Remapping China's Regional Inequalities, 1990–2006: A New Assessment of *de Facto* and *de Jure* Population Data

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Abstract: Two U.S.-based geographers use the most recent data to explain the complexity of China's provincial *de jure* and *de facto* population statistics and their relationship to computed inequality indices of per capita GDP. After reviewing the literature, the paper focuses on trends in regional inequality in China during the 1990s, and contends that the consensus view about the increase of inequality during the late 1990s is based on erroneous interpretation and faulty application of *de jure* provincial population series, which has resulted in significant overstatement of interprovincial inequality in 2000. The analysis presented in this paper shows that, after a significant rise in the first half of the 1990s, China's regional economic disparities began to level off in the second half of the 1990s and have persisted at about the same level since then. The authors proffer explanations for the stability in regional inequality since 1995, especially stressing the role of long-distance migration. *Journal of Economic Literature,* Classification Numbers: I31, O18, R12. 6 figures, 10 tables, 105 references. Key words: China, regional inequality, interprovincial inequality, per capita GDP, population statistics, *de facto* population, *de jure* population, migration, migrant labor, coefficient of variation.

INTRODUCTION

The disparities between the rich and the poor in China have seldom failed to attract the attention of researchers and policymakers alike. The prominence of the issue is due to its critical importance in the country's overall development as well as social and even political stability.[2] Recent opinion polls of officials studying at China's elite Central Party School in the last three years show that inequality between rich and poor was until very recently ranked as the country's No. 1 social issue.[3] There is general agreement among researchers that income or economic inequality in China (measured by a variety of indices) has risen continuously for the last two decades after experiencing a decline during the first half of the 1980s (Khan et al, 1993; Piech, 2004; World Bank, 2005); it is reaching an alarmingly high level at present—probably the highest in the post-1949 era.[4]

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[2]Economic inequality has been a major policy issue on the agenda of the last two Party Congresses in China (2003 and 2007; e,g, Sanzhong, 2003; China Beware, 2007).

[3]I.e., from 2005 to October 2007. *Wujia* (consumer prices and inflation) has become the No. 1 social issue since October 2007 (Shouya, 2007).

[4]According to data from the United Nations (UNDP, 2005, p. 14), China ranked 90th out of a total of 131 countries in the overall Gini coefficient for income distribution in 2000.

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Growing inequality is linked to heightened social tension and a record number of mass protests in recent years (Keidel, 2006). The harshest critics, such as Pei (2006), have viewed the broadening of inequality as a symptom of China's flawed political system and development model. Mirroring the inequality among individuals is the gap between the affluent coastal and poor inland regions—a major spatial dimension of disparity. While "disparity" clearly is a broad and multi-dimensional concept, most, if not all, studies of China's interprovincial disparities focus on the economic aspect, with many following that route due to the availability of systematic economic output data.[5] The bulk of the substantial accumulation of literature on China's regional economic disparities covers both the pre-reform and reform eras at the inter-provincial level.[6]

Despite China's accelerating economic growth in the 1990s, there is a strong sense in many writings (based on computed indices derived from economic output data) and a widespread public perception that the gap between the rich coastal and the lagging inland provinces is widening (see Table 1). Factors regarded as causes of the divergence among the provinces include China's increasing marketization, fiscal decentralization, integration with the global economy, and regional development policies favoring the coastal provinces. Paradoxically, the so-called "increasing divergence" thesis flies in the face of the extraordinary geographic mobility of the population (mainly labor) witnessed in the last two decades.[7] The movements are so extensive that they are regarded by some writers (journalists and scholars as well) as the world's largest migration;[8] arguably, given its enormity, one would think that migration would have a significant effect in equalizing the economic disparities among provinces (e.g., see Lin et al, 2004; Ma et al., 2004; Whalley and Zhang, 2004; Chan, 2008b).

Chan's (2003) effort to compare the *de facto* population statistics available in China's 2000 Census with the "regular" annual provincial population series, has served to highlight the apparent differences between the subnational figures in the Census (which are based on *de facto* population) and the regular data (calculated on a *de jure* basis) of many locales.[9] The most common problem relating to these differences and encountered in many previously published urban studies of China can be traced to overstatements of the per capita GDP of individual cities. However, challenges continue to be present in attempts to compute almost any "average" per capita indicator. In fact, with increasing migration of persons without local *hukou* (household registration) status at their destination,[10] the difference between the two sets of data has grown much larger and the bias inherent in the previous official subnational

[5]A few studies, such as Wang and Zhang (2003), and UNDP (1999, 2002, 2005), have examined China's interprovincial inequality using data (other than economic) pertaining to education and health.

[6]Selected sources covering the 1990s are given in Table 1. For different views on pre-reform era, see Lardy (1978), Leung and Chan (1986), Tsui (1991, 2007), and Lyons (1991). For the 1980s, refer to Fan (1995) and Tsui (2007). See also the preceding study in this issue by Fan and Sun (2008).

[7]The 2005 One Percent Population Survey shows that the size of the "migrant population," loosely defined as persons without local *hukou*, was about 147 million in 2005, of which 48 million came from another province-level unit (SC and NBS, 2007, p.851).

[8]The claim is debatable, depending on the definition of migration. Some observers have also confused the concepts of "migration stock" and "migration flows," leading to adoption of exaggerated migration figures. See discussion in Chan (2008b).

[9]The differences prompted Chan (2003) to raise the possibility of inadvertent application of inappropriate population series in the computation of per capita GDP at the subnational (province and city) level in previously published studies. Most recently, he has presented and discussed the complicated system of defining population at the city level and examined the systematic errors and misuses of urban population and per capita GDP data due to uncritical acceptance of Chinese statistics at face value (Chan, 2007).

[10]Definitions of the different types of migrants in China are to be found in Chan (2001).

Table 1. Selected Studies Covering Regional Inequality in the 1990s

Authors	Period of study	Measurements of inequality[c]	Indicator[a]	Scale[b]	Findings on regional inequality
Lin et al., 1996	1978–1995	Gini	pc GDP pc income	InterP	Declined slowly between 1978 and 1985 and increased steadily thereafter
Duncan and Tian, 1999	1952–1995	CV	pc GDP, income consumption	InterP IntraP	Rose in the first half of the 1990s
Fujita and Hu, 2001	1985–1994	CV, Theil index	pc GDP	InterP	Declined in the 80s; increased in 1990s
Wang and Hu, 1999	1978–1994	STD, CV	pc GDP	InterP	Converged during late 1970s and early 1980s; stabilized during the 2nd half of the 1980s; diverged in the 1990s
Ying, 1999	1978–1994	Theil Index	pc GDP	InterP	Diminished until 1990; then widened
Wei, 2000	1949–mid-90s	Various	Multiple	Multiple	Generally increased in the first half of the 1990s
Zhao and Tong, 2000	1985–1995	CV Gini	pc GDP pc income	InterP 3 regions, R/U	Increased since 1985 and exacerbated in the 1990s
Lu and Wang, 2002	1978–1998	CV Gini Theil Index	pc GDP pc consumption pc income	InterP 3 regions R/U	Declined between 1978 and 1990 but widened steadily since 1990
Cai et al., 2001	1978–1999	CV Theil Index	pc GDP	InterP	Declined between 1978 and 1990 but widened since ca. 1990
Naughton, 2002	1978–1997	CV	pc GDP	InterP	Strong convergence in the 1980s; modest divergence in the 1990s
Huang et al., 2003	1991–2001	Gini	pc GDP	7 regions	Increased
Yu and Wei, 2003	1978–2000	CV Location quotient Spatial cluster	pc GDP	InterP 3 regions	U-shaped: declined in 1980s and increased substantially in the 1990s
Lin et al., 2004	1985–2000		pc income (survey)	InterP	Increased, but migration become more responsive to income differences
Wang, 2004	1991–1999	GMM	pc GDP	InterP	Increased
Fan, 2005a	1985–2000	CV	pc GDP	InterP 3 regions	Declined during the second half of the 1980s and increased during the 1990s
Kanbur and Zhang, 2005	1952–2000	Gini	pc GDP	InterP, R/U costal-inland	Increased sharply and steadily since 1984
Wan, 2007	1987–2002	Theil index	pc income	InterP, R/U	Rapid rise up to 1994; a drop in 1994–1998; rapid rise again in 1998-2002.

(*table continues*)

Table 1. *Continued*

Authors	Period of study	Measurements of inequality	Indicator[a]	Scale[b]	Findings on regional inequality
Tsui, 2007	1952–1999	Theil Index	pc GDP	InterP	An overall upward trend in the first half of 1990s; results based on official data show a sharp increase since 1995 while results based on author's adjusted data indicate stabilization.
Fan and Sun, 2008	1978–2006	CV Theil index Gini	pc GDP	InterP 3 regions InterR	Decline during the 1980s; increase during the 1990s, followed by stabilization and ultimate decrease

[a]pc = per capita.
[b]InterP = interprovincial; IntraP = intraprovincial; InterR = interregional; R/U = rural/urban.
[c]GMM = generalized method of moments.

per capita indicators has become more serious. The complexity of Chinese provincial population statistics has similarly been brought to the attention of investigators by Qiao (2002), Naughton (2002), and Johnson (2003).

