

SOURCES OF DIVERGENCE BETWEEN COASTAL AND INTERIOR REGIONS IN CHINA

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This paper decomposes the income divergence between coastal and interior regions into three components: a part due to the differences in the labor transfer rate between the coastal and interior regions, a second part due to the nationwide relative income gap between the nonagricultural workers and agricultural workers, and a third part due to the coast-noncoast differentials in incomes for nonagricultural and agricultural workers. We find that this third component, the coast-noncoast differentials in incomes for nonagricultural and agricultural workers, explains most of the divergence in the pre-reform period. In the post-reform period, both the regional difference in labor transfer rate and the coast-noncoast income gap for agricultural and nonagricultural workers play significant roles in explaining the divergence between the interior and the coast. Between 1978 and 1990, the different labor reallocation between the coast and interior accounted for most of the divergence. The nationwide income differentials between nonagricultural and agricultural sectors played little role in explaining the growing divergence between regions. Finally, after 1990 the largest contributor to the widening coast-noncoast income gap was the coast-noncoast divergence in incomes within the nonagricultural sector. Thus, I conclude that the removal of interregional obstacles to factor mobility, especially labor mobility, is important for reducing regional income divergence.

Keywords: Labor Reallocation Channel, Between Industry Channel, Within Industry Channel

JEL classification: O18, O53, P20

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1. INTRODUCTION

Numerous empirical studies have been conducted to identify factors contributing to the regional income disparity in China and a broad range of reasons has been suggested as explanations for the divergence of regional income. Among the reasons for the large overall regional disparity, the most commonly cited is the growing gap between the coastal provinces and the inland provinces in the post-1978 (Tsui (1993), Chen and Fleisher (1996), Fleisher and Chen (1997), Jian, Sachs and Warner (1996), Kanbur and Zhang (1999, 2004), Lee (2000), Demurger (2001), Yao and Zhang (2001), Bao, Chang, Sachs, and Woo (2002), Demurger, Sachs, Woo, Bao, and Chang (2002), Weeks and Yao (2003)). Kanbur and Zhang (1999, 2004) develop a framework to assess the contributions of rural-urban and inland-coastal inequalities to the overall regional income inequality. They found that the rural-urban contribution has not changed very much over time, but the inland-coastal contribution has increased several fold. Jian *et al.* (1996) also show that overall regional incomes apparently started to diverge after 1990 because the widening income gap between the coast and interior more than offset the continued convergence within the coast. If this is the case, what has caused the divergence between the coast and interior?

Caselli and Coleman (2001) link interregional convergence in incomes to convergence in economic structure. To explain the empirical link between the structural transformation and regional convergence, they show that the measure of convergence can be exactly decomposed into three channels: convergence of incomes within each industry (within industry income convergence channel), convergence in the industrial composition of the labor force (labor reallocation channel), and convergence of the economy wide average agricultural income to the average nonagricultural income (between industry income convergence channel). They find empirically that most of the regional convergence between the South and the North in the U.S. is attributable to structural transformation: the nationwide convergence of agricultural incomes to nonagricultural incomes and the faster rate of transition of the southern labor force from agriculture to nonagricultural jobs.

In this paper, we adopt the methodology in Caseli *et al.* to decompose the regional divergence between the coast and interior in China into these three sources, and to see the role of structural transformation in regional income divergence in China. Section II explains decomposition method and the data. Section III offers the empirical results, and section IV summarizes and discusses these results.

2. METHODOLOGY AND DATA

We adopt the methodology in Caselli and Coleman (2001) to decompose income divergence between the coastal and interior regions in China. We divide China's provinces into coastal and interior regions according to Kanbur and Zhang (2004). The coastal region includes the metropolises (Beijing, Tianjin, and Shanghai) and the

provinces of Liaoning, Hebei, Shandong, Jiangsu, Zhejiang, Fujian, Guangdong, Hainan, and Guangxi. Hainan was separated from Guangdong in 1988. The interior includes provinces in the central and western regions. The central region includes the provinces of Jilin, Heilongjiang, Inner Mongolia, Shanxi, Henan, Anhui, Hunan, Hubei, and Jiangxi. The western provinces are Sichuan, Chongqing, Yunnan, Guizhou, Shaanxi, Ningxia, Gansu, Qinghai, Xinjiang, and Tibet. Chongqing was granted province-level status in 1997. Chongqing data were consolidated with those of Sichuan. We exclude Hainan and Tibet due to missing data.

