

Conference Paper: Session 3-D

Asia-Pacific Economic Association (APEA), Third Annual Conference

Hong Kong, July 25-26, 2007

**Industrial Agglomeration or Dispersion?
Reassessment of the Regional Inequality in China by Imported
Intermediate Inputs**

By

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Abstract

This paper examines the regional income inequality in China after the accession to the World Trade Organization (WTO) by calculating a variety of measures such as coefficient of variance, Gini coefficient, and Theil index, and aims at finding impacts of the accession on the industrial agglomeration in terms of imported intermediate inputs. Our data shows that the level of inequality appears to decrease in 2004 and 2005, especially for manufacturing. Then, we compute locational Gini coefficients for manufacturing sectors, by which we find that the localization becomes less important for some industries. By regression analyses based on the economic geography model, we obtain the results showing that an increase in imports of intermediates leads to industrial agglomeration, but the effect is reduced after China joined the WTO. All these may imply that industrial dispersion has taken place, thereby changing the regional income distribution.

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1. Introduction

The regional income inequality in China is an increasingly important issue not only for the country itself but also for the world, as its economic presence becomes more and more influential in the world especially after the country joined the World Trade Organization (WTO) in 2001. There is a strong fear of further expansion of the existing-inequality, but depending on the data source and definition though, the recent situation appears to be the case where the level of inequality decreased, particularly in 2004 and 2005. This possible change in the regional distribution of income is worth conducting careful examination so as to know if the accession to the WTO has begun to contribute to regional convergence. The objective of this study is, therefore, to carefully examine the recent change in the Chinese income distribution, and to discuss whether the force of the change is related with the international trade, which has been drastically increased because of the WTO accession.⁴

The linkage between international trade and industrial location is typically argued by the model of new economic geography (Krugman (1991), Fujita, Krugman, and Venables (1999)). It is suggested that freer trade first lead to concentration of production since industries locate in those regions that are closer to the foreign demands. The more concentrated one region is, however, the higher congestion cost results in. Since land and housing prices become higher, wages must be raised as well to cover those expensive costs. In the next stage, industries start moving to regions with lower costs, and industrial deconcentration begins. In the long run, this leads to regional convergence. Thus, it is inferred that the regional wage difference expands in the first stage while it shrinks in the second stage. As Overman, Redding, and Venables (2003) discuss, the process from agglomeration to dispersion of industries is integral to economic development.⁵

Our focus is in considering the effect of imported intermediate inputs on industrial location and regional wage disparity. There are two major reasons for this: importance

⁴ There is a bulk of literature concerning regional income inequality in China and huge differences in economic characteristics among coastal, central and inland regions. Fujita and Hu (2001) studied the impact of globalization and economic liberalization on regional disparity between 1985 and 1994, and found an increasing trend of regional disparity but did not obtain evidence for regional convergence. Pan and Li (2007) suggest that the degree of economic impact between coastal and inland provinces is asymmetric. Economic growth in the coastal region does not influence the inland economy very much, while growth of the inland economy impacts the coastal economy more strongly. This is because the coastal economy much more depends on foreign products, while the inland economy crucially depends on products from the coast. Our concern is whether the recent change is strong enough to draw a new picture.

⁵ It is assumed that labor force migration from agricultural sector to manufacturing sector is perfect. In reality, such internal labor migration used to be very restricted in China due to the household registration control system, but in 2001, the control system has been further weakened in parallel with the 10th five-year plan. (The system was initially reformed in 1978.)

of the inter-industry linkages and foreign capital. First, as Krugman (1991) describes, one of the Marshallian reasons for localization is the presence of intermediate inputs. An industry providing specific inputs to a particular industry tends to locate closer to the buyer. That is, the forward and backward linkages give rise to an incentive for agglomeration. Second, what makes Chinese globalization particular is the presence of foreign owned firms. Foreign direct investment (FDI) had already started expanding during the 1990s, and thus, the existing foreign firms or joint-venture firms might have increased trade volume especially after the WTO accession.⁶ Since, as Wan, Lu, and Chen (2007) point out, various laws and regulations were abolished in accordance with WTO rules, foreign-owned firms as well as small-and-medium-sized enterprises can now directly export and import. Therefore, we argue that regions with many imported intermediate inputs can be an industrial center driven by the foreign capital, and thus, their wages are likely to go up.

As an empirical strategy for industrial agglomeration, we follow the estimation equations used by Hanson (1998b) and Tomiura (2003 and 2005). Hanson (1998b) examined the locational impact of Mexican trade policy reforms in 1985, by splitting the data set into two periods: before and after the trade reform. He dealt with forward and backward linkage combined effects by looking at the ratio of two-digit state employment over four-digit state employment, and obtained a smaller effect of the inter-industry linkages in the latter period. Analogous to this model, we construct the Chinese data set consisting of two periods, before joining the WTO and after it. However, as Tomiura defined using the Input-Output Table, we can distinguish the forward linkage from the backward linkage. It is often considered that the inter-industry linkage effects are less important as imports increase. Tomiura (2003) shows that during the period of growing imports in 1990s, the forward and backward linkage effects on industrial agglomeration faded out for Japanese industries. Our model includes import of intermediate inputs and its interaction term with after-WTO-period dummy. We obtained positive estimate for the former term and negative for the latter. Therefore, an increase in intermediary imports leads to industrial agglomeration but the effect is reduced since 2001. Finally, we estimate the wage conversion equation shown in Tomiura (2005) to assess if an increase in imports of intermediate inputs contributes to wage growth. Compared with an estimate for initial wages, we would argue on the relationship between intermediate imports and wage growth, in other words, on how

⁶ According to Wan, Lu, and Chen (2007), in China the first wave of FDI inflow started in 1984, and the second surge of FDI inflow took place in 1992. Looking at the percentage of trade by foreign owned firms over total trade, it increased from 31.5 in 1995 to 58.3 in 2005 for exports, and from 47.7 to 58.7 for imports.

important foreign firms' operation for a particular region to seek regional wage conversion.

We use several sources to collect data, such as China Statistical Yearbook, Labour/Industrial Economic Statistical Yearbook, Input-Output Table of China, Asian International I-O Table, and Multi-Regional I-O Model. The data set for regression consists of 29 industries for 31 provinces over the years from 1997 to 2005. The data are all industry-region specific. In the following section of descriptive analyses, we first carefully calculate three measures of income inequality to investigate what is the true situation of the recent China. In our observation, the level of inequality seems to decrease in 2004 and 2005, in particular, for manufacturing industries. Then, we calculate so-called "locational Gini coefficient" for manufacturing sectors. Observing the coefficients, we come to know that localization is less important for some industries after the WTO accession.

The rest of the paper is organized as follows. Section 2 describes in detail calculation formulas of a variety of inequality measures, and shows the results. Section 3 deals with formal regression analyses for industrial agglomeration and wage convergence. Section 4 concludes the paper.

2. Agglomeration or dispersion: Evidences on localization and specialization

2.1. Measures of inequality

To obtain insights to judge whether regional equality in China has begun to shrink or has been still widening, we start our fact finding by observing conventional measures of regional inequality, i.e., coefficient of variance (Cv), weighted coefficient of variance by population share (Cv^W)⁷, Gini coefficient (*Gini*), and Theil index weighted by per capita income (*Theil*). As for the Theil index, we employ a decomposition method⁸ to know trends of inequality, not only over 31 province-level units, but also over 8 aggregated regions which concord with regional classification of *Multi-regional input-output model for China 2000* (IDE 2003)⁹. In the most case in this literature,

⁷ We calculated both weighted and un-weighted coefficient of variance because of the same reason as in Fujita and Hu (2001): "The weighted coefficient of variation ... can be viewed as an estimator of the disparity among persons nationwide. ... But when province itself is the basic unit of interest ..., use of un-weighted CV may be more appropriate." (Appendix 2)

⁸ Akita (2003) explains how to decompose Theil measure in detail.

⁹ Eight aggregated regions are comprised of the following Province-level units:

- | | |
|--|----------------------------------|
| 1. North East [<i>Dongbei</i>]: | Liaoning, Jilin, Heilongjiang; |
| 2. North Municipalities [<i>Huabei</i>]: | Beijing (M), Tianjin (M); |
| 3. North Coast [<i>Huabei</i>]: | Hebei, Shandong; |
| 4. Central Coast [<i>Huadong</i>]: | Shanghai (M), Jiangsu, Zhejiang; |

regional units in China are aggregated into two or three greater regions¹⁰. However, this paper uses eight regions for the upper division. The reasons for this are: (1) To accord with the literature in economic geography analyzing the U.S., EU and Japan in terms of area size; (2) to take in account the geographical diversity of China; and (3) to consider the justification of combining 31-region data and eight-region data extracted from IDE (2003) to prepare for the later section of this paper.

Let $p = 1, \dots, P$ denote province-level units, $a = 1, \dots, A$ indicate aggregated regions, and $s = 1, \dots, S_a$ be sub-regions in each aggregated region a . Y_p and N_p are income level (GDP or wage bill) and population (or number of workers) in each region and Y and N mean national-level total of income and population, respectively. In addition, $p' = 1, \dots, P$ are province-level units rearranged in ascending order of per capita income (or average wage). As a conventional way, the inequality measures are calculated as follows:

$$C_v = \sqrt{\frac{1}{P} \sum_{p=1}^P \left(\frac{Y_p}{N_p} - \frac{1}{P} \sum_{p=1}^P \frac{Y_p}{N_p} \right)^2} \bigg/ \left[\frac{1}{P} \sum_{p=1}^P \frac{Y_p}{N_p} \right], \quad (1)$$

$$C_v^w = \sqrt{\sum_{p=1}^P \frac{N_p}{N} \left(\frac{Y_p}{N_p} - \frac{1}{P} \sum_{p=1}^P \frac{Y_p}{N_p} \right)^2} \bigg/ \left[\frac{1}{P} \sum_{p=1}^P \frac{Y_p}{N_p} \right], \quad (2)$$

$$\begin{aligned} Gini &= \frac{1}{2Y/N} \sum_{p=1}^P \sum_{q=1}^P \frac{N_p}{N} \frac{N_q}{N} \left| \frac{Y_p}{N_p} - \frac{Y_q}{N_q} \right| \\ &= 1 - \sum_{p'=1}^P \left[\frac{N_{p'}}{N} \left(\sum_{q=1}^{p'} \frac{N_q Y_q}{NY} + \sum_{q=1}^{p'-1} \frac{N_q Y_q}{NY} \right) \right] \end{aligned}, \quad (3)$$

$$\begin{aligned} Theil &= \sum_{p=1}^P \frac{Y_p}{Y} \log \left(\frac{Y_p/Y}{N_p/N} \right) = \sum_{a=1}^A \sum_{s=1}^{S_a} \frac{Y_{as}}{Y} \log \left(\frac{Y_{as}/Y}{N_{as}/N} \right), \\ &= Theil^{between} + Theil^{within} \end{aligned}, \quad (4)$$

where

5. South Coast [<i>Huanan</i>]:	Fujian, Guangdong, Hainan;
6. Central Region [<i>Huazhong</i>]:	Shanxi, Anhui, Jiangxi, Henan, Hubei, Hunan;
7. North West [<i>Xibei</i>]:	Shaanxi, Gansu, Qinghai, Inner Mongolia (AR), Ningxia Hui (AR), Xinjiang Uyghur (AR);
8. South West [<i>Xinan</i>]:	Chongqing (M), Sichuan, Guizhou, Yunnan, Guangxi Zhuang (AR), Tibet (AR).

where (M) means Municipality and (AR) means Autonomous Region. We exclude Hong Kong and Macau from our analysis. Region names in brackets are 7 regions in the *Transnational Interregional Input-Output Table between China and Japan 2000* (IDE, 2007).

¹⁰ For instance, Fujita and Hu (2001) and Zhang and Kanbur (2001) compare “Coast” and “Interior (inland)”.

$$Theil^{between} = \sum_{a=1}^A \frac{Y_a}{Y} \log \left(\frac{Y_a / Y}{N_a / N} \right), \quad (5)$$

is Theil measure indicating the inequality *between* 8 aggregated regions, and,

$$Theil^{within} = \sum_{a=1}^A \frac{Y_a}{Y} \left[\sum_{s=1}^{S_a} \frac{Y_{as}}{Y} \log \left(\frac{Y_{as} / Y_a}{N_{as} / N_a} \right) \right], \quad (6)$$

demonstrates disparity among province-level units *within* each aggregated region weighted with each region's share in total income.

Figures 1a-1h show trends in these five indicators of regional inequality in China from 1990 to 2005. In order to highlight the changes before and after China's accession to WTO, we also calculated the measures using four-year average income and population for 1998-2001 ("before") and for 2002-2005 ("after"). Note that, in order to show all the indicators in a figure, the scale for two series of coefficient of variation is reduced to 1/4 and Gini coefficient is scaled down to 1/2.

At the outset, we look at the regional disparity based on GDP statistics in *Figures 1a-1d*. We have to keep in mind that the series, "Per capita gross regional products" collected in *China Statistical Yearbook* utilize the population data different from those reported in the "Population" chapter¹¹. *Figure 1a* is based on these "Per capita gross regional products" data. All measures show significant increase in disparity from mid 1990s to 2003 as the peak and turn to decrease after that except Gini coefficient and Theil index between 8 regions which re-increase from 2004 to 2005. Although the "between" Theil indexes always outweigh "within", the share of "within" augmented after 2003. As for the change between "before" and "after" WTO accession years, all but un-weighted Cv and "within" *Theil* suggest income divergence.

It is also often pointed out that the high and regionally diversified inflation rate affects the regional income level differently. So, we try to deflate the "Per capita gross regional products" in *Figure 1b* using regional GDP deflators with the previous year as the base year¹². This means focusing only on the income changes free from the price change from the previous year. Such an adjustment of price did not change the trend

¹¹ For example, a note to the Table 3-11 in *China Statistical Yearbook - 2004* explains: "Per capita gross regional products of Beijing, Tianjin, Shanghai, Chongqing, and Sichuan are calculated by the population of permanent registered residence, others by *de facto* population." Because of this, we obtained the "*de facto* population" data necessary for computing weighted Cv, Gini and *Theil*, by dividing nominal regional GDP by "Per capita gross regional products" data.

¹² Since the inflation rate is quite high in China, the choice of base year would crucially affects the change in inequality measures significantly if we use an ordinary deflator with constant base year.

of disparity a lot except the change between “before” and “after” years becomes flat rather than decreasing.

Use of the ordinary population data instead of per capita data with “de fact population” alters graphs substantially. In *Figures 1c* and *1d*, the magnitudes of change become flatter in comparison to *Figures 1a* and *1b*. Though there is a long-term upward trend at least in all measures except in un-weighted *Cv*, they fluctuate between up and down. It is noteworthy that 2003 is not the only peak of disparity any more. From “before” to “after” years, the majority of indicators shows divergence and “within” *Theil* is only measure that decrease. Again, price adjustment did not change the observation a lot. Thus far, our finding did not support the interregional convergence of income after WTO accession, at least in nation wide, in terms of gross national product.

Using the labor’s data, we have a different story. *Figures 1e* and *1f* depict regional disparities in terms of average wage rates of “Staff and Workers” in all industries in China. No matter adjusted or unadjusted by price change, both of weighted *Cv* and *Theil* have double peaks of inequality in 2001 and 2003. The peak of unweighted *Cv* is 2001 and that of *Gini* is 2003. After these peak years all the measures show obvious decline, while averages for 4 years “after” WTO accession are lower than “before.” This may imply that disparity in terms of labors’ wage has started to turn from divergence to convergence triggered by China’s accession to WTO, but the widened wage gap has not yet been fully narrowed. The share of *between Theil* is far greater than that of *within Theil* similarly as in our observation based on GDP data, although the former share increases and the latter share decreases especially after 2003.

If we confine our observation to wages for only manufacturing industries, all five measures show their peaks in 2001, no matter we adjust for price or not. All measures significantly decline after that. Decrease in all measures between “before” and “after” years is also remarkable. *Between Theil* is greater than *within Theil* also here, but the gap is not so large as in our previous observation and becomes narrower a at least after 2001.

From these observations, we may conclude that the convergence of wages has already started since early 2000s preceded by narrowed gap of wage rates for manufacturing industries as early as 2001. This result is consistent with our intuition because the trade liberalization stimulated by China’s accession to WTO in December 2001 can affect manufacturing sector most strongly and rapidly through the increased import of manufacturing products. So, we will focus our analysis on the

manufacturing sector¹³ from the following sections. In the next two sections, we will calculate the regional localization of industries and the industrial specification of regions¹⁴ in order to find facts concerning industrial agglomeration lying behind the regional inequality in China.

2.2. Regional localization in manufacturing sector

At first, let us observe “locational Gini coefficients” introduced in Krugman (1991)¹⁵. Let $r = 1, \dots, R$ denote each regions where $r = \{p \text{ or } a\}$ corresponds to 31 province-level units ($p = 1, \dots, P$) or 8 aggregated regions ($a = 1, \dots, A$), respectively. Y_{ir} is a variable measuring the magnitude of economic activity (employment, wage bill or production output) of industry i in location r . $Y_i = \sum_r Y_{ir}$, $Y_r = \sum_i Y_{ir}$ and $Y = \sum_i \sum_r Y_{ir}$ are the nation-level economic activity in industry i , the total economic activity in manufacturing sector in region r , and that in the nation level. Following the literature, we define the *location quotient*¹⁶:

$$Lq_{ir} = \frac{Y_{ir}/Y_i}{Y_r/Y} = \frac{Y_{ir}/Y_r}{Y_i/Y} \quad (7)$$

which means normalized share of location in an industry and, simultaneously, normalized share of industry in a location. $r' = 1, \dots, R$ are regions rearranged in ascending order of the *location quotients*. Then, for each industry, “locational Gini coefficient” is computed as:

$$G^L_i = 1 - \sum_{r'=1}^R \left[\frac{Y_{r'}}{Y} \left(\sum_{q=1}^{r'} \frac{Y_{iq}}{Y_i} + \sum_{q=1}^{r'-1} \frac{Y_{iq}}{Y_i} \right) \right], \quad r = \begin{cases} p = 1, \dots, P \\ \text{or} \\ a = 1, \dots, A \end{cases} \quad (8)$$

This is the area between the 45 degree line and the “localization curve”, which is analogous to the Lorenz curve with the cumulative percentage of economic activity in industry i over the regions (y-axis) and the cumulative percentage of economic activity in total

¹³ Fujita and Hu (2001) focus on industrial agglomeration and “choose industry production agglomeration as one measurement of disparity for the following reasons. First, industrialization dominates the direction of development, and the shift of agricultural labor to industry is important for urbanization. ... Second, because agriculture is highly dependent on natural conditions, most political complaints about the increasing regional disparity in recent years have been based on the uneven distribution of industrial production. Third, under a strong restriction on labor mobility, production agglomeration can be direct source of regional income inequality.” (p. 13)

¹⁴ Overman, Redding and Venables (2003) discuss the “measurement issues” on localization and specialization of economic activity extensively.

¹⁵ Krugman presented “locational Gini coefficients” for 106 U.S. three-digit industries (Appendix D in Krugman, 1991).

¹⁶ We follow Kim (1995) who followed Hoover (1936), just as Overman, Redding and Venables (2003) did. Kim called this “Hoover’s coefficient of localization.”

manufacturing over the regions (x -axis), divided by the area under the 45 degree line. Similarly to the Gini coefficient in the income distribution literature, “locational Gini coefficients” take a value between 0 and 1. The value equals zero if the industry is completely dispersed across regions, while it becomes one if the industry is completely localized in one region.

Tables 1a and *1b* reports “locational Gini coefficients” calculated using employment data¹⁷ of “Staff and Workers” by regions and by industries¹⁸ in manufacturing sector from 1997 to 2005. In the similar way as when we calculated the measures of inequality, we compared 4 years “before” (1998-2001) and “after” (2002-2005) WTO accession. In *Table 1a* computed over 31 province-level units¹⁹, there is only one industry (“Chemical Raw Material and Chemical Products”) out of 29 where the coefficient declines from “before” to “after” years. For the annual coefficients, the majority of industries show almost constant increase in the coefficients. Eight industries demonstrate decline of locational concentration after peak years: 2001 for 5 industries including “Chemical Raw Material and Chemical Products”, and 2003 for 3 industries. There are also 4 industries having the first peak in 2001, decline until the next year, and re-increased in regional concentration thereafter. Therefore, we can tell that there is an industrial difference in patterns of localization after China’s accession to WTO.

Since it has been pointed out in the literature that the aggregation level of both industries and regions could be crucial to detect geographical agglomeration, we attempt to calculate the coefficient over regions in another aggregation level, i.e., 8 aggregated regions in accordance with the *Multi-regional input-output model for China 2000* (IDE, 2003). The number of industries in *Table 1b* that showed regional dispersion from “before” to “after” is five: “Chemical Raw Material and Chemical Products”, “Medicines”, “Chemical Fiber”, “Communication Equipment”, “Computer and Other Electronic Equipment” and “Paper and Paper Products” (in the descending order of the absolute value of negative change). Here, we can categorize the industries into three patterns: (a) 10 industries almost constantly increase in concentration until 2005; (b) 6 industries turn from increase to decrease with inverted U-shaped pattern with a single

¹⁷ Krugman (1991) and Kim (1995) used employment data for calculating the coefficients, while Overman, Redding and Venables (2003) defined that with production.

¹⁸ Since the labor statistics, industry statistics and the input-output tables have different classifications of industries, we re-aggregated all data into 29 manufacturing industries which concord with 53 sectors in *Labour Statistical Yearbook*. As for concordance between classifications used for matching, see *Appendix Table*.

¹⁹ Since several data are missing for by-region-by-industry dataset, we estimate missing data using other year’s industry share in the region. Tibet AR is the only region where more than few series are missing, so we used industry share in aggregated region for estimate. Because exclusion of Tibet did not change the result substantially, we report results using all 31 province-level units including estimated data.

peak in 2002, 2003 or 2004; (c) 13 industries have the first peak (in 2001 for 12 industries) and fluctuate between decrease and increase after that.

