Interprovincial Migration, Population Redistribution, and Regional Development in China: 1990 and 2000 Census Comparisons*

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Until recently, migration has had a limited role to play in China's space economy because of central-planning logic and mechanisms. Mobility increases and economic restructuring since the 1980s, however, call for new conceptualizations of migration. Using interprovincial migration data from China's 1990 and 2000 censuses, I analyze migration rates, migration effectiveness, population growth, net migration flows, and spatial focusing of migration. The analysis supports the notions that migration is an increasingly effective factor of population redistribution and that it has a strong relationship with regional development. While these relationships have been documented in many other parts of the world, they have been less well addressed in the case of China. Regional divergence in economic development during the 1990s was accompanied by a marked increase in interprovincial migration and sharply concentrated migration flows, especially from relatively poor central and western provinces to the rapidly growing eastern region. These results suggest that migration theories that draw from experiences of capitalist economies may be of increased relevance to China. **Key Words: migration, regional development, population redistribution, China, transitional economy.**

Introduction

It is well known that migration is an important factor of population redistribution and that it is strongly related to regional economic development. A large body of literature has examined these relationships (e.g., Greenwood 1981). Most migration studies, however, focus on capitalist economies where decisions at the individual and household levels constitute the primary determinants of migration. This assumption is less valid in socialist and transitional economies. During much of the socialist period in China, especially from the late 1950s to the early 1980s, rural–urban migration was strictly controlled. Since the mid-1980s, economic reforms and the relaxation of migration controls have brought about sharp increase in mobility (Yan 1998; Liang 2001; Cai and Wang 2003). These changes hint at new roles and conceptualizations of migration in the Chinese economy, which can be summarized by two notions. First, migration has become a more effective factor of population redistribution, and, second, the relationship between migration and regional development is becoming stronger. In this article, I examine these themes by analyzing interprovincial[1] migration data from China's 1990 and 2000 censuses.

Compared to most capitalist economies, China's population mobility is low. Intercounty[2] migrants between the years 1985 and 1990 accounted for, respectively, 19 percent and 4 percent of the U.S. and Chinese populations aged five and above in 1990 (U.S. Census Bureau 1992; State Statistical Bureau 1993, 20, 72). In the same period, the rate of interstate migration in the U.S. was 9 percent, while its counterpart in China—rate of interprovincial migration—was only 1 percent. The interstate/interprovincial migration rate for the 1995–2000 period was 8 percent in the U.S. and 3 percent in China (National Bureau of Statistics 2002, 1813–1817; U.S. Census Bureau 2003), indicating a narrower, but still large, gap in mobility. The recent and substantial surge in mobility in China, however, signals that migration is playing an increasingly central role in shaping its demographic and economic landscape. What also makes China interesting are the ways in

* This research was partially supported by a UCLA Academic Senate research grant. I would like to acknowledge Jiantao Lu for research assistance and Chase Langford for cartographic assistance. I would also like to thank Truman Hartshorn and seven anonymous reviewers for their comments and suggestions on an earlier version of the paper.

The Professional Geographer, 57(2) 2005, pages 295–311
Initial submission, September 2003; final acceptance, June 2004.
Published by Blackwell Publishing, 350 Main Street, Malden, MA 02148, and 9600 Garsington Road, Oxford OX4 2DQ, U.K.

which economic reforms and uneven regional development have driven population movement.

In the next section, I briefly review established theoretical perspectives relating migration to regional development. This is followed by two background sections on China, focusing on changes between the socialist and transitional periods and on data issues. Then, the first part of the empirical analysis assesses the effect of interprovincial migration on population redistribution and the second part examines the relationship between migration and regional development in China.

Theories of Migration

Most macrolevel theories on migration deal with the relationships between mobility on one hand and regional development and population redistribution on the other. Ravenstein's (1889) laws of migration introduced the notion that people move in order to better themselves economically. In this view, migration is considered as the individual's response to regional differentials in economic development. Similarly, neoclassical theory views migration as an outcome of geographic differences in labor demand and supply and of individuals' rational calculation of costs and returns (Sjaastad 1962). At the same time, neoclassical theorists see migration as an equilibrating tool and predict that labor movement from low-wage to high-wage areas will eventually even out regional wage differentials (Borts and Stein 1964). On the contrary, researchers subscribing to structural approaches emphasize the cumulative causation of regional growth and contend that flows of human resources from peripheral, less-developed regions, to core, more-developed regions, will accelerate polarization (Myrdal 1957; Hirschman 1958). Regardless of which view one adopts, it is quite clear that the relationship between migration and regional economic development is a "chicken or egg" one (Richardson 1978, 108–9). One scenario, for example, is that economic and employment growth induces labor in-migration, which further boosts investment and economic growth. Such a relationship has been analyzed by methods that identify bidirectional causality, such as simultaneous equations (Greenwood 1981, 143–68).

Studies of both developed and developing countries have emphasized the role of migration in population redistribution and regional development. For example, research has identified the snowbelt–sunbelt shifts of jobs and population as key processes that accelerated the economic development of southern and western U.S. since the 1960s (Casetti 1984). In Japan, increased and renewed concentration of population in the Tokyo metropolitan region has played an important role shaping its space economy (Tsuyo and Kuroda 1989). In these advanced industrialized economies, natural increase is low, and thus, migration is an especially important explanation of regional variation of population growth. But even in developing countries that have relatively high rates of natural increase, internal migration contributes to uneven population distribution and regional development. The continued growth of core regions in, for example, Ecuador, Philippines, and Egypt, is the outcome of net migration from their respective peripheral regions (MacKellar and Vining 1995).

Most migration studies deal with contexts where "free-individual" migration is the norm. In socialist and transitional economies, however, mobility control limits the magnitude and impact of migration. In the former Soviet Union, migration was subject to official approval (Buckley 1995). Even after the late 1980s, mobility in Russia was still unduly affected by the legacy of the Soviet-period registration system and access to services and resources tied to that system (Mitchneck and Plane 1995). Likewise, migration control exists in China (covered in the next section).

Migration in Socialist and Transitional China

Central planning is a key factor in understanding migration during China's socialist period. Mao's radical ideology led to the sending of urban youths to the countryside and to remote regions in the 1960s and 1970s. The Third Front program between the mid-1960s and early 1970s involved the transfer of resources, including human resources, from more developed coastal provinces to relatively poor and remote provinces in central and western China. Contrary to neoclassical logic, therefore, migration took place down, rather than up, the gradient of development. This was mainly due to the

socialist state's adoption of egalitarian ideology and its use of migration as a tool of political and economic planning.

The *hukou* (household registration) system curtailed self-initiated moves and limited migration from rural to urban areas. This system, implemented in the late 1950s and still being enforced today, assigns a hukou location (*hukou suozaidi*) to every Chinese citizen. For the most part, these placed-based statuses are inherited from one's parents. The details of the hukou system have been extensively reviewed elsewhere (Chan and Zhang 1999; Yu 2002) and are not repeated here. Suffice it to say that, until the mid-1980s, the system strictly controlled rural–urban migration because only persons with an urban hukou had access to jobs, housing, food, and other necessities in urban areas.

