4. Several points are evident from these results.

First, such policy actions do provide some cushioning effects to agricultural sectors. The increase in agricultural imports does decline sharply, falling from 47.3 percent to 15.2 percent. Consequently, agricultural output declines by only 0.03 percent. Second, because the central region is the major

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<sup>12</sup>It should be noted that China's crop imports account for only about 1.3 percent of total imports in the baseline, and after the 88 percent increase crop imports are still small in absolute terms.

**Table 5: Macroeconomic Effects of Tariff Cuts—No Change in Trade Balance**

Indicators	WTO agreement				WTO agreement plus agricultural protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
Real GDP (%)	0.85	-0.07	0.33	0.54	0.75	-0.10	0.27	0.46
GDP deflator (%)	3.35	3.04	2.28	3.11	2.50	2.27	1.56	2.29
CPI (%)								
Rural households	2.42	2.51	1.90	2.35	1.86	1.92	1.42	1.79
Urban households	2.55	2.82	2.33	2.57	1.89	2.05	1.60	1.88
Government	4.72	3.98	3.97	4.40	3.57	2.86	2.83	3.27
Regional average	2.48	2.64	2.10	2.45	1.87	1.98	1.50	1.83
Total utility (%)								
Rural households	0.35	0.01	0.02	0.20	0.64	0.27	0.36	0.48
Urban households	1.30	0.69	1.05	1.13	1.14	0.53	0.84	0.96
Government	1.41	-2.01	-2.54	0.23	0.99	-1.97	-2.48	-0.04
Regional average	0.98	0.02	0.25	0.63	0.93	0.10	0.25	0.62
Equivalent variation (billion yuan)								
Rural households	6.23	0.13	0.10	6.46	11.34	2.85	1.71	15.89
Urban households	27.08	4.66	7.53	39.26	23.72	3.60	6.03	33.36
Government	15.97	-7.07	-6.58	2.32	11.19	-6.95	-6.44	-2.19
Regional sum	49.28	-2.28	1.04	48.04	46.25	-0.50	1.31	47.06
Savings (nominal, %)								
Rural households	3.58	2.97	2.28	3.26	3.05	2.44	2.00	2.75
Urban households	5.29	4.25	4.29	4.91	4.07	3.08	3.10	3.70
Government	1.63	1.85	1.32	1.64	0.50	0.80	0.27	0.51
Regional average	4.24	3.47	3.84	4.01	3.26	2.67	2.84	3.07
Nominal exchange rate				5.45				4.39
Change in trade balance (billion yuan)				0				0
Terms of trade (%)				-0.47				-0.43

agricultural production area, this protection helps the central region achieve higher welfare (up from 3.36 billion yuan to 4.12 million yuan). Third, it also helps to ease the worsening rural-urban inequality. Rural households have a higher growth in utility than in the previous scenario while urban households have a lower growth. Fourth, the negative impact on the trade balance and the terms of trade is now smaller. Finally, however, the total welfare gain is smaller than for the full tariff cuts set by the WTO agreement.

## 4.2 Zero Change in Trade Balance

This closure has a similar impact on regional economies, despite some differences in the macroeconomic dimensions. The fixed exchange rate in the previous closure brings about domestic deflation, while the fixed trade balance with a floating exchange rate leads to depreciation of RMB by 4.4 to 5.5 percent depending on the scenario, which in turn causes domestic inflation of 1.83 to 2.45 percent. In both cases, the real exchange rate increases, but in the current closure the increase is slightly greater (2.6 to 3.0 percent versus 2.3 to 2.6 percent).

This closure has a smaller welfare gain than the previous one because it restrains the gains from trade by fixing the trade balance. Moreover, it causes an even wider welfare gap. In the previous closure, the eastern region's share in the total equivalent variation is 86.6 to 88.0 percent. In the current closure, almost all the gains are absorbed by the eastern region: with additional agricultural protection, the inland regions gain only 1.7 percent of the total equivalent variation, while they have a net loss with the full tariff cut set by the WTO agreement. The gap between rural and urban households is also likely to widen. Urban households' share in the total household welfare gain

**Table 6: Impact of Tariff Cuts on Regional Output, Exports, Imports and Demand for Products from Other Regions—No Change in Trade Balance**