As Fujita and Hu (2001) pointed out, use of employment of labor for the measure of agglomeration has a problem because of the strict restriction of labor mobility in China²⁰. So we compute the “locational Gini coefficients” based on wage bill and production data. In *Table 1c*, 6 sectors out of 29 decrease in the coefficient over 31 province-level units in terms of wage bill: “Chemical Raw Material and Chemical Products”, “Medicines”, “Transport Equipment”, “Tobacco”, “Foods” and “General Purpose Machinery” (in the descending order of the absolute value of change). In this table, the coefficients fluctuate between upward and downward with multiple peaks for the most of industrial sectors. This might reflect lack of inter-regional labor mobility according to wage difference in China. If we turn our eyes to the coefficients over 8 aggregated regions using wage bill in *Table 1d*, the number of sectors with shrinking concentration between “before” and “after” become 9. The annual changes in the coefficients are in fluctuation similarly as in the previous table.

As for the manufacturing output data by region and by sector, we could collect consistent statistics only for 20 sectors instead of 29. In addition, we could not obtain data for 1998 and 2004. With such a limited coverage, we present the coefficients based on output in *Tables 1e* and *1f*. Over 31 regions in *Table 1e*, declining coefficients from “before” and “after” years (3 years each in this case) number as many as 8 out of 20: “Special Purpose Machinery”, “Tobacco”, “Manufacture and Processing of Ferrous Metals”, “Chemical Raw Material and Chemical Products”, “Measuring Instrument and Machinery for Cultural Activity & Office Work”, “Metal Products”, “General Purpose Machinery” and “Transport Equipment” (again in descending order of absolute value). The 20 sectors are classified into three categories of annual change patterns: (a) 7 sectors increase in concentration constantly, (b) 8 sectors draw inverse U-shaped patterns with a single peak (in 2000 for 3 sectors, 2002 for 4 and 2003 for 1); and (c) 5 fluctuate with multiple peaks.

Over 8 aggregated regions, 4 industries out of 20 demonstrate downward move in the coefficient between “before” and “after”: “Special Purpose Machinery”, “Tobacco”, “General Purpose Machinery” and “Metal Products”. Again, we can categorize the patterns of annual movement into: (a) 5 increase constantly; (b) 5 with inverse U-shaped patterns with a single peak (1999, 2000 and 2001 for 1 sector each and 2002 for 2 sectors); and (c) 10 with multiple peaks.

²⁰ See note 7.

To summarize the investigation in this section: (1) observation based on employment, wage bill and production are quite different. “locational Gini coefficient” based on output data showed a much greater number of industries with declining regional agglomeration from “before” to “after” WTO than that based on employment which was used in many works in this literature. (2) different regional aggregations leads to different conclusion. (3) patterns in annual changes in agglomeration differs among industries. In general, less than half of the number of manufacturing sectors showed inverse U-shaped patterns with a single peak around 2001 but the peak years also vary between sectors. For these industries, globalization stimulated by WTO accession possibly changes the trend from agglomeration to dispersion. Of course, we should analyze the case with a more formal econometric model to obtain a more concrete conclusion to this.

3. Empirical results based on formal regression

3.1. Analytical framework

The foremost motivation of this paper is to figure out the mechanism lying behind the effect of trade liberalization caused by China’s WTO accession on locational agglomeration in manufacturing sector and on regional wage gap. We pay a particular attention to the impact of increased import of intermediate goods.

Using a model incorporating the industrial linkage structure through input and output of intermediates, Venables²¹ concludes that decrease in transport cost and trade liberalization cause domestic agglomeration of industries, while further reduction and liberalization may undermine the agglomeration to bring convergence.

His logic is like this. When the cost of imported intermediate goods decreases from very high, proximity to a high-productivity region producing less expensive intermediates due to the economy of scale is advantageous for a manufacturer. Such a cost of input through the *forward linkage* effect leads to industrial agglomeration. However, further reduction and trade liberalization make transport cost relatively irrelevant and regional convergence of industry starts in order to avoid congestion or to pursue market access (*backward linkage* effect) if *inter*-industry linkage is stronger than *intra*-industry link, while stronger *intra*-industry linkage make agglomeration easier to survive.

²¹ Venables (1996) and Chapter 16 in Fujita, Krugman and Venables (2001).

As for empirics, Hanson (1998b) examines the effect of trade liberalization in Mexico on regional employment growth. He associate regional labor demand with three factors, i.e., (1) transport cost, (2) backward-forward linkage and (3) agglomeration economies (“within-industry agglomeration” and “industrial diversity”). He concludes that the the employment growth are significantly correlated with the first two factors (negatively with the first and positively with the second), while no significant evidence of positive correlation with the last one.

Our paper employs a similar regression methods as in Hanson (1998b) which has been widely applied. The largest difference of our approach from Hanson’s and other works in the literature is that we try to include the import of intermediate input explicitly in the regression. In addition, we estimate not only the models with employment growth as dependent variable most often used in the literature, but also with the growth of product output and wage rates²². This is because the fact that regional mobility of population has been strictly restricted in China²³. We expect that, under the restraint on the migration of labor, regional wage rate will grow instead of the potential growth in labor demand. Industrial output can also grow in a region even under restricted labor movement through the mobility of capital and labor-capital substitution.

3.2. Estimation models, variables and data

Let $r = 1, \dots, R$ be regions in a country (China, here). Let $i = 1, \dots, I$ denote industrial sectors in an economy and $H (> I)$ the number of whole industries in the private sector including both manufacturing and non-manufacturing. Let $t = t_0, \dots, T$ denote time periods (year). Note that the dependent variables in our regression are change in regional economic data relative to national level from the initial year t_0 to end year T in the period, while dependent variables are data in the initial year²⁴. Estimation parameters are denoted by α ’s, β ’s and γ ’s, and ε ’s are error terms. The estimation models are as follows.

Regression model 1 (Growth of relative employment):

²² Hanson (1998a) and Tomiura (2005) use the relative growth of wage as a dependent variable in a similar framework. A series of works by Davis and Weinstein regress region-specific industrial output data on variables corresponding both to comparative advantage and economic geography, though their approach is different from ours (e.g., Davis, D. and D. Weinstein, 1999).

²³ See note 7.

²⁴ Hanson (1998b) explains that he uses, for example, “the relative wage in the initial period rather than the change in the relative wage, to avoid introducing simultaneity into the regression.”

$$\ln\left(\frac{L_{iT}}{L_{i0}}\right) - \ln\left(\frac{L_{irt_0}}{L_{it_0}}\right) = \alpha_0 + \alpha_1 Wage_{irt_0} + \alpha_2 Scale^L_{irt_0} + \alpha_3 Frwd^{AL}_{irt_0} + \alpha_4 Bkwd^{AL}_{irt_0},$$

$$+ \alpha_5 Intra^L_{irt_0} + \alpha_6 Diver^L_{irt_0} + \alpha_7 Skill^L_{irt_0} + \alpha_8 Intim^L_{irt_0} + \alpha_9 Trans^{nL}_{irt_0} + \varepsilon_{ir}$$

for $j = \{MNF \text{ or } ALL\}$, and $n = \{1, \dots, 5\}$.

Regression model 2 (Growth of relative output):

$$\ln\left(\frac{Q_{iT}}{Q_{i0}}\right) - \ln\left(\frac{Q_{irt_0}}{Q_{it_0}}\right) = \beta_0 + \beta_1 Wage_{irt_0} + \beta_2 Scale^Q_{irt_0} + \beta_3 Frwd^{MQ}_{irt_0} + \beta_4 Bkwd^{MQ}_{irt_0}$$

$$+ \beta_5 Intra^Q_{irt_0} + \beta_6 Diver^Q_{irt_0} + \beta_7 Skill^Q_{irt_0} + \beta_8 Intim^Q_{irt_0} + \beta_9 Trans^{nQ}_{irt_0} + \varepsilon_{ir}$$

for $j = \{MNF \text{ or } ALL\}$, and $n = \{1, \dots, 5\}$.

Regression model 3&4 (Growth of relative wage rate):

$$\ln\left(\frac{W_{iT}}{W_{i0}}\right) - \ln\left(\frac{W_{irt_0}}{W_{it_0}}\right) = \gamma_0 + \gamma_1 lWage_{irt_0} + \gamma_2 Scale^y_{irt_0} + \gamma_3 Frwd^j_{irt_0} + \gamma_4 Bkwd^j_{irt_0},$$

$$+ \gamma_5 Intra^y_{irt_0} + \gamma_6 Diver^y_{irt_0} + \gamma_7 Skill^y_{irt_0} + \gamma_8 Intim^y_{irt_0} + \gamma_9 Trans^{ny}_{irt_0} + \varepsilon_{ir}$$

for $j = \{MNF \text{ or } ALL\}$, $n = \{1, \dots, 5\}$, and $y = \{L \text{ or } Q\}$.

We collect data for two periods. The first period is five years from “before” accession of China to WTO starting from $t_0=1997$ (1999 for *Scale* and *Skill*) to $T = 2001$. The second is four years “after” WTO accession with $t_0 = 2002$, $T = 2005$. We pool these periods into a “pooled sample” in order to detect a structural change possibly triggered by the trade liberalization in a similar way to Hanson (1998b).

Now, we explain about the dependent variables. The LHS in the *Regression model 1* is the growth of industry specific regional employment normalized by the national level employment in that industry. The increase in this variable means the growth of that region in the industry is more rapid than the national average, or industrial agglomeration of the industry to the region in the sense of employment. For this variable, we obtain 31 region (province-level units) and 53 industry specific data on the number of “Staff and Workers” including 29 manufacturing sectors in a consistent classification from the *China Labour Statistical Yearbook* (Department of Population, Social, Science And Technology Statistics National Bureau of Statistics, P.R.C; and

Department of Planning and Finance, Ministry of Labour And Social Security, P.R.C) for each year from 1997 to 2005 although whole data are missing for 1998 and 2004.

The dependent variable in the *Regression model 1* is the growth of region and industry specific manufacturing relative to the national level data. The data source is *China Industrial Economic Statistical Yearbook* by the Department of Industrial and Transportation Statistics, National bureau of Statistics, P.R.C. The region and industry specific data is consisted of only 20 manufacturing sectors²⁵. So, we limit our sample for the estimation of the *Regression model 2* and *4* to these 20 sectors.

For the growth of relative wage in the *Regression model 3* and *4*, we divide region and industry specific wage bill data by number of labor (both for “Staff and Workers”) taken from the *China Labour Statistical Yearbook*. The number of manufacturing industries is 29, which is the same as employment data.

All of the data we used for computing these three variables have several missing values. If data in another year is available, we estimated missing data using share of that industry in the region calculated from other year’s share. In the case that all other years’ data is also missing, we used the industry share of the neighboring region since we have already seen that the disparity within an aggregated region is much smaller than that between aggregated regions.

Now let us move on to notation of each independent variable. The computation of these variables often uses the share of region in industry and industry share in a region as weights for normalization. For these weights, we used the employment share for the labor employment models (*Regression model 1* and *3*) and output share for the product output models (*Regression model 2* and *4*) to make sure the consistency in processing data. Some variables for certain region and industry cannot be calculated because of the denominators take zero value. In that case, we substitute -20.0 for the log value ($\exp(-20) \approx 2.06115^{-09}$).

Now we take a look at the definitions of each explanatory variable one by one.

$$Wage_{irt_0} = \ln\left(\frac{W_{irt}}{W_{it}}\right).$$

is relative wage rate of regional labor to national level average wage in an industry. This is calculated in the same manner when we prepare the data set for dependent variable in the Regression models 3 and 4. Expect sign on this variable is negative in the *Regression model 1* because high labor cost may discourage firms from hiring more

²⁵ As for the missing sector names, compare Table 1a-1d and 1e-1f.

labors²⁶, in particular when labor mobility is restricted. The sign in the *Regression model 2* is expected to be positive because labor cost raises price of a product and high labor cost can be considered to reflect high labor productivity. Trade theory predicts that globalization leads to factor price equalization between and within a country. If this is the case, the expected coefficient on the *Wage* term in the *Regression model 3* has to have a negative sign which implies regional divergence.

We include a variable controlling the scale of economy or degree of internal increasing return reflecting the difference in technology and market competition. Many of preceding works use plant size (or establishment) size calculated by dividing employment by number of plants (establishments) in a industry. Nevertheless, we could not get region and industry specific data on plant or establishment. So, we substitute for this by dividing labor (or output) by the number of companies²⁷ in an industry in a region (from *China Industrial Economic Statistical Yearbook*) to compute firm size, such as:

$$Scale^L_{irt} = \ln\left(\frac{L_{irt}/F_{irt}}{L_{it}/F_{it}}\right)$$

$$Scale^Q_{irt} = \ln\left(\frac{Q_{irt}/F_{irt}}{Q_{it}/F_{it}}\right)$$

where F_{irt} means the number of firms in an industry in a region. Like product output data, 1998 and 2004 data on the number of firms are missing. There is also a large gap in values (by 2-3 times) between 1997 and 1999 data caused by the change of definition of firms. So, we use firm number together with employment and output data of 1999. It can be inferred that firms with increasing return have a strong market power and can pay high wage which attracts more labors.

The next variables capture the forward linkage with upstream sectors and the backward linkage with downstream sectors within the region. Let X_k^l denote intermediate purchase from an output industry k by an output industry l . Following Dumais, Ellison and Glaeser (1997) and Tomiura (2003), we define the forward linkage as:

²⁶ It is also pointed out: “The wage variable is also supposed to partly reflect urban congestion, such as high land price and costly commuting” (Tomiura, 2005).

²⁷ Since there are data only by 20 industry sectors for the number of firms, we estimated missing industry data by multiplying the national data on firm number by the share of a region in a total manufacturing.

$$\begin{aligned}
Frwd^{ALL}_{irt} &= \ln \left[R \left(\frac{1}{X^i} \right) \sum_{k \neq i} (X^i_k) \left(\frac{L_{krt}}{L_{kt}} \right) / \frac{\sum_k X^i_k}{X^i} \right] \quad \text{for } k = 1, \dots, H. \\
&= \ln \left[R \sum_{k \neq i} \left(\frac{X^i_k}{X^i} \right) \left(\frac{L_{krt}}{L_{kt}} \right) \right] \\
Frwd^{MNF}_{irt} &= \ln \left[R \sum_{k \neq i} \left(\frac{X^i_k}{X^i} \right) \left(\frac{Q_{krt}}{Q_{kt}} \right) \right] \quad \text{for } k = 1, \dots, I,
\end{aligned}$$

and backward linkage as:

$$\begin{aligned}
Bkwd^{ALL}_{irt} &= \ln \left[R \left(\frac{1}{X_i} \right) \sum_{l \neq i} X_i^l \left(\frac{L_{lrt}}{L_{lt}} \right) / \frac{\sum_l X_i^l}{X_i} \right] \quad \text{for } l = 1, \dots, H. \\
&= \ln \left[R \sum_{l \neq i} \left(\frac{X_i^l}{X_i} \right) \left(\frac{L_{lrt}}{L_{lt}} \right) \right] \\
Bkwd^{MNF}_{irt} &= \ln \left[R \sum_{l \neq i} \left(\frac{X_i^l}{X_i} \right) \left(\frac{Q_{lrt}}{Q_{lt}} \right) \right] \quad \text{for } l = 1, \dots, I.
\end{aligned}$$

We use transaction data from *Input-Output Tables of China 1997* for the “before” period and from *Input-Output Tables of China 2002* for the “after” period. The input sectors and output sectors are converted into 53 sectors consistent with labor statistics²⁸. Following Tomiura (2003), we attempt to capture linkage in two different ways, i.e. linkage with all industries (*ALL*) and linkage with only manufacturing sectors (*MNF*). In calculation, Dumais et al. (1997) combine transaction data of I-O table with region’s share of employment in an industry, while Tomiura (2003) and (2005) does so with the share in terms of shipment. We try to use the both shares to compute the variables. As for linkage with all industries, we combine I-O Table with labor share because output data consistent with manufacturing do not exist for non-manufacturing sectors. Output share is used to process linkage variables limited with manufacturing sectors. For combining output share with I-O table, missing data of output for nine manufacturing sectors are estimated using region specific labor productivity and mark-up over labor cost (wage bill) of total manufacturing together with region and industry specific employment and wage bill data.

²⁸ See Appendix Table for the matching between classifications.

As Tomiura (2003) claims, “the coefficients on these input-output linkage variables ... must be negative if previously established concentrations are destroyed” after trade liberalization. Therefore, we also expect negative correlation between the linkage variables with the growth of labor as well as of output for the drastic liberalization period. If the relative wage grows along with stronger forward and backward linkage like Tomiura (2005) detect, further divergence effect can be occur because firms likely hate higher wage and congestion in a concentrated region.

In addition to the above mentioned *inter*-industry linkage, we also take in account so-called *intra*-industry agglomeration within an already concentrated industry reflecting externality within an industry. This effect is defined as:

$$Intra^L_{irt} = \ln\left(\frac{L_{irt}/L_{rt}}{L_{it}/L_t}\right)$$

$$Intra^Q_{irt} = \ln\left(\frac{Q_{irt}/Q_{rt}}{Q_{it}/Q_t}\right)$$

which corresponds to *location quotient*, a measure of regional specialization and, at the same time, that of industrial specialization, as we have already seen in the previous section in this paper. As Krugman (1991) points out, industrial specialization will be promoted if globalization goes further like the experience of European countries facing to the EU integration.

Another factor involving externality is industrial diversity defined as:

$$Diver^L_{irt} = \ln\left[\frac{\sum_j \left(\frac{L_{rjt}}{L_{rt}}\right)^2}{\sum_j \left(\frac{L_{jt}}{L_t}\right)^2}\right] \quad \text{for } j = 1, \dots, I$$

$$Diver^Q_{irt} = \ln\left[\frac{\sum_j \left(\frac{Q_{rjt}}{Q_{rt}}\right)^2}{\sum_j \left(\frac{Q_{jt}}{Q_t}\right)^2}\right] \quad \text{for } j = 1, \dots, I$$

These variables are defined as the square sum of industrial share in a region relative to that in the nation level. If the distribution of employment or output is even across industries, this value becomes smaller. Under the assumption that higher diversity promotes spillover of knowledge as an externality, high value of this variable helps agglomeration to survive and allows higher wage.

Also, we consider the pool of skilled labor as:

$$Skill^L_{irt} = \ln \left[\frac{\sigma_r L_{irt}}{L_{irt}} \bigg/ \frac{\sum_{q=1}^R \sigma_q L_{iqt}}{L_{it}} \right]$$

$$= \ln \left[\sigma_r \bigg/ \sum_{q=1}^R \tau_q \left(\frac{L_{iqt}}{L_{it}} \right) \right]$$

$$Skill^Q_{irt} = \ln \left[\frac{\sigma_r Q_{irt}}{Q_{irt}} \bigg/ \frac{\sum_{q=1}^R \sigma_q Q_{iqt}}{Q_{it}} \right]$$

$$= \ln \left[\sigma_r \bigg/ \sum_{q=1}^R \tau_q \left(\frac{Q_{iqt}}{Q_{it}} \right) \right]$$

where σ_r is the ratio of engineers to the total employment in the whole manufacturing sectors in the region. The region specific data on number of engineers is taken from *China Labour Statistical Yearbook*. Since we cannot take industry specific data on skilled labor, we compute the weighted average using regional share in the industrial employment or output as weights as a proxy for region and industry specific pooling of human capital. A greater pooling of human capital raise wage rate and can help agglomeration sustain even after the trade liberalization.

One of our greatest contributions to the literature is the inclusion of the ratio of imported intermediate to inputs from China specific to regions and industries. To estimate this variable, we combine three different kinds of Input-output tables, i.e., (1) *Input-Output Tables of China 1997 and 2002*; (2) *Multi-regional input-output model for China 2000* (IDE, 2003); and *Asian International Input-Output Table 2000* (IDE, 2006).

First, we calculate region and industry specific values of imported intermediate inputs from abroad:

$$\mu^L_{irt} = \left(\frac{M_{irt}/(Y_{irt} + M_{irt} - E_{irt})}{M_{iat}/(Y_{iat} + M_{iat} - E_{iat})} \right) \left(\frac{L_{irt}}{L_{iat}} \right) \sum_{k=1}^I X_k^i \left(\frac{\tilde{M}_k^i}{\tilde{Q}_k^i + \tilde{M}_k^i} \right) \left(\frac{\bar{X}_k^{ia}}{\bar{X}_k^i} \right),$$

$$\mu^Q_{irt} = \left(\frac{M_{irt}/(Y_{irt} + M_{irt} - E_{irt})}{M_{iat}/(Y_{iat} + M_{iat} - E_{iat})} \right) \left(\frac{Q_{irt}}{Q_{iat}} \right) \sum_{k=1}^I X_k^i \left(\frac{\tilde{M}_k^i}{\tilde{Q}_k^i + \tilde{M}_k^i} \right) \left(\frac{\bar{X}_k^{ia}}{\bar{X}_k^i} \right),$$

where \tilde{M}_k^i is the purchase of imported intermediate goods from the k -th industry abroad by domestic industry i and \tilde{Q}_k^i means the purchase of intermediate goods from the k -th industry in China, both taken from IDE (2006). \bar{X}_k^{ia} is the purchase of intermediates including both imported and domestic goods from the k -th industry by the i -th industry in one of eight aggregated region a . This is obtainable from IDE (2003). The product of three terms in the summation makes the value of “imported intermediates goods by the i -th industry in the aggregated region a .” The product of two terms before summation means the share of region r in the imported goods in the industry i 's import in the aggregated region a . Thus, μ 's mean “input of imported intermediates by the i -th industry in the region r .” using “employment or output share of region r in aggregated region a ” as a weight. Similarly, “purchase of domestic intermediate produced domestically in China by the i -th industry in the region r ” is computed as:

$$\delta^L_{irt} = \left(\frac{L_{irt}}{L_{iat}} \right) \sum_{k=1}^I X_k^i \left(\frac{\tilde{Q}_k^i}{\tilde{Q}_k^i + \tilde{M}_k^i} \right) \left(\frac{\bar{X}_k^{ia}}{\bar{X}_k^i} \right),$$

$$\delta^Q_{irt} = \left(\frac{Q_{irt}}{Q_{iat}} \right) \sum_{k=1}^I X_k^i \left(\frac{\tilde{Q}_k^i}{\tilde{Q}_k^i + \tilde{M}_k^i} \right) \left(\frac{\bar{X}_k^{ia}}{\bar{X}_k^i} \right).$$

Using these estimated value, we define “region and industry specific relative ratio of intermediate inputs” as:

$$Intim^Q_{irt} = \ln \left[\frac{\mu^Q_{irt} / \delta^Q_{irt}}{\sum_{r=1}^R \mu^Q_{irt} / \sum_{r=1}^R \delta^Q_{irt}} \right],$$

$$Intim^L_{irt} = \ln \left[\frac{\mu^L_{irt} / \delta^L_{irt}}{\sum_{r=1}^R \mu^L_{irt} / \sum_{r=1}^R \delta^L_{irt}} \right].$$

We believe this variable captures the globalization in terms of imported intermediate goods which plays an essential role in regional dispersion of industries.