For $i = C$ (coast), I (interior), we have

$$w_t^i = w_{ft}^i L_{ft}^i + w_{mt}^i (1 - L_{ft}^i), \quad (1)$$

Where w_t^i is the weighted average income per worker in region i in year t , w_{ft}^i is income per worker in agriculture, w_{mt}^i is nonagricultural income per worker, and L_{ft}^i is the share of the labor force that is employed in agriculture. By adding and subtracting the quantity $w_{ft} L_{ft}^i + w_{mt} L_{mt}^i$ to Equation (1) we can rewrite w_t^i as

$$w_t^i = (w_{ft}^i - w_{ft}) L_{ft}^i + (w_{mt}^i - w_{mt}) L_{mt}^i + w_{ft} L_{ft}^i + w_{mt} L_{mt}^i. \quad (2)$$

Using Equation (2) we can express the Coast-Interior income differential as

$$\begin{aligned} \frac{w_t^C - w_t^I}{w_t} &= \frac{(w_{ft}^C - w_{ft})}{w_t} L_{ft}^C + \frac{(w_{mt}^C - w_{mt})}{w_t} (1 - L_{ft}^C) - \frac{(w_{ft}^I - w_{ft})}{w_t} L_{ft}^I \\ &\quad - \frac{(w_{mt}^I - w_{mt})}{w_t} (1 - L_{ft}^I) + \frac{(w_{ft} - w_{mt})}{w_t} (L_{ft}^C - L_{ft}^I). \end{aligned} \quad (3)$$

Define $\omega_{jt}^i = (w_{jt}^i - w_{jt}) / w_t$, $i = C, I$, $j = f, m$. Also, let $\omega_t^i = (w_{ft}^i - w_{mt}^i) / w_t$, and $\omega_t = (w_{ft} - w_{mt}) / w_t$. We can now write the equation above in first differences as

$$\begin{aligned} \frac{w_t^C - w_t^I}{w_t} - \frac{w_{t-1}^C - w_{t-1}^I}{w_{t-1}} &= \Delta \omega_{ft}^C \cdot \bar{L}_{ft}^C + \Delta \omega_{mt}^C \cdot (1 - \bar{L}_{ft}^C) - \Delta \omega_{ft}^I \cdot \bar{L}_{ft}^I \\ &\quad - \Delta \omega_{mt}^I \cdot (1 - \bar{L}_{ft}^I) + \bar{\omega}_t^C \cdot \Delta L_{ft}^C - \bar{\omega}_t^I \cdot \Delta L_{ft}^I \\ &\quad + \Delta \omega_t \cdot (\bar{L}_{ft}^C - \bar{L}_{ft}^I), \end{aligned} \quad (4)$$

Where $\Delta x_t = x_t - x_{t-1}$ and $\bar{x}_t = (x_t + x_{t-1}) / 2$.

We measure income divergence between the coast and interior areas by the change in the relative income gap between the two years denoted as left hand side of (4).

Income divergence between the coast and interior has three channels: the within industry channel, the labor reallocation channel, and the between industry channel. First, the within industry channel (the quantity in the first line of (4)) captures the effect of divergence between the coast and interior regions within each industry, that is, the effect of divergence of w_{ft}^C from w_{ft}^I and of w_{mt}^C from w_{mt}^I . This within industry channel shows the effect of interregional frictions within agricultural and nonagricultural sectors. Second, the labor reallocation channel (the second line of (4)) captures the effect of divergence of L_{ft}^C from L_{ft}^I on the coast-noncoast income divergence. This channel captures how much regional divergence we would have observed if all incomes had been fixed at their period average but the labor force in agriculture had shrunk faster in the coast than in the interior. Finally, the between industry channel (the third line of (4)) is the effect of divergence of the economy-wide average nonagricultural and agricultural income on the coast-noncoast income divergence, or the effect of divergence of w_{mt} from w_{ft} .