Sectors <sup>a</sup>	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
Output								
agri	-0.06	-0.17	-0.12	-0.10	-0.05	-0.09	-0.07	-0.07
mine	-1.88	1.40	2.76	-0.02	-1.62	1.37	2.91	0.12
fprc	-4.33	-1.80	-5.53	-3.71	-5.42	-1.87	-5.55	-4.33
lind	7.77	0.20	3.37	6.00	7.43	-0.08	1.81	5.59
chem	-2.04	-0.90	-0.69	-1.63	-1.94	-0.91	-0.69	-1.56
motr	-18.05	-14.58	-11.10	-16.36	-17.76	-14.48	-10.76	-16.09
mche	-3.92	-0.75	0.49	-2.73	-3.66	-0.73	0.65	-2.54
elen	5.75	-0.76	3.38	5.03	6.44	-0.71	3.73	5.65
cnst	0.43	1.11	1.20	0.72	0.42	1.06	1.17	0.69
svce	0.87	-0.22	0.07	0.52	0.80	-0.21	0.08	0.48
Exports								
agri	20.21	17.83	19.90	19.44	13.88	13.11	14.60	13.72
mine	1.83	8.78	9.76	5.05	2.69	9.05	10.48	5.73
fprc	10.95	11.09	7.85	10.50	6.38	8.92	5.86	6.95
lind	22.37	9.93	21.78	20.82	21.53	8.98	16.60	19.79
chem	5.16	6.49	7.20	5.48	5.47	6.71	7.33	5.76
motr	-10.37	-4.81	1.59	-7.70	-9.70	-4.42	2.36	-7.04
mche	1.32	6.45	8.01	2.84	2.01	6.83	8.65	3.48
elen	15.23	6.16	13.50	14.72	16.55	6.53	14.39	15.97
cnst	2.58	5.54	5.59	3.11	2.88	5.73	5.85	3.41
svce	2.86	4.29	5.11	3.41	3.08	4.47	5.33	3.62
Imports								
agri	44.21	36.35	60.84	44.82	13.08	9.42	18.43	13.11
mine	-4.72	-5.14	-4.53	-4.77	-5.07	-5.52	-4.88	-5.12
fprc	151.10	169.02	154.93	154.15	158.03	174.18	159.65	160.40
lind	21.96	9.85	4.02	18.31	22.06	10.49	4.78	18.56
chem	22.17	18.85	20.41	21.44	22.05	18.71	20.30	21.32
motr	110.06	106.43	87.27	105.17	108.68	105.28	86.20	103.90
mche	12.30	13.05	12.33	12.42	11.92	12.58	11.86	12.01
elen	6.31	3.40	4.03	5.58	6.07	2.93	3.60	5.28
cnst	-2.31	-4.34	-4.25	-3.36	-2.72	-4.66	-4.62	-3.73
svce	-2.31	-5.37	-5.52	-3.70	-2.64	-5.56	-5.76	-3.98

<sup>a</sup> sector code:

agri: agriculture; mine: mining; fprc: food processing; lind: light industry; chem: chemicals; motr: motor vehicle and other transportation equipment; mche: machinery and equipment; elen: electronics and electric equipment; cnst: construction; svce: services.

increases from 67 to 80 percent to 68 to 86 percent.

The results of the two scenarios using this closure have similar patterns to those using the previous closure. WTO tariff cuts with additional agricultural protection lead to smaller welfare gains, but tend to ease the widening gap between rural and urban households and between coastal and inland regions.



## 5 Conclusion

Regional income disparity in China has been worsening since 1991. Using a general equilibrium model of the Chinese economy with regional details, this paper finds that this trend will be reinforced rather than eased by the WTO accession. The eastern coastal region will have much higher gains than the inland regions. The two inland regions will have similar gains with the central region being only marginally better off than the western region. It is also found that the rural-urban inequality will worsen in all regions.

The results are robust no matter whether the trade balance is fixed or not. However, keeping the trade balance unchanged leads to smaller overall welfare gains and a wider regional income gap than the trade balance is endogenous.

Lowering the tariff cuts in agriculture reduces the total welfare gains, although it modifies the trend of worsening inequality between rural and urban households and between regions.

Although most of the results derived by the analysis are consistent with other studies and people's perceptions, one should be cautious in accepting these results. Firstly, this paper discusses only tariff cuts, rather than the whole picture implied by China's WTO commitments. The analysis could be extended to cover other issues, such as non-tariff barriers, tariff rate quotas (TRQs) and domestic support. For example, the baseline tariff rates of the service sector are set at zero. Clearly this is not the case. The simulation using the closure of no control on trade balance shows that imports of crops increase by 84 to 88 percent, which implies that the tariff rate quota for some crops may be binding. So the introduction of the TRQ in the model is necessary to obtain more realistic results.

Secondly, the **CERD** model is a national model which suppresses international linkages and may omit some important information. For example, it predicts that China's apparel sector will increase following WTO accession. However, this result is very much dependent on whether other countries initiate the special textile safeguards. Therefore, it is appropriate to link **CERD** with a global model to reflect these international relationships.

Thirdly, the database and parameters need to be refined. For example, regional protection measures should be introduced. Also, the agricultural sectors could be disaggregated further as the present aggregation may hide significant impacts on some crops.