After the late 1970s, China began to transform itself into a "socialist market economy," whereby market mechanisms operated alongside central planning legacies. During this transitional period, the state undertook a developmental role and actively pursued economic reforms, including refocusing investment to coastal, more developed provinces, and opened the economy to foreign investors. Much of the new investment occurred in labor-intensive manufacturing such as garments and consumer electronics. It became increasingly clear over time that cheap labor from rural areas would facilitate the type of industrialization being pursued and that strict migration control was not compatible with such a strategy. Moreover, rapid development of sectors such as construction and services in urban areas accelerated the demand for cheap labor (Solinger 1999). Since the mid-1980s, therefore, the state has relaxed migration control, enabling the movement of rural labor to urban areas. Yet the state continued to withhold urban hukou from rural migrants, who could now survive in cities because markets for housing and daily necessities existed but who were still denied access to the full array of jobs and subsidized services available to urban residents. These migrants were channeled to low-paid, manual jobs, and the bottom rung of urban society. I have argued elsewhere that by relaxing migration controls and continuing to deny migrants urban hukou status, the state has fostered a migrant labor regime in order to accelerate industrialization at a low cost (Fan 2003, 2004).

The peculiar institutional structure reviewed above has given rise to the coexistence of "permanent migrants"—migrants whose movements are state sponsored or officially recognized and are thus accompanied by hukou change—and "temporary migrants" whose movements are self-initiated and not associated with hukou change (Fan 2002). The term "floating population" (*liudong renkou*) loosely describes temporary migrants.[3] Not surprisingly, increased mobility since the 1980s is largely attributable to temporary migrants (Yan 1998; Liang 2001). Further relaxation of the hukou system in the 1990s, especially in towns and small cities (Yu 2002, 370–406), continued to boost migration.

The analysis in this article focuses on the relationships between migration on one hand and population redistribution and regional development on the other hand during the transitional period. First, as China's natural increase declines, in part due to a draconian birth control policy, migration is expected to be an increasingly effective factor of population redistribution. Second, economic reforms have widened the development gaps between regions. Economic growth, job opportunities, and higher wages in more developed regions exert a strong pull to migrants from poorer regions (Fan 1996). Third, migrants from poor provinces are the major source of cheap labor to facilitate industrialization in more developed regions, further accelerating the latter's economic growth (Yang, Xu, and Xiang 2003). Thus, the relationship between migration and regional development is expected to be strong and bidirectional. Indeed, the reciprocal relationships between migration and regional development are often implied, if not explicitly analyzed, in recent studies on China (Z. Ma 1999; Liang 2001). In this article, the analysis seeks to document the similarities of the spatial patterns of interprovincial migration and uneven regional development. Compared with intraprovincial migration, interprovincial migration is a more prominent factor of population redistribution and economic development at the national and regional levels (L. J. C. Ma 1996).

Chinese Migration Data

The first Chinese census that provided systematic information about migration occurred in

1990. The most recent census, taken in 2000, also recorded information about migration. Sample surveys between the two censuses provided estimates of population change but offered much less detail.

China's National Bureau of Statistics, which conducts census surveys, uses two main criteria to define migration. The first criterion is spatial. The 1990 census defined a migrant as a person five years or older who on 1 July 1990 resided in a county-level unit (hereafter, counties; see also note 2) different from that on 1 July 1985. This criterion is similar to that used in the U.S. population census, which requires that an individual must have moved across a county boundary during the five years prior to the census in order to be defined a migrant.[4]

The second census criterion is temporal and is tied to the concept of hukou. In the 1990 census, in addition to satisfying the spatial criterion, an individual must (1) have moved his/her hukou to the place of enumeration or (2) have physically stayed in the place of enumeration or have left the hukou location for more than one year, in order to be defined as a migrant. The first condition defines permanent migrants and the second condition defines temporary migrants. These two terms refer to hukou status rather than the duration of stay. As described earlier, even though a migrant may have stayed in a destination for an extended period of time, he/she is still considered a temporary migrant so long as he/she has not managed to move the hukou to the destination. In this regard, urban hukou assumes the function of urban citizenship (Solinger 1999).

By definition, the 1990 census did not include migrants who died between 1985 and 1990, migrants under five years of age in 1990, migrants who returned to the place of origin by the time of the census, and migrants who moved within counties, nor did it document multiple moves. These are limitations similar to those in censuses conducted in other parts of the world. In addition, the one-year temporal criterion excluded short-term migrants, that is, those who stayed in the destination for less than one year or left the hukou location for less than one year. All of the above suggests that the census underestimated population movement and that caution must be taken when interpreting migration data.

The 2000 census used different spatial and temporal criteria for defining migration. The spatial criterion changed to the subcounty level, and the temporal criterion changed to six months. Thus, a migrant was defined as an individual who on 1 November 2000 resided in a subcounty-level unit[5] different from that on 1 November 1995 and who (1) had moved his/her hukou to the place of enumeration or (2) had stayed in the place of enumeration for more than six months or had left the hukou location for more than six months. Both the spatial and temporal changes increased the number of migrants. In particular, persons who moved between subcounty-level units but within a county were not considered migrants in the 1990 census but were counted as migrants in the 2000 census. Thus, the total migration volumes from the two censuses are not comparable.[6] Indeed, the censuses documented a substantial increase in the number of intraprovincial migrants—from 24 million or 2 percent of the age 5 + population in 1990 to 91 million or 7 percent of the age 5 + population in 2000. This surge in volume reflects not only actual mobility increases but also the changes in the census definition.

Clearly, definitional changes present a challenge to researchers wishing to compare data across census intervals. This article focuses on interprovincial migration, which is less problematic than intraprovincial migration for comparison purposes because data for the former are not affected by spatial criterion change. The 2000 census documented a total of 33 million interprovincial migrants, accounting for 3 percent of the age 5 + population in 2000, compared to the respective figures of 12 million and 1 percent in 1990. The effect of the temporal criterion change—from one year to six months—is difficult to determine. However, since the literature suggests that mobility did increase significantly in the 1990s (Yan 1998; Liang 2001), it is reasonable to assume that the surge in interprovincial migration between the 1990 and 2000 censuses was primarily due to a mobility increase. In their recent analysis of census and sample survey data from 1987 to 2000, Cai and Wang (2003) suggest that migration data based on different statistical criteria be used primarily to compare changes in migration directions. Along the same vein, this article's analysis focuses more on changes in spatial patterns than on changes in volume.