Their works have led us to take a fresh look at the regional "divergence" thesis (see above) by reexamining the data used and replicating the main indices based on the newly revised understanding of the country's population statistics. Our investigation attempts to expose a fairly complex system of multiple *de jure* and *de facto* provincial population statistics used in China, instead of the single system on which most researchers have relied on in the past. Indeed, many other related phenomena (based on statistics and definitions such as "rural," "urban," and "migration") often described or invoked in analyses of China's spatial economy also are plagued by similar complexities.[11] In other words, many sets of statistical data pertaining to China should not be taken at their face value.

In this paper, we undertake to survey China's main provincial population statistics based on two major definitions. We rework one of the most commonly used interprovincial inequality indices—namely the coefficient of variation (CV, see below) for three benchmark years (1990, 1995, and 2000) for which usable *de facto* provincial population statistics are available (from two national censuses and one large national survey)—to show the differing findings that result from application of different provincial population numbers. Our study seriously calls into question the divergence thesis. We also explore here the possible factors that counter the trends of divergence, with a particular focus on the impact of long-distance migration on regional disparities. Based on a revised understanding of the population statistics, we also take advantage of the newly revised provincial GDP and population data to generate an annual interprovincial inequality (IPI) index for the period from 2000 to 2006. The analysis allows us to present a picture of the broad trends in regional economic disparities during the period from 1990 to 2006 based on per capita GDP averages and the inequality index. Going beyond the face value of data and indices, and engaging a broader social

[11]See Chan and Xu (1985), Zhou and Ma (2005), Chan (2001, 2007, 2008a). Many researchers (especially developers of models) are perhaps too focused on demonstrating the sophistication of their models than on addressing the complexities of the statistical data (see the critique of existing urban studies by Chan, 2007).

science literature, we proffer a nuanced and different interpretation of the observed regional inequality trends and explore plausible dynamics underlying the IPI in the post-1990 period., focusing on the role of migration in narrowing regional disparities. We intend to illustrate in this paper how the application of two sets of provincial per capita GDP statistics, each generated by a different series of population data, can yield two starkly different stories of regional development and migration in China. We also discuss several relevant and broader methodological and empirical issues arising in the compilation and interpretation of inequality indices in the context of present-day China. These discussions also provide information on China's statistics that can be used for deconstructing some data sets found in the past literature and for constructing new sets.

A BRIEF REVIEW OF THE LITERATURE

For the purposes of this paper, we will concentrate on the study of the overall IPI in the 1990s and subsequent years through 2006. Table 1 presents some of the major contributions to the literature pertaining to the last decade of the 20th century.[12] Typically, these studies employ standard inequality indices, such as the Gini coefficient, coefficient of variation (CV), and/or the Theil index, which show broadly similar trends. Because of its relative simplicity, the CV appears to be the most popular indicator used in studies of China's IPI. The data used to compute these inequality indices include per capita GDP as well as rural/urban income and/or consumption at the provincial level (or above), with provincial per capita GDP being the most commonly used. This is explained by its "supreme" status as the most important indicator of development or "well-being" in the growth-oriented economic and geographical literature, in tandem with the availability of complete annual time-series data. Interestingly, in the reform era China has also been almost single-mindedly preoccupied with development defined within the very narrow confines of GDP;[13] the preoccupation has been widely criticized for contributing to the neglect of many other important aspects (such as ecological sustainability) of "development" defined more broadly. Ironically, the emphasis on GDP has resulted in it being one of China's more problematic statistics. Because GDP growth figures are used to assess the performance of local officials, the numbers are subject to local political pressures and their accuracy, especially at the local level, can be questioned (Whiting, 2000; Rawski, 2001; Holz, 2002, 2004; Shizhen, 2004; Chan, 2007).

Despite the differences in the indices and data, almost all studies listed in Table 1 agree on one clear trend: China's IPI increased in the 1990s.[14] This is true not only for the first half of the 1990s, which all studies cover, but also for the second half, which is addressed by the more recent ones. Typically, the rapid economic growth of the southern coastal provinces (especially Guangdong and Fujian), along with other factors, such as the concentration of FDI in these provinces, preferential policies of the central government, the long-lasting urban-rural divide, geographical location, and transportation costs, are cited as reasons for the increasing divergence in the last decade of the 20th century (e.g., see Lin et al., 1998; Wei, 2000; Bao et al., 2002; Fan, 2005a).

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[12]Studies that focus solely on interprovincial rural or urban inequality (a separate issue addressed in the concluding discussion) are not included in the table.

[13]In the late 1970s, the paramount goal of China's leaders was to pursue a quadrupling of the nation's *aggregate GDP* by 2000. Note a subtle change in the current goal, which is to quadruple the *per capita GDP* from 2000 to 2020 (see Hu, 2007, Section 4).

[14]One distinct exception is Tsui (2007); other possible ones are Naughton (2002) and Wan (2007).

The role of migration has tended to be overlooked in most studies of regional disparities. The few that address migration in that context tend to emphasize the response to rising regional economic disparities (e.g., Lin et al., 2004; Fan, 2005a), or argue the ineffectiveness of migration in counteracting spatial inequality in light of institutional distortions in the labor market (e.g., Cai et al., 2001). In the following pages, we will revisit the divergence thesis in the 1990s by examining the population data used by other researchers and turn to some of the related issues (especially long-distance migration) in an effort to enhance our understanding of China's changing spatial economy.

MEASURING CHINA'S INTERPROVINCIAL INEQUALITY

Before proceeding to calculate IPI and study the trends, we will review a number of pertinent issues involved in the measurement of IPI in China and explain our choices. Because a major objective of this paper is to call attention to misapplications of provincial population data in the literature and to demonstrate how it has affected our understanding of the regional disparities in the 1990s, we will present an abbreviated empirical study as an illustration rather than a fully fledged, updated study.[15] Another objective is to study the IPI for the first seven years of the 21st century on the basis of this renewed understanding, by taking advantage of some newly revised GDP and population data that have just recently become available. Several measurement "treatments" in computing and using IPI have now become "standard." Because the rationale has been well covered elsewhere,[16] the details and different views will not be repeated. Below we present only a summary of our specific choices in tandem with the rationale. However, four "new" issues, largely overlooked in the past, are treated in some detail below.

The "Standard" Issues

(1) The choice of one or more economic or social indicators to represent "living standards" or "well-being": a majority of previously published studies have utilized provincial per capita GDP, and this paper will focus on that indicator.

(2) In further reference to (1) above and our interest in looking at temporal trends, we follow the standard way and use provincial GDP data in comparable constant prices for computing the IPI index instead of using such data in current prices; the results in current prices are included for reference.

(3) The choice of one or more inequality indices: the CV, the Gini, and the Theil index are the three most commonly used. Previously published studies have shown that they yield broadly similar (although not identical) trends and directions. We will use here the CV, defined as the standard deviation divided by the mean.

(4) The choice of a geographical scale/unit: the basic unit is the one at the province level (hereafter, "province"). As in many other studies, we also try two versions, namely "Group 1," which includes all units (thus $N = 30$ for 1990–2000 and $N = 31$ for 2000–2006), and "Group 2," which excludes the three province-level cities, Beijing, Shanghai, and Tianjin (accordingly, $N = 27$ for 1990–2000 and $N = 28$ for 2000–2006). These three units are the

[15]Completely revised provincial GDP data for the 1990s are as yet not available for that purpose; see the discussion below.

[16]See Tsui (1991), and Wang and Hu (1999).

most urbanized and have the highest per capita GDP in 1990–2000.[17] Their inclusion or exclusion often affects the dispersion of observations (and hence the CVs).

(5) Following the seminal work by Williamson (1965), we also believe that a population-weighted CV[18] is the more appropriate given the huge differences in the size of the populations of China's provinces. Our discussion of the trends will be based on weighted CVs, with unweighted CVs presented for reference.

New Issues and the Systems of Population Statistics

(6) The provincial population base will be used for computing the provincial per capita GDP. Before examining the issue, we ought to briefly review the Chinese systems of population statistics.[19]

China currently has two systems for the collection and reporting of statistical data. The first is the "regular" system developed to serve the traditional, Soviet-type planned economy prevailing in pre-reform China. The system was a component of the apparatus of economic planning, which relied heavily on the use of quantitative (often output) indicators to monitor the economy, the society, as well as the performance of local governments and officials. Essentially, the system was closely aligned with the "planning" needs of the government. It generated statistical data that had primarily been designed to serve economic planners, and not necessarily to facilitate research as understood in the West. This system relied almost entirely on statistical reports submitted at regular intervals by all constituent units. Surprisingly, after almost 30 years of reform, it still remains the mainstay of China's current statistical system. Local governments/agencies receive their statistics from the constituent units and aggregate and submit them, in turn, to the next higher level of government. Statistics serve as sources of information, but perhaps more significantly as indicators of performance by local governments, used to evaluate local officials by their supervisors.