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## A Appendix

**Table A.1: Sector Classification in the Model**

Sector in the model	Code	Sector in the model	Code
<b>Agriculture</b>			
01.Crops	crop	04.Fishery	fish
02.Forestry	frst	05.Other agricultural products	otha
03.Livestock and livestock products	live		
<b>Industry and construction</b>			
06.Coal mining and processing	coal	19.Metal products	mtlp
07.Crude petroleum and natural gas products	petr	20.Machinery and equipment	mach
08.Metal ore mining	mtom	21.Transport equipment	trep
09.Nonmetal mineral mining	nmtn	22.Electric equipment and machinery	elct
10.Manufacture of food products and tobacco processing	fdtp	23.Electronic and telecommunication equipment	eltn
11.Textile goods	txtl	24.Instruments, meters, cultural and office machinery	inst
12.Wearing apparel, leather, furs, down and related products	aprl	25.Maintenance and repair of machine and equipment	main
13.Sawmills and furniture	furn	26.Other manufacturing products	omnp
14.Paper and products, printing and record medium reproduction	papr	27.Scrap and waste	scrp
15.Petroleum processing and coking	ptpc	28.Electricity, steam and hot water production and supply	powr
16.Chemicals	chem	29.Gas production and supply	gasp
17.Nonmetal mineral products	nmmp	30.Water production and supply	watr
18.Metals smelting and pressing	mtsp	31.Construction	cons
<b>Services</b>			
32.Transport and warehousing	tran	40.Health services, sports and social welfare	heth
33.Post and telecommunication	ptlc	41.Education, culture and arts, radio, film and television	educ
34.Wholesale and retail trade	trad	42.Scientific research	scir
35.Eating and drinking places	cate	43.General technical services	teks
36.Passenger transport	past	44.Public administration and other sectors	padm
37.Finance and insurance	fin		
38.Real estate	rest		
39.Social services	sser		

**Table A.2: Baseline and WTO Commitment Tariff Rates**

Sector	Baseline rate	WTO rate	Reduction (percent)	Sector	Baseline rate	WTO rate	Reduction (percent)
1 crop	27.70	16.88	-39.06	23 eltn	13.54	10.00	-26.15
2 frst	2.65	2.00	-24.41	24 inst	13.54	10.00	-26.15
3 live	17.63	15.00	-14.93	25 main	0.00	0.00	0.00
4 fish	16.59	15.00	-9.59	26 omnp	26.25	15.00	-42.86
5 otha	59.01	17.00	-71.19	27 scrp	0.00	0.00	0.00
6 coal	4.97	1.26	-74.65	28 powr	-0.01	0.00	0.00
7 petr	0.00	0.00	-46.24	29 gasp	0.00	0.00	0.00
8 mtom	0.00	0.00	0.00	30 watr	0.00	0.00	0.00
9 nmtm	0.44	0.00	0.00	31 cons	0.00	0.00	0.00
10 fdtp	52.90	20.00	-62.20	32 tran	0.00	0.00	0.00
11 txtl	33.49	20.00	-40.28	33 ptlc	0.00	0.00	0.00
12 aprl	25.55	25.00	-2.15	34 trad	0.00	0.00	0.00
13 furn	13.81	10.00	-27.60	35 cate	0.00	0.00	0.00
14 papr	13.19	10.00	-24.17	36 past	0.00	0.00	0.00
15 ptpc	9.09	7.00	-23.01	37 fina	0.00	0.00	0.00
16 chem	15.41	5.00	-67.55	38 rest	0.00	0.00	0.00
17 nmmp	22.12	20.00	-9.60	39 sser	0.00	0.00	0.00
18 mtsp	9.85	7.00	-28.91	40 heth	0.00	0.00	0.00
19 mtlp	15.37	7.00	-54.46	41 educ	0.00	0.00	0.00
20 mach	15.62	11.00	-29.57	42 scir	0.00	0.00	0.00
21 treq	23.26	10.00	-57.01	43 teks	0.00	0.00	0.00
22 eltc	13.54	10.00	-26.15	44 padm	0.00	0.00	0.00