The empirical analysis in this article excludes Tibet because of data limitations. And, since

Table 1 *Interprovincial Migration*

	1985–1990	1995–2000
Volume (million)	10.76	31.81
Rate (% of 5 + population)	1.06	2.72
In-migration rate (% of 5 + population)		
Highest	6.59 (Beijing)	14.43 (Guangdong)
Lowest	0.42 (Guangxi)	0.54 (Henan)
Standard deviation	1.44	4.13
Out-migration rate (% of 5 + population)		
Highest	2.48 (Qinghai)	7.12 (Jiangxi)
Lowest	0.45 (Guangdong)	0.55 (Guangdong)
Standard deviation	0.46	1.62
Net migration rate (% of 5 + population)		
Highest	5.37 (Beijing)	13.88 (Guangdong)
Lowest	−1.04 (Guangxi)	−6.49 (Jiangxi)
Standard deviation	1.43	5.09
Migration effectiveness		
System	28.28	63.31
Provincial		
Highest	68.62 (Beijing)	92.67 (Guangdong)
Lowest	−55.44 (Guangxi)	−83.85 (Jiangxi)
Standard deviation	32.34	56.18

Sources: State Statistical Bureau (1992); National Bureau of Statistics (2002).
Notes: Tibet is excluded and Chongqing is combined with Sichuan.

Chongqing was not a separate province until 1996, it is combined with Sichuan. After these adjustments, the analysis includes twenty-nine provinces. In this data set, the volume of interprovincial migration is 11 million and 32 million in 1990 and 2000, respectively; and the migration rate is 1 percent in 1990 and 3 percent in 2000 (Table 1). Because, at the time of this article's writing, published data from the 2000 census do not report the hukou status of migrants, the empirical analysis includes all migrants and does not separately examine permanent migrants and temporary migrants.

Migration and Population Redistribution

I assess here the effect of interprovincial migration on population redistribution by examining migration rates, migration effectiveness, and the correlation between migration and population growth. First, Table 1 depicts that provincial migration rates diverged between the 1990 and 2000 censuses. The standard deviation of in-migration, out-migration, and net migration rates increased from 1 percent, 0.5 percent, and 1 percent to 4 percent, 2 percent, and 5 percent, respectively. Guangdong had the highest in-migration rate in 2000, more than twice the highest rate in 1990 (Beijing); Jiangxi, on the other hand, had the highest out-migration rate in 2000, almost triple the highest rate in 1990 (Qinghai). The range of net migration rates also increased, and Guangdong and Jiangxi had the highest and lowest rates in 2000, respectively. These changes indicate that gainers are adding more population from migration and sending areas are losing more through it.

The effect of migration on population change can be further illustrated via indicators of migration effectiveness (or demographic effectiveness) (Plane 1984). Migration effectiveness for each province is computed as

$$E_j = (N_j/T_j) * 100 \qquad (1)$$

where N_j refers to net migration (in-migration minus out-migration); and T_j refers to total migration (in-migration plus out-migration).

E_j is therefore the percentage of turnover that results in population change. It ranges from −100 to 100 and is not a function of population size. A value of 100 means that all migrants are in-migrants and there are no out-migrants; conversely, provinces with only out-migrants and no in-migrants would have an E_j value of –100. A summary measure of migration effec-

Table 2 *Interprovincial In-Migration, Out-Migration, Net Migration, and GDP Per Capita*

Province	1985–1990 ('000)					1995–2000 ('000)					GDP per capita (2001 constant yuan)	
	Migration (5+)			Natural increase	Population growth	Migration (5+)			Natural increase	Population growth		
	In	Out	Net			In	Out	Net			1988	1998
Eastern	**6,129**	**4,174**	**1,955**	**26,840**	**23,618**	**24,945**	**7,807**	**17,138**	**15,039**	**23,095**	**3,590**	**8,995**
Beijing	663	123	539	496	1,380	1,888	174	1,714	88	690	8,924	15,584
Tianjin	312	86	225	398	864	491	104	387	144	395	6,071	13,237
Hebei	468	665	−197	4,268	3,638	769	872	−103	2,153	2,195	2,470	6,267
Shandong	609	523	86	4,500	1,965	903	878	26	2,072	2,570	2,799	7,759
Liaoning	517	272	245	1,934	836	754	380	375	898	905	4,485	8,777
Shanghai	655	150	505	410	−23	2,167	163	2,004	−93	1,290	10,669	23,299
Jiangsu	837	588	248	3,319	6,455	1,907	1,240	667	1,482	2,180	3,948	9,473
Zhejiang	321	626	−305	1,941	−928	2,714	968	1,746	1,028	2,250	3,867	10,620
Fujian	294	228	67	2,191	2,574	1,346	624	722	975	1,410	2,668	9,441
Guangdong	1,162	250	911	4,656	5,137	11,500	438	11,062	3,765	6,585	3,660	10,571
Hainan	133	112	22	389	243	218	130	88	471	550	2,763	5,496
Guangxi	157	549	−391	2,336	1,477	287	1,838	−1,551	2,056	2,075	1,611	3,815
Central	**2,814**	**3,690**	**−876**	**27,088**	**39,036**	**3,246**	**15,590**	**−12,344**	**16,202**	**15,720**	**2,340**	**4,943**
Anhui	343	538	−195	3,961	2,295	313	2,892	−2,579	2,705	2,695	2,115	4,278
Shanxi	269	227	42	1,905	5,056	382	333	49	1,530	1,610	2,509	4,697
Inner Mongolia	239	278	−39	1,368	1,021	325	441	−116	916	855	2,751	4,908
Jiangxi	226	277	−52	2,624	8,246	235	2,680	−2,445	2,077	1,455	1,858	4,146
Jilin	254	346	−92	1,217	140	254	529	−275	769	825	3,250	5,634
Heilongjiang	332	594	−262	1,688	3,382	301	940	−639	1,110	1,005	3,488	7,085
Henan	493	578	−85	6,229	11,734	468	2,306	−1,838	3,545	3,710	1,730	4,423
Hubei	411	348	62	3,499	3,715	605	2,209	−1,604	1,880	1,845	2,592	5,729
Hunan	248	504	−256	4,598	3,447	362	3,260	−2,898	1,670	1,720	2,188	4,729
Western	**1,818**	**2,897**	**−1,078**	**16,356**	**6,712**	**3,621**	**8,415**	**−4,794**	**13,358**	**13,370**	**2,064**	**3,873**
Sichuan	410	1,287	−877	6,198	2,122	660	5,091	−4,432	4,112	3,560	2,009	4,155
Guizhou	198	309	−111	1,698	1,686	261	1,231	−971	2,530	2,465	1,458	2,157
Yunnan	232	272	−40	2,870	927	731	397	334	2,490	2,495	1,885	4,087
Shaanxi	301	332	−31	2,211	675	420	716	−296	1,229	1,245	2,316	3,649
Gansu	159	269	−110	1,611	377	203	555	−353	1,248	1,210	1,992	3,313
Qinghai	104	98	5	314	290	76	120	−44	352	355	3,054	4,264
Ningxia	78	56	22	398	724	129	87	41	340	400	2,486	4,040
Xinjiang	336	273	63	1,055	−89	1,142	216	926	1,056	1,640	3,373	6,196

Sources: State Statistical Bureau (1990, 1992); National Bureau of Statistics (2002); and China Statistical Yearbooks for various years.
Notes: Tibet is excluded and Chongqing is combined with Sichuan. Population growth due to natural increase is computed with respect to the published yearly natural increase rates and the year-end population of every year within the period. Year-end population for 2000 is not reported in publications by the National Statistical Bureau and is therefore estimated by the average of 1999 and 2001 figures.