Carrying out this decomposition requires panel data by region on income per worker in agriculture (w_{ft}^I), income per worker in non-agriculture (w_{mt}^I), and the share of the labor force that is employed in agriculture (L_{ft}^I). We use *Comprehensive Statistical Data and Materials on 50 Years of New China* (NBS (1999)), *China's Provincial Statistics* (Huseh *et al.* (1993)), and *Statistical Yearbook* (NBS (2004)) for data collection. The NBS (1999) provides the three components (primary, secondary, and tertiary sectors) of provincial GDP from 1952 to 1998. We recalculate the three components of GDP at 1995 prices to obtain real agricultural and nonagricultural GDP series for each province. We interpret the primary sector as the agricultural sector, and the secondary and tertiary sectors as the nonagricultural sector. The NBS (1999) provides data on the number of employed persons in rural and urban areas from 1952, but only provides data on employment by industry from 1978. Fortunately, the share of employment in the agricultural sector is almost the same as the share of employment in the rural area before 1978.¹ As such, we assume that the share of employment in the agricultural sector is same as the share of employment in rural area before 1978, and then we use rural and urban employment to calculate the contributions to the coast-noncoast income divergence between 1952 and 1978.² For the period 1978-2003, we use agricultural and nonagricultural

¹In 1952, the rural share of employment was 88.1 percent, and the agricultural share was 83.5 percent of total employment. In 1965, these shares were 82.8 percent and 81.8 percent respectively. In 1978, the rural employment share was 76 percent and the agricultural employment share was 73 percent.

²When using the series on rural employment, agricultural income per worker will be smaller than when using agricultural employment because rural employment includes workers employed in rural industry and thus, per capita income for the agricultural sector will be biased downward. However, the size and the share of employment differentials between agricultural sector and rural area were smaller before 1978, so the bias

employment directly. The employment data for agricultural sector in Guangxi are available from 1980, and for Gansu it is available from 1983 in NBS (1999). We use Huseh *et al.* (1993) for the employment in the agricultural sector of Guangxi and Gansu in 1978. However, the data for the employed persons by industry in Tianjin are only available from 1985 in both NBS (1999) and Hsueh *et al.* (1993). For Tianjin, we use data on the number of employed persons by rural area in 1978 as a proxy for the employed persons in the agricultural sector.

We divide the span of our analysis (1952-2003) into two periods, the pre - and post - reform periods.³ The pre-reform period (1952-1978) includes the central planning period (1952-1965) and the Cultural Revolution period (1965-1978). Since most studies on the regional income inequality in China argue that the regional income inequality started to visibly increase in 1990, we divide the post-reform period (1978-2003) into two periods: 1978-1990 and 1990-2003. Our analysis focuses primarily on the economic reform period.

3. SOURCES OF DIVERGENCE BETWEEN COASTAL AND INTERIOR REGIONS

The basic facts about the structural transformation and relative income gap between the coastal and noncoastal regions in China since 1952 are summarized in Table 1. Structural transformations usually lead to a declining share of agricultural workers in total employment, and hence to a decline in the relative income gap between the nonagricultural and agricultural sector (Caselli and Colman (2001)). We present in Table 1 the share of employment in agriculture within the coast and interior and the relative coast-noncoast income gap within nonagricultural and agricultural sectors.

During the central planning period (1952-1965), the share of employment in the agricultural sector did not change; the relative nationwide income gap between nonagricultural and agricultural sectors increased slightly. The structural transformation apparently did not occur in this period. The relative income gap between the coast and interior widened in this period.⁴ We can expect that the structural transformation might

from using the rural/urban employment data, rather than agricultural/nonagricultural employment data, should not be significant.

³ Jian *et al.* (1996) and Demurger *et al.* (2002) describe well the regional economic policies in China by sub-periods since 1952.

⁴ I computed variance decompositions adopting the method in Jian *et al.* (1996) to see the role of the coast-interior gap in explaining the overall regional disparity. During the central planning period (1952-1965) and the Cultural Revolution period (1965-1978), most of the increase in the overall variance was driven by an increase in income dispersion within the coast. There was also an increase in the dispersion of incomes within the interior and the average income gap between the coast and noncoast, but it was much smaller. Between

have no role in explaining the increase in relative income gap between the coast and noncoast in the central planning period. The relative income gap between the coast and interior within nonagricultural and agricultural sectors might play an important role in explaining the divergence between two regions. The bottom panel of Table 1 shows that between 1952 and 1965, the regional income gap within the agricultural sector narrowed. In contrast, the regional income gap within the nonagricultural sector widened. These results imply that the relative income gap between the coast and interior within nonagricultural sector caused the regional income gap in the central planning period.