**Table A.3: Percentage Change in Output—No Control on Trade Balance**

Sector	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
crop	-1.89	-0.57	-0.81	-1.22	-0.99	-0.33	-0.47	-0.66
frst	1.84	1.34	1.52	1.60	1.04	0.94	1.01	1.00
live	2.96	0.35	1.01	1.63	1.93	0.27	0.62	1.07
fish	-0.09	0.29	0.28	0.00	-0.78	-0.14	-0.02	-0.62
otha	1.18	-0.04	-0.09	0.61	0.46	0.14	-0.24	0.23
coal	-1.94	0.54	0.51	-0.44	-1.85	0.52	0.52	-0.42
petr	-1.05	7.74	4.36	0.89	-0.63	7.88	4.61	1.25
mtom	-3.99	1.08	3.30	-0.92	-3.61	1.12	3.70	-0.66
nmtm	-0.75	1.46	1.52	0.39	-0.63	1.45	1.51	0.44
fdtp	-4.20	-1.71	-5.35	-3.59	-5.33	-1.80	-5.41	-4.24
txtl	8.11	-1.20	7.46	6.34	7.46	-1.87	3.79	5.48
aprl	17.14	0.27	1.49	14.42	16.59	0.03	0.60	13.90
furn	0.51	1.36	1.16	0.81	0.54	1.35	1.11	0.82
papr	1.92	-0.11	-0.80	1.32	1.94	-0.17	-1.00	1.31
ptpc	-1.30	0.66	2.34	-0.41	-1.20	0.65	2.50	-0.32
chem	-3.05	-3.89	-3.07	-3.21	-2.94	-3.86	-3.12	-3.13
nmmp	-0.16	1.40	1.27	0.52	-0.08	1.37	1.29	0.56
mtsp	-4.89	-0.51	1.29	-2.73	-4.55	-0.45	1.53	-2.48
mtlp	-2.82	-1.95	-2.63	-2.66	-2.59	-1.91	-2.58	-2.47
mach	-3.98	-1.10	-0.78	-3.15	-3.77	-1.04	-0.58	-2.97
treq	-17.88	-14.87	-11.54	-16.37	-17.62	-14.71	-11.12	-16.10
eltc	0.52	0.23	0.73	0.50	0.77	0.27	0.85	0.72
eltn	11.04	-2.99	5.62	9.93	12.15	-2.94	6.21	10.95
inst	5.24	-2.38	-0.93	3.95	6.24	-2.17	-0.45	4.82
main	-0.46	-0.13	0.86	-0.16	-0.47	-0.14	0.87	-0.17
omnp	-0.87	0.94	-0.06	-0.30	-0.74	0.86	-0.36	-0.26
scrp	-3.22	-1.08	4.86	-1.88	-2.95	-1.07	4.80	-1.71
powr	-0.45	0.10	0.40	-0.19	-0.43	0.07	0.41	-0.18
gasp	1.16	1.25	0.89	1.15	1.00	1.04	0.89	0.99
watr	0.54	0.03	0.24	0.38	0.49	0.02	0.17	0.34
cons	0.46	1.09	1.18	0.72	0.44	1.04	1.16	0.69
tran	0.06	0.41	0.99	0.25	0.07	0.40	0.96	0.25
ptlc	1.19	0.30	0.52	0.93	1.13	0.27	0.51	0.88
trad	0.59	0.08	1.14	0.56	0.58	0.07	1.12	0.55
cate	1.71	0.63	0.67	1.32	1.50	0.54	0.59	1.15
past	0.76	0.47	0.97	0.71	0.78	0.49	0.99	0.73
fina	0.17	0.06	0.49	0.20	0.14	0.02	0.43	0.17
rest	1.17	0.45	0.69	0.98	1.11	0.45	0.73	0.95
sser	1.50	0.30	0.31	1.16	1.48	0.31	0.30	1.14
heth	2.05	-0.80	-0.66	0.84	1.80	-0.82	-0.66	0.70
educ	1.49	-0.79	-0.72	0.61	1.30	-0.76	-0.70	0.50
scir	0.55	-1.81	-1.89	-0.26	0.55	-1.81	-1.82	-0.25
teks	0.68	-1.44	-1.67	-0.14	0.48	-1.41	-1.58	-0.25
padm	1.87	-1.97	-2.53	0.16	1.57	-1.91	-2.46	0.01