For population statistics, the primary output from this system is the head count based on the country's *hukou* system, administered by public security authorities. As such, the *hukou* population refers to the number of individuals possessing permanent *hukou* registered in the respective administrative area (for our purpose here, a province-level unit). The registration is equivalent to local "citizenship" in determining eligibility for exclusive "benefits" within a particular administrative unit (Chan and Zhang, 1999; Wang, 2005). The numbers are generally used by officials at various levels and branches of the government for a variety of

[17]Chongqing, created from Sichuan as a province-level city in 1997, is merged with Sichuan in our analysis of 1990–2000, and is treated as a province in the analysis for 2000–2006. Chongqing, with a population of ca. 30 million in 2000, is much less urbanized than the other three province-level cities, and resembles more closely a province than a city.

[18]The weighted CV is calculated as $\frac{\sqrt{\sum_{i=1}^{n} P_i(x_i - \bar{x})^2}}{\bar{x}}$, where n is the number of provinces, P_i is the ratio between the population of the ith province and the total population of the nation, x_i is the per capita GDP of the ith province, and $\bar{x}$ is the average per capita GDP of all the provinces, weighted by the respective provincial *de jure* or *de facto* population.

[19]This draws heavily on Chan (2007).

purposes; a reasonably large part is related to fiscal accounting and allocation of resources to government units. These numbers basically constitute registration (i.e., *de jure*) counts instead of actual population counts. They include many people who are registered but actually do not live in the unit and exclude those who live in the unit but lack local *hukou* registration.

The other system is based on surveys undertaken by the National Bureau of Statistics (NBS), frequently in cooperation and/or collaboration with ministries and local governments, in order to generate another body of data, which is based on the *de facto* count. In population statistics, this system now relies upon annual surveys of varying sample sizes. These range from the routine annual national "One per 1000" sample surveys, to decennial "One Percent Sample" population surveys (as in 1995 and 2005), to full census enumerations (as in 1990 and 2000) to produce more useful and trustworthy sets of numbers.[20] Because of their inherent differences, the two systems inevitably generate numbers that differ, at times quite starkly so.

Tables 2 and 3 show the two sets of provincial population statistics for four benchmark years (all relevant to our study) for which *de facto* population data of higher quality (drawn from very large sample surveys or full censuses) are available. A mid-year figure for both sets for every year except 1995 is also given to allow a direct one-to-one comparison of the two sets. Table 2 presents mid-year and year-end *de jure* populations, while Table 3 provides data on the *de facto* population based on the 1990 and 2000 population census enumerations as well as the 1995 and 2005 One Percent Sample population surveys; the table also presents the mid-year population numbers for 2000 and 2005, derived indirectly from NBS's (2007a) most recent data detailing provincial per capita GDP.[21]

At the national aggregate level (i.e., the sum of all provincial populations), the *de jure* series is uniformly smaller than the *de facto* series (see Table 4). This is due to the general, much more serious, undercounting in the *de jure* than in the *de facto* series.[22] At the individual province level, the differences (in percent) between the two sets vary by province and by year. This is probably mainly due to the migration of individuals without local *hukou* (or non-*hukou* population, often called *liudong renkou* or "floating population"), who are not counted in the *de jure* series. Broadly, provinces with more non-*hukou* population have a larger discrepancy between the two sets. Salient examples are Beijing, Shanghai, and Guangdong, which hosted the largest share of the country's non-*hukou* residents in 2000 and 2005. A comparison of the *de facto* population with the *de jure* population in 2000 in these three provinces shows that the *de facto* population exceeds the *de jure* by 10.5 million (12 percent of the province's population) for Guangdong, 2.01 million for Beijing (15 percent) and 2.1 million for Shanghai (13 percent) (Table 4). These already are very substantial numbers, and in 2005, the differences were even greater. Thus Beijing's *de facto* population exceeded its *de jure* population by 3.39 million (22 percent of its total), Shanghai's by 4.22

[20]To increase data quality and reduce underreporting and local government interference (for example, in the 2000 census), the State Council (2000) decreed that the individual-level data collected could not be used to prosecute any resident. The government also informed local officials that they would not be penalized if the census enumeration resulted in population numbers that exceeded the local birth quota.

[21]In 2003, the NBS has decided to revise the provincial per capita GDP compiled in the recent past (see below). In the process, NBS used a new set of *de facto* provincial populations for the years 2000–2005. This mid-year series constitutes implied populations derived from the revised provincial GDP and per capita GDP data in NBS (2007a; see also footnote 31). Prior to that revision, the emphasis was on the growth of aggregate GDP. The current focus is on per capita GDP, which politicizes that indicator.

[22]For a discussion of the undercounting issue affecting the 2000 Census, see Qiao (2002) and Chan (2003).

Table 2. Provincial *de Jure* Population, 1990–2005 (in 10,000s)

Province-level unit	1990		1995		2000		2005	
	Mid-year[a]	Year-end	Mid-year[a]	Year-end	Mid-year[a]	Year-end	Mid-year[a]	Year-end
Beijing	1,031	1,036	1,073	1,077	1,110	1,113	1,176	1,184
Tianjin	864	870	897	899	917	918	941	943
Hebei	6,003	6,117	6,393	6,420	6,642	6,671	6,843	6,865
Shanxi	2,810	2,845	3,009	3,026	3,200	3,196	3,294	3,294
Nei Mongol	2,131	2,149	2,227	2,237	2,331	2,301	2,356	2,352
Liaoning	3,897	3,917	4,021	4,034	4,153	4,135	4,181	4,189
Jilin	2,418	2,440	2,534	2,551	2,643	2,627	2,666	2,669
Heilongjiang	3,466	3,489	3,568	3,577	3,745	3,698	3,764	3,768
Shanghai	1,280	1,283	1,300	1,301	1,398	1,322	1,356	1,360
Jiangsu	6,604	6,672	6,850	6,868	7,141	7,069	7,229	7,253
Zhejiang	4,222	4,235	4,356	4,370	4,488	4,501	4,590	4,602
Anhui	5,565	5,661	5,969	6,000	6,258	6,278	6,489	6,516
Fujian	2,945	3,000	3,146	3,165	3,295	3,305	3,376	3,385
Jiangxi	3,728	3,761	3,917	3,939	4,198	4,164	4,373	4,384
Shandong	8,303	8,424	8,677	8,701	8,929	8,975	9,188	9,212
Henan	8,398	8,564	9,057	9,109	9,457	9,527	9,949	10,010
Hubei	5,299	5,373	5,692	5,727	5,937	5,936	6,000	5,984
Hunan	6,063	6,111	6,332	6,357	6,524	6,515	6,658	6,674
Guangdong	6,136	6,246	6,740	6,789	7,384	7,499	7,852	7,900
Guangxi	4,196	4,242	4,479	4,502	4,719	4,724	4,888	4,894
Hainan	645	6,512	697	702	761	761	812	819
Sichuan	10,758	10,813	11,124	11,163	8,479	8,408	8,619	8,642
Chongqing	NA[b]	NA	NA	NA	3,083	3,091	3,157	3,169
Guizhou	3,211	3,237	3,401	3,420	3,693	3,677	3,849	3,868
Yunnan	3,669	3,695	3,855	3,873	4,134	4,077	4,250	4,270
Tibet	217	218	234	236	254	251	265	268
Shaanxi	3,237	3,275	3,417	3,432	3,546	3,572	3,712	3,720
Gansu	2,201	2,230	2,370	2,388	2,538	2,534	2,597	2,600
Qinghai	431	435	454	456	495	480	501	504
Ningxia	461	466	508	512	549	554	590	589
Xinjiang	1,477	1,499	1,621	1,637	1,778	1,792	1,944	1,962
Total	111,657	118,815	117,911	118,468	123,777	123,671	127,465	127,849

[a]The mid-year population was calculated as the average of the year-end populations of the previous and current years.
[b]NA = data not available.
Sources: Compiled by the authors from annual volumes of MPS, 1990–2006.

million (24 percent), and Guandong's by 13.01 million (14 percent) (Table 4). Conversely, the major "exporters" of those non-*hukou* residents (migrants), such as Sichuan and Guangxi,

Table 3. Provincial *de Facto* Population, 1990–2005 (in 10,000s)