Table 1. Structural Transformation and Regional Inequality in China

	1952	1957	1965	1978	1985	1990	2003
Agri. share of employment	0.84	0.81	0.82	0.76 0.73	0.62	0.60	0.49
Nonagri./ agri. relative gap	3.19	3.40	3.40	3.03 1.47	1.10	1.25	1.46
Coast/interior relative gap	0.31	0.29	0.43	0.55 0.27	0.33	0.43	0.73
Agri. share of emp. in coast	0.86	0.82	0.82	0.73 0.71	0.58	0.55	0.43
Agri. share of emp. In interior	0.91	0.89	0.86	0.79 0.78	0.70	0.68	0.58
Coast/interior gap within nonag.	0.71	0.44	1.92	1.99 0.41	0.28	0.43	0.88
Coast/interior gap within agri.	0.07	0.007	0.029	0.023 0.09	0.16	0.16	0.14

Source: Calculated from NBS (1999), Hseh *et al.* (1993), and NBS (2004).

Notes: Agri. share of employment is the share of employment in agriculture to total employment; in order to calculate the share of employment in agriculture, we use the rural employment in the 1952-1978 and the agricultural employment in 1978-2003. Nonag./agri. relative gap is the difference between nonagricultural income per worker and agricultural income per worker divided by the national income per worker. The national income per worker is weighted averages of nonagricultural and agricultural per worker incomes using nonagricultural and agricultural shares of employment as weights. Coast/interior relative gap is the difference between income per worker in the coast and interior divided by the national income per worker. Coast/interior gap within nonagri. is the difference between income per worker in the coast and interior within nonagricultural sector divided by the national income per worker. Coast/interior gap within agri. is the difference between income per worker in the coast and interior within agricultural sector divided by the national income per worker.

1952 and 1978, the coast-noncoast income gap explained about 20% of the overall regional disparity.

Table 1 shows that there was also an increase in the income gap between the coast and interior during the cultural revolution period (1965-78). The share of employment working in the agricultural sector declined from 82% in 1965 to 76% in 1978. The relative income gap between nonagriculture and agriculture decreased. The bottom panel of Table 1 shows that the labor force in agriculture more rapidly transferred to nonagricultural sector within the coast than within the interior. The coast-noncoast income gap within the nonagricultural sector slightly increased while the regional gap within the agricultural sector remained unchanged. Hence, the regional differences in labor transfer and the regional income differences within nonagricultural sector might explain the increase in the coast-noncoast income gap during the Cultural Revolution period.

The reform period started in 1978, and income divergence between the regions continued widening.⁵ The coastal region gained 16 percentage points during 1978-1990. The labor force working in agricultural sector rapidly declined after 1978, compared with the pre-reform period. The share of agricultural labor decreased 11 percentage points from 71% to 60% between 1978 and 1990. The bulk of this decline occurred in the period of 1978-1985. In contrast, the composition of employment by industry remained unchanged during the second half of 1980s. The bottom panel of Table 1 shows that the labor transfer rate was much faster on the coast than in the interior. In the coastal region, the agricultural employment share declined from 71% in 1978 to 55% in 1990. In the interior region for the same period, the agricultural employment declined from 78% to 68%. The table shows that in both regions, labor moved into nonagricultural sector mainly during 1978-1985. China's government focused economic reforms on the agricultural sector in this period through a dismantling of the Commune System and the adoption of the Household Responsibility System. Between 1978 and 1990, the nation-wide relative nonagricultural-agricultural income gap declined from 147 to 125 as a percentage of the national average income. In particular, between 1978 and 1985, agriculture experienced a 37-percentage-point gain. According to Table 1, the coast-noncoast income gap within each sector remained fairly stable. Thus during 1978-1990, the regional divergence between the coast and interior might be caused by the differences in the labor transfer between the coast and interior region, especially for the 1978-1985.