**Table A.4: Percentage Change in Exports–No Control on Trade Balance**

Sector	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
crop	17.01	15.18	17.08	16.52	11.29	11.02	12.40	11.33
frst	13.40	12.93	15.23	13.39	8.96	9.07	10.83	9.13
live	20.60	15.60	18.67	18.20	13.35	11.20	13.29	12.44
fish	17.36	15.38	17.51	16.60	12.71	10.98	12.50	12.05
otha	16.50	13.18	17.15	15.71	10.62	9.99	12.59	10.73
coal	0.85	6.67	7.22	5.84	1.44	7.02	7.75	6.24
petr	1.81	13.01	9.47	4.15	2.79	13.69	10.33	5.09
mtom	-0.54	7.74	9.24	4.41	0.32	8.21	10.17	5.15
nmtn	1.90	8.22	8.72	5.60	2.51	8.58	9.14	6.06
fdtp	9.58	9.67	6.92	9.19	5.25	7.75	5.08	5.86
txtl	20.88	9.54	23.13	19.45	19.61	7.85	16.87	17.68
aprl	30.28	9.15	13.92	28.59	29.35	8.52	11.87	27.67
furn	5.84	8.34	9.47	6.60	6.06	8.53	9.53	6.81
papr	8.40	7.05	8.29	8.26	8.67	7.06	7.81	8.48
ptpc	1.54	5.90	8.33	3.39	2.14	6.31	9.09	3.99
chem	5.39	4.10	5.84	5.31	5.70	4.33	5.85	5.59
nmmp	3.43	8.00	8.06	5.44	4.03	8.39	8.56	5.95
mtsp	-1.16	5.89	7.91	3.24	-0.34	6.39	8.68	3.96
mtlp	2.13	4.97	4.46	2.34	2.83	5.45	4.99	3.02
mach	1.12	6.15	7.30	2.31	1.82	6.66	8.02	2.98
treq	-10.31	-5.47	0.80	-7.86	-9.64	-4.95	1.71	-7.17
eltc	6.15	7.41	8.15	6.31	6.89	7.88	8.76	7.03
eltn	20.14	3.82	14.32	19.16	21.83	4.25	15.43	20.76
inst	11.68	4.44	6.28	11.18	13.20	5.02	7.23	12.64
main	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
omnp	5.80	8.42	8.52	6.50	6.29	8.57	8.06	6.88
scrp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
powr	2.34	5.57	5.51	4.04	2.91	6.03	6.12	4.58
gasp	3.17	5.25	4.86	3.41	3.32	5.30	5.22	3.59
watr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
cons	2.53	5.26	5.37	3.04	2.85	5.50	5.67	3.35
tran	1.56	4.21	4.85	2.56	1.90	4.50	5.18	2.89
ptlc	2.78	3.36	4.12	3.08	3.09	3.65	4.46	3.39
trad	2.23	3.69	5.05	3.04	2.48	3.96	5.28	3.29
cate	6.27	5.77	6.98	6.13	5.50	5.29	6.50	5.45
past	2.72	4.30	4.79	3.57	3.03	4.62	5.11	3.88
fina	1.90	3.34	3.86	1.95	2.22	3.59	4.12	2.27
rest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
sser	3.65	4.15	4.62	3.71	3.90	4.37	4.86	3.96
heth	5.92	4.27	4.16	5.88	5.93	4.50	4.45	5.90
educ	2.64	2.59	3.03	2.64	2.79	2.93	3.42	2.80
scir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
teks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
padm	3.57	1.50	0.87	1.83	3.57	1.86	1.33	2.12

**Table A.5: Percentage Change in Imports—No Control on Trade Balance**

Sector	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
crop	86.02	95.08	91.48	87.77	30.33	32.80	31.06	30.71
frst	-8.21	-8.22	-9.74	-8.27	-6.59	-6.60	-8.01	-6.64
live	-3.11	-3.11	-5.17	-3.35	-3.59	-4.80	-6.38	-4.06
fish	-10.90	-7.02	-9.95	-10.53	-11.12	-6.70	-9.07	-10.61
otha	299.33	306.77	285.04	301.77	83.18	83.46	75.49	83.03
coal	14.83	12.28	12.32	14.34	14.24	11.80	11.68	13.76
petr	-4.11	-3.58	-4.70	-4.07	-4.56	-4.02	-5.25	-4.53
mtom	-7.04	-7.01	-3.76	-6.15	-7.25	-7.41	-4.01	-6.41
nmtm	-3.71	-7.18	-6.67	-4.75	-4.20	-7.57	-7.13	-5.22
fdtp	155.48	173.44	158.17	158.30	161.79	177.93	162.41	163.94
txtl	42.07	34.88	27.90	40.36	42.22	35.78	29.19	40.67
aprl	-19.38	-15.66	-18.98	-18.51	-18.99	-15.10	-17.96	-17.97
furn	11.77	10.26	9.61	11.35	11.49	9.94	9.42	11.08
papr	5.18	3.65	0.97	4.28	4.91	3.54	1.04	4.08
ptpc	3.84	2.79	2.77	3.37	3.47	2.45	2.34	3.00
chem	25.91	27.27	26.95	26.19	25.78	27.11	26.85	26.07
nmmp	5.17	1.68	2.44	4.52	4.60	1.19	1.92	3.96
mtsp	5.34	5.04	5.46	5.31	5.03	4.50	4.88	4.95
mtlp	34.92	34.93	33.34	34.74	34.25	34.25	32.62	34.06
mach	12.25	12.64	10.70	12.10	11.78	12.11	10.22	11.62
treq	110.89	107.67	87.98	106.08	109.31	106.26	86.76	104.61
eltc	8.81	7.10	8.02	8.45	8.25	6.54	7.49	7.89
eltn	6.66	2.70	3.51	5.71	6.48	2.09	2.98	5.42
inst	2.97	4.50	3.26	3.29	2.43	4.11	2.89	2.81
main	0.00	-8.53	-9.61	-7.65	0.00	-9.00	-10.10	-8.05
omnp	47.91	49.51	47.19	47.95	47.27	49.06	47.25	47.37
scrp	-3.17	-3.48	0.00	-2.01	-3.67	-4.18	0.00	-2.37
powr	-3.66	-6.17	-5.35	-4.51	-4.25	-6.71	-5.97	-5.08
gasp	-2.49	-5.92	-6.41	-4.70	-3.19	-6.56	-6.97	-5.34
watr	-2.84	-6.34	-5.83	-4.50	-3.47	-6.85	-6.52	-5.10
cons	-2.19	-4.06	-4.03	-3.17	-2.64	-4.44	-4.45	-3.60
tran	-1.85	-5.08	-4.41	-3.61	-2.29	-5.47	-4.90	-4.05
ptlc	-1.13	-4.05	-4.46	-2.68	-1.70	-4.50	-4.91	-3.19
trad	0.00	-5.34	-5.15	-4.64	0.00	-5.73	-5.52	-4.98
cate	-4.42	-6.38	-7.08	-4.90	-3.91	-5.98	-6.70	-4.41
past	-1.78	-5.47	-4.87	-3.08	-2.19	-5.83	-5.25	-3.48
fina	-1.71	-3.98	-3.66	-3.52	-2.18	-4.37	-4.10	-3.94
rest	-0.87	-1.99	-2.18	-1.39	-1.31	-2.46	-2.61	-1.84
sser	-2.14	-4.87	-5.34	-3.37	-2.59	-5.13	-5.64	-3.75
heth	-2.80	-7.11	-6.67	-5.25	-3.35	-7.37	-6.99	-5.65
educ	-0.05	-5.04	-5.40	-2.93	-0.67	-5.36	-5.80	-3.40
scir	-2.06	-7.03	-6.64	-5.68	-2.49	-7.27	-6.93	-5.99
teks	-0.57	-6.11	0.00	-2.28	-0.97	-6.33	0.00	-2.52
padm	-0.25	-6.20	-6.82	-3.23	-0.91	-6.52	-7.20	-3.72