Province-level unit	1990	1995	2000		2005	
	Census, July 1[a]	Survey, October 1[b]	Implied, mid-year[c]	Census adj., November 1[d]	Implied, mid-year[c]	Survey, November 1[e]
Beijing	1,082	1,240	1,310	1,382	1,515	1,538
Tianjin	879	933	981	1,001	1,033	1,043
Hebei	6,108	6,367	6,644	6,744	6,830	6,851
Shanxi	2,876	3,043	3,224	3,297	3,345	3,355
Nei Mongol	2,146	2,259	2,367	2,376	2,385	2,386
Liaoning	3,946	4,052	4,177	4,238	4,219	4,221
Jilin	2,466	2,566	2,655	2,728	2,712	2,716
Heilongjiang	3,522	3,663	3,800	3,689	3,818	3,820
Shanghai	1,334	1,402	1,608	1,674	1,778	1,778
Jiangsu	6,706	6,994	7,270	7,438	7,453	7,475
Zhejiang	4,145	4,276	4,577	4,677	4,851	4,898
Anhui	5,618	5,946	6,073	5,986	6,200	6,120
Fujian	3,005	3,201	3,363	3,471	3,523	3,535
Jiangxi	3,771	4,013	4,129	4,140	4,297	4,311
Shandong	8,439	8,618	8,940	9,079	9,214	9,248
Henan	8,583	8,995	9,272	9,256	9,331	9,380
Hubei	5,397	5,708	5,634	6,028	5,704	5,710
Hunan	6,066	6,333	6,547	6,440	6,245	6,326
Guangdong	6,283	6,780	8,434	8,642	9,153	9,194
Guangxi	4,224	4,489	4,471	4,489	4,638	4,660
Hainan	656	714	775	787	823	828
Sichuan	10,722	11,186	7,926	8,329	8,151	8,212
Chongqing	NA[f]	NA	2,855	3,090	2,796	2,798
Guizhou	3,239	3,466	3,733	3,525	3,917	3,730
Yunnan	3,697	3,938	4,217	4,288	4,433	4,450
Tibet	220	237	270	262	276	277
Shaanxi	3,288	3,471	3,631	3,605	3,713	3,720
Gansu	2,237	2,406	2,550	2,562	2,587	2,594
Qinghai	446	475	513	518	541	543
Ningxia	466	505	549	562	592	596
Xinjiang	1,516	1,640	1,850	1,925	1,987	2,010
Total	113,081	118,913	124,345	126,228	128,062	128,323

[a]Census counts are as of July 1, 1990; computed from SC and NBS, 1993, Vol. 1, Table 1–2.
[b]Computed from NBS, 1996, Table 3–6.
[c]Computed from provincial GDP and per capita GDP in NBS, 2007a.
[d]Census adjusted figures; computed from NBS, 2001, Table 4–5.
[e]Computed from NBS, 2006a, Table 4–9.
[f]NA = data not available.

Table 4. Difference between *de Facto* and *de Jure* Populations, 1990–2005

Province-level unit	1990		1995		2000		2005	
	Abs.[a]	Pct.	Abs.	Pct.	Abs.	Pct.	Abs.	Pct.
Beijing	51	4.8	168	13.5	201	15.3	339	22.4
Tianjin	15	1.7	36	3.9	64	6.5	93	9.0
Hebei	106	1.7	-26	-0.4	1	0.0	-13	-0.2
Shanxi	66	2.3	35	1.1	24	0.8	51	1.5
Nei Mongol	15	0.7	32	1.4	36	1.5	30	1.2
Liaoning	49	1.3	31	0.8	24	0.6	38	0.9
Jilin	49	2.0	33	1.3	12	0.5	47	1.7
Heilongjiang	56	1.6	95	2.6	55	1.4	54	1.4
Shanghai	55	4.1	102	7.3	210	13.1	422	23.7
Jiangsu	102	1.5	144	2.1	129	1.8	224	3.0
Zhejiang	-77	-1.9	-80	-1.9	89	2.0	261	5.4
Anhui	53	0.9	-23	-0.4	-185	-3.0	-289	-4.7
Fujian	60	2.0	55	1.7	68	2.0	147	4.2
Jiangxi	43	1.1	96	2.4	-68	-1.7	-76	-1.8
Shandong	137	1.6	-59	-0.7	11	0.1	27	0.3
Henan	186	2.2	-62	-0.7	-185	-2.0	-618	-6.6
Hubei	99	1.8	16	0.3	-303	-5.4	-296	-5.2
Hunan	3	0.1	2	0.0	23	0.3	-413	-6.6
Guangdong	147	2.3	40	0.6	1050	12.4	1301	14.2
Guangxi	28	0.7	10	0.2	-247	-5.5	-250	-5.4
Hainan	11	1.6	17	2.4	13	1.7	10	1.3
Sichuan	-36	-0.3	62	0.6	-553	-7.0	-468	-5.7
Chongqing	NA[b]	NA	NA	NA	-228	-8.0	-361	-12.9
Guizhou	29	0.9	65	1.9	40	1.1	68	1.7
Yunnan	29	0.8	83	2.1	83	2.0	183	4.1
Tibet	3	1.2	3	1.3	17	6.1	10	3.7
Shaanxi	52	1.6	54	1.5	86	2.4	1	0.0
Gansu	37	1.6	36	1.5	12	0.5	-10	-0.4
Qinghai	15	3.3	21	4.5	18	3.5	40	7.3
Ningxia	5	1.0	-3	-0.7	0	0.0	2	0.4
Xinjiang	39	2.6	19	1.2	72	3.9	43	2.1
Total	1425	1.3	1002	0.8	568	0.5	597	0.5

[a]Absolute value in 10,000s (abs.) is derived by subtracting the mid-year *de jure* population (from Table 2) from the *de facto* population (Table 3). Percentage value (pct.) is the absolute value divided by the *de facto* population.
[b]NA = data not available.

had significant population overcounts in the *de jure* totals for 2000 and 2005.[23] In 1990 and 1995, the differences between the two population series in individual provinces were not as

[23]E.g., 5.53 million (7 percent) and 4.68 million (6 percent) for Sichuan in 2000 and 2005, respectively.

large.[24] Given the above analysis, one can argue that using the *de jure* and *de facto* population series may produce quite different results in the calculation of per capita statistics (such as per capita GDP, and their CVs for 2000 and 2005), but this may not be the case for 1990 and 1995, as the two series are quite similar.

(7) Provincial per capita GDP: the correct way to derive this indicator is to divide the GDP of a province by its corresponding *de facto* population.[25] It should be noted, however, that provincial per capita GDPs for the years 1990 to 2000 were calculated by the NBS on the basis of the *de jure* population, or a variant of it, particularly in the mid-1990s, late 1990s, and in 2000.[26] The application of the *de jure* population to calculate per capita GDP tended to overstate that economic indicator for the country's rich provinces (with large net in-migration) and understate it for most of the poor provinces (with large net out-migration). The net result of the misapplication was an exaggerated dispersion of per capita GDP, and hence also of IPI (see below).

(8) In 2003, the NBS reached a decision to revise its approach to calculating per capita GDP. In December of that year, it stipulated that beginning in 2004, all per capita GDP indicators reported at the subnational level[27] have to be based on the *changzhu* population,[28] including migrants without local *hukou,* and that reporting of per capita GDP based on the *hukou* population be phased out entirely by the end of 2005 (Renjun, 2003, 2007; Jinnian, 2004). In other words, the new decision mandated that provincial per capita GDP would have to be based on the *de facto* (not the *de jure*) population by 2006.[29]

(9) Revision of GDP data after China's 2004 Economic Census: The country's first economic census, conducted in 2004, shows that the previously published GDP data have been undercounted, due to undercounting of the value added, especially in the service sector (NBS, 2006b). Since then, the NBS has undertaken to adjust the national and provincial GDP data for the years immediately preceding 2003. Thus far, judging by the most recent

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[24]It is true that the total volume of interprovincial migration was quite small in the first half of the 1990s, although it may have been undercounted judging from the trend (see Table 9 below). In general, it is likely that the two *de facto* figures of 1990 and 1995 do not embrace all of what would have generally been considered *de facto* population. For example, the definition of the resident population in the 1990 Census does not encompass the non-*hukou* population as adequately, because it uses a one-year length-of-stay criterion for defining residents (see Liu and Chan, 2001; Chan, 2003). The 1995 *de facto* counts have been shown to be quite problematic in terms of the percentage of urban population (Chan and Hu, 2003). Looking at the absolute values for 1995 in Table 4, one can see that some provinces do not have the numbers or signs that might be expected by considering the interprovincial migration data (e.g., a negative number for Sichuan and a small positive number for Guizhou; see Chan, 2008b). In other words, there are still some problems with the accuracy of *de facto* provincial population statistics in 1990 and 1995; the pattern of the *de facto* series still broadly resembles that of the *de jure*.

[25]The ideal de facto population would be one based on a six-month length-of-stay criterion. Theoretically, this criterion would assign a person to one and only one province of the country at the time of enumeration, and would thus account for the entire population of the country. As explained above, the 1990 Census uses a one-year criterion.

[26]In the past, most researchers simply used these sets of numbers; some may have used the provincial population statistics for 1990 to 2000 published annually in the *China Statistical Yearbooks* prior to 2003 (mainly to compute per capita GDP in constant prices), which also represent the provincial *de jure* population.