Table 3 *Correlation Coefficients on Population Growth*

	Population growth	
	1985–1990	**1995–2000**
Natural increase		
1985–1990	0.6163**	—
1995–2000	—	0.8615**
Net migration		
1985–1990	0.0553	—
1995–2000	—	0.4057*

** significant at the 0.05 level.*
*** significant at the 0.01 level.*
Sources: State Statistical Bureau (1990, 1992); National Bureau of Statistics (2002); China Statistical Yearbooks for various years.
Notes: See Table 2.

tiveness for the country as a whole is "system effectiveness," computed as

$$E = \sum_j |N_j| \Big/ \sum_j T_j * 100 \qquad (2)$$

and ranging from 0 to 100.

Between the two census periods, system effectiveness increased considerably (Table 1). In 1990, 28 percent of interprovincial migration in China resulted in net population gain or decline; in 2000 the proportion increased to 63 percent. Thus, population movements are increasingly unidirectional rather than bidirectional. Provincial migration effectiveness further confirms this finding. Its range and standard deviation indicate an increased divergence between 1990 and 2000. In 2000, again it was Guangdong that had the highest level (93) and Jiangxi that had the lowest level (–84) of migration effectiveness, compared to 1990 when Beijing had the highest level (69) and Guangxi had the lowest level (–55). The increased divergence finding suggests that, at the provincial level, in-migration and out-migration are increasingly imbalanced, again supporting the argument that gainers are gaining more and losers are losing more population through migration.

The increased volume of interprovincial migration, combined with greater system effectiveness and more divergent provincial effectiveness levels, supports the notion that migration was a more effective factor of population redistribution in the 1990s than in the 1980s. Moreover, natural increase continued to decline, though unevenly, in the 1990s, which would further boost the relative effect of migration on population change. Table 2 shows that between the 1985–1990 and 1995–2000 periods, the vast majority of provinces experienced (1) a considerable decline in natural increase and (2) significant increase in net migration volumes, regardless of sign. However, due to the limitations of migration data, alluded to earlier, and the unavailability of yearly migration volumes, population growth figures cannot accurately be estimated by the sum of net migration and natural increase.

Generally speaking, the data in Table 2 do suggest that net migration plays an increasingly important role in explaining population growth. To further confirm this observation, I computed correlation coefficients between natural increase and net migration on one hand and population growth on the other (Table 3). In the 1985–1990 period, natural increase is positively correlated with population growth, while the correlation coefficient associated with net migration is small and not significant. In the 1995–2000 period, both correlation coefficients increase in size. Most importantly, the coefficient for net migration is positive and significant, suggesting that migration is assuming an increasingly important role in redistributing population between provinces.

Migration and Regional Development

The large regional disparity in economic development in China is well documented (Fan 1995). The "three economic belts," a product of the seventh Five-Year Plan (1985–1990) that conceptualized the nation as comprising three regions, each having its own comparative advantage and economic specialization, provides a convenient regionalization scheme to describe the level and changes of regional inequality (Figure 1). Using GDP per capita as a proxy for the level of economic development, Figure 2 illustrates the gap between the three regions and the trend of interprovincial inequality since the mid-1980s. It is clear that the eastern region has had the most rapid economic growth and, as a result, differences between this region and the central and western regions widened over time. In 2001, GDP per capita for the eastern region as a whole stood at 12,071 yuan, nearly two times that of the central region and over

Figure 1 *Provincial-level units and the three regions.*

two times that of the western region. The gap between the central and western regions has also widened, but to a smaller degree.

Taking provinces as units of observation, I assess interprovincial inequality by computing the coefficient of variation (CV) of GDP per capita (Figure 2). Though the decline in interprovincial inequality during the second half of the 1980s seems to depict regional convergence, more detailed analyses show that the trend toward more equality can be traced to the relatively slow growth of the traditional economic core in the northern coastal region and the northeast, including Beijing and Liaoning, which offset the rapid growth of previously less developed provinces in the southeastern coastal region such as Guangdong and Fujian (Fan 1995). The increase in the CV during the 1990s shows that the regional convergence was short-lived and quickly replaced by increase of interprovincial inequality.

Table 2 compares 1988 and 1998 GDP per capita trends over space, revealing that the three centrally administered municipalities—Shanghai, Beijing and Tianjian—had the largest GDP per capita in 1988. Most other eastern-region provinces, the northeastern provinces of Heilongjiang and Jilin, and the northwestern provinces of Xinjiang, also had relatively high levels of GDP per capita at that time. In 1998, the general pattern of regional disparity persisted, but the absolute gaps among provinces grew wider. In particular, Beijing, Tianjin, Jiangsu, Shanghai, Zhejiang, Fujian, and Guangdong enjoyed significantly higher levels of GDP per capita than the rest of the country. This pattern reveals that the contiguous coastal region extending from Jiangsu to Guangdong had

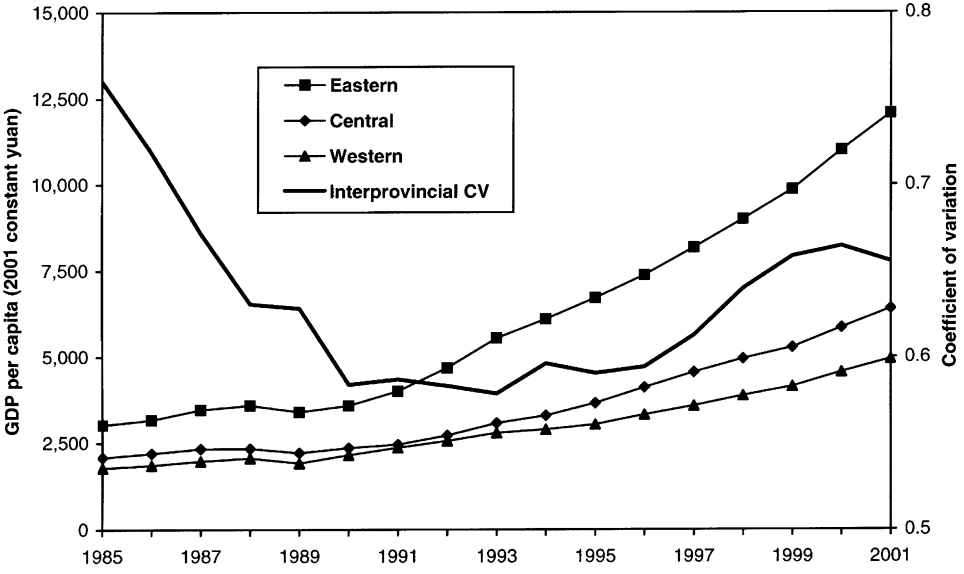

Figure 2 *Regional distribution and inequality of GDP per capita, 1985–2001.*
Sources: China Statistical Yearbooks and Provincial Statistical Yearbooks, various years; Hsueh et al. (1993).
Note: Tibet is excluded, and Chongqing is combined with Sichuan. CV = Coefficient of variation.

emerged as the new growth core of China (Fan 1995).[7] The prominence of Xinjiang in the west is also notable, due in no small part to robust cross-border trade between China and the Central Asian Republics (Loughlin and Pannell 2001). Much of central and western China, however, remained poor. The gap between Shanghai and Guizhou, the provinces with the highest and lowest GDP per capita, widened from 9,211 yuan in 1988 to 21,142 yuan in 1998. The Shanghai–Guizhou ratio surged from 7:1 to 11:1, depicting not only an increase in the absolute level of disparity but an increase in relative disparity.