**Table A.6: Percentage Change in Output–No Change in Trade Balance**

Sector	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
crop	-1.90	-0.58	-0.78	-1.22	-1.00	-0.34	-0.45	-0.67
frst	2.20	1.54	1.66	1.86	1.35	1.11	1.13	1.22
live	2.88	0.27	0.88	1.54	1.88	0.21	0.51	1.01
fish	-0.34	0.11	-0.07	-0.23	-0.97	-0.28	-0.30	-0.80
otha	1.07	-0.25	-0.12	0.49	0.38	-0.03	-0.26	0.14
coal	-2.21	0.61	0.53	-0.52	-2.08	0.58	0.54	-0.48
petr	-1.10	8.47	4.59	0.96	-0.69	8.47	4.80	1.30
mtom	-4.11	1.39	3.62	-0.82	-3.72	1.38	3.96	-0.57
nmtn	-0.90	1.57	1.54	0.36	-0.76	1.54	1.52	0.41
fdtp	-4.33	-1.80	-5.53	-3.71	-5.42	-1.87	-5.55	-4.33
txtl	8.40	-0.66	9.23	6.79	7.71	-1.42	5.18	5.85
aprl	17.29	0.18	1.32	14.53	16.72	-0.04	0.48	14.00
furn	0.35	1.35	1.05	0.69	0.40	1.34	1.03	0.72
papr	1.96	-0.11	-0.75	1.35	1.97	-0.17	-0.96	1.33
ptpc	-1.41	0.80	2.48	-0.43	-1.29	0.77	2.61	-0.34
chem	-3.01	-3.85	-2.96	-3.16	-2.91	-3.82	-3.03	-3.09
nmmp	-0.29	1.45	1.24	0.46	-0.19	1.42	1.27	0.51
mtsp	-5.02	-0.24	1.51	-2.71	-4.66	-0.23	1.72	-2.46
mtlp	-2.83	-1.86	-2.57	-2.65	-2.60	-1.83	-2.52	-2.47
mach	-4.00	-0.91	-0.54	-3.10	-3.79	-0.88	-0.38	-2.93
treq	-18.05	-14.58	-11.10	-16.36	-17.76	-14.48	-10.76	-16.09
eltc	0.37	0.31	0.84	0.39	0.65	0.34	0.94	0.63
eltn	11.22	-2.92	6.04	10.13	12.28	-2.88	6.56	11.10
inst	5.45	-2.15	-0.63	4.17	6.40	-1.99	-0.21	4.98
main	-0.51	-0.10	0.87	-0.18	-0.51	-0.11	0.88	-0.19
omnp	-1.11	1.08	-0.02	-0.41	-0.94	0.97	-0.31	-0.35
scrp	-3.34	-1.01	5.12	-1.91	-3.05	-1.01	5.02	-1.74
powr	-0.62	0.13	0.46	-0.28	-0.57	0.10	0.46	-0.26
gasp	0.48	0.38	0.75	0.49	0.45	0.33	0.78	0.46
watr	0.36	-0.16	0.09	0.20	0.34	-0.14	0.06	0.20
cons	0.43	1.11	1.20	0.72	0.42	1.06	1.17	0.69
tran	-0.05	0.48	1.05	0.20	-0.02	0.45	1.01	0.21
ptlc	0.98	0.08	0.32	0.72	0.96	0.09	0.35	0.71
trad	0.40	0.07	1.14	0.44	0.43	0.07	1.12	0.46
cate	1.46	0.34	0.35	1.05	1.30	0.30	0.33	0.93
past	0.66	0.33	0.91	0.60	0.69	0.38	0.95	0.64
fina	-0.09	0.08	0.58	0.04	-0.07	0.03	0.50	0.03
rest	0.79	-0.03	0.37	0.59	0.81	0.06	0.47	0.63
sser	1.59	0.20	0.21	1.19	1.55	0.23	0.23	1.17
heth	2.47	-1.02	-1.02	0.96	2.15	-1.00	-0.95	0.80
educ	1.95	-1.11	-1.06	0.75	1.67	-1.01	-0.98	0.62
scir	1.18	-1.86	-1.92	0.14	1.06	-1.85	-1.84	0.07
teks	1.63	-1.51	-1.73	0.44	1.25	-1.47	-1.63	0.22
padm	3.33	-2.04	-2.60	0.98	2.76	-1.98	-2.52	0.68