[27]The NBS also renamed "local GDP" (the official English-language term) as "gross regional product" and reserved the term "gross domestic product" solely for the national GDP.

[28]Chan (2003, p. 2) believes that the closest English translation of "*changzhou*" is "ordinarily resident." The NBS now includes those without local *hukou* but staying more than 6 months in the local *changzhou* population count.

[29]The redefined data have begun to appear in some of the recent statistical volumes published by the NBS, namely the *China Statistical Yearbook 2006* and the *China Statistical Abstract 2007*, where per capita GDP numbers, including those for 2000 to 2006, are based on the *de facto* population.

provincial statistical yearbooks available to the authors, the progress in different provinces appears to be mixed. Complete revised provincial GDP series are now available only for the years 2000 through 2006 in China's most recent statistical volume (NBS, 2007a). At the same time, the NBS also has published a new complete provincial series of per capita GDP, presumably based on the *de facto* population, logically following the implementation of the new 2003 NBS rule.[30] Essentially, we now have two series for provincial GDP data—the newly revised (hereafter, "new") from 2000 to 2006, and the unrevised ("old") for the period prior to 2000. In the future, we expect that the NBS will publish the revised data for the 1990s.

EMPIRICAL ANALYSIS

As discussed and illustrated above, a significant discrepancy exists in some cases between the two sets of population statistics. And these sets can yield quite different per capita indicators.[31] In this section, we will compare the trends in IPI based on the *de facto* and *de jure* populations by developing two sets of CVs for two periods: 1990–2000 (based on the benchmark years 1990, 1995 and 2000),[32] and 2000–2006 (based on annual data), primarily from the "old" and "new" provincial GDP statistics. Thus, CV_{df}, the coefficient of variation based on the *de facto* population, is the new set that we generate for this study (for 1990–2000). CV_{dj}, based on the *de jure* population, uses the same approach as that presented in the existing literature (for the 1990s) or what one would derive following the old "official" approach (for 2000–2006). These two sets of numbers allow us to make direct numerical comparisons and draw useful inferences.

As noted in the preceding section, the CVs can be affected by such factors/approaches as use of either constant or current prices, inclusion of the three province-level cities of Beijing, Shanghai, and Tianjin (Group 1 or Group 2), and the weighting (or not) of the provincial population. There is no consensus among scholars as to which approach is better. In view of the above, our calculations consider all the factors in order to present a more comprehensive picture. However, because of space limitations, the discussion will focus mainly on CVs using per capita GDP in constant prices, weighted by provincial population (as explained above, this combination is preferred), although the ones in current prices are also presented for reference. Unweighted CVs in current and constant prices for both periods are detailed in Appendices 1 and 2.

Interprovincial Inequality, 1990–2000

Table 5 presents the weighted CVs, means, and standard deviations based on the *de facto* and *de jure* populations, while changes in IPI in constant prices are illustrated in Figure 1. As

[30]A comparison of the 2000 and 2005 provincial *de facto* population statistics generated by the 2000 Census and 2005 Survey with the implied provincial population (mid-year) in NBS (2007a) indicates a high degree of concurrence, especially in 2005. There is a significant difference for three to four provinces in 2000, presumably due to the most recent NBS adjustments to the 2000 provincial population data of the census. For a discussion of the discrepancies in various 2000 provincial population series, see Chan (2003).

[31]The per capita GDP data we use for our main analysis for all the benchmark years are listed in Table 6 below.

[32]The year-to-year figures in the 1990s do not appear to be particularly meaningful, as accurate *de facto* provincial population data do not exist. Moreover, we expect the annual changes in the CV to be gradual under normal conditions.

Table 5. Coefficients of Variation by Per Capita GDP, 1990, 1995, and 2000

Group[a]	Indicator	Current prices			Constant 1990 prices		
		1990	1995	2000	1990	1995	2000
				***de facto* population**			
Group 1	CV	0.450	0.498	0.515	0.450	0.502	0.482
	Mean	1623	4834	7700	1623	2938	4586
	SD	731	2408	3964	731	1474	2209
Group 2	CV	0.308	0.397	0.394	0.308	0.420	0.392
	Mean	1529	4570	7351	1529	2785	4409
	SD	473	1813	2898	473	1171	1727
				***de jure* population**			
Group 1	CV	0.460	0.517	0.574	0.460	0.507	0.527
	Mean	1635	4839	7829	1635	2983	4673
	SD	751	2502	4494	751	1511	2462
Group 2	CV	0.309	0.395	0.421	0.309	0.405	0.419
	Mean	1539	4559	7306	1539	2821	4413
	SD	474	1799	3074	474	1142	1848

[a]Group 1 includes the province-level cities of Beijing, Shanghai, and Tianjin, whereas Group 2 does not.

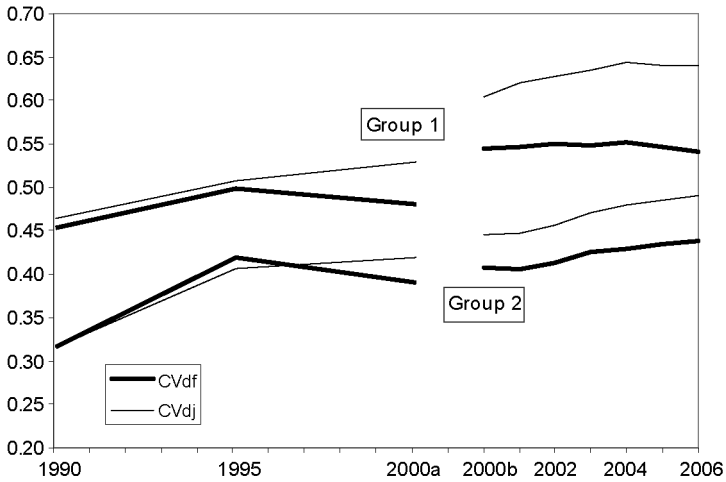

Fig. 1. Interprovincial inequality, 1990–2006. CV values for 1990, 1995, and 2000a are based on old GDP data in constant 1990 prices; those for 2000b–2006 are based on new GDP data in 2000 constant prices.

expected, the CVs for Group 1 are larger than those based on Group 2 (which excludes Beijing, Shanghai, and Tianjin). Moreover, CV_{dj} shows an upward trend from 1990 to 2000, consistent with what is reported in the literature. However, while CV_{dj} and CV_{df} have almost the same values in 1990 and 1995, CV_{df} is much smaller than CV_{dj} in 2000. In fact, CV_{df}

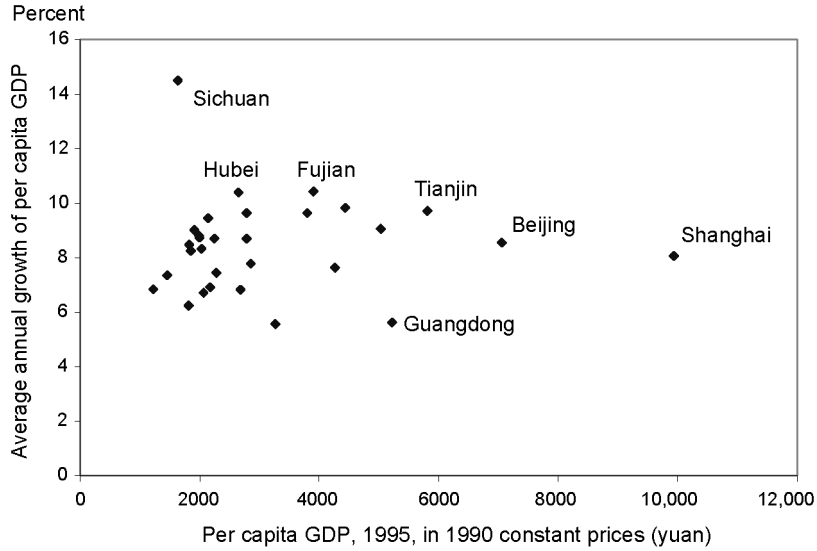

Fig. 2. Rate of growth in per capita GDP by province, 1995–2000 in relation to relative wealth of province (1995 per capita GDP).

shows a significant drop from 1995 to 2000 for both groups, in contrast to the mild increase shown by CV_{dj} (Table 5).[33]

A detailed examination of the growth patterns in Table 6 and Figure 2 supports the observation of slight regional convergence in per capita GDP in 1995–2000. The plot in Figure 2 does not show any pronounced trend, but it does indicate that three of the four most affluent provinces have a mean growth rate that is about average for China (Shanghai and Beijing), or far below the average (Guangdong), whereas the three provinces with the highest mean growth rates are poor (Sichuan) or average in terms of per capita GDP (Hubei and Fujian) (see also Fig. 5 later). This situation thus has contributed to the slight regional convergence observed at the end of the period.