Table 2 also shows that the eastern region experienced a gain in interprovincial migration. Both censuses documented a positive net migration for the eastern region and that both the central and western regions experienced a negative net migration. Moreover, in the 1995–2000 period, the volumes of net migration and the discrepancies among the three regions grew larger. Net migration rates in the eastern, central, and western regions, according to the 2000 census, registered approximately nine, fourteen, and five times their 1990 counterparts, respectively.

To more specifically identify the migration flows among the three regions, Table 4 shows the proportions of interprovincial migration attributable to intraregional and interregional flows, represented by diagonal and off-diagonal cells. In both periods, the eastern region had the largest diagonal proportion—24 percent and 18

Table 4 *Interprovincial Migration Within and Among Regions*

To	From			
	Eastern	**Central**	**Western**	**Sum**
Proportion of total flows				
1985–1990				
Eastern	24.41	21.03	11.51	56.95
Central	10.67	9.20	6.28	26.15
Western	3.71	4.06	9.12	16.90
Sum	38.79	34.29	26.92	100.00
1995–2000				
Eastern	18.35	41.82	18.24	78.41
Central	3.83	4.00	2.37	10.20
Western	2.36	3.19	5.84	11.38
Sum	24.54	49.01	26.45	100.00

Sources: State Statistical Bureau (1992); National Bureau of Statistics (2002).
Notes: Tibet is excluded and Chongqing is combined with Sichuan.

percent, indicating more active interprovincial migration there than within the other two regions (Cai and Wang 2003). Intraregional flows, however, declined in relative importance. Between the two censuses, the sum of off-diagonal proportions increased from 57 percent to 72 percent, depicting the increased prominence of interregional flows relative to intraregional flows. Of the six off-diagonal cells, only two—the central-to-eastern and the western-to-eastern—increased over time, indicating an acceleration of migration flows from the two noncoastal regions to the eastern region. The flow from the central region to the eastern region is especially noteworthy, as it increased in proportion from 21 percent to 42 percent. The 1985–1990 western-to-central flow (6 percent) was bigger than that of central-to-western flow (4 percent), but in the 1995–2000 period, the latter (3 percent) was bigger than the former (2 percent). This change reflects the increased prominence of western region provinces such as Xinjiang and Yunnan in attracting migrants.

Figure 3 illustrates further the volumes of interprovincial migration within and among the three regions (see also Fan 1996). From the 1985–1990 to the 1995–2000 periods, all flows increased in volume, with the most pronounced increases within the eastern region and those from the central and western regions to the eastern region. The 1995–2000 central-to-eastern flow exceeded the 1985–1990 flow by six times, and the western-to-eastern flows stood five times greater.

By mapping the net migration rates of migrants, Figures 4 and 5 seek to identify more specifically the gainers and losers of migration at the provincial level. In the 1985–1990 period, Beijing and Shanghai revealed the highest rates. Other eastern-region provinces, including Liaoning, Tianjin, Shandong, Jiangsu, Fujian, Guangdong, and Hainan, the two central-region provinces of Shanxi and Hubei, and the three western-region provinces of Ningxia, Qinghai,[8] and Xinjiang, also demonstrated positive migration rates. The rest of the country had negative rates. In the 1995–2000 period, variations in provincial rates increased. Guangdong, Beijing, and Shanghai led the nation with two-digit positive rates. Other eastern-region provinces, except Hebei and Guangxi, all registered positive net migration rates. As in the previous period, Shanxi, Ningxia, and Xinjiang continued to have positive rates, and they were further joined by Yunnan in the southwest. Xinjiang, in particular, produced a larger net migration rate than most other provinces, suggesting that its economic growth related to cross-border trade offered a significant attraction to migrants (Loughlin and Pannell 2001). Yunnan's case is less clear, but its attraction to migrants possibly reflects its recent success in tobacco production (Shen 2001). Both Xinjiang and Yunnan are members of the western region, and their positive rates have likely contributed to the reversal of positions between the central and western regions in the 1995–2000 period, as observed earlier (Table 4 and Figure 3).

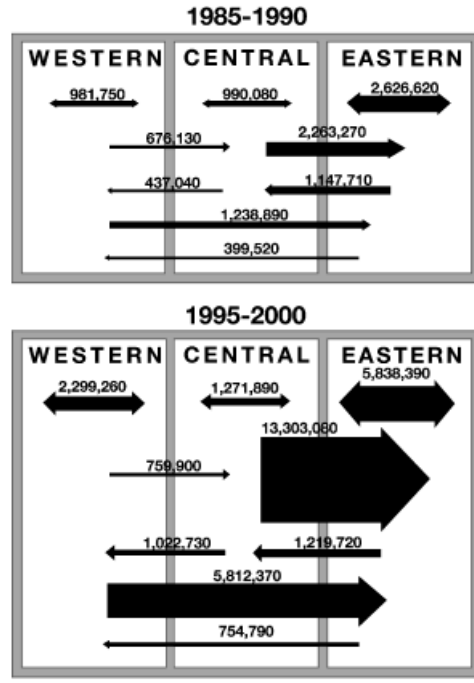

Figure 3 *Interprovincial migration within and among the three regions.*
Sources: National Bureau of Statistics (2002); State Statistical Bureau (1992).