The income divergence between the coast and interior further widened after 1990.⁶

⁵The dispersion within the two regions, especially within the coast, started to decline after 1978. Between 1978 and 1990, the convergence within the coast offset the continued widening income gap between the coast and interior (Jian *et al.* (1996)). As a result, the overall regional variance remained unchanged during 1978-1990.

⁶Most studies on regional inequality in China agree that after 1990 the gap between the coast and interior started to play an important role in explaining the overall regional inequality (Jian *et al.* (1996), Kanbur and Zhang (1999)). According to my own calculations, the between variance term doubles from 0.139 in 1990 to 0.237 in 2003. The gap between the coast and interior explains 30% of the overall variance in 1990 and 47% of the overall variance in 2003. The widening income gap between the coast and interior more than offset the

The coastal region gained 30 percentage points between 1990 and 2003. In this period, the share of agricultural employment decreased 11 percentage points from 60% to 49%.⁷ The nationwide relative nonagricultural-agricultural income gap did increase, but not by much. The bottom panel of Table 1 shows that the labor transfer into nonagricultural sector occurred at a slightly more rapid rate in the coastal provinces than in the interior. In the coastal region, the share of agricultural employment declined from 55% in 1990 to 43% in 2003. In the interior provinces, the share declined from 68% in 1990 to 58% in 2003. In contrast, the coast-noncoast relative income gap within the nonagricultural sector widened substantially. Within the agricultural sector, the coast-noncoast relative income gap decreased slightly. As a result, the rapid increase between 1990 and 2003 in income divergence between the coast and interior may reflect the regional income differences within the nonagricultural sector.

In Table 2 we present the results for decomposing the change in the relative income gap between the coast and interior into the three channels: the channel of the labor reallocation to nonagricultural sector, the channel of nationwide income gap between nonagricultural and agricultural sector, and the channel of the income gap between the coast and interior within each industry. The first column measures the regional income divergence between two periods, the second column reports the effect of the regional differences in labor transfer out of agricultural sector on the regional divergence, the third column shows the effect of the nationwide nonagricultural-agricultural income gap on the regional divergence, and the fourth column is the effect of the regional income differences within nonagricultural and agricultural sectors on the regional divergence. We focus our analysis on the reform period, especially for the period between 1990 and 2003 because the income divergence between the coast and interior played a far more important role in the overall regional income inequality in China after 1990.

The coast-noncoast income differential increased by 25 percentage points between 1952 and 1978. Of these, about 6 percentage points (27 percent of the total) are due to the faster coastal transition of labor out of agriculture. The national relative income gap between nonagricultural and agricultural sectors actually did not play any role in explaining the divergence. Finally, 19 percentage points of divergence (76 percent of the total) are accounted for by the coast-noncoast divergence of incomes within each sector. The data confirm that the coast-noncoast divergence of incomes within each sector did play a dominant role in the regional divergence between 1952 and 1978.

convergence within the coast so that overall regional income variance increased during 1990-2003.

⁷ It is interesting to note that the share of the output of agricultural sector declines to 14% of GDP in 2003, but the agricultural sector still accounts for about 49% of total employment in China. The gap between the share of agricultural output in GDP and the share of employment in agricultural sector is attributed to the restriction of the labor mobility in China. Chinese government imposed a systematic friction through the household registration (*hukou*) system.

Table 2. Decomposition of Divergence between the Coastal and Interior Regions

Period	Total	Labor Reallocation	Between Industry	Within Industry
A. pre-reform period				
1952-1978	0.2450	0.0653	-0.0072	0.1869
% of total	100.0	26.7	2.9	76.3
1952-1965	0.1242	-0.0214	0.0093	0.1363
% of total	100.0	-17.2	7.5	109.7
1965-1978	0.1207	0.1191	-0.02120	0.0137
% of total	100.0	98.7	-0.099	11.4
B. post-reform period				
1978-2003	0.4612	0.2489	-0.0011	0.2133
% of total	100.0	54.0	-0.23	46.2
1978-1990	0.1619	0.1229	-0.0221	0.0611
% of total	100.0	75.9	-13.6	37.7
1990-2003	0.2993	0.0835	0.0299	0.1859
% of total	100.0	27.9	10.2	62.1

Source: Author's calculations. Data sources: see Table 1.