The differences produced by the two series are related to migration (mostly involving non-*hukou* population). Figure 3 maps the over/understatement of per capita GDP in 2000 (resulting from the use of *de jure* rather than *de facto* population) and net interprovincial migration from 1995 to 2000. One can see that in percentage terms, high net out-migration tends to be associated with understatement of per capita GDP, high in-migration with overstatement. The richest provinces, such as Shanghai, Beijing, and Guangdong, which attracted large numbers of migrants, all have substantially overstated per capita GDP.[34] Conversely, provinces with understated per capita GDP numbers are all in the low-income category and most experienced a high level of net out-migration.[35] Consequently, use of *de jure* population in calculating per capita GDP increases the regional variation (CV).

[33]A similar pattern is apparent in Appendix 1, in which the unweighted CV_{dj} values between 1995 and 2000 are essentially unchanged (largely flat or at best mildly upward or downward), in contrast to the significant rise revealed by comparisons of CV_{dj} values between the same two years during the period.

[34]The highest percentages of overstatement are found in Shanghai (22 percent) and Beijing (19 percent).

[35]The prime example is Sichuan, the largest net exporter of migrants from 1995 to 2000, the per capita GDP of which was understated by 5.4 percent.

Table 6. Per Capita GDP and Annual Average Growth Rate, 1990–2006[a]

Province-level unit	Per capita GDP, yuan					Annual average growth rate, pct.		
	1990	1995	2000a	2000b	2006	1990–1995	1995–2000	2000–2006
Beijing	4,629	7,056	10,817	24,122	40,027	8.4	8.5	8.4
Tianjin	3,539	5,809	9,437	17,353	35,404	9.9	9.7	11.9
Hebei	1,467	2,783	4,505	7,592	14,125	12.8	9.6	10.3
Shanxi	1,493	2,281	3,309	5,722	11,345	8.5	7.4	11.4
Nei Mongol	1,488	2,241	3,460	6,502	16,763	8.2	8.7	15.8
Liaoning	2,691	4,266	6,245	11,177	21,141	9.2	7.6	10.6
Jilin	1,725	2,785	4,302	7,351	13,671	9.6	8.7	10.3
Heilongjiang	2,031	2,858	4,216	8,294	15,273	6.8	7.8	10.2
Shanghai	5,670	9,940	14,864	29,671	51,576	11.2	8.0	9.2
Jiangsu	2,112	4,437	7,251	11,765	24,043	14.8	9.8	11.9
Zhejiang	2,167	5,030	7,910	13,416	26,058	16.8	9.1	11.1
Anhui	1,171	2,138	3,429	4,779	8,793	12.0	9.4	10.2
Fujian	1,742	3,904	6,576	11,194	20,067	16.1	10.4	9.7
Jiangxi	1,113	1,991	3,082	4,851	9,026	11.6	8.7	10.3
Shandong	1,791	3,803	6,157	9,326	19,108	15.1	9.6	12.0
Henan	1,089	1,911	2,998	5,450	10,545	11.2	9.0	11.0
Hubei	1,527	2,651	4,455	6,293	11,337	11.0	10.4	9.8
Hunan	1,227	1,985	3,084	5,425	9,929	9.6	8.8	10.1
Guangdong	2,343	5,221	6,912	12,736	24,688	16.0	5.6	11
Guangxi	1,063	2,025	3,070	4,652	8,409	12.9	8.3	9.9
Hainan	1,563	3,263	4,308	6,798	11,501	14.7	5.6	8.8
Sichuan	1,106	1,630	3,366	4,956	9,231	7.7	14.5	10.4
Chongqing	n.a.	n.a.	3,043	5,616	10,740	n.a.	n.a.	10.8
Guizhou	803	1,218	1,714	2,759	4,728	8.3	6.8	9.0
Yunnan	1,222	1,819	2,779	4,769	7,780	8.0	8.5	8.2
Tibet	1,261	1,812	2,474	4,572	8,574	7.2	6.2	10.5
Shaanxi	1,230	1,848	2,791	4,968	9,467	8.1	8.2	10.7
Gansu	1,085	1,454	2,099	4,129	7,515	5.8	7.4	10.0
Qinghai	1,569	2,176	3,075	5,138	9,567	6.5	6.9	10.4
Ningxia	1,393	2,061	2,883	5,376	9,332	7.8	6.7	9.2
Xinjiang	1,808	2,681	3,769	7,372	12,021	7.9	6.8	8.1
Unweighted mean	1,837	3,169	4,845	8,520	15,864	10.5	8.4	10.4

[a]Per capita GDP figures are based on *de facto* population. 1990, 1995, and 2000 figures are in 1990 constant prices; 2000 and 2006 figures are in 2000 constant prices. 2000a is the unrevised per capita GDP, and 2000b is the figure newly revised by NBS (see text).

Interprovincial Inequality, 2000–2006

The most recent trends in IPI can now be examined on the basis of the *de facto* provincial population and the consequent revision of provincial GDP and per capita GDP data in

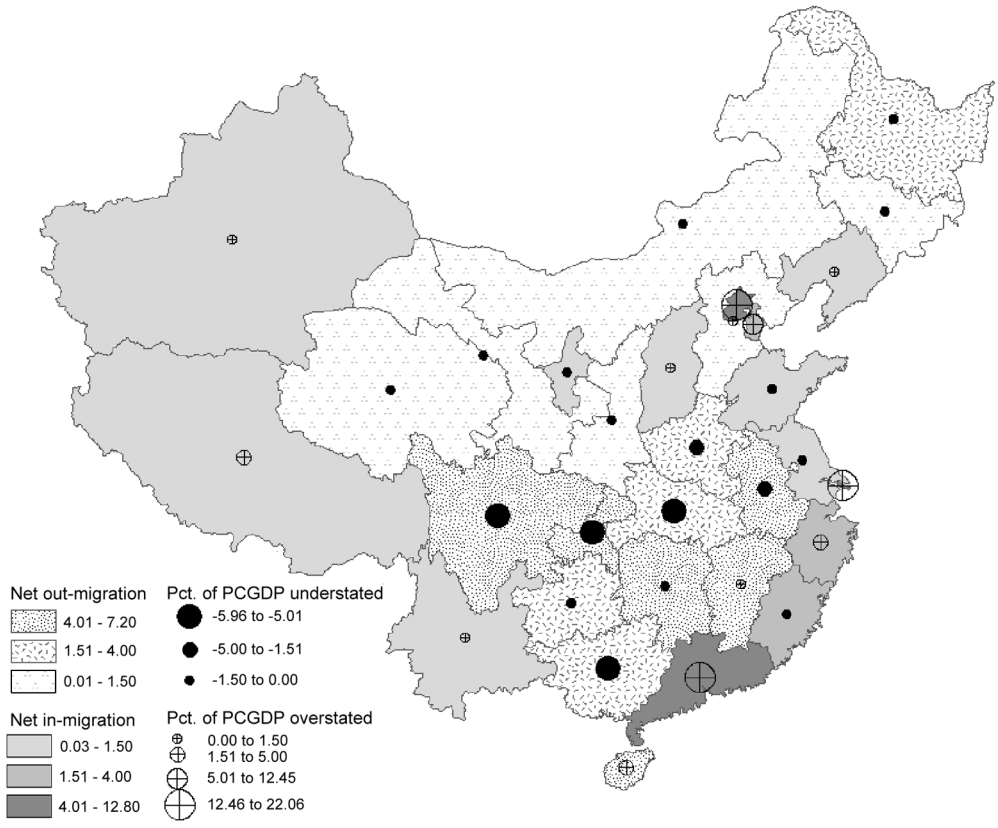

Fig. 3. Net migration (1995–2000) and over/understatement of per capita GDP in 2000 by province. Net migration is net interprovincial migration between 1995 and 2000 expressed as a percentage of the *de facto* population in 2000. Over/understatement of per capita GDP is the difference between the GDPs based on the *de jure* and *de facto* populations, expressed as a percentage of the *de facto* population in 2000. Compiled by the authors from NBS (1996, 2001, 2007a) and SC and NBS (2002).

NBS (2007a). Table 7 presents weighted CV_{df} values based on per capita GDP in current and constant prices, but we focus on the latter only here. For the sake of comparison, we also present weighted CV_{dj} values.[36]

Figure 1 shows that all the annual changes in CVs are remarkably gradual;[37] in fact, they are almost flat throughout. CV_{df} for Group 1 exhibits a slight downward trend, whereas that for Group 2 has a slight upward trend. Unweighted CV_{df} values in Appendix 2 display a similar, stable trend. Examining the average annual growth rates of provincial per capita GDP between 2000 and 2006 (Table 6 and Fig. 4) reveals that Beijing and Shanghai have experienced below-average per capita GDP growth rates. This observation, combined with the almost spectacular growth rate of Nei Mongol, contributes to the stability (or slight drop) in CV_{df} in Group 1 during this period. On the other hand, if the three province-level cities are

[36]Unweighted CVs are reported in Appendix 2.