Among provinces with negative net migration rates, the most prominent ones—with rates more negative than –3.0—constitute a contiguous zone spanning south central and southwestern China and including Anhui, Jiangxi,

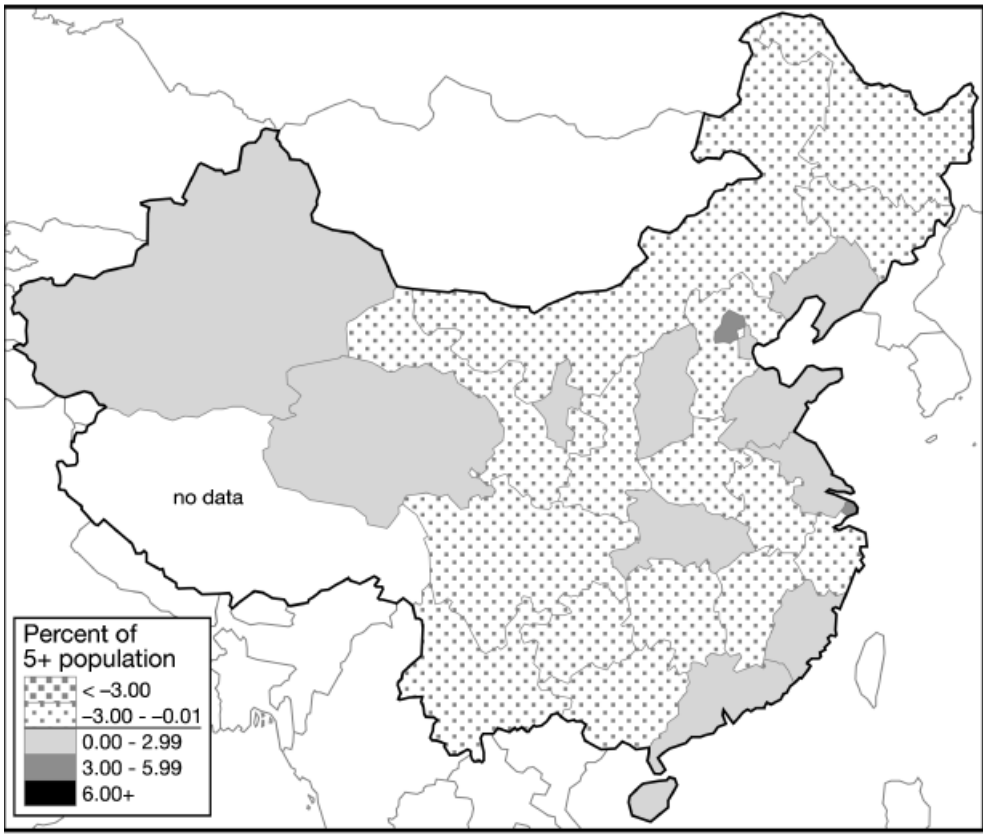

Figure 4 *Interprovincial net migration, 1985–1990. Source: State Statistical Bureau (1992).*

Hunan, Guangxi, Guizhou, and Sichuan. Sichuan provided the largest source of interprovincial migration (Table 2). As shown earlier and in Table 2, these provinces are among the least developed in China. Recent research has documented that Anhui, Jiangxi, Hunan, and Sichuan suffered from negative employment growth in the 1990s (Yang, Xu, and Xiang 2003). And Anhui, Jiangxi, and Hunan—all in the central region—experienced the most negative net migration rates, respectively, –5 percent, –7 percent, and –5 percent. Clearly, these three provinces have contributed significantly to making the central region the largest donor of migrants among the three regions.

The pattern of increased divergence of net migration rates between the two censuses, observed above, apparently paralleled the increased divergence in the levels of economic development shown earlier. Specifically, the southern half of the eastern region, along with Beijing and Tianjin, and Xinjiang in the northwest, received the largest shares of interprovincial migration. At the same time, they led all provinces in increases in development levels. The south central and southwestern provinces of Anhui, Jiangxi, Hunan, Guangxi, Guizhou, and Sichuan became the most prominent donors of migrants, and they also stood among the poorest provinces in China.

Figures 6 and 7 map the most prominent net migration flows between pairs of provinces. Two criteria were used to identify prominent flows. First, the stream effectiveness had to be large. Here, stream effectiveness refers to migration effectiveness for specific pairs of

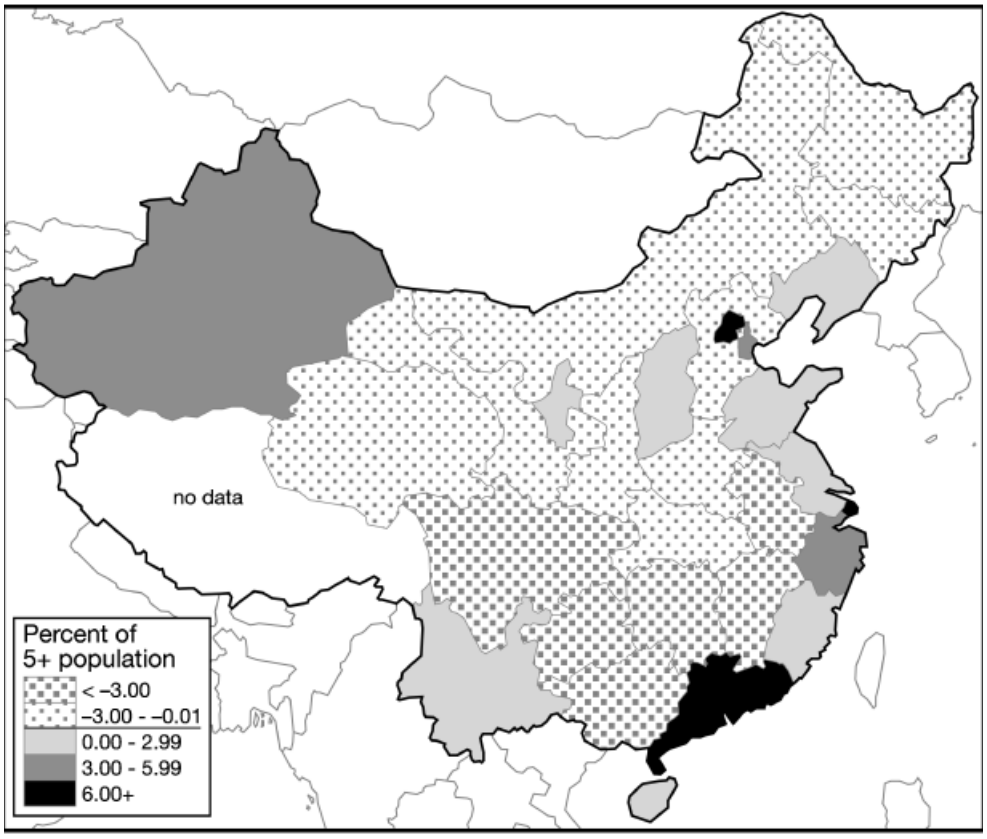

Figure 5 *Interprovincial net migration, 1995–2000. Source: National Bureau of Statistics (2002).*

provinces (Plane 1984):

$$e_{ij} = (n_{ij}/t_{ij}) * 100 \qquad (3)$$

where

$n_{ij} = m_{ij} - m_{ji}$;
$t_{ij} = m_{ij} + m_{ji}$;
m_{ij} is migration from the i^{th} province to the j^{th} province; and
m_{ji} is migration from the j^{th} province to the i^{th} province.

Stream effectiveness values can range from –100 to 100. Both extremes signify unidirectional movements from one province to another, while values close to zero indicate roughly equal flows in the two directions.