Finally, we measure the weighted average of the region specific relative transport cost ratio per a unit of product as:

$$\begin{aligned}
Trans^{nL}_{irt} &= \ln \left[\frac{\tau_r^n L_{irt}}{L_{irt}} \bigg/ \frac{\sum_{q=1}^R \tau_q^n L_{iqt}}{L_{it}} \right], \\
&= \ln \left[\tau_r^n / \sum_{q=1}^R \tau_q^n \left(\frac{L_{iqt}}{L_{it}} \right) \right] \\
Trans^{nQ}_{irt} &= \ln \left[\frac{\tau_r^n Q_{irt}}{L_{irt}} \bigg/ \frac{\sum_{q=1}^R \tau_q^n Q_{iqt}}{L_{it}} \right] \\
&= \ln \left[\tau_r^n / \sum_{q=1}^R \tau_q^n \left(\frac{Q_{iqt}}{Q_{it}} \right) \right]
\end{aligned}$$

for $n = \{1, \dots, 5\}$ correspond to five different proxies for the regional “iceberg” transportation cost per unit of product. For τ_r^1 , we take the square root of area in each region. τ_r^2 is the square root of area divided by the sum of the length of roads and railways in a region. τ_r^3 is the inverse of freight transport per population in a region. τ_r^4 is the inverse of the sum of population of great mega-cities²⁹ divided by the distance from each region. τ_r^5 is the inverse of the sum of Gross Regional Product of great mega-cities divided by the distance from each region.

Table 2a and *2b* present the summary statistics of these variables. For the most of dependent variables, the standard deviation decrease from “before” period to “after” period implying regional dispersion in industries, while the majority of independent variables raise their variance.

Table 3a and *3b* show correlation matrices between dependent and independent variables and regional dummy for coastal region. What we have the strongest interest here is the correlation between relative intermediate import ratio and relative unit transport costs. In the “before” period, 2 out of 5 transportation variables have positive correlation with the relative intermediate input ratio. In the “after” period, all transportation variables and become negatively correlated with the relative intermediate input ratio which is consistent with our intuition. The change in absolute value of correlation becomes stronger, too. An interesting fact is the correlation between

²⁹ We selected the following five mega-cities which have either more than 10 million of population or 200 billion of gross regional product for the average of 1997 and 2002: Chongqing (population:30.8 mil / GRP: 187 bil.), Shanghai (population: 13.2 mil / GRP: 563 bil.), Beijing (population: 11.8 mil / GRP: 267 bil.), Tianjin (population: 9.1 mil / GRP: 252 bil.), and Guangzhou (population: 6.9 mil / GRP: 276 bil.)

relative intermediate import ratio and coastal dummy is weak. Among the transportation variables, all correlations are positive and strong. Coastal dummy and all transportation variables are negatively correlated.

Another interesting fact is that correlations between forward and backward linkage with “ALL” sectors are quite strong, while such a correlations between “MNF” linkages are not so strong. Note that there are quite strong negative correlations between forward or backward linkage and some transportation variables. It is also noteworthy that correlation between linkage effects and intermediate input turn from negative to positive. The change in correlation is also large particularly for linkage with “ALL” sectors.

3.3. Regression results

We use pooled variables over “before” and “after” periods to detect the structural changes between these two periods applying the method in Hanson (1998b). A brief glance at the *F*-statistics on independent variables tells us that the existence of structural change significant at 1% level between the “before” and “after” periods in all estimation based on all regression models.

Table 4 demonstrates the result from the *Regression model 1* with change in relative employment as the dependent variable. First four columns are results with no transportation variable. Coefficients without dummy for “after” period are shown in the upper half of the table, and those multiplied by the dummy are presented in the lower half. Coefficients on the initial relative wage are significant and positive, that contradict against our expectation, but coefficients with “after” dummy shows significant change in variable in the direction to partially cancel out the positive correlation. Scale of economy has significant positive correlation with the dependent variable which is consistent with our prediction. The significant negative changes in the coefficient on this variable reverse the sign into negative. *Intra*-industry linkage do not show very significant effect in the “before” period.

Concerning the estimate of the imported intermediate inputs, it is positively associated with the employment growth. However, the interaction term with after-WTO-period dummy shows a significantly negative estimate. Therefore, an industry-region with many intermediate imports is likely to agglomerate, but such effect is reduced since 2001. Hence, these industries can be considered to move toward industrial dispersion after the WTO accession.

Regarding the inter-industry linkage effects, we fail to obtain significant estimates. This is maybe because of the globalization, which is often considered to weaken the merit of agglomeration.

Table 5 shows estimation results of the model for output growth. We find many of the estimates are not significant. We consider this is because of missing variables for FDI.

Table 6 reports estimation results of the model for wage convergence. We obtain significantly negative estimates for the initial wages. Thus, it is inferred that wages are converging across industry-regions. Negative forward linkage effect and positive backward linkage effect are also obtained with statistical significance. Since there is high correlation between forward and backward linkage effects, the results should be carefully dealt with.

Overall, we obtain strong impacts of joining the WTO on the industrial agglomeration.

4. Concluding Remarks

We have carefully examined the regional income distribution in China. Although depending on the data definition and sources, the measures of inequality, like coefficient of variance, Gini coefficient, and Theil's index, show slightly different pictures, we have more often observed that the level of inequality is lowered in recent years, specifically in 2004 and 2005. This is particularly the case for manufacturing sectors, whose level of inequality actually started decreasing earlier in 2000s. Economic geography tells us that the regional wage gap is reduced when industries are dispersed, and the industrial dispersion can be facilitated by an increase in international trade. We then calculated the locational Gini coefficients for manufacturing industries, and found that there are some industries, which have decreased the extent of localization since 2001.

Since foreign firms operating in China play a very important role for the economy, we emphasized the effects of imported intermediate inputs, in which supposedly those firms have engaged for a large part. By the wage convergence model, we obtained positive and statistically significant estimate for the imported intermediate input. It is implied that an industry-region experiencing an increase in the import gains a higher wage growth rate. We also obtained significantly negative estimate for the initial wages. Thus, convergence of the wage gap can be inferred. In terms of industrial agglomeration, we estimated a model for employment growth. An industry-region with higher imports

of intermediates experiences a high employment growth rate, which implies industrial concentration. The estimate of the interacted term with after-WTO-period dummy, however, shows a significantly negative effect on the agglomeration. Therefore, the surge of intermediate imports since 2001 makes industrial agglomeration less important. We also found that, as literature shows, an increase in international trade weakens inter-industry linkages.

In sum, combined the fact of the decreasing inequality with the wage convergence and industrial deconcentration after the WTO accession, it appears that industrial dispersion lead to reduction of income inequality of the Chinese economy. However, one of the important features about the Chinese globalization lies in the FDI. After the WTO accession, the importance of the foreign firms seems pronounced again. Thus, whether the regional income inequality will be reduced in the future can be highly dependent on the foreign firms' locational decisions and therefore appropriateness of Chinese government's regional policy implementation.

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Table 1a. "locational Gini confidents": Employment basis over 31 province-level units

<i>i</i>	Industry name	1997	1998	1999	2000	2001	2002	2003	2004	2005	"Before" (1998-2001)	"After" (2002-2005)	Change
1	Processing of Food from Agricultural Products	0.2650	0.2744	0.2758	0.2841	0.3047	0.3098	0.3079	0.3224	0.3464	0.2772	0.3188	0.0417
2	Foods	0.1806	0.2059	0.2158	0.1970	0.1915	0.1992	0.2043	0.2151	0.2388	0.1935	0.2034	0.0100
3	Beverage	0.2409	0.2689	0.2498	0.2679	0.2697	0.2932	0.2985	0.3027	0.3180	0.2569	0.3020	0.0451
4	Tobacco	0.4624	0.4726	0.4779	0.4725	0.4338	0.4611	0.4853	0.4980	0.5131	0.4193	0.4251	0.0057
5	Textile	0.2118	0.2560	0.2482	0.2622	0.2660	0.2869	0.2808	0.2967	0.2963	0.2534	0.2861	0.0327
6	Textile Wearing Apparel	0.3275	0.4032	0.4244	0.4362	0.4874	0.4395	0.4476	0.4647	0.4372	0.4357	0.4465	0.0108
7	Leather, Fur, Feather and Footware, and Caps; Its Products	0.6162	0.4848	0.5053	0.5356	0.5645	0.5806	0.5839	0.5574	0.5503	0.5173	0.5661	0.0488
8	Processing of Timbers, Wood, Bamboo, Rattan, Palm, and Straw Products	0.5416	0.4977	0.4818	0.4552	0.5116	0.4244	0.5169	0.5038	0.4950	0.4807	0.4832	0.0025
9	Furniture	0.2246	0.2534	0.3016	0.3222	0.3608	0.3803	0.3826	0.3802	0.3952	0.2998	0.3733	0.0735
10	Paper and Paper Products	0.1578	0.2060	0.1872	0.2109	0.2402	0.2328	0.2307	0.2286	0.2385	0.2043	0.2379	0.0336
11	Printing, Reproduction of Recording Media	0.1419	0.1371	0.1575	0.1483	0.1974	0.1844	0.1929	0.2088	0.2147	0.1536	0.1991	0.0454
12	Articles for Culture, Education and Sport Activity	0.4728	0.5196	0.5479	0.5566	0.5991	0.5799	0.5884	0.5773	0.5523	0.5516	0.5727	0.0210
13	Processing of Petroleum, Coking, Processing of Nucleus Fuel	0.3852	0.4019	0.3798	0.4357	0.4529	0.4189	0.4525	0.5071	0.5050	0.4104	0.4586	0.0482
14	Chemical Raw Material and Chemical Products	0.1567	0.1650	0.1799	0.1870	0.4497	0.2020	0.2014	0.2221	0.2326	0.2670	0.2144	-0.0526
15	Medicines	0.1560	0.1587	0.3839	0.1766	0.1948	0.2092	0.2158	0.2323	0.2546	0.2069	0.2253	0.0185
16	Chemical Fiber	0.3014	0.3178	0.3177	0.3431	0.3610	0.3537	0.3796	0.4189	0.4161	0.3224	0.3742	0.0518
17	Rubber	0.1647	0.2016	0.2121	0.2201	0.2377	0.2473	0.2620	0.2540	0.2598	0.2104	0.2558	0.0455
18	Plastic	0.2107	0.2299	0.2718	0.2839	0.3795	0.2773	0.2997	0.3126	0.3079	0.2466	0.2964	0.0497
19	Non-metallic Mineral Products	0.1737	0.1782	0.1923	0.1996	0.2098	0.2300	0.2354	0.2425	0.2477	0.1866	0.2396	0.0531
20	Manufacture and Processing of Ferrous Metals	0.3298	0.3578	0.3739	0.3787	0.3964	0.3669	0.3862	0.4084	0.4183	0.3731	0.4049	0.0319
21	Manufacture & Processing of Non-ferrous Metals	0.4330	0.4656	0.4788	0.4812	0.4845	0.4948	0.5277	0.5271	0.5255	0.4759	0.5212	0.0454
22	Metal Products	0.1436	0.1331	0.1660	0.1572	0.2146	0.1787	0.1970	0.1978	0.2071	0.1604	0.1880	0.0275
23	General Purpose Machinery	0.1871	0.1833	0.2015	0.2023	0.2428	0.2152	0.2251	0.2366	0.2429	0.2001	0.2255	0.0254
24	Special Purpose Machinery	0.1866	0.2021	0.2062	0.2183	0.2149	0.2368	0.2656	0.2726	0.2706	0.1985	0.2527	0.0542
25	Transport Equipment	0.2622	0.2937	0.3062	0.3033	0.3413	0.3188	0.3139	0.3292	0.3265	0.3057	0.3187	0.0130
26	Electrical Machinery & Equipment	0.1964	0.1962	0.2022	0.2021	0.2486	0.2276	0.2461	0.2745	0.2787	0.2055	0.2620	0.0564
27	Communication Equipment, Computer and Other Electronic Equipment	0.4065	0.4354	0.4640	0.4723	0.5112	0.4768	0.4932	0.4803	0.4868	0.4674	0.4856	0.0183
28	Measuring Instrument and Machinery for Cultural Activity & Office Work	0.3020	0.3046	0.3088	0.2974	0.3295	0.3284	0.3345	0.3323	0.3418	0.3068	0.3377	0.0308
29	Artwork, Other Manufacture n.e.c.	0.2783	0.3526	0.3506	0.3991	0.4146	0.4075	0.4289	0.4420	0.4540	0.3688	0.4176	0.0488

Sources: See Appendix Table 1.

Notes: "Before" means "before WTO accession" using average of employment, wage bill or output data for 4 years from 1998 to 2001. "After" means "after WTO accession" using average for 4 years from 2002 to 2005. As for the 31 province-level regions and 8 aggregated regions, see note 3 to the text.

Table 1b. "locational Gini confidents": Employment basis over 8 aggregated regions

<i>i</i>	Industry name	1997	1998	1999	2000	2001	2002	2003	2004	2005	"Before" (1998-2001)	"After" (2002-2005)	Change
1	Processing of Food from Agricultural Products	0.1222	0.1181	0.1158	0.1200	0.1502	0.1572	0.1724	0.1927	0.2298	0.1175	0.1914	0.0739
2	Foods	0.1040	0.1046	0.1210	0.1037	0.1086	0.0830	0.0975	0.1162	0.1445	0.1051	0.0994	-0.0058
3	Beverage	0.1264	0.1419	0.1402	0.1730	0.1760	0.1975	0.2060	0.2251	0.2532	0.1574	0.2213	0.0639
4	Tobacco	0.3709	0.3695	0.3970	0.3888	0.3510	0.3801	0.4048	0.4237	0.4408	0.3069	0.3291	0.0222
5	Textile	0.1461	0.1925	0.1756	0.1916	0.1960	0.2155	0.2152	0.2295	0.2407	0.1869	0.2233	0.0364
6	Textile Wearing Apparel	0.3013	0.3704	0.3886	0.4018	0.4370	0.4020	0.4063	0.4261	0.3873	0.3984	0.4054	0.0070
7	Leather, Fur, Feather and Footware, and Caps; Its Products	0.5513	0.4300	0.4460	0.4653	0.4980	0.5129	0.5016	0.4790	0.4688	0.4570	0.4886	0.0316
8	Processing of Timbers, Wood, Bamboo, Rattan, Palm, and Straw Products	0.3956	0.3549	0.3416	0.3199	0.3644	0.3090	0.3951	0.3686	0.3206	0.3433	0.3485	0.0052
9	Furniture	0.1402	0.1678	0.2117	0.2468	0.2884	0.2903	0.3184	0.3126	0.3222	0.2231	0.3110	0.0878
10	Paper and Paper Products	0.0861	0.1238	0.1096	0.1206	0.1503	0.1261	0.1307	0.1193	0.0955	0.1230	0.1193	-0.0037
11	Printing, Reproduction of Recording Media	0.0911	0.0901	0.1018	0.0931	0.1235	0.1265	0.1341	0.1432	0.1470	0.0992	0.1408	0.0416
12	Articles for Culture, Education and Sport Activity	0.4218	0.4655	0.5033	0.5135	0.5433	0.5206	0.5272	0.5275	0.5110	0.5038	0.5205	0.0167
13	Processing of Petroleum , Coking, Processing of Nucleus Fuel	0.2856	0.3177	0.2983	0.3366	0.3472	0.2841	0.3362	0.3728	0.3897	0.3225	0.3380	0.0155
14	Chemical Raw Material and Chemical Products	0.1093	0.1181	0.1297	0.1420	0.3697	0.1525	0.1587	0.1835	0.1985	0.2072	0.1755	-0.0316
15	Medicines	0.0605	0.0636	0.3283	0.0708	0.0759	0.0933	0.0961	0.1207	0.1497	0.1417	0.1147	-0.0270
16	Chemical Fiber	0.2233	0.2293	0.2298	0.2512	0.2735	0.2152	0.2322	0.2614	0.2808	0.2428	0.2349	-0.0079
17	Rubber	0.0631	0.0917	0.0687	0.0915	0.1216	0.1060	0.1137	0.1324	0.1266	0.0900	0.1204	0.0304
18	Plastic	0.0962	0.1911	0.2338	0.2546	0.2624	0.2482	0.2687	0.2796	0.2622	0.2085	0.2629	0.0544
19	Non-metallic Mineral Products	0.1124	0.1271	0.1369	0.1550	0.1500	0.1855	0.1967	0.2028	0.2178	0.1381	0.2040	0.0659
20	Manufacture and Processing of Ferrous Metals	0.1893	0.2077	0.2159	0.2198	0.2219	0.2189	0.2322	0.2827	0.2993	0.2137	0.2492	0.0355
21	Manufacture & Processing of Non-ferrous Metals	0.3598	0.3836	0.3955	0.4037	0.3992	0.4143	0.4461	0.4482	0.4501	0.3955	0.4416	0.0461
22	Metal Products	0.0903	0.0746	0.1069	0.1028	0.1605	0.1350	0.1370	0.1385	0.1443	0.1067	0.1358	0.0291
23	General Purpose Machinery	0.1524	0.1456	0.1573	0.1648	0.2011	0.1861	0.1916	0.2057	0.1955	0.1634	0.1940	0.0306
24	Special Purpose Machinery	0.0968	0.1299	0.1236	0.1429	0.1475	0.1420	0.1588	0.1661	0.1728	0.1266	0.1495	0.0229
25	Transport Equipment	0.1671	0.1605	0.1792	0.1709	0.1811	0.2009	0.2090	0.2237	0.2201	0.1708	0.2150	0.0442
26	Electrical Machinery & Equipment	0.1393	0.1342	0.1441	0.1400	0.1896	0.1686	0.1889	0.2123	0.2215	0.1448	0.2061	0.0612
27	Communication Equipment, Computer and Other Electronic Equipment	0.3505	0.3752	0.4098	0.4141	0.4503	0.4068	0.4114	0.3961	0.4024	0.4120	0.4063	-0.0057
28	Measuring Instrument and Machinery for Cultural Activity & Office Work	0.2002	0.2159	0.2139	0.2066	0.2326	0.2263	0.2493	0.2567	0.2620	0.2137	0.2544	0.0407
29	Artwork, Other Manufacture n.e.c.	0.1473	0.1649	0.1836	0.1880	0.2273	0.2893	0.3380	0.3252	0.3634	0.1726	0.3224	0.1498

Sources: See Appendix Table 1.

Notes: "Before" means "before WTO accession" using average of employment, wage bill or output data for 4 years from 1998 to 2001. "After" means "after WTO accession" using average for 4 years from 2002 to 2005. As for the 31 province-level regions and 8 aggregated regions, see note 3 to the text.

Table 1c. "locational Gini confidents": Wage bill basis over 31 province-level units

<i>i</i>	Industry name	1997	1998	1999	2000	2001	2002	2003	2004	2005	"Before" (1998-2001)	"After" (2002-2005)	Change
1	Processing of Food from Agricultural Products	0.3934	0.3139	0.3133	0.3636	0.3353	0.3363	0.3550	0.3706	0.3903	0.3237	0.3585	<i>0.0348</i>
2	Foods	0.2953	0.2324	0.2602	0.2776	0.2365	0.2312	0.2275	0.2364	0.2434	0.2422	0.2229	<i>-0.0193</i>
3	Beverage	0.3311	0.2816	0.2440	0.3135	0.2844	0.2972	0.2705	0.3701	0.2419	0.2720	0.2890	<i>0.0170</i>
4	Tobacco	0.5337	0.5335	0.4909	0.5059	0.4651	0.4693	0.4542	0.4529	0.4808	0.4859	0.4584	<i>-0.0275</i>
5	Textile	0.3462	0.3119	0.2921	0.3320	0.3076	0.3285	0.3178	0.3299	0.3502	0.3019	0.3288	<i>0.0269</i>
6	Textile Wearing Apparel	0.4685	0.4019	0.5135	0.4594	0.4899	0.4637	0.4528	0.4836	0.4614	0.4359	0.4664	<i>0.0305</i>
7	Leather, Fur, Feather and Footware, and Caps; Its Products	0.7023	0.5249	0.5652	0.5915	0.5956	0.6098	0.6145	0.5899	0.5826	0.5674	0.5976	<i>0.0303</i>
8	Processing of Timbers, Wood, Bamboo, Rattan, Palm, and Straw Products	0.4853	0.3926	0.4054	0.4073	0.4442	0.3371	0.4205	0.4466	0.4404	0.4021	0.4068	<i>0.0048</i>
9	Furniture	0.3313	0.2752	0.3225	0.3711	0.3756	0.3938	0.4090	0.3916	0.4177	0.3241	0.3894	<i>0.0653</i>
10	Paper and Paper Products	0.3033	0.2385	0.2061	0.2838	0.2623	0.2532	0.2719	0.2896	0.2926	0.2395	0.2627	<i>0.0232</i>
11	Printing, Reproduction of Recording Media	0.2698	0.1725	0.2050	0.1944	0.2380	0.2250	0.2363	0.2465	0.2489	0.1817	0.2342	<i>0.0524</i>
12	Articles for Culture, Education and Sport Activity	0.4755	0.4668	0.5199	0.5313	0.5633	0.5590	0.5670	0.5577	0.5356	0.5155	0.5525	<i>0.0371</i>
13	Processing of Petroleum, Coking, Processing of Nucleus Fuel	0.4718	0.4236	0.3785	0.4517	0.4302	0.4013	0.4241	0.4591	0.4611	0.4169	0.4209	<i>0.0040</i>
14	Chemical Raw Material and Chemical Products	0.2679	0.2149	0.2004	0.2634	0.3994	0.2034	0.1824	0.1828	0.1805	0.2801	0.1737	<i>-0.1064</i>
15	Medicines	0.2131	0.1943	0.3835	0.4930	0.2183	0.2183	0.2234	0.2729	0.2558	0.2828	0.2298	<i>-0.0530</i>
16	Chemical Fiber	0.2914	0.3734	0.3542	0.4367	0.3911	0.4456	0.4469	0.4743	0.4792	0.3811	0.4453	<i>0.0641</i>
17	Rubber	0.2550	0.2751	0.2551	0.3129	0.2826	0.2967	0.3111	0.3084	0.2996	0.2731	0.2989	<i>0.0258</i>
18	Plastic	0.3464	0.2505	0.3157	0.3529	0.3388	0.3184	0.3202	0.3377	0.3308	0.2870	0.3246	<i>0.0376</i>
19	Non-metallic Mineral Products	0.2937	0.2061	0.2110	0.2602	0.2117	0.2285	0.2413	0.2371	0.2342	0.2081	0.2307	<i>0.0227</i>
20	Manufacture and Processing of Ferrous Metals	0.4546	0.4107	0.3831	0.4428	0.4015	0.4047	0.4117	0.4336	0.4418	0.4066	0.4228	<i>0.0162</i>
21	Manufacture & Processing of Non-ferrous Metals	0.5562	0.5428	0.5359	0.5791	0.5628	0.5592	0.5903	0.5767	0.5806	0.5524	0.5740	<i>0.0216</i>
22	Metal Products	0.2346	0.1224	0.2096	0.2136	0.2210	0.2015	0.2019	0.1960	0.2492	0.1806	0.2097	<i>0.0291</i>
23	General Purpose Machinery	0.2791	0.2739	0.2499	0.3147	0.2892	0.2817	0.2727	0.2835	0.2724	0.2749	0.2745	<i>-0.0004</i>
24	Special Purpose Machinery	0.2510	0.2523	0.2167	0.2665	0.2312	0.2575	0.2831	0.2874	0.2824	0.2243	0.2671	<i>0.0428</i>
25	Transport Equipment	0.4678	0.4130	0.3281	0.5320	0.3576	0.4046	0.3329	0.3437	0.3201	0.3781	0.3429	<i>-0.0352</i>
26	Electrical Machinery & Equipment	0.2486	0.1675	0.2067	0.2149	0.2363	0.2452	0.2320	0.2598	0.2634	0.1903	0.2428	<i>0.0525</i>
27	Communication Equipment, Computer and Other Electronic Equipment	0.4722	0.4117	0.4864	0.4669	0.5012	0.4894	0.4847	0.4720	0.4695	0.4630	0.4756	<i>0.0126</i>
28	Measuring Instrument and Machinery for Cultural Activity & Office Work	0.3238	0.3378	0.3573	0.3075	0.3425	0.3599	0.3667	0.3565	0.3462	0.3202	0.3509	<i>0.0307</i>
29	Artwork, Other Manufacture n.e.c.	0.3801	0.3831	0.3511	0.4471	0.4155	0.4389	0.4567	0.4674	0.4832	0.3819	0.4482	<i>0.0662</i>

Sources: See Appendix Table 1.