**Table A.7: Percentage Change in Exports–No Change in Trade Balance**

Sector	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
crop	20.01	17.91	19.52	19.39	13.71	13.23	14.40	13.65
frst	15.89	15.46	17.73	15.89	10.99	11.13	12.87	11.17
live	23.79	18.38	21.22	21.11	15.89	13.44	15.37	14.79
fish	20.84	18.62	20.30	19.99	15.49	13.59	14.75	14.76
otha	19.40	15.40	19.79	18.39	12.95	11.81	14.74	12.90
coal	0.67	7.19	7.56	6.24	1.28	7.43	8.02	6.55
petr	1.95	14.14	10.01	4.44	2.88	14.60	10.77	5.31
mtom	-0.54	8.47	9.86	4.79	0.31	8.79	10.68	5.46
nmtm	1.86	8.79	9.10	5.91	2.47	9.04	9.46	6.31
fdtp	10.95	11.09	7.85	10.50	6.38	8.92	5.86	6.95
txtl	21.75	11.20	26.51	20.66	20.33	9.21	19.52	18.67
aprl	31.07	9.92	14.74	29.37	30.00	9.15	12.57	28.32
furn	5.97	8.88	9.88	6.84	6.16	8.98	9.87	7.01
papr	8.72	7.62	8.93	8.62	8.93	7.53	8.34	8.76
ptpc	1.60	6.41	8.81	3.59	2.18	6.71	9.48	4.14
chem	5.71	4.64	6.45	5.66	5.96	4.76	6.34	5.88
nmmp	3.45	8.50	8.38	5.66	4.03	8.79	8.82	6.12
mtsp	-1.16	6.56	8.45	3.57	-0.35	6.93	9.12	4.22
mtlp	2.28	5.47	4.88	2.52	2.94	5.85	5.32	3.16
mach	1.25	6.74	7.88	2.53	1.91	7.13	8.49	3.15
treq	-10.37	-4.81	1.59	-7.70	-9.70	-4.42	2.36	-7.04
eltc	6.19	7.92	8.61	6.40	6.91	8.29	9.14	7.08
eltn	20.54	4.23	15.11	19.60	22.13	4.57	16.08	21.10
inst	12.07	5.05	6.88	11.58	13.49	5.50	7.72	12.94
main	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
omnp	5.78	9.15	9.19	6.68	6.26	9.16	8.62	7.01
scrp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
powr	2.35	6.00	5.87	4.26	2.91	6.37	6.40	4.74
gasp	2.58	4.63	4.92	2.91	2.84	4.80	5.27	3.18
watr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
cons	2.58	5.54	5.59	3.11	2.88	5.73	5.85	3.41
tran	1.51	4.51	5.10	2.63	1.85	4.74	5.38	2.94
ptlc	2.68	3.36	4.12	3.02	3.01	3.65	4.45	3.33
trad	2.15	3.94	5.28	3.08	2.41	4.16	5.47	3.32
cate	6.49	6.08	7.13	6.37	5.69	5.55	6.64	5.66
past	2.70	4.39	4.94	3.62	3.01	4.69	5.23	3.92
fina	1.75	3.62	4.18	1.81	2.09	3.81	4.37	2.15
rest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
sser	3.84	4.33	4.75	3.90	4.05	4.51	4.96	4.11
heth	6.42	4.29	3.98	6.37	6.34	4.51	4.30	6.30
educ	3.12	2.49	2.84	3.10	3.17	2.84	3.26	3.16
scir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
teks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
padm	5.08	1.64	0.95	2.41	4.80	1.97	1.38	2.59