I selected only the flows for which the absolute value of e_{ij} was above 80 in order to highlight net migration flows that clearly contributed to the redistribution of population. Second, net migration volume must be large relative to the average of the 406 pairs of net migration among the 29 provinces. The average volumes for the 1985–1990 and 1995–2000 periods fell at 11,305 and 57,653, respectively. I selected only the flows that were at least twice the average net migration. Combining these two criteria yielded a set of large net migration flows that denote significant one-sidedness in migration flows between pairs of provinces. There were nine and twenty-nine such flows in the 1985–1990 and 1995–2000 periods, respectively, indicating that the degree of one-sidedness intensified over time.

The nine migration flows in the 1985–1990 period, depicted by Figure 6, reflect two pat-

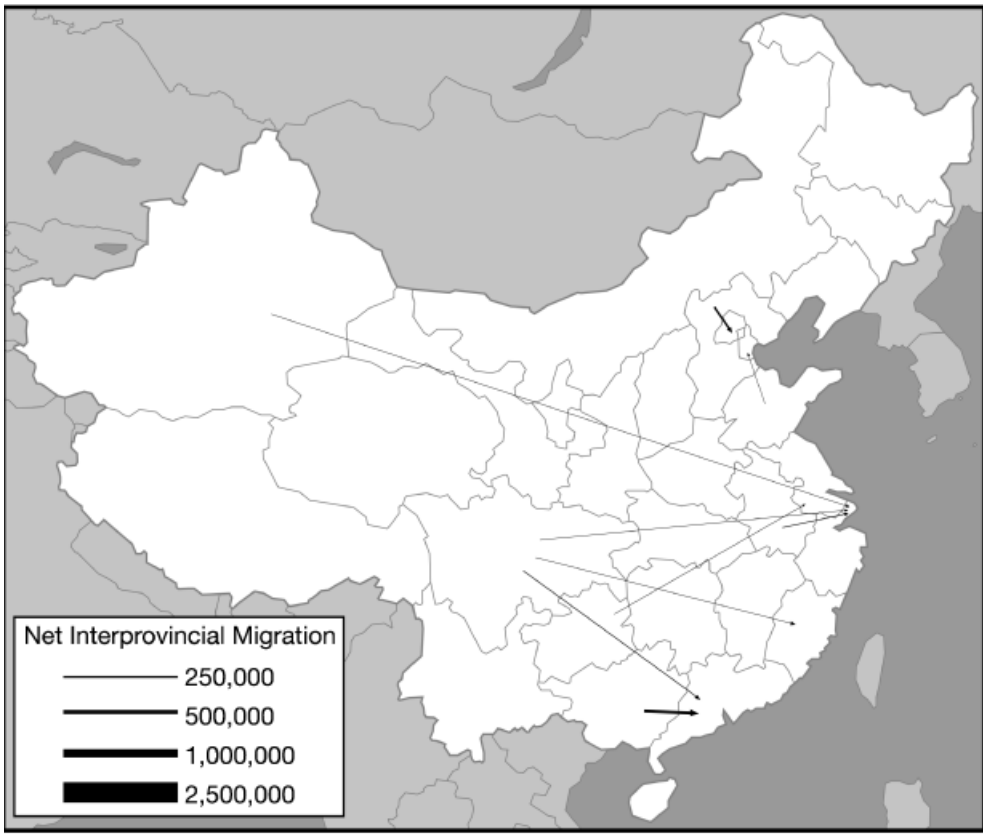

Figure 6 *Prominent interprovincial net migration flows, 1985–1990. Source: State Statistical Bureau (1992).*

terns, both with coastal and more developed provinces as destinations. The first pattern reflects substantial levels of economic disparity between origin and destination provinces. Flows from Xinjiang and Sichuan to Shanghai, Sichuan to Fujian and Guangdong, and Guizhou to Jiangsu, are of this type. The second pattern includes short-distance moves from neighboring provinces to coastal and more developed provinces, reflecting the well-known idea that migration is negatively related to distance (Cai and Wang 2003). Flows from Hebei to Beijing and Shandong to Tianjin are characterized by relatively short distances. In addition, flows from Anhui to Shanghai and Guangxi to Guangdong reveal both short-distance characteristics and significant economic disparities.

Net migration flows in the 1995–2000 period exhibit significantly bigger volumes (Figure 7). They also display a more concentrated pattern. The most striking destination is Guangdong, which experienced very large net migration flows from a number of central and western region provinces. In addition, Beijing, Jiangsu, Shanghai, Zhejiang, and Fujian also became prominent destinations. The only noncoastal province with significantly large net flows is Xinjiang. Donor provinces with prominent flows to several destinations include Anhui, Jiangxi, and Sichuan. Again, both economic disparity and adjacency appear to be important factors contributing to this concentrated pattern.

Increased heterogeneity of migration rates and the concentration of donor and destination provinces suggest that the degree of "spatial focusing" has increased. Spatial focusing refers to the "inequality that exists in the relative volumes of a set of origin-destination-specific migration

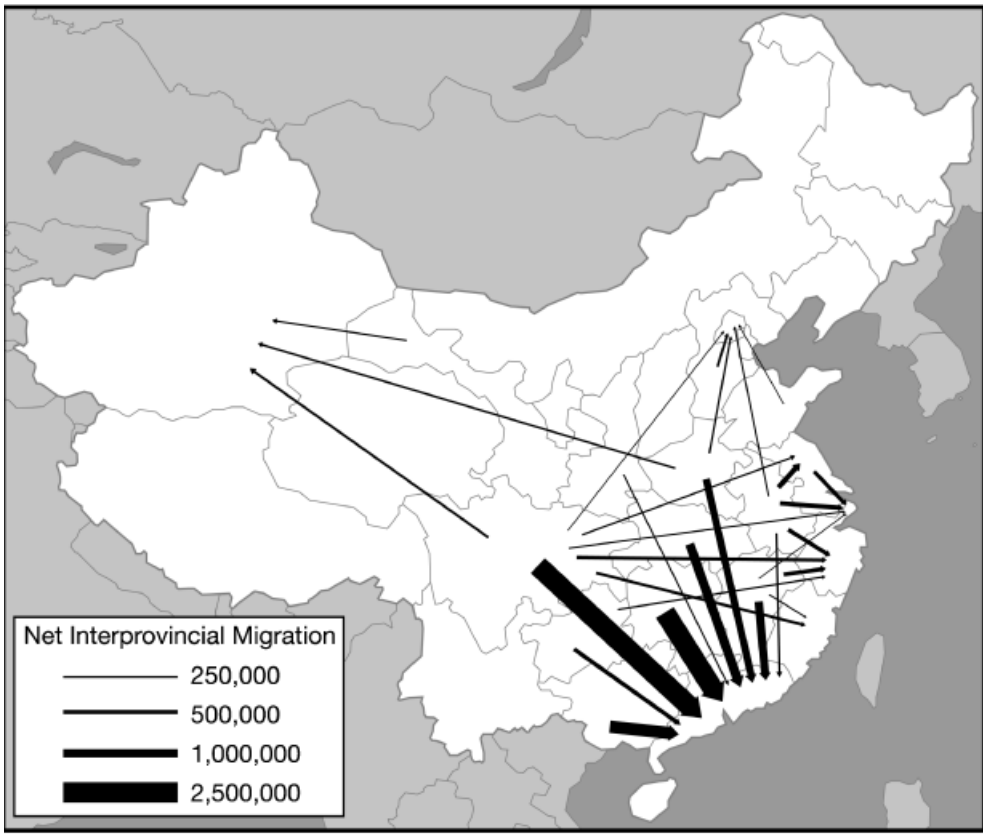

Figure 7 *Prominent interprovincial net migration flows, 1995–2000. Source: National Bureau of Statistics (2002).*