Notes: "Before" means "before WTO accession" using average of employment, wage bill or output data for 4 years from 1998 to 2001. "After" means "after WTO accession" using average for 4 years from 2002 to 2005. As for the 31 province-level regions and 8 aggregated regions, see note 3 to the text.

Table 1d. "locational Gini confidents": Wage bill basis over 8 aggregated regions

<i>i</i>	Industry name	1997	1998	1999	2000	2001	2002	2003	2004	2005	"Before" (1998-2001)	"After" (2002-2005)	Change
1	Processing of Food from Agricultural Products	0.2457	0.1561	0.1585	0.2031	0.1898	0.1942	0.2185	0.2325	0.2727	0.1578	0.2335	0.0757
2	Foods	0.1552	0.1537	0.1852	0.1931	0.1588	0.1379	0.0974	0.1100	0.1085	0.1674	0.0989	-0.0686
3	Beverage	0.2121	0.1618	0.1252	0.2036	0.1714	0.1659	0.1721	0.2869	0.1654	0.1553	0.2003	0.0450
4	Tobacco	0.4551	0.4401	0.4111	0.4394	0.3866	0.3659	0.3811	0.3820	0.4027	0.4125	0.3834	-0.0291
5	Textile	0.1800	0.2376	0.2022	0.2381	0.2244	0.2467	0.2391	0.2503	0.2756	0.2198	0.2518	0.0321
6	Textile Wearing Apparel	0.3666	0.3595	0.3854	0.4093	0.4348	0.4149	0.3988	0.4217	0.3922	0.3554	0.4070	0.0517
7	Leather, Fur, Feather and Footware, and Caps; Its Products	0.6135	0.4577	0.5097	0.5182	0.5270	0.5330	0.5132	0.4884	0.4715	0.5017	0.4977	-0.0041
8	Processing of Timbers, Wood, Bamboo, Rattan, Palm, and Straw Products	0.3189	0.2558	0.2651	0.2517	0.3057	0.2240	0.3026	0.2951	0.2538	0.2595	0.2663	0.0068
9	Furniture	0.2715	0.1697	0.2420	0.2829	0.3240	0.3146	0.3503	0.3304	0.3193	0.2526	0.3243	0.0717
10	Paper and Paper Products	0.2212	0.1396	0.1021	0.1467	0.1304	0.1263	0.1315	0.1305	0.1188	0.1219	0.1153	-0.0066
11	Printing, Reproduction of Recording Media	0.2174	0.1233	0.1434	0.1467	0.1665	0.1408	0.1578	0.1663	0.1571	0.1233	0.1534	0.0301
12	Articles for Culture, Education and Sport Activity	0.4379	0.4242	0.4840	0.4923	0.5113	0.5118	0.5182	0.5161	0.4989	0.4779	0.5105	0.0325
13	Processing of Petroleum , Coking, Processing of Nucleus Fuel	0.3705	0.3546	0.2957	0.3341	0.3430	0.2975	0.3357	0.3746	0.3805	0.3240	0.3463	0.0223
14	Chemical Raw Material and Chemical Products	0.1622	0.1471	0.1401	0.1931	0.3289	0.1156	0.1212	0.1285	0.1269	0.2104	0.1187	-0.0917
15	Medicines	0.1098	0.1092	0.3366	0.4206	0.1097	0.1058	0.1098	0.1671	0.1422	0.2123	0.1264	-0.0859
16	Chemical Fiber	0.1822	0.2809	0.2779	0.3531	0.3100	0.2615	0.2749	0.2947	0.3165	0.3050	0.2755	-0.0295
17	Rubber	0.1319	0.1249	0.0945	0.1698	0.1427	0.1319	0.1491	0.1576	0.1507	0.1266	0.1442	0.0176
18	Plastic	0.0624	0.1933	0.2751	0.3068	0.2195	0.2837	0.2772	0.2929	0.2815	0.2340	0.2828	0.0488
19	Non-metallic Mineral Products	0.2040	0.1567	0.1589	0.1756	0.1700	0.1844	0.1980	0.1903	0.1940	0.1544	0.1894	0.0350
20	Manufacture and Processing of Ferrous Metals	0.2721	0.2510	0.2135	0.2751	0.2065	0.2450	0.2670	0.3134	0.3102	0.2283	0.2872	0.0589
21	Manufacture & Processing of Non-ferrous Metals	0.4922	0.4791	0.4708	0.4356	0.4778	0.4931	0.5110	0.5048	0.5027	0.4608	0.5012	0.0404
22	Metal Products	0.1440	0.0697	0.1596	0.1678	0.1703	0.1587	0.1557	0.1552	0.1961	0.1352	0.1677	0.0325
23	General Purpose Machinery	0.1843	0.2262	0.1949	0.2687	0.2426	0.2380	0.2237	0.2404	0.2279	0.2319	0.2320	0.0001
24	Special Purpose Machinery	0.1552	0.1909	0.1528	0.2116	0.1652	0.1617	0.1751	0.1778	0.1802	0.1742	0.1604	-0.0138
25	Transport Equipment	0.3527	0.2808	0.1817	0.4429	0.2008	0.2941	0.2313	0.2266	0.2100	0.2020	0.2330	0.0310
26	Electrical Machinery & Equipment	0.1252	0.1107	0.1487	0.1762	0.1850	0.1902	0.1835	0.2014	0.2035	0.1437	0.1925	0.0488
27	Communication Equipment, Computer and Other Electronic Equipment	0.3805	0.3719	0.4413	0.4258	0.4489	0.4289	0.4140	0.3958	0.3878	0.4194	0.4042	-0.0153
28	Measuring Instrument and Machinery for Cultural Activity & Office Work	0.2025	0.2682	0.2746	0.2519	0.2676	0.2594	0.2891	0.2763	0.2687	0.2541	0.2705	0.0164
29	Artwork, Other Manufacture n.e.c.	0.2261	0.2004	0.2360	0.2608	0.3050	0.3314	0.3390	0.3326	0.3683	0.2261	0.3388	0.1128

Sources: See Appendix Table 1.

Notes: "Before" means "before WTO accession" using average of employment, wage bill or output data for 4 years from 1998 to 2001. "After" means "after WTO accession" using average for 4 years from 2002 to 2005. As for the 31 province-level regions and 8 aggregated regions, see note 3 to the text.

Table 1e. "locational Gini confidents": Output basis over 31 province-level units

<i>i</i>	Industry name	1997	1998	1999	2000	2001	2002	2003	2004	2005	"Before" (1998-2001)	"After" (2002-2005)	Change
1	Processing of Food from Agricultural Products	0.2693	-	0.3037	0.3302	0.3388	0.3515	0.3701	-	0.3910	0.3244	0.3735	0.0491
2	Foods	0.2204	-	0.2335	0.2472	0.2631	0.2902	0.2926	-	0.3323	0.2468	0.3025	0.0557
3	Beverage	0.2438	-	0.3087	0.2624	0.2541	0.2633	0.2724	-	0.2839	0.2687	0.2696	0.0009
4	Tobacco	0.6002	-	0.6065	0.6107	0.5876	0.5523	0.5451	-	0.5447	0.6001	0.5456	-0.0544
5	Textile	0.3038	-	0.3396	0.3311	0.3601	0.3667	0.3730	-	0.3910	0.3436	0.3782	0.0346
6	Textile Wearing Apparel	-	-	-	-	-	-	-	-	-	-	-	-
7	Leather, Fur, Feather and Footware, and Caps; Its Products	-	-	-	-	-	-	-	-	-	-	-	-
8	Processing of Timbers, Wood, Bamboo, Rattan, Palm, and Straw Products	-	-	-	-	-	-	-	-	-	-	-	-
9	Furniture	-	-	-	-	-	-	-	-	-	-	-	-
10	Paper and Paper Products	0.2243	-	0.2334	0.2506	0.2532	0.2521	0.2699	-	0.2872	0.2453	0.2700	0.0247
11	Printing, Reproduction of Recording Media	-	-	-	-	-	-	-	-	-	-	-	-
12	Articles for Culture, Education and Sport Activity	-	-	-	-	-	-	-	-	-	-	-	-
13	Processing of Petroleum , Coking, Processing of Nucleus Fuel	0.3864	-	0.3799	0.3896	0.4061	0.4290	0.4198	-	0.4189	0.3837	0.4200	0.0364
14	Chemical Raw Material and Chemical Products	0.1380	-	0.1536	0.1596	0.1464	0.1283	0.1217	-	0.1641	0.1483	0.1384	-0.0099
15	Medicines	0.1768	-	0.2314	0.2396	0.2453	0.2545	0.2481	-	0.2445	0.2381	0.2446	0.0065
16	Chemical Fiber	0.3498	-	0.3553	0.3816	0.4133	0.4334	0.5239	-	0.5682	0.3644	0.5199	0.1555
17	Rubber	-	-	-	-	-	-	-	-	-	-	-	-
18	Plastic	-	-	-	-	-	-	-	-	-	-	-	-
19	Non-metallic Mineral Products	0.1982	-	0.1954	0.2013	0.1969	0.2027	0.2341	-	0.2413	0.1968	0.2263	0.0295
20	Manufacture and Processing of Ferrous Metals	0.3702	-	0.4003	0.3967	0.3908	0.3973	0.3961	-	0.3730	0.3945	0.3792	-0.0153
21	Manufacture & Processing of Non-ferrous Metals	0.3726	-	0.3712	0.3935	0.3975	0.6691	0.3880	-	0.3862	0.3879	0.4267	0.0387
22	Metal Products	0.1657	-	0.2530	0.2569	0.2465	0.2523	0.2561	-	0.2394	0.2505	0.2451	-0.0053
23	General Purpose Machinery	0.2196	-	0.2714	0.2748	0.2829	0.2872	0.2833	-	0.2691	0.2753	0.2700	-0.0053
24	Special Purpose Machinery	0.2412	-	0.2944	0.2991	0.2786	0.2806	0.2619	-	0.2010	0.2879	0.2233	-0.0645
25	Transport Equipment	0.3158	-	0.3343	0.3425	0.3574	0.3612	0.3641	-	0.3280	0.3434	0.3430	-0.0004
26	Electrical Machinery & Equipment	0.2588	-	0.2615	0.2718	0.2721	0.2702	0.2816	-	0.2823	0.2684	0.2775	0.0090
27	Communication Equipment, Computer and Other Electronic Equipment	0.4996	-	0.4785	0.4716	0.4763	0.4825	0.4738	-	0.4969	0.4746	0.4854	0.0109
28	Measuring Instrument and Machinery for Cultural Activity & Office Work	0.3991	-	0.4131	0.4177	0.3922	0.4012	0.4172	-	0.3953	0.4060	0.4006	-0.0055
29	Artwork, Other Manufacture n.e.c.	-	-	-	-	-	-	-	-	-	-	-	-

Sources: See Appendix Table 1.

Notes: "Before" means "before WTO accession" using average of employment, wage bill or output data for 4 years from 1998 to 2001. "After" means "after WTO accession" using average for 4 years from 2002 to 2005. As for the 31 province-level regions and 8 aggregated regions, see note 3 to the text.

Table 1f. "locational Gini confidents": Output basis over 8 aggregated regions

<i>i</i>	Industry name	1997	1998	1999	2000	2001	2002	2003	2004	2005	"Before" (1998-2001)	"After" (2002-2005)	Change
1	Processing of Food from Agricultural Products	0.1762	-	0.2225	0.2537	0.2653	0.2751	0.3071	-	0.3300	0.2485	0.3097	0.0612
2	Foods	0.1228	-	0.1431	0.1539	0.1650	0.1973	0.1937	-	0.2457	0.1540	0.2167	0.0627
3	Beverage	0.1471	-	0.2054	0.1811	0.1862	0.1858	0.1938	-	0.2334	0.1851	0.2081	0.0229
4	Tobacco	0.5162	-	0.5269	0.5328	0.4997	0.4671	0.4673	-	0.4672	0.5168	0.4674	-0.0493
5	Textile	0.2389	-	0.2602	0.2639	0.2754	0.2823	0.2770	-	0.2924	0.2667	0.2841	0.0173
6	Textile Wearing Apparel	-	-	-	-	-	-	-	-	-	-	-	-
7	Leather, Fur, Feather and Footware, and Caps; Its Products	-	-	-	-	-	-	-	-	-	-	-	-
8	Processing of Timbers, Wood, Bamboo, Rattan, Palm, and Straw Products	-	-	-	-	-	-	-	-	-	-	-	-
9	Furniture	-	-	-	-	-	-	-	-	-	-	-	-
10	Paper and Paper Products	0.1747	-	0.1649	0.1695	0.1659	0.1655	0.1798	-	0.2035	0.1668	0.1877	0.0209
11	Printing, Reproduction of Recording Media	-	-	-	-	-	-	-	-	-	-	-	-
12	Articles for Culture, Education and Sport Activity	-	-	-	-	-	-	-	-	-	-	-	-
13	Processing of Petroleum , Coking, Processing of Nucleus Fuel	0.3349	-	0.3253	0.3384	0.3346	0.3553	0.3504	-	0.3523	0.3339	0.3513	0.0174
14	Chemical Raw Material and Chemical Products	0.0702	-	0.0830	0.0853	0.0675	0.0706	0.0587	-	0.1042	0.0735	0.0807	0.0072
15	Medicines	0.0730	-	0.1277	0.1242	0.1319	0.1500	0.1564	-	0.1715	0.1280	0.1615	0.0334
16	Chemical Fiber	0.3182	-	0.3134	0.3319	0.3031	0.3237	0.3958	-	0.4241	0.3157	0.3895	0.0738
17	Rubber	-	-	-	-	-	-	-	-	-	-	-	-
18	Plastic	-	-	-	-	-	-	-	-	-	-	-	-
19	Non-metallic Mineral Products	0.1730	-	0.1656	0.1722	0.1655	0.1668	0.1974	-	0.1940	0.1680	0.1878	0.0198
20	Manufacture and Processing of Ferrous Metals	0.1739	-	0.2123	0.2032	0.2102	0.2353	0.2452	-	0.2361	0.2067	0.2374	0.0307
21	Manufacture & Processing of Non-ferrous Metals	0.3006	-	0.3024	0.3274	0.3294	0.5837	0.3251	-	0.3206	0.3207	0.3613	0.0406
22	Metal Products	0.1325	-	0.2181	0.2269	0.2143	0.2251	0.2220	-	0.2118	0.2194	0.2178	-0.0017
23	General Purpose Machinery	0.1775	-	0.2304	0.2361	0.2436	0.2453	0.2471	-	0.2228	0.2373	0.2325	-0.0048
24	Special Purpose Machinery	0.1850	-	0.2371	0.2326	0.2200	0.2141	0.1813	-	0.1036	0.2296	0.1459	-0.0836
25	Transport Equipment	0.1538	-	0.1850	0.2133	0.2303	0.2263	0.2247	-	0.2133	0.2120	0.2185	0.0066
26	Electrical Machinery & Equipment	0.2229	-	0.2170	0.2234	0.2262	0.2209	0.2235	-	0.2293	0.2227	0.2256	0.0029
27	Communication Equipment, Computer and Other Electronic Equipment	0.4452	-	0.4265	0.4283	0.4281	0.4360	0.4287	-	0.4517	0.4280	0.4400	0.0120
28	Measuring Instrument and Machinery for Cultural Activity & Office Work	0.3353	-	0.3525	0.3654	0.3373	0.3412	0.3783	-	0.3502	0.3508	0.3560	0.0052
29	Artwork, Other Manufacture n.e.c.	-	-	-	-	-	-	-	-	-	-	-	-

Sources: See Appendix Table 1.

Notes: "Before" means "before WTO accession" using average of employment, wage bill or output data for 4 years from 1998 to 2001. "After" means "after WTO accession" using average for 4 years from 2002 to 2005. As for the 31 province-level regions and 8 aggregated regions, see note 3 to the text.

Table 2a. Summary statistics: Labor employment weight

Variables (natural logarism)	"Before" period ($t_0=1997, T=2001$)				"After" period ($t_0=2002, T=2005$)				Pooled sample	
	Observations = 897				Observations = 897				Observations = 1794	
	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation
(1) Relative employment growth	-0.1151	0.5651	-3.6055	2.5236	-0.1334	0.4977	-3.0446	2.4778	-0.1243	0.5324
(2) Relative wage growth	0.0137	0.3263	-2.2439	1.9478	0.0009	0.2414	-2.1358	1.3133	0.0073	0.2870
(3) Wage	-0.1508	0.4344	-2.8310	2.3487	-0.1588	0.4053	-3.7162	2.1958	-0.1548	0.4200
(4) Scale ^L	-0.0879	0.7778	-5.8140	1.9444	-0.0529	0.8974	-4.5855	2.8235	-0.0704	0.8397
(5) Frwd ^{ALL}	-0.5875	1.0223	-4.7358	1.3722	-0.5808	1.0028	-4.9603	1.5919	-0.5841	1.0123
(6) Frwd ^{MNF}	-1.2389	2.0280	-17.0226	1.9133	-1.3903	2.0976	-17.0979	1.8943	-1.3146	2.0639
(7) Bkwd ^{ALL}	-0.6031	0.9954	-5.1795	0.9468	-0.6138	1.0330	-5.0923	1.1541	-0.6085	1.0141
(8) Bkwd ^{MNF}	-1.9442	3.7561	-20.0000	1.5292	-2.1838	3.8582	-20.0000	1.6095	-2.0640	3.8083
(9) Intra ^L	-0.2092	0.7402	-4.7358	1.3722	-0.3339	0.9456	-6.8362	2.5676	-0.2716	0.8512
(10) Diver ^L	0.4955	0.3555	-0.5698	1.4363	0.5459	0.4165	-0.7646	1.6474	0.5207	0.3879
(11) Skill ^L	-0.0076	0.1862	-0.5205	0.5306	0.0203	0.1887	-0.4903	0.6009	0.0063	0.1879
(12) Intim ^L	-0.1461	0.5563	-1.6703	1.6397	-0.1695	0.4546	-1.6885	0.7962	-0.1578	0.5080
(13) Trans ^{1L}	-0.0375	0.6211	-1.8946	1.2969	-0.0145	0.6211	-1.8127	1.2933	-0.0260	0.6210
(14) Trans ^{2L}	0.1577	0.5696	-0.9162	1.8479	0.1753	0.5303	-0.8011	1.7536	0.1665	0.5502
(15) Trans ^{3L}	0.0234	0.7675	-1.2582	3.5367	0.0203	0.6792	-1.3507	2.8299	0.0218	0.7245
(16) Trans ^{4L}	-0.5801	2.0874	-6.4743	1.7252	-0.5272	2.0919	-6.3840	1.8977	-0.5537	2.0892
(17) Trans ^{5L}	-0.5556	2.1124	-6.3123	1.9376	-0.5018	2.1201	-6.1208	2.1051	-0.5287	2.1159