[37]Figure 1 shows two sets of curves—one for 1990–2000 and another for 2000–2006. Because of different constant base prices, they are not directly comparable.

Table 7. Coefficients of Variation Based on Per Capita GDP, 2000–2006

Group	Indicator	2000	2001	2002	2003	2004	2005	2006
				***de facto* population**				
				Current prices				
Group 1	CV	0.545	0.547	0.557	0.562	0.554	0.543	0.531
	Mean	7922	8667	9584	11011	13180	15445	17803
	SD	4319	4743	5339	6191	7308	8380	9458
Group 2	CV	0.408	0.407	0.417	0.432	0.424	0.431	0.432
	Mean	7379	8058	8898	10216	12231	14390	16639
	SD	3011	3280	3712	4414	5187	6200	7184
				Constant 2000 prices				
Group 1	CV	0.545	0.546	0.551	0.549	0.552	0.546	0.541
	Mean	7922	8615	9511	10625	12013	13491	15196
	SD	4319	4710	5243	5837	6629	7372	8215
Group 2	CV	0.408	0.406	0.413	0.425	0.430	0.434	0.438
	Mean	7379	8016	8844	9888	11177	12572	14189
	SD	3011	3258	3657	4201	4809	5462	6210
				***de jure* population**				
				Current prices				
Group 1	CV	0.605	0.624	0.636	0.651	0.648	0.637	0.637
	Mean	7959	8751	9686	11115	13242	15517	15471
	SD	4813	5456	6159	7233	8587	9892	9852
Group 2	CV	0.445	0.450	0.462	0.480	0.474	0.482	0.481
	Mean	7385	8097	8948	10253	12212	14360	14137
	SD	3286	3644	4135	4920	5790	6916	6889
				Constant 2000 prices				
Group 1	CV	0.605	0.620	0.627	0.635	0.644	0.641	0.640
	Mean	7959	8708	9623	10737	12082	13569	15312
	SD	4813	5401	6038	6822	7774	8695	9818
Group 2	CV	0.445	0.448	0.457	0.471	0.480	0.485	0.491
	Mean	7385	8064	8905	9936	11171	12561	14226
	SD	3286	3610	4068	4682	5362	6094	6981

excluded (as in Group 2), the evidence then shows a very slight rise in the CV_{df} (Fig. 1). All told, however, the overall trend indicates that the CV_{df} values are basically flat.

Although the most recent provincial per capita GDP statistics for 2000–2006 published by NBS (2007a) are now based on *de facto* population, this was not the case for the statistics for 2000–2003 released prior to 2005, which to one degree or another have been used in previously published studies. We have thus also decided to present the CV_{dj} values for 2000–2006 in order to determine what the regional inequality would turn out to be if the *de jure* population figures were still used (see Table 7 and Fig. 1). As expected on the basis of our analysis of the 1990–2000 period above, the CV_{dj} values are much higher, and show more

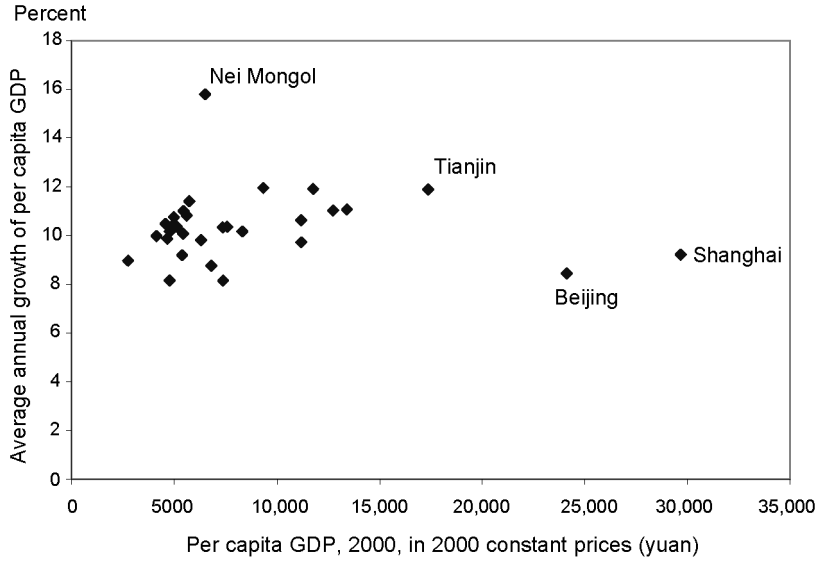

Fig. 4. Rate of growth in per capita GDP by province, 2000–2006 in relation to relative wealth of province (2000 per capita GDP).

discernible increases over time. If one were to adopt this set of numbers (as did many for the pre-2000 period), one would again come to the inaccurate conclusion that disparities widened significantly in 2000–2006.

EXPLANATION AND DISCUSSION

In the preceding section, we calculated CVs for the 1990s and the subsequent period of 2000–2006 by using two different (*de facto* vs. *de jure*) population bases. The results based on the more appropriate (*de facto*) base show that, after an increase in the first half of the 1990s, IPI has remained stable or actually dropped slightly. This observation about the stability of IPI in the second half of the 1990s runs counter to the assertion in the previously published studies, which have almost universally proclaimed an alarming widening of IPI in the 1990s. The thesis of increasing divergence during the period of 1995–2000 must therefore be refuted, because it is not supported by data based on a proper population series. Accordingly, the interpretations of and explanations for trends in IPI for this period also need to be revised.

Impact of Future Data Revisions

Before proceeding further, we would also like to consider briefly whether the break in the pattern of increasing IPI in 1995–2000 would still hold if the provincial GDP data were to be revised (to adjust for undercounting of value added)[38] in the same manner as the NBS has revised the figures retroactively for the period of 2000–2004.[39] To roughly gauge the likely

[38]See point 9 in the section entitled "New Issues" above.

[39]Provincial GDP data for 1993–1999 are presently being revised by the NBS; however, they are not as yet available for release.

Table 8. Comparison of Revised and Unrevised Provincial GDP, 2000

Province	GDP[a]		Difference	
	Revised	Unrevised	Absolute	As pct. of unrevised
Beijing	3,161	2,479	682	27.5
Tianjin	1,702	1,639	63	3.8
Hebei	5,044	5,089	-45	-0.9
Shanxi	1,846	1,644	202	12.3
Nei Mongol	1,539	1,401	138	9.9
Liaoning	4,669	4,669	0	0.0
Jilin	1,952	1,821	130	7.2
Heilongjiang	3,151	3,253	-98	-3.0
Shanghai	4,771	4,551	220	4.8
Jiangsu	8,554	8,583	-29	-0.3
Zhejiang	6,141	6,036	105	1.7
Anhui	2,902	3,038	-136	-4.5
Fujian	3,765	3,920	-156	-4.0
Jiangxi	2,003	2,003	0	0.0
Shandong	8,338	8,542	-205	-2.4
Henan	5,053	5,138	-85	-1.6
Hubei	3,545	4,276	-731	-17.1
Hunan	3,552	3,692	-140	-3.8
Guangdong	10,741	9,662	1,079	11.2
Guangxi	2,080	2,050	30	1.5
Hainan	527	518	8	1.6
Sichuan[b]	5,531	5,599	-68	-1.2
Guizhou	1,030	994	36	3.7
Yunnan	2,011	1,955	56	2.9
Tibet	124	117	6	5.1
Shaanxi	1,804	1,661	143	8.6
Gansu	1,053	983	70	7.1
Qinghai	264	264	0	0.0
Ningxia	295	266	29	11.1
Xinjiang	1,364	1,364	-1	-0.1
Unweighted mean	3,284	3,240	43	2.7

[a]In current prices in 100,000,000 yuan.
[b]Including Chongqing.

changes of the CV_{df} in 1995–2000 using revised GDP figures, we have used data for 2000 (for which both the old and new provincial GDP are available using the same price base) to formulate adjustment ratios for each province (Table 8). Such an exercise yields widely

variable adjustment ratios, which are then correlated with the provincial per capita GDP in 1995 (in 1990 constant prices; see Table 6) as a basis for speculation regarding the possible impact of adjustments on per capita GDP, assuming that these ratios can also be applied to GDP in 1995 (in constant prices). The computed bivariate correlation for Group 1 is 0.276 (very weakly positive); in other words, the CV_{df} is likely to show little to no increase over the period 1995–2000.[40] For Group 2, the correlation is almost non-existent (–0.066), and there should be no change using the revised GDP data. It therefore seems quite safe to say that even with revised per capita GDP data, the CV in 1995–2000 would be basically stable. Our findings here are also supported by the most recent works based on the application of a more reasonable (*de facto*) provincial population series (e.g., Tsui, 2007, Fig. 2) or based on a geographical classification that is less sensitive to the population denominator issue examined in this paper (e.g., see Lin et al., 2004, Table 1).