flows" (Plane and Mulligan 1997, 251). Increased migration selectivity to only a few destinations and/or from only a few origins enhances spatial focusing. Researchers have used both the Gini coefficient and the CV to measure spatial focusing (Rogers and Sweeney 1998). For the sake of simplicity, I used the CV to compare spatial focusing of migration in the 1985–1990 and 1995–2000 periods. This entails computing the CV for every row (destination) and column (origin) of a 29 $\times$ 29 matrix of interprovincial migration flows. Using provincial shares of the total flow as weights, the coefficients are standardized. The sum of row coefficients is the in-migration aggregate CV that assesses origin selectivity; and the sum of column coefficients is the out-migration aggregate CV that evaluates destination selectivity. The sum of the two aggregate weighted CV is the aggregate systemwide measure that summarizes the overall degree of spatial focusing.

Table 5 shows the aggregate measures of spatial focusing. Between the 1985–1990 and 1995–2000 periods, migration selectivity increased, as depicted by the increase of the systemwide measure from 3 to 4.[9] The in-migration aggregate weighted CV changed little, but the out-migration aggregate weighted CV increased from nearly 1.5 to over 2, indicating an increased concentration of destinations over time. As illustrated earlier in Figure 7, the southern half of the eastern region, especially Guangdong, has been the most prominent destination of interprovincial migration, pulling migrants from many especially poor provinces.

Table 5 *Spatial Focusing*

	1985–1990	1995–2000
In-migration aggregate CV	45.30	43.53
Out-migration aggregate CV	43.99	53.72
In-migration aggregate weighted CV	1.51	1.65
Out-migration aggregate weighted CV	1.46	2.35
Aggregate systemwide measure of spatial focusing	2.97	4.00

Sources: State Statistical Bureau (1992); National Bureau of Statistics (2002).
Notes: Tibet is excluded and Chongqing is combined with Sichuan. CV = Coefficient of variation.

Evidence described above, most notably the parallel between increased inequalities in economic development and migration and the concentrated flows from poor provinces in the south central and southwestern China to the most developed eastern-region provinces, is consistent with the notion of a stronger relationship between migration and regional development in the 1990s than in the 1980s. These results also support the argument that migration is increasingly related to regional differentials of economic opportunities (Fan 1996).

Summary and Conclusion

Migration research, drawing primarily on experiences of capitalist economies, has shown that population movement is strongly related to regional economic development. During the socialist period of China, however, mobility was constrained by central planning and the hukou system. Since the 1980s, economic reforms and the relaxation of migration controls have resulted in a surge in migration. Using interprovincial migration data from the 1990 and 2000 censuses, I examined two themes: first, migration as a more effective factor in population redistribution, and second, the strengthening of the relationship between migration and regional development.

Results of data analysis reinforce both notions. Between the 1985–1990 and 1995–2000 periods, interprovincial migration volumes surged, migration rates diverged, migration effectiveness for China as a whole increased, and migration effectiveness levels for provinces became more extreme. All of these trends suggest that gainers gained more and losers lost more population from net migration. In addition, the statistical correlation between migration and population growth was not significant in the 1980s but became positive and significant in the 1990s. Thus, the role of migration in redistributing population among provinces clearly increased.

Studies in both China and elsewhere suggest that the relationship between migration and regional development is bidirectional. The analysis presented here also indicates that the relationship between migration and regional development has become stronger over time. Migration flows from the central and western regions to the eastern region increased exponentially in the 1995–2000 period. Beijing, Tianjin, and the southern half of the eastern region, which led the country in level of development, were the most prominent destinations. Guangdong, in particular, which has experienced remarkable economic growth since the economic reforms, further increased its attractiveness and become a nationwide magnet to migrants.[10] Xinjiang in the west, which enjoyed relatively high rates of economic growth in the 1990s, also gained population from migration. By contrast, several south central and southwestern provinces, among the poorest regions in China, emerged as the most prominent donors of migrants. Furthermore, analyses of stream effectiveness (between pairs of provinces) and spatial focusing indicate that the pattern of interprovincial migration was more concentrated in the 1990s than in the 1980s. The concentrated migration pattern once again mirrors the increased heterogeneity in economic development among provinces.

More so than in the first decade of the transitional period, migration in the 1990s had a significant impact on regional population distribution and a strong relationship with regional development. This finding reflects an accelerated penetration of market mechanisms and hints at the increased relevance of existing migration theories and of the experiences of other countries (Roberts 1997) for conceptualizing population movement in China. Though not examined in this article, the specific impacts of migration, such as labor market changes in the destination and remittances received by the origin, warrant special attention by researchers. A greater understanding of the interplay between migration and regional development in China will shed further light on how economic transition has shaped its space economy. ■

Notes

[1] In this article, the term *province* refers to provincial-level unit; *interprovincial migration* refers to migration among all thirty-one provincial-level units (see also Figure 1).

[2] In this article, the term *county* refers to all county-level units in China, including counties, county-level cities, and suburban counties and urban districts of prefecture-level cities. There are more than 2,000 counties in China.

[3] In public and scholarly discourses, the term *floating population* is often used to refer to migrants in general, without providing specifics about their *hukou* status.

[4] In the U.S census, those who move within counties are called *movers*.

[5] Subcounty-level units include streets, towns, and townships. In broad terms, streets and towns are considered urban areas, and townships are considered rural areas.

[6] As of September 2003, data released by the National Bureau of Statistics to the public do not permit separate analysis of intercounty moves and intracounty moves.

[7] Though variations within provinces exist, the data show that the spatial changes at the provincial level are pronounced.

[8] Note that Qinghai had the highest out-migration rate in the 1985–1990 period (Table 1). Its out-migration, however, was more than offset by in-migration to the province.

[9] Using the same technique and comparing data from the 1987 One-Percent Population Survey and the 1990 census, He and Pooler (2002) found that the systemwide measure remained stable between the 1982–1987 and 1985–1990 periods. This suggests that increased spatial focusing is primarily a phenomenon of the 1990s.

[10] Although Shanghai had the highest GDP per capita, its rate of economic growth between the 1980s and the 1990s was lower than that of Guangdong. This differential explains in part why Shanghai's rates of in-migration and net migration were lower than those of Guangdong.

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