Table 2b. Summary statistics: Product output weight

Variables (natural logarism)	"Before" period ($t_0=1997, T=2001$)				"After" period ($t_0=2002, T=2005$)				Pooled sample	
	Observations = 619				Observations = 619				Observations = 1238	
	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation
(1) Relative output growth	-0.1494	0.5062	-3.7047	2.3429	-0.1119	0.5317	-3.7047	3.6469	-0.0745	0.5539
(2) Relative wage growth	0.0363	0.3386	-2.2439	1.9478	0.0165	0.2933	-2.2439	1.9478	-0.0032	0.2384
(3) Wage	-0.1528	0.4436	-2.8310	2.3487	-0.1429	0.4302	-3.7162	2.3487	-0.1331	0.4165
(4) Scale ^Q	-0.4168	0.8812	-7.4043	1.7605	-0.4032	0.8899	-7.4043	2.4470	-0.3897	0.8989
(5) Frwd ^{ALL}	-0.6261	1.0102	-5.3453	1.3722	-0.6266	1.0058	-5.3453	1.5919	-0.6272	1.0024
(6) Frwd ^{MNF}	-1.3457	2.1413	-17.0226	1.5285	-1.4074	2.1083	-17.0226	1.8635	-1.4690	2.0748
(7) Bkwd ^{ALL}	-0.6331	1.0030	-5.1795	0.9468	-0.6299	1.0131	-5.1795	1.1541	-0.6267	1.0239
(8) Bkwd ^{MNF}	-2.3159	4.3754	-20.0000	1.5292	-2.4433	4.4262	-20.0000	1.6095	-2.5705	4.4762
(9) Intra ^Q	-0.3065	0.8829	-4.1026	2.8433	-0.3538	1.0125	-6.9460	2.9460	-0.4010	1.1259
(10) Diver ^Q	0.4915	0.3636	-0.5698	1.4363	0.5167	0.3983	-0.7646	1.6474	0.5419	0.4290
(11) Skill ^Q	0.0079	0.1866	-0.5080	0.5196	0.0166	0.1865	-0.5181	0.5196	0.0253	0.1861
(12) Intim ^Q	-0.1720	0.5543	-1.7025	1.5971	-0.1729	0.5079	-1.7173	1.5971	-0.1738	0.4574
(13) Trans ^{1Q}	0.0529	0.6222	-1.7854	1.3612	0.0632	0.6215	-1.7854	1.3683	0.0736	0.6211
(14) Trans ^{2Q}	0.1757	0.5679	-0.8925	1.7089	0.2007	0.5502	-0.8925	1.7089	0.2257	0.5313
(15) Trans ^{3Q}	0.0733	0.7730	-1.1707	3.5642	0.0928	0.7290	-1.2143	3.5642	0.1123	0.6822
(16) Trans ^{4Q}	-0.3765	2.0944	-6.2160	2.0974	-0.3466	2.0956	-6.2160	2.2492	-0.3168	2.0980
(17) Trans ^{5Q}	-0.3162	2.1223	-6.2331	2.2489	-0.2808	2.1251	-6.2331	2.4631	-0.2454	2.1290

Table 3a. Correlation matrix: Labor employment weight

"Before" period ($t_0=1997, T=2001$)																		
Log variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Relative employment growth	1.00																	
(2) Relative wage growth	-0.11	1.00																
(3) <i>Wage</i> ^L	0.25	-0.47	1.00															
(4) <i>Scale</i> ^L	0.18	-0.09	0.04	1.00														
(5) <i>Frwd</i> ^{ALL}	0.11	-0.01	0.04	0.29	1.00													
(6) <i>Frwd</i> ^{MNF}	0.09	-0.01	0.10	0.30	0.81	1.00												
(7) <i>Bkwd</i> ^{ALL}	0.11	0.02	0.10	0.25	0.90	0.81	1.00											
(8) <i>Bkwd</i> ^{MNF}	0.05	0.02	0.06	0.10	0.32	0.35	0.41	1.00										
(9) <i>Intra</i> ^L	0.06	-0.07	0.22	0.48	0.20	0.20	0.18	0.06	1.00									
(10) <i>Diver</i> ^L	-0.20	-0.03	-0.03	-0.13	-0.49	-0.44	-0.48	-0.16	-0.19	1.00								
(11) <i>Skill</i> ^L	-0.08	0.06	-0.05	0.11	0.17	0.16	0.18	0.07	-0.01	0.07	1.00							
(12) <i>Intim</i> ^L	0.13	0.02	0.22	-0.13	-0.12	-0.18	-0.06	-0.03	0.01	0.00	0.01	1.00						
(13) <i>Trans</i> ^{1L}	-0.16	-0.04	-0.39	0.02	-0.15	-0.31	-0.22	-0.12	-0.12	0.24	-0.20	-0.10	1.00					
(14) <i>Trans</i> ^{2L}	-0.15	0.00	-0.04	-0.20	-0.67	-0.61	-0.72	-0.30	-0.13	0.42	-0.03	0.07	0.23	1.00				
(15) <i>Trans</i> ^{3L}	-0.03	-0.06	-0.14	-0.26	-0.54	-0.59	-0.51	-0.14	-0.11	0.08	-0.29	0.26	0.42	0.23	1.00			
(16) <i>Trans</i> ^{4L}	-0.12	-0.05	-0.39	0.04	-0.14	-0.26	-0.23	-0.12	-0.06	-0.01	-0.38	-0.32	0.67	0.15	0.35	1.00		
(17) <i>Trans</i> ^{5L}	-0.13	-0.04	-0.44	0.04	-0.17	-0.30	-0.27	-0.14	-0.08	0.05	-0.29	-0.31	0.72	0.16	0.39	0.98	1.00	
(18) Dummy for coastal regions	0.14	0.03	0.46	-0.09	0.24	0.37	0.32	0.19	0.07	-0.21	-0.17	0.04	-0.60	-0.29	-0.39	-0.42	-0.51	1.00

"After" period ($t_0=2002, T=2005$)																		
Log variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Relative employment growth	1.00																	
(2) Relative wage growth	-0.02	1.00																
(3) <i>Wage</i> ^L	0.19	-0.35	1.00															
(4) <i>Scale</i> ^L	-0.11	-0.03	0.06	1.00														
(5) <i>Frwd</i> ^{ALL}	0.05	0.07	0.12	0.25	1.00													
(6) <i>Frwd</i> ^{MNF}	0.11	0.07	0.19	0.19	0.80	1.00												
(7) <i>Bkwd</i> ^{ALL}	0.12	0.07	0.20	0.23	0.88	0.80	1.00											
(8) <i>Bkwd</i> ^{MNF}	0.02	0.01	0.11	0.09	0.39	0.39	0.40	1.00										
(9) <i>Intra</i> ^L	0.06	-0.11	0.23	0.58	0.26	0.19	0.25	0.09	1.00									
(10) <i>Diver</i> ^L	-0.18	-0.06	-0.11	-0.09	-0.43	-0.40	-0.43	-0.18	-0.24	1.00								
(11) <i>Skill</i> ^L	-0.20	0.05	-0.06	0.07	0.08	0.06	0.04	0.03	-0.10	-0.03	1.00							
(12) <i>Intim</i> ^L	-0.01	0.03	0.19	0.11	0.30	0.20	0.32	0.10	0.14	-0.12	0.16	1.00						
(13) <i>Trans</i> ^{1L}	-0.07	0.04	-0.44	-0.03	-0.18	-0.34	-0.25	-0.15	-0.15	0.24	-0.08	-0.12	1.00					
(14) <i>Trans</i> ^{2L}	-0.15	-0.05	-0.11	-0.15	-0.69	-0.59	-0.73	-0.32	-0.20	0.44	0.11	-0.29	0.21	1.00				
(15) <i>Trans</i> ^{3L}	0.00	-0.05	-0.25	-0.19	-0.48	-0.56	-0.45	-0.17	-0.09	0.07	-0.19	-0.15	0.49	0.18	1.00			
(16) <i>Trans</i> ^{4L}	-0.07	0.02	-0.46	-0.01	-0.18	-0.29	-0.28	-0.15	-0.10	-0.04	-0.23	-0.35	0.67	0.14	0.42	1.00		
(17) <i>Trans</i> ^{5L}	-0.09	0.03	-0.51	0.00	-0.22	-0.33	-0.32	-0.17	-0.12	-0.01	-0.17	-0.35	0.71	0.17	0.47	0.99	1.00	
(18) Dummy for coastal regions	0.21	-0.09	0.50	-0.09	0.28	0.42	0.35	0.23	0.11	-0.13	-0.25	0.00	-0.60	-0.26	-0.44	-0.42	-0.50	1.00

Change in correlation (difference between absolute values)																		
Log variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Relative employment growth	-																	
(2) Relative wage growth	-0.09	-																
(3) <i>Wage</i> ^L	-0.07	-0.12	-															
(4) <i>Scale</i> ^L	-0.07	-0.06	0.02	-														
(5) <i>Frwd</i> ^{ALL}	-0.06	0.06	0.08	-0.04	-													
(6) <i>Frwd</i> ^{MNF}	0.02	0.06	0.09	-0.11	-0.01	-												
(7) <i>Bkwd</i> ^{ALL}	0.00	0.05	0.10	-0.01	-0.01	-0.02	-											
(8) <i>Bkwd</i> ^{MNF}	-0.03	-0.01	0.06	-0.01	0.06	0.05	-0.02	-										
(9) <i>Intra</i> ^L	0.00	0.03	0.01	0.09	0.06	-0.01	0.07	0.03	-									
(10) <i>Diver</i> ^L	-0.02	0.02	0.07	-0.04	-0.05	-0.04	-0.05	0.02	0.05	-								
(11) <i>Skill</i> ^L	0.12	0.00	0.01	-0.04	-0.09	-0.10	-0.15	-0.04	0.09	-0.04	-							
(12) <i>Intim</i> ^L	-0.12	0.01	-0.03	-0.02	0.18	0.02	0.26	0.07	0.13	0.12	0.15	-						
(13) <i>Trans</i> ^{1L}	-0.09	0.00	0.06	0.01	0.04	0.03	0.04	0.03	0.04	0.00	-0.12	0.01	-					
(14) <i>Trans</i> ^{2L}	0.00	0.05	0.07	-0.05	0.02	-0.02	0.00	0.02	0.07	0.02	0.08	0.22	-0.02	-				
(15) <i>Trans</i> ^{3L}	-0.03	-0.01	0.11	-0.07	-0.06	-0.02	-0.06	0.02	-0.02	-0.02	-0.10	-0.11	0.08	-0.05	-			
(16) <i>Trans</i> ^{4L}	-0.05	-0.03	0.07	-0.03	0.04	0.03	0.05	0.03	0.03	0.04	-0.14	0.03	0.00	-0.02	0.07	-		
(17) <i>Trans</i> ^{5L}	-0.05	-0.01	0.07	-0.04	0.05	0.03	0.05	0.03	0.04	-0.04	-0.13	0.05	-0.01	0.00	0.08	0.00	-	
(18) Dummy for coastal regions	0.07	0.06	0.04	-0.01	0.04	0.06	0.03	0.04	0.04	-0.08	0.08	-0.03	0.00	-0.03	0.05	0.00	-0.01	-

Table 3b. Correlation matrix: Product output weight

"Before" period ($t_0=1997, T=2001$)																		
Log variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Relative output growth	1.00																	
(2) Relative wage growth	0.16	1.00																
(3) Wage	0.21	-0.49	1.00															
(4) Scale ^Q	0.26	0.08	0.32	1.00														
(5) Frwd ^{ALL}	-0.02	0.02	0.07	0.52	1.00													
(6) Frwd ^{MNF}	-0.02	0.01	0.10	0.53	0.79	1.00												
(7) Bkwd ^{ALL}	0.03	0.06	0.12	0.54	0.90	0.81	1.00											
(8) Bkwd ^{MNF}	-0.07	0.06	0.03	0.19	0.27	0.29	0.38	1.00										
(9) Intra ^Q	0.15	0.00	0.25	0.63	0.29	0.16	0.25	0.07	1.00									
(10) Diver ^Q	-0.09	-0.06	-0.05	-0.43	-0.46	-0.42	-0.47	-0.12	-0.40	1.00								
(11) Skill ^Q	-0.16	0.03	0.01	0.08	0.18	0.19	0.20	0.11	0.02	0.06	1.00							
(12) Intim ^Q	0.11	-0.02	0.21	-0.10	-0.14	-0.22	-0.10	-0.05	0.03	0.02	0.03	1.00						
(13) Trans ^{1Q}	-0.18	-0.04	-0.40	-0.30	-0.14	-0.32	-0.22	-0.06	-0.12	0.23	-0.20	-0.09	1.00					
(14) Trans ^{2Q}	-0.06	-0.07	-0.02	-0.40	-0.64	-0.60	-0.71	-0.27	-0.16	0.40	-0.03	0.10	0.22	1.00				
(15) Trans ^{3Q}	0.02	-0.09	-0.18	-0.45	-0.55	-0.61	-0.54	-0.12	-0.11	0.08	-0.29	0.26	0.42	0.23	1.00			
(16) Trans ^{4Q}	-0.13	-0.06	-0.39	-0.24	-0.13	-0.25	-0.23	-0.08	-0.10	0.00	-0.37	-0.32	0.68	0.15	0.35	1.00		
(17) Trans ^{5Q}	-0.16	-0.06	-0.44	-0.28	-0.16	-0.29	-0.27	-0.08	-0.11	0.05	-0.29	-0.30	0.72	0.16	0.39	0.98	1.00	
(18) Dummy for coastal regions	0.29	0.04	0.43	0.30	0.23	0.35	0.32	0.16	0.07	-0.20	-0.16	0.01	-0.60	-0.29	-0.39	-0.42	-0.50	1.00

"After" period ($t_0=2002, T=2005$)																		
Log variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Relative output growth	1.00																	
(2) Relative wage growth	0.24	1.00																
(3) Wage	-0.07	-0.30	1.00															
(4) Scale ^Q	-0.25	-0.08	0.43	1.00														
(5) Frwd ^{ALL}	0.07	0.08	0.17	0.50	1.00													
(6) Frwd ^{MNF}	0.08	0.06	0.24	0.52	0.79	1.00												
(7) Bkwd ^{ALL}	0.06	0.06	0.24	0.51	0.90	0.81	1.00											
(8) Bkwd ^{MNF}	0.00	0.01	0.11	0.18	0.35	0.36	0.36	1.00										
(9) Intra ^Q	-0.18	-0.11	0.29	0.68	0.29	0.20	0.28	0.04	1.00									
(10) Diver ^Q	-0.11	-0.02	-0.13	-0.40	-0.42	-0.39	-0.43	-0.16	-0.43	1.00								
(11) Skill ^Q	0.01	0.05	-0.01	0.05	0.11	0.09	0.08	0.07	-0.06	-0.03	1.00							
(12) Intim ^Q	0.04	0.06	0.16	0.15	0.29	0.18	0.29	0.07	0.08	-0.12	0.18	1.00						
(13) Trans ^{1Q}	0.06	0.04	-0.45	-0.33	-0.19	-0.36	-0.27	-0.10	-0.16	0.23	-0.09	-0.11	1.00					
(14) Trans ^{2Q}	-0.04	-0.06	-0.12	-0.39	-0.66	-0.59	-0.72	-0.28	-0.22	0.43	0.10	-0.29	0.20	1.00				
(15) Trans ^{3Q}	-0.03	-0.06	-0.29	-0.43	-0.50	-0.58	-0.48	-0.15	-0.09	0.07	-0.20	-0.14	0.49	0.18	1.00			
(16) Trans ^{4Q}	0.01	-0.01	-0.46	-0.25	-0.18	-0.30	-0.28	-0.11	-0.08	-0.03	-0.23	-0.35	0.67	0.14	0.42	1.00		
(17) Trans ^{5Q}	0.01	0.00	-0.51	-0.28	-0.22	-0.34	-0.33	-0.11	-0.10	0.00	-0.17	-0.34	0.71	0.16	0.47	0.99	1.00	
(18) Dummy for coastal regions	0.00	-0.08	0.48	0.31	0.27	0.43	0.35	0.20	0.10	-0.12	-0.25	-0.02	-0.60	-0.26	-0.44	-0.42	-0.50	1.00

Change in correlation (difference between absolute values)																		
Log variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Relative employment growth	-																	
(2) Relative wage growth	0.07	-																
(3) Wage	-0.14	-0.19	-															
(4) Scale ^L	-0.01	-0.01	0.10	-														
(5) Frwd ^{ALL}	0.05	0.06	0.10	-0.01	-													
(6) Frwd ^{MNF}	0.06	0.05	0.13	-0.01	0.00	-												
(7) Bkwd ^{ALL}	0.03	0.00	0.13	-0.03	0.00	0.00	-											
(8) Bkwd ^{MNF}	-0.07	-0.05	0.08	0.00	0.08	0.07	-0.02	-										
(9) Intra ^L	0.03	0.11	0.04	0.04	0.00	0.04	0.03	-0.03	-									
(10) Diver ^L	0.02	-0.03	0.09	-0.03	-0.04	-0.03	-0.04	0.04	0.03	-								
(11) Skill ^L	-0.15	0.02	0.01	-0.03	-0.08	-0.10	-0.12	-0.04	0.04	-0.03	-							
(12) Intim ^L	-0.07	0.04	-0.05	0.05	0.16	-0.04	0.19	0.02	0.05	0.10	0.16	-						
(13) Trans ^{1L}	-0.12	0.00	0.05	0.03	0.05	0.04	0.04	0.05	0.04	0.00	-0.11	0.02	-					
(14) Trans ^{2L}	-0.01	0.00	0.11	-0.01	0.02	-0.02	0.01	0.01	0.06	0.02	0.07	0.18	-0.02	-				
(15) Trans ^{3L}	0.01	-0.03	0.11	-0.01	-0.05	-0.03	-0.06	0.03	-0.02	-0.02	-0.09	-0.13	0.07	-0.05	-			
(16) Trans ^{4L}	-0.12	-0.05	0.07	0.01	0.06	0.05	0.05	0.03	-0.02	0.03	-0.14	0.03	0.00	-0.01	0.07	-		
(17) Trans ^{5L}	-0.15	-0.05	0.07	0.00	0.06	0.05	0.06	0.03	-0.01	-0.05	-0.12	0.04	-0.01	0.01	0.07	0.00	-	
(18) Dummy for coastal regions	-0.29	0.05	0.05	0.00	0.04	0.07	0.03	0.04	0.03	-0.08	0.09	0.01	0.00	-0.03	0.05	0.00	-0.01	-

Table 4. Regression results on pooled sample

Dependent variable: Relative employment growth (natural logarithm)								
Variables	(1.a)	(1.b)	(1.c)	(1.d)	(2.a)	(2.b)	(3.a)	(3.b)
<i>Wage</i>	0.2868 *** (0.0542)	0.1956 *** (0.0642)	0.2856 *** (0.0531)	0.1957 *** (0.0635)	0.2632 *** (0.0539)	0.1609 *** (0.0643)	0.2955 *** (0.0544)	0.1945 *** (0.0642)
<i>Scale^L</i>	0.1801 *** (0.0421)	0.2157 *** (0.0460)	0.1888 *** (0.0422)	0.2207 *** (0.0461)	0.1842 *** (0.0421)	0.2219 *** (0.0459)	0.1765 *** (0.0422)	0.2175 *** (0.0461)
<i>Frwd^{ALL}</i>	0.0436 (0.0454)	0.1057 ** (0.0469)			0.0478 (0.0455)	0.1088 *** (0.0465)	0.0397 (0.0458)	0.0992 ** (0.0475)
<i>Frwd^{MNF}</i>			-0.0148 (0.0137)	0.0007 (0.0242)				
<i>Bkwd^{ALL}</i>	-0.0522 (0.0431)	-0.0291 (0.0619)			-0.0589 * (0.0428)	-0.0320 (0.0616)	-0.0988 ** (0.0432)	-0.0328 (0.0619)
<i>Bkwd^{MNF}</i>			0.0004 (0.0043)	0.0257 * (0.0184)				
<i>Intra^L</i>	-0.1112 *** (0.0473)	-0.1416 *** (0.0474)	-0.1099 ** (0.0477)	-0.1348 *** (0.0483)	-0.1128 *** (0.0471)	-0.1450 *** (0.0470)	-0.1096 *** (0.0469)	-0.1414 *** (0.0473)
<i>Diver^L</i>	-0.2406 *** (0.0474)	-0.3148 *** (0.0672)	-0.2647 *** (0.0523)	-0.3699 *** (0.0694)	-0.2446 *** (0.0465)	-0.3335 *** (0.0678)	-0.2317 *** (0.0470)	-0.3250 *** (0.0707)
<i>Skill^L</i>	-0.2369 *** (0.0974)	-0.9507 *** (0.3582)	-0.2206 ** (0.1003)	-0.9385 *** (0.3454)	-0.2650 *** (0.1024)	-1.0602 *** (0.3877)	-0.1987 ** (0.0985)	-0.9778 *** (0.3633)
<i>Intim^L</i>	0.1206 *** (0.0465)	0.2462 *** (0.0770)	0.1087 *** (0.0466)	0.1778 ** (0.0843)	0.1229 *** (0.0467)	0.2405 *** (0.0771)	0.1225 *** (0.0467)	0.2513 *** (0.0777)
<i>Trans^{1L}</i>					-0.0449 (0.0377)	-1.5246 *** (0.6274)		
<i>Trans^{2L}</i>							-0.1260 *** (0.0476)	0.1297 (0.1095)
<i>Trans^{3L}</i>								
<i>Trans^{4L}</i>								
<i>Trans^{5L}</i>								
<i>Wage</i> * "After" dummy	-0.1386 * (0.0940)	-0.1559 ** (0.0818)	-0.1229 * (0.0929)	-0.1570 ** (0.0821)	-0.0796 (0.1029)	-0.1014 (0.0873)	-0.1399 * (0.0954)	-0.1556 ** (0.0830)
<i>Scale^L</i> * "After" dummy	-0.2681 *** (0.0505)	-0.2748 *** (0.0515)	-0.2778 *** (0.0504)	-0.2808 *** (0.0514)	-0.2743 *** (0.0506)	-0.2819 *** (0.0516)	-0.2649 *** (0.0505)	-0.2779 *** (0.0521)
<i>Frwd^{ALL}</i> * "After" dummy	-0.1337 ** (0.0642)	-0.1154 ** (0.0602)			-0.1434 ** (0.0643)	-0.1133 ** (0.0595)	-0.1357 ** (0.0644)	-0.1067 ** (0.0610)
<i>Frwd^{MNF}</i> * "After" dummy			0.0283 ** (0.0160)	0.0184 (0.0181)				
<i>Bkwd^{ALL}</i> * "After" dummy	0.1502 *** (0.0583)	0.0951 * (0.0580)			0.1656 *** (0.0580)	0.1010 ** (0.0569)	0.1816 *** (0.0600)	0.1019 * (0.0621)
<i>Bkwd^{MNF}</i> * "After" dummy			-0.0043 (0.0053)	-0.0044 (0.0052)				
<i>Intra^L</i> * "After" dummy	0.1484 *** (0.0611)	0.1209 ** (0.0588)	0.1437 *** (0.0616)	0.1141 ** (0.0598)	0.1524 *** (0.0608)	0.1257 ** (0.0584)	0.1477 *** (0.0610)	0.1201 ** (0.0591)
<i>Diver^L</i> * "After" dummy	0.0201 (0.0465)	0.0232 (0.0439)	0.0540 (0.0516)	0.0761 * (0.0497)	0.0269 (0.0473)	0.0729 * (0.0473)	0.0271 (0.0464)	0.0258 (0.0440)
<i>Skill^L</i> * "After" dummy	-0.1903 * (0.1275)	-0.2491 ** (0.1256)	-0.2290 ** (0.1305)	-0.2544 ** (0.1263)	-0.1278 (0.1305)	-0.1446 (0.1273)	-0.2006 * (0.1300)	-0.3183 *** (0.1303)
<i>Intim^L</i> * "After" dummy	-0.1515 *** (0.0635)	-0.0982 * (0.0618)	-0.1362 ** (0.0643)	-0.1031 * (0.0630)	-0.1584 *** (0.0635)	-0.1182 ** (0.0618)	-0.1631 *** (0.0639)	-0.0640 (0.0638)
<i>Trans^{1L}</i> * "After" dummy					0.1125 *** (0.0453)	0.1122 *** (0.0458)		
<i>Trans^{2L}</i> * "After" dummy							0.0619 (0.0716)	0.0636 (0.0747)
<i>Trans^{3L}</i> * "After" dummy								
<i>Trans^{4L}</i> * "After" dummy								
<i>Trans^{5L}</i> * "After" dummy								
Dummy for coastal regions	0.0468 * (0.0330)		0.0498 * (0.0351)		0.0531 * (0.0398)		0.0398 (0.0332)	
<i>F</i> -statistics on coefficients with "After" dummy	11.2209 ***	12.4808 ***	10.5943 ***	12.0329 ***	10.8073 ***	12.3972 ***	10.1517 ***	11.3405 ***
Fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.1338	0.2134	0.1312	0.2119	0.1364	0.2199	0.1378	0.2137
Observations	1794	1794	1794	1794	1794	1794	1794	1794