Notes: Labor reallocation is the component due to divergence of the share of agricultural employment in the coast from the share of agricultural employment in the interior. Between industry is the component due to divergence of nationwide average nonagricultural income per worker from nationwide agricultural income per worker. Within industry is component due to divergence of coast-interior income per capita within nonagricultural and agricultural sectors.

The relative importance of the various sources of divergence changes across periods. For the period 1952-1965 and 1965-1978, coastal per worker income gained 12 percentage points relative to the interior. However, the relative contributions of labor reallocation and the coast-noncoast gap within each industry are different for the different sub-periods. Between 1952 and 1965, the regional income gap within each sector appears most important. The regional differences in labor transfer and the national relative income gap between nonagricultural and agricultural sectors play no role in the divergence during this period. In contrast, the faster labor transfer out of the agricultural sector in the coast explains most of the regional divergence between 1965 and 1978. After 1965, incomes in the coast diverged to incomes in the interior mainly because coastal workers left agriculture at a higher speed.

The coast-noncoast income gap further diverged between 1978 and 2003. The divergence during 1978-2003 almost entirely reflects the divergence that occurred during 1990-2003. Between 1978 and 2003, the interior income per worker fell 46 percentage points relative to the coastal. Of this decline, 25 percentage points (54 percent of total) accounted for by the regional differences in labor reallocation into nonagricultural sector and 21 percentage points (46 percent of total) accounted for by the

regional income differences within each industry. In the period 1978-1990, the coastal income diverged to the interior income mainly due to the faster labor reallocation out of farm sector in the coastal provinces. The faster labor reallocation in the coast accounts for 76 percent of the regional divergence in this period. The coast-noncoast income gap within each industry explains 38 percent of the divergence between the coast and interior. The income divergence between the coast and interior after 1990 is explained mainly by the coast-noncoast relative income gap within the nonagricultural and agricultural sectors. The coast-noncoast relative income gap within each sector explains 62% of the regional divergence between 1990 and 2003. The faster labor reallocation into nonagricultural sector in the coastal provinces explains 28% of the regional divergence in this period. The nationwide nonagricultural-agricultural income gap explains only small portions of the regional divergence.⁸

4. SUMMARY AND DISCUSSION

Caselli and Coleman (2001) argue that the poor region starts with a disproportionate share of the agricultural labor force and lower per capita incomes. Over time, declining moving costs induce an increasing proportion of the labor force to move out of the agricultural sector and into the nonagricultural sector.⁹ This decline in the agricultural labor force leads to an increase in relative agricultural income. Both effects benefit the poor region disproportionately since it has more agricultural workers. They find that the most of the regional convergence between the South and the North of the U.S. is attributable to the structural transformation: the nationwide convergence of agricultural incomes to nonagricultural incomes and the faster rate of transition of the southern labor force from agriculture to nonagricultural jobs.

In China, the divergence between the coast and interior in the reform period explained by both the faster transfer of labor within the coastal region and the coast-noncoast relative income gap within nonagricultural sector. Between 1978 and 1990, it was the faster labor reallocation in the coastal provinces that caused the coast-noncoast income divergence. The growing income divergence after 1990 was mainly caused by the coast-noncoast relative income gap within nonagricultural sector.¹⁰

⁸ Using rural and urban income per capita, Lin *et al.* (2004) finds results similar to ours: the coast-noncoast income divergence within urban and rural sectors accounted for 70.4 % of regional divergence between the coast and interior; differential rates of urbanization between the coastal and interior regions explained 24.4 % of the regional income divergence; the effect of the economy-wide divergence between urban and rural incomes was smaller than the magnitude in this paper. They restricted the analysis to the period 1990-2000.

⁹ Sectoral migration involves a cost, such as investment in the differential skills required by urban, nonagricultural employment and utility costs from living in towns (Caselli and Coleman (2001)).