**Table A.8: Percentage Change in Imports—No Change in Trade Balance**

Sector	WTO agreement				WTO agreement plus agri. protection			
	Eastern	Central	Western	National	Eastern	Central	Western	National
crop	81.98	91.39	88.52	83.91	27.91	30.69	29.32	28.41
frst	-9.98	-10.30	-11.72	-10.12	-8.11	-8.39	-9.71	-8.23
live	-5.65	-5.31	-7.16	-5.79	-5.72	-6.61	-8.04	-6.09
fish	-14.25	-10.16	-12.83	-13.82	-13.90	-9.34	-11.51	-13.34
otha	286.96	296.73	275.51	290.42	78.42	79.67	71.81	78.68
coal	14.38	11.71	11.94	13.87	13.88	11.35	11.38	13.40
petr	-4.38	-3.70	-4.94	-4.32	-4.77	-4.11	-5.44	-4.72
mtom	-7.27	-7.21	-3.80	-6.33	-7.43	-7.56	-4.04	-6.55
nmtn	-3.99	-7.60	-7.03	-5.07	-4.41	-7.90	-7.42	-5.46
fdtp	151.10	169.02	154.93	154.15	158.03	174.18	159.65	160.40
txtl	41.50	33.63	26.62	39.68	41.76	34.74	28.11	40.10
aprl	-20.60	-17.36	-20.58	-19.90	-19.99	-16.50	-19.29	-19.12
furn	11.18	9.41	8.86	10.71	11.01	9.25	8.81	10.56
papr	4.95	3.13	0.49	3.97	4.73	3.13	0.65	3.83
ptpc	3.62	2.59	2.55	3.15	3.30	2.30	2.17	2.84
chem	25.64	26.75	26.49	25.87	25.56	26.69	26.48	25.80
nmmp	4.88	1.13	2.01	4.19	4.37	0.76	1.58	3.70
mtsp	5.05	4.72	5.21	5.02	4.81	4.26	4.69	4.73
mtlp	34.57	34.41	32.87	34.34	33.98	33.84	32.25	33.75
mach	12.04	12.29	10.48	11.87	11.61	11.83	10.04	11.44
treq	110.06	106.43	87.27	105.17	108.68	105.28	86.20	103.90
eltc	8.36	6.52	7.65	7.98	7.89	6.08	7.20	7.52
eltn	6.37	2.21	3.11	5.37	6.25	1.70	2.66	5.15
inst	2.67	4.18	3.05	3.00	2.20	3.85	2.73	2.58
main	-3.47	-8.86	-9.90	-8.48	-3.74	-9.25	-10.31	-8.86
omnp	47.24	48.15	46.07	47.19	46.73	47.96	46.33	46.77
scrp	-3.39	-3.66	-3.09	-3.36	-3.82	-4.30	-3.22	-3.74
powr	-4.02	-6.56	-5.60	-4.86	-4.52	-7.01	-6.16	-5.36
gasp	-3.24	-7.14	-6.78	-5.42	-3.78	-7.53	-7.27	-5.91
watr	-3.17	-6.89	-6.26	-4.92	-3.72	-7.29	-6.85	-5.43
cons	-2.31	-4.34	-4.25	-3.36	-2.72	-4.66	-4.62	-3.73
tran	-2.02	-5.33	-4.60	-3.82	-2.43	-5.67	-5.05	-4.21
ptlc	-1.48	-4.55	-4.89	-3.09	-1.97	-4.90	-5.25	-3.51
trad	-1.92	-5.69	-5.48	-5.15	-2.22	-6.00	-5.78	-5.46
cate	-5.23	-7.40	-7.89	-5.72	-4.58	-6.83	-7.37	-5.10
past	-1.98	-5.94	-5.22	-3.36	-2.35	-6.20	-5.53	-3.70
fina	-2.09	-4.24	-3.82	-3.77	-2.48	-4.58	-4.22	-4.14
rest	-1.38	-2.67	-2.70	-1.96	-1.72	-3.00	-3.02	-2.29
sser	-2.22	-5.32	-5.71	-3.60	-2.65	-5.49	-5.94	-3.92
heth	-2.48	-7.62	-7.25	-5.46	-3.08	-7.78	-7.46	-5.81
educ	0.35	-5.64	-5.94	-3.09	-0.33	-5.84	-6.24	-3.51
scir	-1.49	-7.40	-6.90	-5.78	-2.02	-7.56	-7.14	-6.06
teks	0.37	-6.50	-3.47	-2.83	-0.18	-6.64	-3.61	-3.15
padm	1.08	-6.58	-7.14	-2.75	0.17	-6.81	-7.45	-3.32