Dependent variable: Relative employment growth (natural logarithm)

Variables	(4.a)	(4.b)	(5.a)	(5.b)	(6.a)	(6.b)
<i>Wage</i>	0.2904 *** (0.0536)	0.1957 *** (0.0635)	0.2688 *** (0.0548)	0.1811 *** (0.0643)	0.2679 *** (0.0551)	0.1823 *** (0.0647)
<i>Scale^L</i>	0.1841 *** (0.0423)	0.2149 *** (0.0460)	0.1826 *** (0.0421)	0.2169 *** (0.0460)	0.1831 *** (0.0423)	0.2178 *** (0.0460)
<i>Frwd^{ALL}</i>	0.0529 (0.0446)	0.1026 ** (0.0477)	0.0495 (0.0459)	0.1121 *** (0.0468)	0.0482 (0.0459)	0.1070 ** (0.0474)
<i>Frwd^{MNF}</i>						
<i>Bkwd^{ALL}</i>	-0.0509 (0.0432)	-0.0284 (0.0621)	-0.0626 * (0.0437)	-0.0389 (0.0615)	-0.0622 * (0.0440)	-0.0325 (0.0619)
<i>Bkwd^{MNF}</i>						
<i>Intra^L</i>	-0.1125 *** (0.0473)	-0.1414 *** (0.0473)	-0.1127 *** (0.0471)	-0.1422 *** (0.0474)	-0.1127 *** (0.0472)	-0.1412 *** (0.0472)
<i>Diver^L</i>	-0.2277 *** (0.0524)	-0.3158 *** (0.0673)	-0.2604 *** (0.0507)	-0.3485 *** (0.0680)	-0.2573 *** (0.0506)	-0.3242 *** (0.0675)
<i>Skill^L</i>	-0.2096 ** (0.0990)	-0.9423 *** (0.3662)	-0.3240 *** (0.1017)	-1.0520 *** (0.3777)	-0.2975 *** (0.0987)	-1.1668 *** (0.3910)
<i>Intim^L</i>	0.1119 *** (0.0436)	0.2542 *** (0.0776)	0.1031 ** (0.0478)	0.2276 *** (0.0776)	0.1067 ** (0.0477)	0.2497 *** (0.0762)
<i>Trans^{1L}</i>						
<i>Trans^{2L}</i>						
<i>Trans^{3L}</i>	0.0294 (0.0376)	-0.0637 (0.1442)				
<i>Trans^{4L}</i>			-0.0195 ** (0.0102)	-0.7367 ** (0.3463)		
<i>Trans^{5L}</i>					-0.0169 ** (0.0097)	-0.2291 (0.1791)
<i>Wage</i> * "After" dummy	-0.1446 * (0.0954)	-0.1540 ** (0.0849)	-0.1240 (0.1042)	-0.1437 * (0.0908)	-0.1186 (0.1067)	-0.1290 * (0.0951)
<i>Scale^L</i> * "After" dummy	-0.2700 *** (0.0503)	-0.2726 *** (0.0511)	-0.2706 *** (0.0507)	-0.2761 *** (0.0521)	-0.2716 *** (0.0510)	-0.2808 *** (0.0522)
<i>Frwd^{ALL}</i> * "After" dummy	-0.1402 ** (0.0649)	-0.1086 ** (0.0630)	-0.1355 ** (0.0637)	-0.1212 ** (0.0600)	-0.1360 ** (0.0637)	-0.1164 ** (0.0600)
<i>Frwd^{MNF}</i> * "After" dummy						
<i>Bkwd^{ALL}</i> * "After" dummy	0.1479 *** (0.0584)	0.0964 ** (0.0578)	0.1578 *** (0.0585)	0.1153 ** (0.0578)	0.1597 *** (0.0586)	0.0989 ** (0.0586)
<i>Bkwd^{MNF}</i> * "After" dummy						
<i>Intra^L</i> * "After" dummy	0.1489 *** (0.0609)	0.1194 ** (0.0582)	0.1491 *** (0.0607)	0.1208 ** (0.0589)	0.1495 *** (0.0608)	0.1214 ** (0.0587)
<i>Diver^L</i> * "After" dummy	0.0098 (0.0530)	0.0291 (0.0510)	0.0407 (0.0563)	0.1051 ** (0.0566)	0.0419 (0.0570)	0.0672 (0.0529)
<i>Skill^L</i> * "After" dummy	-0.2046 * (0.1288)	-0.2361 ** (0.1289)	-0.1329 (0.1318)	-0.1248 (0.1321)	-0.1466 (0.1300)	-0.2285 ** (0.1354)
<i>Intim^L</i> * "After" dummy	-0.1420 ** (0.0615)	-0.1041 ** (0.0610)	-0.1454 ** (0.0639)	-0.1009 * (0.0623)	-0.1457 ** (0.0637)	-0.0856 * (0.0621)
<i>Trans^{1L}</i> * "After" dummy						
<i>Trans^{2L}</i> * "After" dummy						
<i>Trans^{3L}</i> * "After" dummy	-0.0181 (0.0468)	0.0063 (0.0455)				
<i>Trans^{4L}</i> * "After" dummy			0.0123 (0.0141)	0.0185 * (0.0138)		
<i>Trans^{5L}</i> * "After" dummy					0.0129 (0.0135)	0.0195 * (0.0134)
Dummy for coastal regions	0.0594 * (0.0379)		0.0235 (0.0342)		0.0256 (0.0342)	
<i>F</i> -statistics on coefficients						
with "After" dummy	9.9408 ***	10.4729 ***	10.0186 ***	11.6731 ***	10.0571 ***	11.5731
Fixed effects	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.1333	0.2126	0.1346	0.2163	0.1341	0.2144
Observations	1794	1794	1794	1794	1794	1794

Notes: “*”, “**” and “***” indicate significance at the 0.10, 0.05 and 0.01 levels (one-tailed), respectively. Heteroskedasticity-consistent standard errors in parentheses. “After” dummy takes zero for the period from 1997, and one for the period from 2002. Fixed effect include both industry- and region-specific dummy variables.

Table 5. Regression results on pooled sample

Dependent variable: Relative output growth (natural logarithm)								
Variables	(1.a)	(1.b)	(1.c)	(1.d)	(2.a)	(2.b)	(3.a)	(3.b)
<i>Wage</i>	0.0799 (0.0644)	0.0244 (0.0684)	0.0825 * (0.0627)	0.0367 (0.0681)	0.0737 (0.0639)	0.0066 (0.0684)	0.0909 * (0.0653)	0.0302 (0.0694)
<i>Scale</i> ^Q	0.0808 (0.0680)	0.1528 ** (0.0746)	0.1006 * (0.0660)	0.1672 ** (0.0726)	0.0798 (0.0689)	0.1473 ** (0.0756)	0.0766 (0.0689)	0.1500 ** (0.0755)
<i>Frwd</i> ^{ALL}	0.0276 (0.0540)	0.1160 ** (0.0549)			0.0291 (0.0542)	0.1228 ** (0.0549)	0.0275 (0.0545)	0.1137 ** (0.0550)
<i>Frwd</i> ^{MNF}			-0.0093 (0.0220)	0.0072 (0.0360)				
<i>Bkwd</i> ^{ALL}	-0.0147 (0.0581)	-0.0272 (0.0691)			-0.0199 (0.0579)	-0.0280 (0.0690)	-0.0435 (0.0581)	-0.0413 (0.0692)
<i>Bkwd</i> ^{MNF}			-0.0003 (0.0044)	0.0238 * (0.0163)				
<i>Intra</i> ^Q	0.0640 * (0.0473)	-0.0062 (0.0505)	0.0544 (0.0435)	-0.0045 (0.0461)	0.0654 * (0.0475)	-0.0030 (0.0509)	0.0664 * (0.0475)	-0.0042 (0.0506)
<i>Diver</i> ^Q	-0.1213 ** (0.0550)	-0.2019 *** (0.0836)	-0.1628 *** (0.0612)	-0.2807 *** (0.0860)	-0.1287 *** (0.0542)	-0.1998 *** (0.0837)	-0.1211 ** (0.0548)	-0.2089 *** (0.0862)
<i>Skill</i> ^Q	-0.1380 (0.1159)	-0.5289 * (0.3340)	-0.1099 (0.1165)	-0.4125 (0.3231)	-0.1130 (0.1179)	-0.6986 ** (0.3644)	-0.1152 (0.1182)	-0.5059 * (0.3446)
<i>Intim</i> ^Q	0.1141 ** (0.0547)	0.1917 ** (0.1002)	0.1069 ** (0.0540)	0.0859 (0.1073)	0.1158 ** (0.0551)	0.1901 ** (0.1009)	0.1149 ** (0.0548)	0.1913 ** (0.1015)
<i>Trans</i> ^{1Q}					0.0113 (0.0384)	-0.5402 (0.5276)		
<i>Trans</i> ^{2Q}							-0.0768 * (0.0518)	0.0316 (0.1239)
<i>Trans</i> ^{3Q}								
<i>Trans</i> ^{4Q}								
<i>Trans</i> ^{5Q}								
<i>Wage</i> * "After" dummy	-0.0417 (0.0959)	-0.0728 (0.0865)	-0.0212 (0.0945)	-0.0785 (0.0845)	-0.0124 (0.1038)	-0.0404 (0.0910)	-0.0545 (0.0982)	-0.0821 (0.0893)
<i>Scale</i> ^Q * "After" dummy	-0.1154 * (0.0798)	-0.1020 (0.0808)	-0.1736 ** (0.0784)	-0.1526 ** (0.0800)	-0.1077 * (0.0813)	-0.0900 (0.0821)	-0.1093 * (0.0810)	-0.0974 (0.0822)
<i>Frwd</i> ^{ALL} * "After" dummy	-0.1436 ** (0.0787)	-0.1434 ** (0.0763)			-0.1540 ** (0.0789)	-0.1557 ** (0.0776)	-0.1437 ** (0.0791)	-0.1421 ** (0.0764)
<i>Frwd</i> ^{MNF} * "After" dummy			0.0353 * (0.0256)	0.0340 (0.0271)				
<i>Bkwd</i> ^{ALL} * "After" dummy	0.1244 * (0.0786)	0.0958 (0.0768)			0.1354 ** (0.0782)	0.1023 * (0.0763)	0.1626 ** (0.0818)	0.1266 * (0.0814)
<i>Bkwd</i> ^{MNF} * "After" dummy			-0.0014 (0.0055)	-0.0023 (0.0055)				
<i>Intra</i> ^Q * "After" dummy	-0.0004 (0.0623)	0.0127 (0.0628)	0.0216 (0.0601)	0.0262 (0.0605)	-0.0038 (0.0631)	0.0081 (0.0641)	-0.0037 (0.0628)	0.0092 (0.0637)
<i>Diver</i> ^Q * "After" dummy	-0.0259 (0.0535)	-0.0040 (0.0524)	0.0512 (0.0618)	0.0962 * (0.0636)	-0.0288 (0.0531)	0.0025 (0.0547)	-0.0248 (0.0537)	-0.0071 (0.0521)
<i>Skill</i> ^Q * "After" dummy	-0.1419 (0.1431)	-0.2803 ** (0.1457)	-0.1878 * (0.1430)	-0.2774 ** (0.1448)	-0.1259 (0.1444)	-0.2419 ** (0.1467)	-0.1796 (0.1481)	-0.3429 ** (0.1541)
<i>Intim</i> ^Q * "After" dummy	-0.1663 *** (0.0709)	-0.1231 ** (0.0690)	-0.1755 *** (0.0726)	-0.1463 ** (0.0710)	-0.1657 *** (0.0709)	-0.1304 ** (0.0691)	-0.1649 ** (0.0716)	-0.1035 * (0.0722)
<i>Trans</i> ^{1Q} * "After" dummy					0.0588 (0.0499)	0.0628 (0.0508)		
<i>Trans</i> ^{2Q} * "After" dummy							0.1037 * (0.0795)	0.0967 (0.0858)
<i>Trans</i> ^{3Q} * "After" dummy								
<i>Trans</i> ^{4Q} * "After" dummy								
<i>Trans</i> ^{5Q} * "After" dummy								
Dummy for coastal regions	0.0193 (0.0323)		0.0134 (0.0373)		0.0490 * (0.0380)		0.0150 (0.0324)	
<i>F</i> -statistics on coefficients with "After" dummy	6.2831 ***	6.5003 ***	6.2583 ***	6.5705 ***	5.7391 ***	6.0492 ***	5.9002 ***	5.9390 ***
Fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.1048	0.1645	0.1025	0.1652	0.1061	0.1650	0.1057	0.1646
Observations	1238	1238	1238	1238	1238	1238	1238	1238

Dependent variable: Relative output growth (natural logarithm)

Variables	(4.a)	(4.b)	(5.a)	(5.b)	(6.a)	(6.b)
<i>Wage</i>	0.0907 * (0.0639)	0.0374 (0.0682)	0.0840 * (0.0650)	0.0195 (0.0691)	0.0874 * (0.0655)	0.0323 (0.0689)
<i>Scale</i> ^Q	0.1004 * (0.0687)	0.1648 ** (0.0752)	0.0819 (0.0687)	0.1546 ** (0.0742)	0.0832 (0.0687)	0.1542 ** (0.0747)
<i>Frwd</i> ^{ALL}	0.0468 (0.0515)	0.1207 ** (0.0540)	0.0263 (0.0547)	0.1149 ** (0.0548)	0.0243 (0.0544)	0.1106 ** (0.0546)
<i>Frwd</i> ^{MNF}						
<i>Bkwd</i> ^{ALL}	-0.0102 (0.0576)	-0.0263 (0.0685)	-0.0121 (0.0578)	-0.0275 (0.0689)	-0.0096 (0.0579)	-0.0230 (0.0689)
<i>Bkwd</i> ^{MNF}						
<i>Intra</i> ^Q	0.0539 (0.0464)	-0.0125 (0.0504)	0.0629 * (0.0472)	-0.0067 (0.0503)	0.0628 * (0.0472)	-0.0060 (0.0504)
<i>Diver</i> ^Q	-0.0919 * (0.0617)	-0.1979 ** (0.0860)	-0.1181 ** (0.0582)	-0.2157 *** (0.0839)	-0.1147 ** (0.0575)	-0.1973 *** (0.0836)
<i>Skill</i> ^Q	-0.0808 (0.1086)	-0.4271 (0.3381)	-0.1489 (0.1191)	-0.5247 * (0.3654)	-0.1359 (0.1157)	-0.4955 * (0.3776)
<i>Intim</i> ^Q	0.0947 ** (0.0498)	0.1555 * (0.0983)	0.1126 ** (0.0575)	0.1945 ** (0.1005)	0.1160 ** (0.0572)	0.2035 ** (0.1000)
<i>Trans</i> ^{1Q}						
<i>Trans</i> ^{2Q}						
<i>Trans</i> ^{3Q}	0.0704 ** (0.0418)	-0.1028 (0.1743)				
<i>Trans</i> ^{4Q}			-0.0007 (0.0122)	-0.4935 ** (0.2470)		
<i>Trans</i> ^{5Q}					0.0030 (0.0111)	-0.1032 (0.1521)
<i>Wage</i> * "After" dummy	-0.0652 (0.0956)	-0.1050 (0.0866)	-0.0727 (0.1032)	-0.0893 (0.0906)	-0.0751 (0.1057)	-0.0970 (0.0942)
<i>Scale</i> ^Q * "After" dummy	-0.1451 ** (0.0806)	-0.1271 * (0.0810)	-0.1183 * (0.0809)	-0.1022 (0.0806)	-0.1196 * (0.0809)	-0.1042 * (0.0810)
<i>Frwd</i> ^{ALL} * "After" dummy	-0.1697 ** (0.0781)	-0.1540 ** (0.0756)	-0.1307 ** (0.0787)	-0.1393 ** (0.0769)	-0.1308 ** (0.0783)	-0.1348 ** (0.0767)
<i>Frwd</i> ^{MNF} * "After" dummy						
<i>Bkwd</i> ^{ALL} * "After" dummy	0.1166 * (0.0781)	0.0918 (0.0765)	0.1074 * (0.0781)	0.0910 (0.0761)	0.1059 * (0.0781)	0.0799 (0.0759)
<i>Bkwd</i> ^{MNF} * "After" dummy						
<i>Intra</i> ^Q * "After" dummy	0.0154 (0.0608)	0.0265 (0.0607)	0.0003 (0.0625)	0.0141 (0.0629)	0.0009 (0.0625)	0.0128 (0.0626)
<i>Diver</i> ^Q * "After" dummy	-0.0631 (0.0601)	-0.0193 (0.0658)	-0.0496 (0.0606)	0.0173 (0.0638)	-0.0505 (0.0604)	-0.0176 (0.0585)
<i>Skill</i> ^Q * "After" dummy	-0.2065 * (0.1379)	-0.3091 ** (0.1425)	-0.1816 (0.1459)	-0.2770 ** (0.1529)	-0.1745 (0.1437)	-0.3314 ** (0.1488)
<i>Intim</i> ^Q * "After" dummy	-0.1431 ** (0.0668)	-0.1232 ** (0.0678)	-0.1845 *** (0.0725)	-0.1513 ** (0.0707)	-0.1836 *** (0.0721)	-0.1355 ** (0.0701)
<i>Trans</i> ^{1Q} * "After" dummy						
<i>Trans</i> ^{2Q} * "After" dummy						
<i>Trans</i> ^{3Q} * "After" dummy	-0.1005 ** (0.0499)	-0.1086 ** (0.0473)				
<i>Trans</i> ^{4Q} * "After" dummy			-0.0171 (0.0159)	-0.0118 (0.0153)		
<i>Trans</i> ^{5Q} * "After" dummy					-0.0178 (0.0151)	-0.0138 (0.0143)
Dummy for coastal regions	0.0305 (0.0373)		0.0052 (0.0340)		0.0095 (0.0341)	
<i>F</i> -statistics on coefficients						
with "After" dummy	5.9630 ***	3.5215 ***	5.7397 ***	6.3675 ***	5.7515 ***	5.6159 ***
Fixed effects	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.1074	0.1670	0.1052	0.1669	0.1047	0.1640
Observations	1238	1238	1238	1238	1238	1238

Notes: “*”, “**” and “***” indicate significance at the 0.10, 0.05 and 0.01 levels (one-tailed), respectively. Heteroskedasticity-consistent standard errors in parentheses. “After” dummy takes zero for the period from 1997, and one for the period from 2002. Fixed effects include both industry- and region-specific dummy variables.