¹⁰ Explanations of the slow convergence have often emphasized frictions that prevent factor price

We would have observed income convergence between provinces in the interior and provinces in the coast if the coast-noncoast income differentials within each industry converged. The results also suggest that the nationwide relative income gap between nonagricultural and agricultural sectors did not play any important role in explaining the coast-noncoast income divergence.¹¹

The U.S. experience suggests that the free movement of its population over the last century was fundamental to the working of the income convergence process. Johnson (2003) compared the Chinese interprovincial migration rate with migration across the states in the U.S. and concluded that migration in China is far less than in the U.S.¹² Under the household registration (*hukou*) system in China, the residence permits system in effect denies the poor in the interior provinces the possibility of getting a higher-paying job legally by moving to cities in the prosperous coastal provinces because residence status is largely determined by place of birth (Chan and Zhang (1999)). China's *hukou* system, by restraining labor migration both between the countryside and urban areas and between regions and cities, was likely a major reason for the increase in the income gap between the interior and the coast. Whalley and Zhang (2004) analyze the impacts of the *hukou* system on income inequality and labor migration in China.¹³ They find that removal of *hukou* registration plays a significant role in reducing inequality in China, but argues that some inequality in income and wage rates remains after the *hukou* system was removed.¹⁴

equalization among regions. In this view, slow convergence results from the gradual removal or overcoming of these frictions. Caselli and Collman (2001) argue that "Within Industry" channel captures this effect. The data confirms that regional frictions on movement of labor played an important role in the divergence between the coast and interior, especially for the period 1990-2003.

¹¹ Johnson (2002) argues that the transfer of labor out of agriculture will reduce the differential between labor earnings in farm and nonfarm occupations only if that transfer occurs at a fast enough rates. The experience in China substantiates this point. The economy wide relative nonagricultural-agricultural income gap remains unchanged during the pre- and post-reform period.

¹² In one year-1997 to 1998, migration among the states in the U.S. constituted 3% of the population. Migration among provinces in China was 3% for the decade of 1990s or an average annual rate of about 0.3% (Johnson (2002)).

¹³ Hertel and Zhai (2004) also find that *hukou* reform has had a significant impact on income distribution. They also argue that creation of a fully functioning land market has a significant impact on rural-urban inequality. The combined effect of both factor market reforms is to reduce the urban-rural income ratio dramatically.

¹⁴ According to their analysis, removing *hukou* restrictions generate labor flow from rural to urban, but increases in urban house prices retard additional migration. Zhao (1999) also points out that even without artificial barriers to migration, the housing market is a real barrier to family migration. Other barriers to migration also exist, including uncertainties about the portability of pensions and health insurance across regions (see, Brooks and Tao (2003), Li (2004)). In addition, a *hukou* in small towns and cities is not as

Table 3. Composition of Intraprovincial and Interprovincial Migrants

	1985-1990		1995-2000	
	Intraprovincial	Interprovincial	Intraprovincial	Interprovincial
Coast	71.3	28.7	35.4	64.6
Interior	76.1	23.9	66.2	33.8
China	72.3	27.7	46.1	53.9
Coast	48.3	50.9	52.6	83.1
Interior	51.7	49.1	47.4	16.9
Total	100.0	100.0	100.0	100.0

Source: Calculated from Liang *et al.* (2004) based on 1% population census in 1990 and the 2000 population census.

Population survey data indicates that migration patterns in China increasingly involve interprovincial and interregional flows rather than intraprovincial and intraregional migration.¹⁵ Table 3 shows that intraprovincial and interprovincial migration patterns in China. Intraprovincial migration was the dominant pattern of the migration in China between 1985 and 1990. Between 1985 and 1990, the proportion of intraprovincial migrants was 71% in the coastal provinces and 76% in the interior provinces. This pattern has been changed since 1995. The proportion of the interprovincial migrants increased rapidly within the coastal provinces during 1995-2000: it increased from 29% in the period 1985-1990 to 65% in the period 1995-2000. In contrast, the proportion of interprovincial migrants increased from 24% to 34% within the provinces in the interior. The most dramatic rise in the interprovincial migrants was in Guangdong, Jiangsu, and Zhejiang in the coastal region. For example, between 1985 and 1990, 29%, 27%, and 12% of migrants in Guangdong, Jiangsu, and Zhejiang came from other provinces. The corresponding percentages increased to 72%, 68%, and 51% between 1995 and 2000 (Liang and Ma (2004)). Table 3 shows that 51% of the interprovincial migrants went to the provinces in the coastal region between 1985 and 1990. Between 1995 and 2000, this figure increased to 83%. Between 1995 and 2000, only 17% of the interprovincial migrants were found in the interior provinces. Table 4 shows the interregional and intraregional migration patterns. Much of the interprovincial migration was coast to interior migration. Between 1985 and 1990, 33% of the migration occurred

attractive to migrants as a *hukou* in large and medium cities, and those who obtained an urban *hukou* can only give birth to one child, while in many rural areas, two children are permitted.