Table 6a. Regression results on pooled sample

Dependent variable: Relative wage growth (natural logarithm)								
Variables	(1.a)	(1.b)	(1.c)	(1.d)	(2.a)	(2.b)	(3.a)	(3.b)
<i>Wage</i>	-0.4642 *** (0.0407)	-0.5150 *** (0.0699)	-0.4571 *** (0.0407)	-0.5152 *** (0.0691)	-0.4872 *** (0.0404)	-0.5275 *** (0.0686)	-0.4670 *** (0.0412)	-0.5145 *** (0.0698)
<i>Scale^L</i>	-0.0273 ** (0.0157)	-0.0111 (0.0200)	-0.0304 ** (0.0160)	-0.0119 (0.0200)	-0.0250 * (0.0157)	-0.0102 (0.0199)	-0.0261 ** (0.0158)	-0.0112 (0.0200)
<i>Frwd^{ALL}</i>	-0.0796 *** (0.0231)	-0.0663 *** (0.0247)			-0.0725 *** (0.0237)	-0.0624 *** (0.0244)	-0.0784 *** (0.0227)	-0.0668 *** (0.0249)
<i>Frwd^{MNF}</i>			-0.0047 (0.0058)	-0.0100 (0.0113)				
<i>Bkwd^{ALL}</i>	0.0728 *** (0.0220)	0.0814 *** (0.0313)			0.0696 *** (0.0220)	0.0808 *** (0.0314)	0.0882 *** (0.0242)	0.0790 *** (0.0328)
<i>Bkwd^{MNF}</i>			0.0022 (0.0028)	0.0031 (0.0091)				
<i>Intra^L</i>	0.0382 ** (0.0176)	0.0226 * (0.0172)	0.0358 ** (0.0179)	0.0214 (0.0178)	0.0353 ** (0.0177)	0.0231 * (0.0172)	0.0377 ** (0.0174)	0.0226 * (0.0173)
<i>Diver^L</i>	-0.0257 (0.0234)	-0.0622 ** (0.0334)	-0.0180 (0.0260)	-0.0498 * (0.0370)	-0.0110 (0.0238)	-0.0509 * (0.0346)	-0.0291 (0.0234)	-0.0645 ** (0.0341)
<i>Skill^L</i>	0.1291 *** (0.0524)	0.1687 (0.1692)	0.1342 *** (0.0571)	0.1943 (0.1622)	0.0494 (0.0525)	0.0108 (0.1699)	0.1166 ** (0.0538)	0.1822 (0.1682)
<i>Intim^L</i>	0.0714 *** (0.0244)	0.0385 (0.0508)	0.0761 *** (0.0254)	0.0460 (0.0645)	0.0707 *** (0.0244)	0.0386 (0.0505)	0.0708 *** (0.0243)	0.0374 (0.0527)
<i>Trans^{1L}</i>					-0.0813 *** (0.0186)	0.6582 ** (0.3778)		
<i>Trans^{2L}</i>							0.0417 ** (0.0231)	-0.0081 (0.0564)
<i>Trans^{3L}</i>								
<i>Trans^{4L}</i>								
<i>Trans^{5L}</i>								
<i>Wage</i> * "After" dummy	0.1562 ** (0.0886)	0.1049 (0.1020)	0.1520 ** (0.0841)	0.1017 (0.1060)	0.1901 ** (0.0959)	0.1397 (0.1094)	0.1562 ** (0.0896)	0.1037 (0.1036)
<i>Scale^L</i> * "After" dummy	0.0400 ** (0.0198)	0.0340 ** (0.0192)	0.0446 ** (0.0205)	0.0348 ** (0.0196)	0.0349 ** (0.0198)	0.0310 * (0.0191)	0.0389 ** (0.0198)	0.0342 ** (0.0194)
<i>Frwd^{ALL}</i> * "After" dummy	0.0551 * (0.0411)	0.0718 ** (0.0390)			0.0504 (0.0401)	0.0649 ** (0.0375)	0.0562 * (0.0407)	0.0729 ** (0.0391)
<i>Frwd^{MNF}</i> * "After" dummy			0.0037 (0.0070)	0.0090 (0.0077)				
<i>Bkwd^{ALL}</i> * "After" dummy	-0.0486 * (0.0329)	-0.0503 * (0.0330)			-0.0417 * (0.0317)	-0.0436 * (0.0318)	-0.0578 * (0.0354)	-0.0455 (0.0382)
<i>Bkwd^{MNF}</i> * "After" dummy			-0.0037 (0.0033)	-0.0032 (0.0031)				
<i>Intra^L</i> * "After" dummy	-0.0560 ** (0.0278)	-0.0538 ** (0.0253)	-0.0549 ** (0.0270)	-0.0499 ** (0.0250)	-0.0530 ** (0.0274)	-0.0531 ** (0.0250)	-0.0558 ** (0.0277)	-0.0540 ** (0.0252)
<i>Diver^L</i> * "After" dummy	-0.0091 (0.0228)	-0.0074 (0.0217)	-0.0215 (0.0245)	-0.0198 (0.0243)	-0.0070 (0.0234)	-0.0224 (0.0228)	-0.0114 (0.0230)	-0.0068 (0.0219)
<i>Skill^L</i> * "After" dummy	-0.0390 (0.0692)	0.0055 (0.0628)	-0.0453 (0.0746)	0.0090 (0.0647)	0.0203 (0.0720)	0.0374 (0.0656)	-0.0377 (0.0716)	0.0003 (0.0633)
<i>Intim^L</i> * "After" dummy	-0.0147 (0.0354)	-0.0184 (0.0331)	-0.0164 (0.0346)	-0.0134 (0.0318)	-0.0213 (0.0354)	-0.0223 (0.0329)	-0.0104 (0.0360)	-0.0186 (0.0320)
<i>Trans^{1L}</i> * "After" dummy					0.0694 *** (0.0268)	0.0652 *** (0.0280)		
<i>Trans^{2L}</i> * "After" dummy							-0.0160 (0.0336)	0.0138 (0.0357)
<i>Trans^{3L}</i> * "After" dummy								
<i>Trans^{4L}</i> * "After" dummy								
<i>Trans^{5L}</i> * "After" dummy								
Dummy for coastal regions	0.1463 *** (0.0273)		0.1542 *** (0.0269)		0.1084 *** (0.0272)		0.1486 *** (0.0275)	
<i>F</i> -statistics on coefficients								
with "After" dummy	4.7749 ***	3.4786 ***	4.6450 ***	2.8706 ***	5.3995 ***	4.4764 ***	4.2492 ***	3.1078 ***
Fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.2547	0.3241	0.2473	0.3192	0.2636	0.3290	0.2559	0.3233
Observations	1794	1794	1794	1794	1794	1794	1794	1794

Dependent variable: Relative wage growth (natural logarithm)

Variables	(4.a)	(4.b)	(5.a)	(5.b)	(6.a)	(6.b)
<i>Wage</i>	-0.4764 *** (0.0400)	-0.5205 *** (0.0684)	-0.4926 *** (0.0412)	-0.5242 *** (0.0678)	-0.4991 *** (0.0417)	-0.5371 *** (0.0668)
<i>Scale^L</i>	-0.0382 *** (0.0163)	-0.0142 (0.0203)	-0.0234 *** (0.0156)	-0.0085 (0.0191)	-0.0220 * (0.0156)	-0.0068 (0.0191)
<i>Frwd^{ALL}</i>	-0.1065 *** (0.0226)	-0.0779 *** (0.0251)	-0.0703 *** (0.0233)	-0.0653 *** (0.0244)	-0.0708 *** (0.0232)	-0.0554 *** (0.0238)
<i>Frwd^{MNF}</i>						
<i>Bkwd^{ALL}</i>	0.0682 *** (0.0221)	0.0817 *** (0.0318)	0.0564 *** (0.0217)	0.0856 *** (0.0313)	0.0543 *** (0.0217)	0.0749 *** (0.0306)
<i>Bkwd^{MNF}</i>						
<i>Intra^L</i>	0.0422 *** (0.0169)	0.0234 * (0.0170)	0.0358 ** (0.0174)	0.0227 * (0.0172)	0.0354 ** (0.0174)	0.0202 (0.0174)
<i>Diver^L</i>	-0.0632 *** (0.0260)	-0.0701 ** (0.0332)	-0.0568 ** (0.0260)	-0.0439 * (0.0342)	-0.0556 ** (0.0263)	-0.0737 ** (0.0333)
<i>Skill^L</i>	0.0527 (0.0520)	0.1535 (0.1659)	-0.0093 (0.0540)	-0.0067 (0.1606)	0.0098 (0.0532)	0.1941 (0.1642)
<i>Intim^L</i>	0.0966 *** (0.0221)	0.0777 * (0.0508)	0.0436 ** (0.0251)	0.0420 (0.0497)	0.0443 ** (0.0249)	0.0130 (0.0461)
<i>Trans^{1L}</i>						
<i>Trans^{2L}</i>						
<i>Trans^{3L}</i>	-0.0845 *** (0.0243)	-0.1508 ** (0.0738)				
<i>Trans^{4L}</i>			-0.0309 *** (0.0049)	0.7880 *** (0.2151)		
<i>Trans^{5L}</i>					-0.0326 ** (0.0050)	0.4602 *** (0.1124)
<i>Wage</i> * "After" dummy	0.1786 ** (0.0882)	0.1259 (0.1061)	0.1781 ** (0.1012)	0.1521 * (0.1129)	0.1858 ** (0.1039)	0.1649 * (0.1166)
<i>Scale^L</i> * "After" dummy	0.0465 *** (0.0199)	0.0416 ** (0.0195)	0.0362 ** (0.0196)	0.0255 * (0.0188)	0.0346 ** (0.0196)	0.0262 * (0.0191)
<i>Frwd^{ALL}</i> * "After" dummy	0.0780 ** (0.0409)	0.0967 *** (0.0391)	0.0526 * (0.0396)	0.0683 ** (0.0375)	0.0526 * (0.0396)	0.0584 * (0.0363)
<i>Frwd^{MNF}</i> * "After" dummy						
<i>Bkwd^{ALL}</i> * "After" dummy	-0.0409 (0.0326)	-0.0443 * (0.0330)	-0.0370 (0.0304)	-0.0496 * (0.0315)	-0.0343 (0.0301)	-0.0157 (0.0295)
<i>Bkwd^{MNF}</i> * "After" dummy						
<i>Intra^L</i> * "After" dummy	-0.0584 ** (0.0269)	-0.0588 *** (0.0249)	-0.0551 ** (0.0272)	-0.0499 ** (0.0243)	-0.0548 ** (0.0271)	-0.0474 ** (0.0241)
<i>Diver^L</i> * "After" dummy	0.0254 (0.0259)	0.0225 (0.0262)	0.0224 (0.0320)	-0.0272 (0.0286)	0.0246 (0.0331)	0.0190 (0.0319)
<i>Skill^L</i> * "After" dummy	0.0109 (0.0683)	0.0566 (0.0625)	0.0502 (0.0789)	0.0137 (0.0704)	0.0360 (0.0766)	0.1497 ** (0.0832)
<i>Intim^L</i> * "After" dummy	-0.0432 (0.0343)	-0.0374 (0.0313)	-0.0055 (0.0337)	0.0086 (0.0304)	-0.0073 (0.0334)	-0.0060 (0.0313)
<i>Trans^{1L}</i> * "After" dummy						
<i>Trans^{2L}</i> * "After" dummy						
<i>Trans^{3L}</i> * "After" dummy	0.0668 *** (0.0268)	0.0569 ** (0.0276)				
<i>Trans^{4L}</i> * "After" dummy			0.0188 ** (0.0091)	0.0177 ** (0.0093)		
<i>Trans^{5L}</i> * "After" dummy					0.0205 ** (0.0095)	0.0229 ** (0.0103)
Dummy for coastal regions	0.1144 *** (0.0311)		0.1088 *** (0.0249)		0.1015 *** (0.0239)	
<i>F</i> -statistics on coefficients						
with "After" dummy	4.2492 ***	4.4088 ***	4.9125 ***	5.3800 ***	5.1623 ***	5.6234 ***
Fixed effects	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.2670	0.3282	0.2696	0.3375	0.2712	0.3380
Observations	1794	1794	1794	1794	1794	1794

Notes: “*”, “**” and “***” indicate significance at the 0.10, 0.05 and 0.01 levels (one-tailed), respectively. Heteroskedasticity-consistent standard errors in parentheses. “After” dummy takes zero for the period from 1997, and one for the period from 2002. Fixed effects include both industry- and region-specific dummy variables.

Table 6b. Regression results on pooled sample

Dependent variable: Relative wage growth (natural logarithm)								
Variables	(1.a)	(1.b)	(1.c)	(1.d)	(2.c)	(2.d)	(3.c)	(3.d)
<i>Wage</i>	-0.5302 *** (0.0502)	-0.5630 *** (0.0796)	-0.5250 *** (0.0504)	-0.5658 *** (0.0783)	-0.5547 *** (0.0511)	-0.5821 *** (0.0778)	-0.5283 *** (0.0522)	-0.5654 *** (0.0783)
<i>Scale</i> ^Q	0.1239 *** (0.0304)	0.1156 *** (0.0286)	0.1407 *** (0.0359)	0.1292 *** (0.0328)	0.1342 *** (0.0346)	0.1255 *** (0.0322)	0.1425 *** (0.0359)	0.1290 *** (0.0327)
<i>Frwd</i> ^{ALL}	-0.0810 *** (0.0267)	-0.0506 * (0.0316)						
<i>Frwd</i> ^{MNF}			-0.0246 *** (0.0076)	-0.0364 ** (0.0163)	-0.0271 *** (0.0075)	-0.0398 *** (0.0165)	-0.0222 *** (0.0086)	-0.0367 ** (0.0168)
<i>Bkwd</i> ^{ALL}	0.0489 ** (0.0265)	0.0265 (0.0319)						
<i>Bkwd</i> ^{MNF}			0.0026 (0.0026)	-0.0039 (0.0094)	0.0039 * (0.0026)	-0.0032 (0.0093)	0.0028 (0.0026)	-0.0040 (0.0094)
<i>Intra</i> ^Q	0.0004 (0.0184)	-0.0096 (0.0193)	-0.0180 (0.0194)	-0.0235 (0.0188)	-0.0133 (0.0194)	-0.0190 (0.0187)	-0.0183 (0.0194)	-0.0234 (0.0188)
<i>Diver</i> ^Q	0.0376 * (0.0293)	0.0136 (0.0422)	0.0261 (0.0309)	0.0048 (0.0467)	0.0377 (0.0312)	0.0103 (0.0469)	0.0236 (0.0298)	0.0047 (0.0472)
<i>Skill</i> ^Q	0.0871 * (0.0639)	-0.0788 (0.1923)	0.1091 * (0.0696)	-0.0523 (0.1907)	0.0284 *** (0.0687)	-0.2058 (0.1948)	0.1057 * (0.0713)	-0.0509 (0.1900)
<i>Intim</i> ^Q	0.0817 *** (0.0273)	0.0504 (0.0692)	0.0747 *** (0.0286)	0.0525 (0.0840)	0.0694 *** (0.0284)	0.0290 (0.0790)	0.0754 *** (0.0289)	0.0525 (0.0849)
<i>Trans</i> ^{1Q}					-0.0998 *** (0.0223)	0.3849 (0.3266)		
<i>Trans</i> ^{2Q}							0.0198 (0.0301)	-0.0048 (0.0640)
<i>Trans</i> ^{3Q}								
<i>Trans</i> ^{4Q}								
<i>Trans</i> ^{5Q}								
<i>Wage</i> * "After" dummy	0.2787 *** (0.1064)	0.2117 * (0.1314)	0.2647 *** (0.1028)	0.2046 * (0.1346)	0.3139 *** (0.1154)	0.2468 ** (0.1434)	0.2676 *** (0.1059)	0.2040 * (0.1382)
<i>Scale</i> ^Q * "After" dummy	-0.1216 *** (0.0393)	-0.1001 *** (0.0391)	-0.1359 *** (0.0456)	-0.1186 *** (0.0452)	-0.1270 *** (0.0447)	-0.1138 *** (0.0442)	-0.1379 *** (0.0453)	-0.1181 *** (0.0448)
<i>Frwd</i> ^{ALL} * "After" dummy	0.0995 ** (0.0480)	0.1083 *** (0.0459)						
<i>Frwd</i> ^{MNF} * "After" dummy			0.0261 *** (0.0100)	0.0270 ** (0.0122)	0.0315 *** (0.0102)	0.0348 *** (0.0120)	0.0234 ** (0.0118)	0.0275 ** (0.0148)
<i>Bkwd</i> ^{ALL} * "After" dummy	-0.0580 * (0.0414)	-0.0672 * (0.0428)						
<i>Bkwd</i> ^{MNF} * "After" dummy			-0.0037 (0.0032)	-0.0031 (0.0030)	-0.0052 * (0.0033)	-0.0035 (0.0031)	-0.0039 (0.0033)	-0.0030 (0.0030)
<i>Intra</i> ^Q * "After" dummy	-0.0096 (0.0237)	-0.0088 (0.0229)	0.0092 (0.0254)	0.0115 (0.0247)	0.0026 (0.0256)	0.0063 (0.0245)	0.0096 (0.0254)	0.0115 (0.0246)
<i>Diver</i> ^Q * "After" dummy	-0.0558 ** (0.0281)	-0.0469 ** (0.0268)	-0.0507 ** (0.0299)	-0.0379 (0.0322)	-0.0518 ** (0.0297)	-0.0438 * (0.0328)	-0.0495 ** (0.0294)	-0.0382 (0.0317)
<i>Skill</i> ^Q * "After" dummy	0.0119 (0.0839)	0.0391 (0.0752)	0.0008 (0.0903)	0.0251 (0.0774)	0.0605 (0.0945)	0.0845 (0.0839)	0.0053 (0.0965)	0.0244 (0.0802)
<i>Intim</i> ^Q * "After" dummy	-0.0261 (0.0421)	-0.0299 (0.0395)	-0.0135 (0.0414)	-0.0155 (0.0382)	-0.0142 (0.0411)	-0.0224 (0.0387)	-0.0141 (0.0439)	-0.0155 (0.0388)
<i>Trans</i> ^{1Q} * "After" dummy					0.1040 *** (0.0379)	0.0990 *** (0.0373)		
<i>Trans</i> ^{2Q} * "After" dummy					0.1019 *** (0.0288)		-0.0211 (0.0407)	0.0042 (0.0407)
<i>Trans</i> ^{3Q} * "After" dummy								
<i>Trans</i> ^{4Q} * "After" dummy								
<i>Trans</i> ^{5Q} * "After" dummy								
Dummy for coastal regions	0.1274 *** (0.0317)		0.1400 *** (0.0319)		0.1019 *** (0.0288)		0.1414 *** (0.0323)	
<i>F</i> -statistics on coefficients with "After" dummy	10.1893 ***	6.9924 ***	9.8766 ***	6.7729 ***	10.5969 ***	7.9161 ***	8.8304 ***	5.9603 ***
Fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.2873	0.3500	0.2865	0.3531	0.2997	0.3610	0.2858	0.3871
Observations	1238	1238	1238	1238	1238	1238	1238	1238

Dependent variable: Relative wage growth (natural logarithm)

Variables	(4.c)	(4.d)	(5.c)	(5.d)	(6.c)	(6.d)
<i>Wage</i>	-0.5287 *** (0.0504)	-0.5664 *** (0.0776)	-0.5577 *** (0.0514)	-0.5742 *** (0.0782)	-0.5662 *** (0.0521)	-0.5843 *** (0.0766)
<i>Scale</i> ^Q	0.1247 *** (0.0331)	0.1238 *** (0.0321)	0.1330 *** (0.0347)	0.1261 *** (0.0326)	0.1315 *** (0.0346)	0.1261 *** (0.0324)
<i>Frwd</i> ^{ALL}						
<i>Frwd</i> ^{MNF}	-0.0365 *** (0.0096)	-0.0413 *** (0.0174)	-0.0316 *** (0.0073)	-0.0395 *** (0.0164)	-0.0331 *** (0.0073)	-0.0405 *** (0.0166)
<i>Bkwd</i> ^{ALL}						
<i>Bkwd</i> ^{MNF}	0.0037 * (0.0026)	-0.0028 (0.0091)	0.0037 * (0.0025)	-0.0040 (0.0092)	0.0041 * (0.0025)	-0.0036 (0.0092)
<i>Intra</i> ^Q	-0.0146 (0.0190)	-0.0226 (0.0188)	-0.0198 (0.0189)	-0.0227 (0.0187)	-0.0186 (0.0190)	-0.0231 (0.0187)
<i>Diver</i> ^Q	-0.0049 (0.0350)	-0.0020 (0.0469)	-0.0234 (0.0324)	-0.0046 (0.0453)	-0.0203 (0.0324)	-0.0100 (0.0439)
<i>Skill</i> ^Q	0.0436 (0.0650)	-0.0824 (0.1893)	-0.0618 (0.0692)	-0.2369 (0.1931)	-0.0349 (0.0679)	-0.1803 (0.1932)
<i>Intim</i> ^Q	0.0909 *** (0.0262)	0.0880 (0.0775)	0.0283 (0.0289)	0.0260 (0.0765)	0.0279 (0.0289)	0.0176 (0.0742)
<i>Trans</i> ^{1Q}						
<i>Trans</i> ^{2Q}						
<i>Trans</i> ^{3Q}	-0.0727 *** (0.0296)	-0.1438 * (0.0939)				
<i>Trans</i> ^{4Q}			-0.0420 *** (0.0063)	0.2663 ** (0.1582)		
<i>Trans</i> ^{5Q}					-0.0444 *** (0.0062)	0.1922 ** (0.0996)
<i>Wage</i> * "After" dummy	0.2748 *** (0.1015)	0.2134 * (0.1373)	0.2956 *** (0.1220)	0.2459 ** (0.1463)	0.3057 *** (0.1259)	0.2618 ** (0.1511)
<i>Scale</i> ^Q * "After" dummy	-0.1237 *** (0.0423)	-0.1038 *** (0.0418)	-0.1253 *** (0.0447)	-0.1179 *** (0.0445)	-0.1233 *** (0.0447)	-0.1169 *** (0.0444)
<i>Frwd</i> ^{ALL} * "After" dummy						
<i>Frwd</i> ^{MNF} * "After" dummy	0.0362 *** (0.0127)	0.0362 *** (0.0145)	0.0339 *** (0.0100)	0.0347 *** (0.0116)	0.0355 *** (0.0102)	0.0373 *** (0.0115)
<i>Bkwd</i> ^{ALL} * "After" dummy						
<i>Bkwd</i> ^{MNF} * "After" dummy	-0.0044 * (0.0033)	-0.0038 (0.0030)	-0.0048 * (0.0032)	-0.0036 (0.0030)	-0.0051 * (0.0033)	-0.0036 (0.0030)
<i>Intra</i> ^Q * "After" dummy	0.0065 (0.0246)	0.0069 (0.0240)	0.0088 (0.0250)	0.0121 (0.0244)	0.0073 (0.0251)	0.0131 (0.0244)
<i>Diver</i> ^Q * "After" dummy	-0.0258 (0.0345)	-0.0119 (0.0386)	0.0005 (0.0341)	-0.0085 (0.0355)	0.0009 (0.0345)	0.0012 (0.0334)
<i>Skill</i> ^Q * "After" dummy	0.0410 (0.0839)	0.0693 (0.0719)	0.1199 (0.1040)	0.0967 (0.0938)	0.0952 (0.0994)	0.1375 * (0.0965)
<i>Intim</i> ^Q * "After" dummy	-0.0316 (0.0401)	-0.0255 (0.0365)	0.0135 (0.0379)	0.0170 (0.0355)	0.0122 (0.0377)	0.0144 (0.0352)
<i>Trans</i> ^{1Q} * "After" dummy						
<i>Trans</i> ^{2Q} * "After" dummy						
<i>Trans</i> ^{3Q} * "After" dummy	0.0529 * (0.0349)	0.0450 * (0.0318)				
<i>Trans</i> ^{4Q} * "After" dummy			0.0305 *** (0.0126)	0.0285 ** (0.0125)		
<i>Trans</i> ^{5Q} * "After" dummy					0.0326 *** (0.0133)	0.0317 *** (0.0135)
Dummy for coastal regions	0.1193 *** (0.0354)		0.0922 *** (0.0279)		0.0821 *** (0.0266)	
<i>F</i> -statistics on coefficients						
with "After" dummy	9.1349 ***	6.2264 ***	9.6257 ***	7.8594 ***	9.9232 ***	8.2381 ***
Fixed effects	No	Yes	No	Yes	No	Yes
Adjusted <i>R</i> ²	0.2945	0.3554	0.3115	0.3613	0.3146	0.3975
Observations	1238	1238	1238	1238	1238	1238

Notes: “*”, “**” and “***” indicate significance at the 0.10, 0.05 and 0.01 levels (one-tailed), respectively. Heteroskedasticity-consistent standard errors in parentheses. “After” dummy takes zero for the period from 1997, and one for the period from 2002. Fixed effects include both industry- and region-specific dummy variables.