¹⁵ Estimates of the migrant population in China vary, ranging between 80 million and 150million. The National Bureau of Statistics estimates there were about 80 million migrants (i.e., those living in urban areas for more than six months) between 1990-2000 (Brooks and Tao (2003)). Chen *et al.* (2002) suggest that more than 53 million and 28 million rural people are working outside their native counties and provinces, respectively.

through interior to coast. The interior to coast migration increased to 60% between 1995 and 2000. In contrast, coast to interior migration decreased to 6% in 1995-2000 from 14% in 1985-1990. Migration within the coast and interior provinces also decreased to 24% in 1995-2000 from 53% in 1985-1990. This indicates that migration become more distant. The coastal regions draw increasing migrants from the surrounding rural areas, and then from remote interior provinces.

Table 4. Patterns of Migration in China

	1985-1990	1995-2000
Coast to interior	14.0	6.1
Interior to coast	32.5	60.1
Within coast	27.1	18.6
Within interior	26.3	15.2
Total	100.0	100.0

Source: Lin *et al.* (2004) calculated from 1% population census in 1990 and the 2000 population census.

The increase in interprovincial and interregional migration suggests that China's *hukou* system presented less barriers for rural/interior migrants in 1995-2000 than it did in 1985-1990. Since the mid-1990s, reforms to the *hukou* were initiated (Brooks and Tao (2003)). In 1997, the authorities experimented with relaxation of household registration regulation in some small towns and cities, allowing migrants who had either a stable income or owned a house to obtain an urban *hukou*. Since October 2001, a person with stable work and a residence should be able to obtain a *hukou* in more than 20,000 small towns and cities. In large cities, progress has been slow. The *hukou* reform in large cities tends to focus on giving a local *hukou* to migrants with relatively high education and those with the ability to purchase commercial housing. The residency reforms occurred since 2002 and many mid-sized cities began to offer permanent residency to migrants (Lin *et al.* (2004)). In 2004, the central government called for equal access to education for migrant's children. The social nature of the migration process also facilitates interprovincial migration. Migrants from certain provinces began to establish ethnic enclaves in particular labor markets. This creation of migrant networks secures the continuing flow of migration.

As Johnson (2003) noted, given the large income differences in China both regionally and between nonagricultural and agricultural sectors, migration rates should be much higher. To induce many people to change jobs or locations would require a large income differential in the absence of restraints on migration.¹⁶ In South Korea, the

¹⁶ For example, when the annual rate of transfer in agricultural employment exceeds about 4 percent, requiring rates of migration of 5 percent or more because of the growth of the agricultural labor force, a

workforce in agriculture fell from 50% of the total workforce in 1973 to under 10 percent by the end of 2001. China's agricultural work force was 49 percent of the total workforce in the year 2003. A drop in that share comparable to what happened over the last 28 years in Korea would involve in China the movement out of agriculture of nearly 300 million workers or 100 million a decade (Perkins (2004)).¹⁷ The rapidly growing regional income differentials as well as recent policy changes to mitigate the barriers to migration are expected to induce larger migration flows between regions in China. As Johnson (2002) commented, given the experience in the U.S. and Western Europe, the disparity in China will take at least a century to eventually disappear.

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substantial margin between and within agricultural and nonagricultural incomes is required (Johnson (2002)). Using survey data from China, Zhu (2002) examines the effects of income gaps on migration decisions, and confirms that income gap significantly influence migration decisions. Du, Park, and Wang (2005) find an interesting result that hukou restrictions and other urban policies are not viewed by the poor as representing substantial barriers to migration. The most important factor in affecting migration decisions was education.

¹⁷ Johnson (2002) estimates the transfer of labor out of farming in China averaged 10 million annually, which was an annual transfer rate of about 4 percent.

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