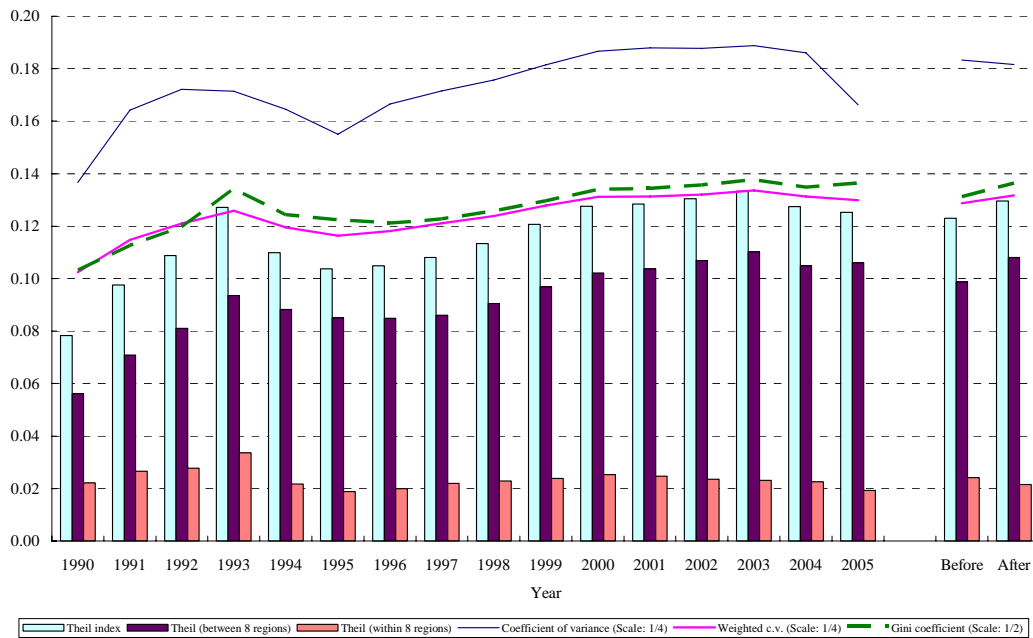


Figure 1a. Measuring regional inequality: "Per capita gross regional products"

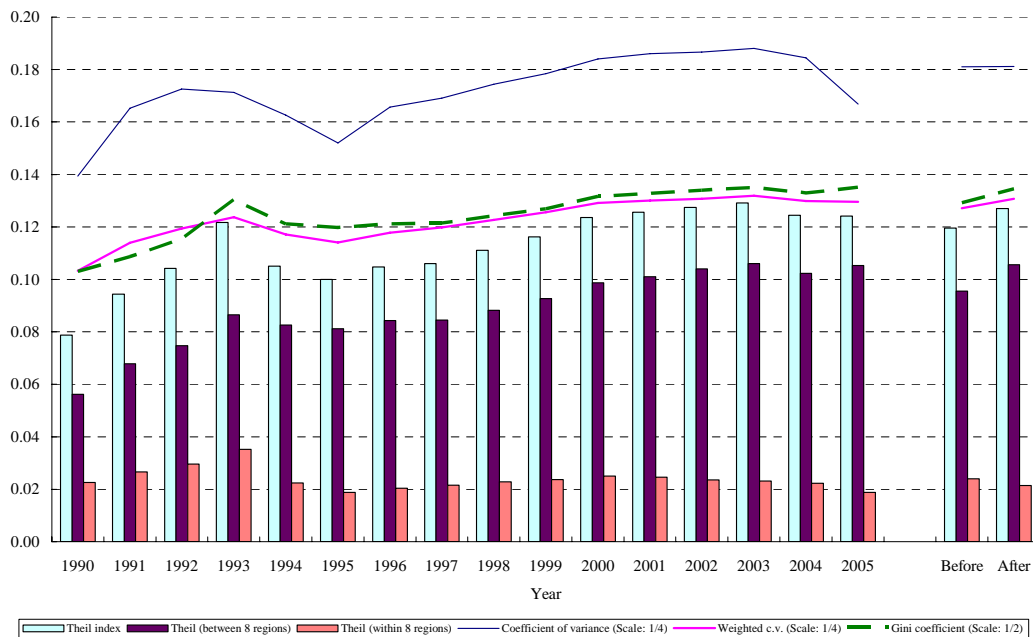


Figure 1b. Measuring regional inequality: Price adjusted "average income" GDP basis

Note: "Before" means "Before WTO accession" using average of income (GDP or wage bill) and population (or number of workers) data for 4 years from 1998 to 2001. "After" means "After WTO accession" using average for 4 years from 2002 to 2005.

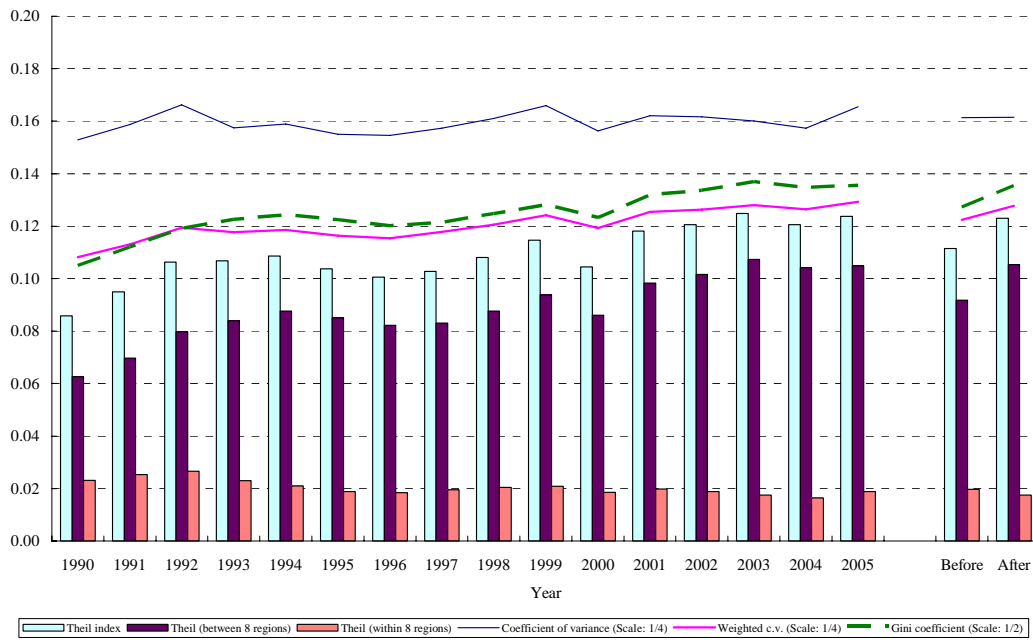


Figure 1c. Measuring regional inequality: GDP and population basis

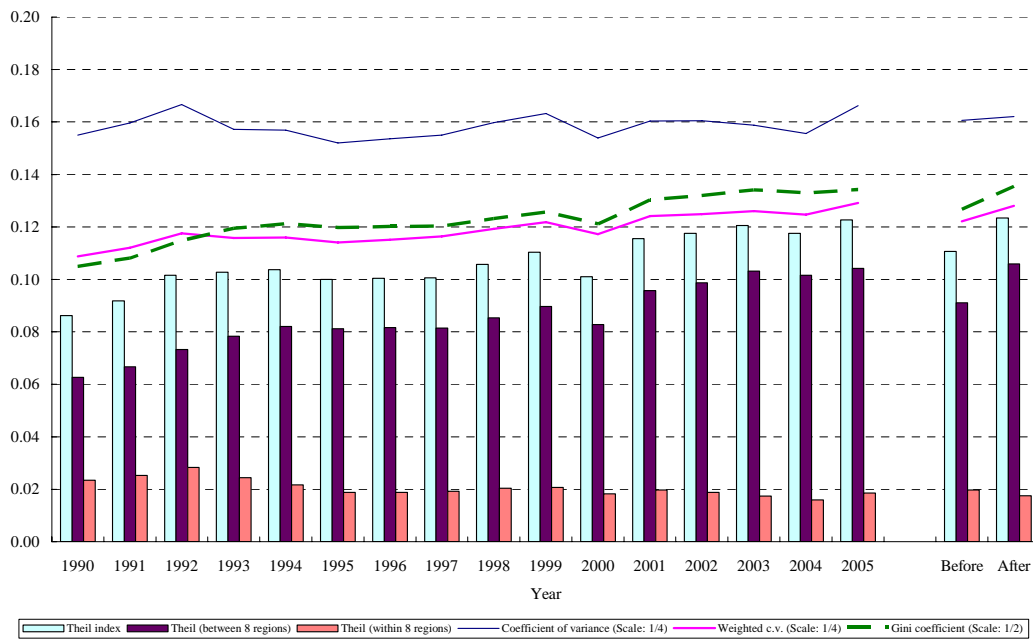


Figure 1d. Measuring regional inequality: Price adjusted GDP and population basis

Note: “Before” means “Before WTO accession” using average of income (GDP or wage bill) and population (or number of workers) data for 4 years from 1998 to 2001. “After” means “After WTO accession” using average for 4 years from 2002 to 2005.

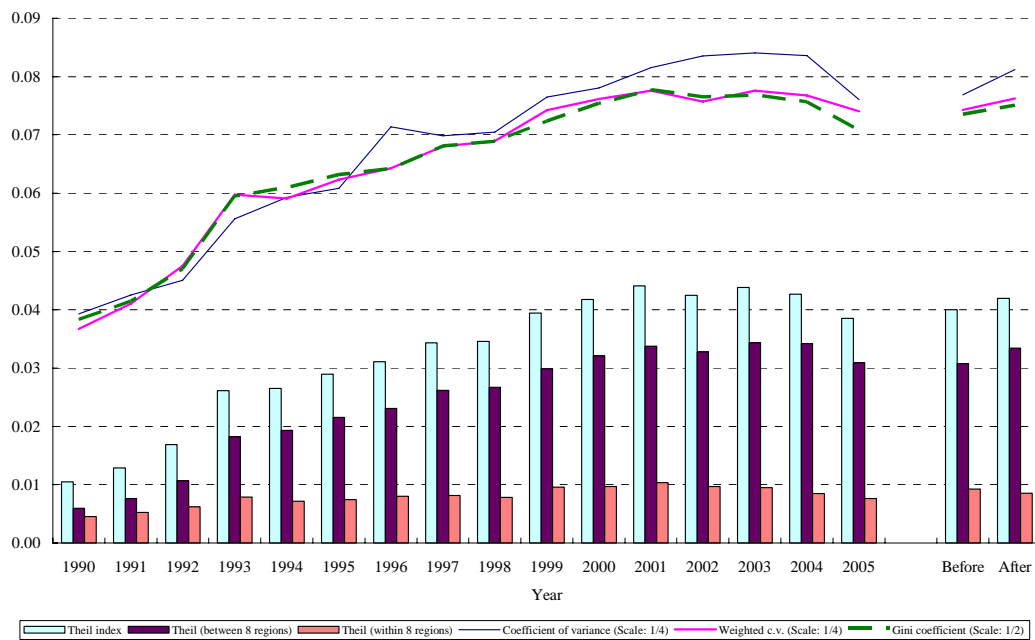


Figure 1e. Measuring regional inequality: Labor wage basis

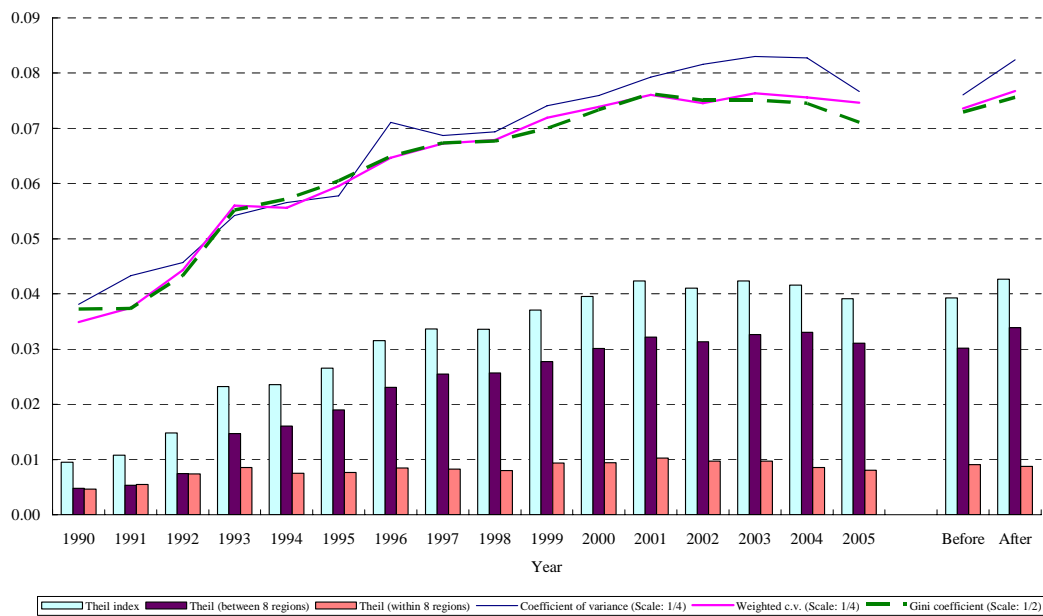


Figure 1f. Measuring regional inequality: Price adjusted labor wage basis

Note: “Before” means “Before WTO accession” using average of income (GDP or wage bill) and population (or number of workers) data for 4 years from 1998 to 2001. “After” means “After WTO accession” using average for 4 years from 2002 to 2005.

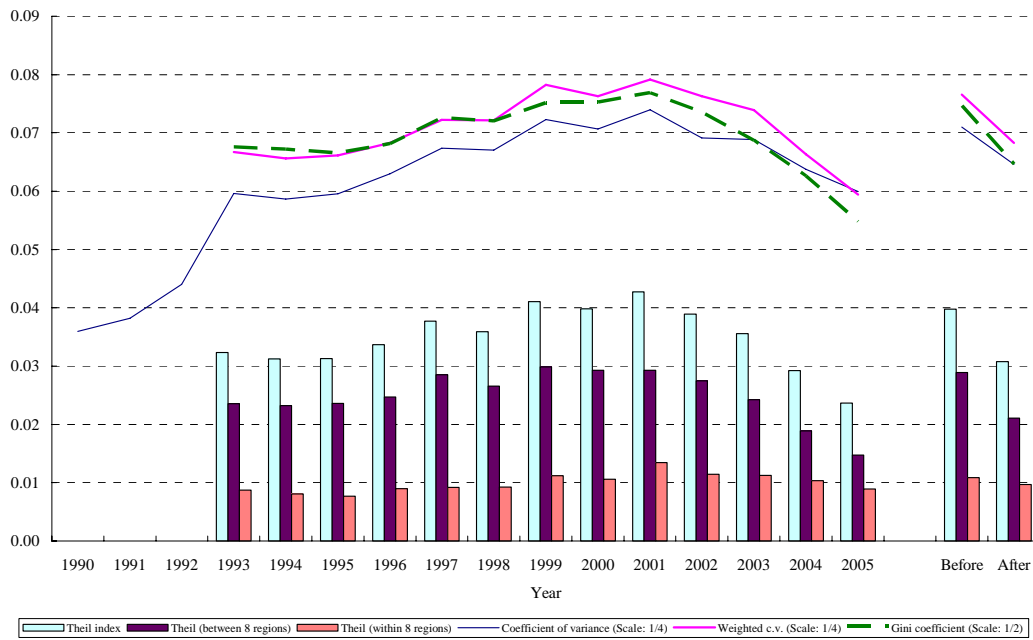


Figure 1g. Measuring regional inequality: Manufacturing wage basis

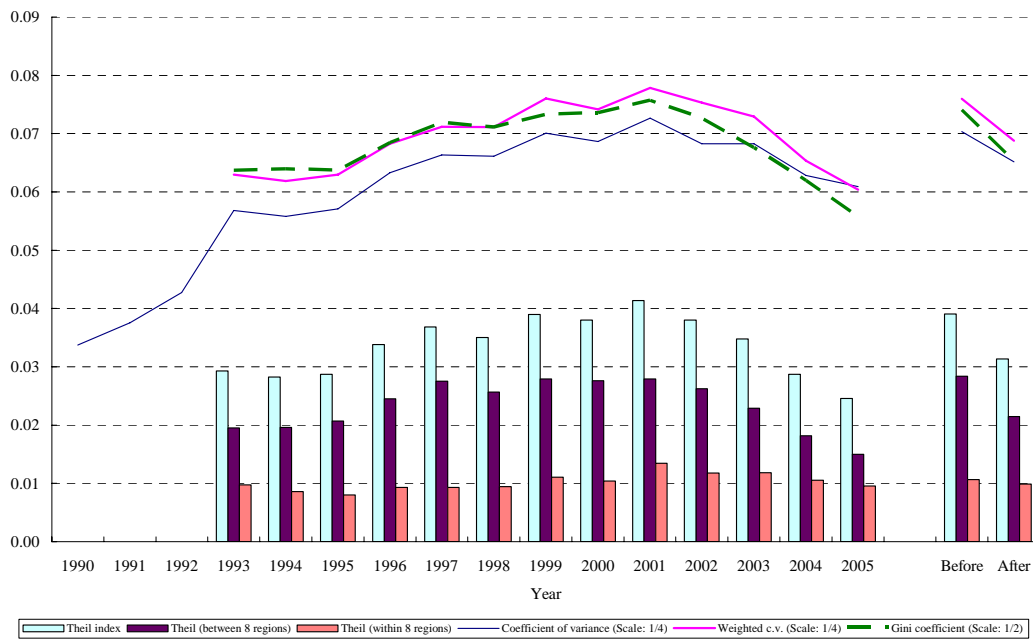


Figure 1h. Measuring regional inequality: Price adjusted manufacturing wage basis

Note: “Before” means “Before WTO accession” using average of income (GDP or wage bill) and population (or number of workers) data for 4 years from 1998 to 2001. “After” means “After WTO accession” using average for 4 years from 2002 to 2005.

Appendix Table 1. Concordance of Industry Classifications

Multi-Regional Input-Output Model (IDE)		Asian International Input-Output Table		China Industrial Economic Statistical		China Statistical Yearbook /China		Input-Output Tables of China 1997	
Code	Classification	Code	Classification	No.	Classification	No.	Classification	Code1997	Code2002
1	Agriculture	001-007	Agriculture	n.a.	n.a.	00	Agriculture	00	01001-05006
2	Coal mining and processing	008-011	Mining and quarrying	01	Mining and Washing of Coal	01	Mining and Washing of Coal	01	006
3	Crude petroleum and natural gas products			02	Extraction of Petroleum and Natural Gas	02	Extraction of Petroleum and Natural Gas	02	007, 008
4	Metal ore mining			03	Mining of Ferrous Metal Ores	03	Mining of Ferrous Metal Ores	03	009
5	Non-ferrous mineral mining			04	Mining of Non-ferrous Metal Ores	04	Mining of Non-ferrous Metal Ores	04	010
				n.a.	n.a.	05	Mining and Processing of Nonmetal Ores	05	011
6	Manufacture of food products and tobacco processing	012-015	Foods	05	Processing of Food from Agricultural Products	06	Processing of Food from Agricultural Products	06	014-017
		016	Beverage	06	Foods	07	Foods	07	018
		017	Tobacco	07	Beverage	08	Beverage	08	019, 020
7	Textile goods	018-020	Textile	08	Tobacco	09	Tobacco	09	021
8	Wearing apparel, leather, furs, down and related products	021-022	Textile Wearing Apparel, Leather and leather products	09	Textile	10	Textile Wearing Apparel, Leather, Fur Feather and Footwear and Caps Its Products	10	022-027
		023	Leather and leather products	n.a.	n.a.	11	Textile Wearing Apparel, Leather, Fur Feather and Footwear and Caps Its Products	11	028
				n.a.	n.a.	12	Textile Wearing Apparel, Leather, Fur Feather and Footwear and Caps Its Products	12	029
9	Sawmills and furniture	024, 026	Timber and Other wooden products	n.a.	n.a.	13	Processing of Timbers, Wood, Bamboo, Rattan, Palm, and Straw Products	13	030
		025	Wooden furniture	n.a.	n.a.	14	Furniture	14	031
10	Paper and products, printing and record medium reproduction	027	Pulp and paper	10	Paper and Paper Products	15	Paper and Paper Products	15	032
		028	Printing and publishing	n.a.	n.a.	16	Printing, Reproduction of Recording Media	16	033
				n.a.	n.a.	17	Articles for Culture, Education and Sport Activity	17	034, 035
11	Petroleum processing and coking	034	Refined petroleum and its products	11	Processing of Petroleum Coking, Processing of Nucleus Fuel	18	Processing of Petroleum Coking, Processing of Nucleus Fuel	18	036, 037
12	Chemicals	030, 031, 033	Chemical and Chemical Products	12	Chemical Raw Material and Chemical Products	19	Chemical Raw Material and Chemical Products	19	038-043
		032	Drugs and medicine	13	Medicines	20	Medicines	20	044
		029	Synthetic resins and fiber	14	Chemical Fiber	21	Chemical Fiber	21	045
		036, 037	Tires and tubes	n.a.	n.a.	22	Rubber	22	046
		035	Plastic products	n.a.	n.a.	23	Plastic	23	047
13	Nonmetal mineral products	038-040	Non-metallic Mineral Products	15	Non-metallic Mineral Products	24	Non-metallic Mineral Products	24	048-054
14	Metals smelting and pressing	041	Iron and steel	16	Manufacture and Processing of Ferrous Metals	25	Manufacture and Processing of Ferrous Metals	25	055-058
		042	Non-ferrous metal	17	Manufacture & Processing of Non-ferrous Metals	26	Manufacture & Processing of Non-ferrous Metals	26	059, 060
15	Metal products	043	Metal products	18	Metal Products	27	Metal Products	27	061
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