Furthermore, as observed in the preceding section, there are reasons to believe that the *de facto* populations of 1990 and 1995 are not truly *de facto* in the desirable sense; they still bear some resemblance to the *de jure* data for those years. If proper *de facto* data were to be applied for those two years, it is likely that the computed CV_{df} values would be smaller (i.e., following the same logic presented in this paper). Therefore, it is probable that the change in CV_{df} between 1990–1995 and 1995–2000 in Figure 1 would be less prominent than depicted, and that the leveling of IPI might have begun earlier, in 1990 or even the late 1980s.

The Equalizing Forces

Data and statistical measurements aside, one might wonder whether such a welcome trend toward stability or even convergence intuitively plausible in the 1990s, especially in the second half of the decade. Below, we will present some additional material to facilitate explanation. It is true that polarizing factors continued to be in force during the late 1990s, including the concentration of FDI predominantly in the coastal provinces, continued decentralization of fiscal management, agglomeration economies, and higher productivity growth in the eastern provinces (Fujita and Hu, 2001; Bao et al., 2002; He et al., 2007; Tsui, 2007; Chan et al, 2008a). However, these factors have been mitigated by forces that can be viewed as equalizing, some of them quite powerful.

A major equalizing force one would expect is long-distance migration, especially viewed from a neoclassical perspective.[41] In the pre-reform era when the migratory flows were mostly minuscule, migration was not an issue in studies of regional inequality. In the 1980s when internal migration intensity began to rise, the magnitude of interprovincial migration also started to grow. This was especially the case in the second half of the 1990s, when aggregate interprovincial migration became massive in scale. Table 9 presents some relevant statistics on interprovincial migration in both absolute and relative terms based on two definitions. As noted above, it is probable that the 1995 data are less accurate and that the population and migrants have been undercounted at the province level; conversely, it is also possible that the 2000 data slightly overcount the non-*hukou* population (see Chan, 2003). In any event, it is still reasonable to believe that a pronounced surge in interprovincial

[40]In other words, a CV_{df} based on a revised GDP figure would likely increase from 0.502 in 1995 (see Table 5) to a level closer to 0.545, the CV_{df} based on the revised GDP figure in 2000 (Table 7).

[41]See, for example, Johnston (1988), Cai et al. (2001), and Lin et al. (2004).

Table 9. Interprovincial Migration, 1985–2005

Period	Migrants from another province (millions)	As pct. of total population at the beginning of the period	Increase over preceding five years (millions)
1985–1990	11.1	1.05	
1990-1995	9.2	0.81	-1.9
1995-2000	32.3	2.61	23.1
2000-2005	38.0	3.00	5.7
Year	Population with *hukou* in another province (millions)	As pct. of total population	Increase over preceding five years (millions)
1995	9.3	0.75	
2000	42.4	3.35	33.1
2005	47.7	3.65	5.3

Sources: Compiled by the authors from NPSSO, 1997; SC and NBS, 1993, 2002, 2007.

migration (likely no less than a twofold increase) occurred in the second half of the 1990s,[42] which has persisted into the 21st century, although increasing more gradually.[43]

In China, the great majority of migrants from other provinces live without local *hukou* in the destination, and are overwhelmingly concentrated in low-skilled occupations. Under ordinary circumstances (with other factors roughly unchanged), simple arithmetic would predict that a shift of large numbers of unemployed migrant laborers to a high-income province would depress the average per capita GDP of the destination province, as these workers typically end up in low-paid jobs. The reverse is true for poor provinces experiencing voluminous out-migration of unemployed low-skilled laborers—the outmigration raises the average per capita GDP of the exporting province. Indeed, using almost exactly the same reasoning, Wang et al. (2004) demonstrated this logic using the Gini coefficient of per capita GDP and migration data for the 1990s. It is no coincidence that our data show that the two provinces registering the largest change in net migration (Guangdong and Sichuan, for in-migration and out-migration, respectively)[44] in 1995–2000 relative to 1990–1995 are also the very same provinces with the lowest and highest per capita GDP growth rates over the same period.[45] If we add to our calculus the substantial remittances migrants sent back to their hometowns, the impact of migration on narrowing IPI becomes even greater.[46]

[42]This increase may be slightly overstated because of the suspected overcounting of "residents" in the 2000 Census (see Chan, 2003, 2008b).

[43]Comparative studies of "rural migrant labor" (*mingong*) also indicate that migrants in the poorest provinces in the Western region have similarly greatly increased their participation in migration in 1998 relative to 1993 (Chan, 2001).

[44]Guangdong increased its net in-migration from 1.8 million in 1990–1995 to an impressive 11.1 million in 1995–2000, while Sichuan more than doubled its net out-migration from 1.3 million in 1990–1995 to 3.8 million in 1995–2000 (NPSSO, 1997; SC and NBS, 2002). The two provinces were also the largest net importer and exporter, respectively, of internal migrants during the latter period.

[45]In 2000, the official per capita GDP of Guangdong (as published in NBS, 2001), is calculated from a population figure that undercounts the actual *de facto* population by about 9 million, thereby effectively exaggerating Guangdong's per capita GDP of that year by 13 percent (see Chan, 2003).

[46]More generally, the relationship of higher rates of rural income growth in locales experiencing higher rates of outmigration (after controlling for other factors) is quite amply documented in the literature on China (e.g., see Ma et al., 2004).

Based on the above, it is quite probable that the plateauing of IPI and the rapid surge in interprovincial migration in 1995–2000 are not merely coincidental, but closely related. More specifically, we believe that the rise in long-distance migration has clearly contributed to the concurrent stabilization of IPI. Most previously published studies on interprovincial migration in China have focused on the migration response to regional economic disparities (e.g., Chan et al, 1999; Cai and Wang, 2002; Lin et al., 2004; Fan 2005a, 2005b). However, our argument here runs counter to those who contend that the surge in long-distance migration was driven by the widening regional inequality in the 1990s. Indeed, as shown in this paper, some of the IPI indices forming the basis for that assertion are inaccurate.

Furthermore, the Chinese migration statistics are complex and relatively confusing (Chan, 2001).[47] Some writers have not fully tackled the complexity in the analysis of regional disparities and migration. Other investigators (e.g., Cai et al., 2001) have argued that the institutional distortions of the labor market have prompted the tendency of long-distance migration of rural labor to increase regional disparities. Such studies have traced the surge in migration to rising regional disparities—inferring that economic growth rates of most wealthy provinces were more rapid than those of the poorer provinces. Our analysis offers a more accurate alternative explanation: the rise in migration has led to narrowing of regional disparities—based on the fact that the economic growth rates of most wealthy provinces were lower than those of the poorer provinces.[48]

Moreover, the central government's concern over the regional inequalities in the 1990s prompted efforts to address such disparities. For example, as early as in 1993, the State Council promulgated a policy to promote the development of China's Central region (Liu, 2006). Another notable change was the introduction of tax assignment reforms in 1994, which recentralized fiscal power in the hands of the central government and expanded its redistributive capacity quite considerably (Wong, 1997). And since 1998, a number of new policies and programs "tilting" the playing field toward the poorer regions have been introduced, including the 1998 fiscal stimulus package to counter the effects of the Asian financial crisis and the massive "Western Development Program" in 1999 (Naughton, 2004).[49] It is also probable that the downturn in China's business cycle in the late 1990s (during the Asian financial crisis) also contributed to the narrowing of IPI.[50] During difficult economic times, regional inequality in transitional and developing economies may decrease, perhaps because less-developed and agriculture-based economies are less affected by the vagaries of modern industry and services that drive business cycles.

Another factor that may underlie the changing dynamic of IPI after 1995 is a decrease in rural-urban differences, although proper measurement of this phenomenon is rather complicated (see Li, 2004; Chan, 2008b). Since the mid-1990s, the government has devoted more attention and resources to the rural sector, raising the procurement prices for farm products (for three continuous years, 1994–1996) and thus the average rural incomes. Conversely, the

[47]To illustrate the difficulties of dealing with Chinese migration statistics, researchers in UNDP (1999, p. 66) have referred to the Chinese floating population as "statistically invisible."

[48]The empirical analysis of the relationship between migration and regional economic disparities is a subject deserving further systematic research using properly explained data. See a related discussion on this issue in Chan (2008b).

[49]In addition, since the late 1990s, numerous ad hoc grants have been made to assist poor regions (Wong, 2005). Tsui (2007), however, has questioned the effectiveness of the capital investment that has been poured into the Western provinces.

[50]We would like to thank Kai Yuen Tsui for pointing this out to us.

program to reform state-owned industrial enterprises has created a new class of unemployed urban poor. The careful research by Yang and Cai (2003) and Li (2004) disclosed that rural-urban income disparities significantly narrowed over the period 1994–1997.[51]

In the 21st century, efforts at rural development have continued under the new administration of Hu Jintao and Wen Jiabao. There has been a greater allocation of investment (in percentage terms) to the interior and Western provinces.[52] A series of initiatives to reduce the fiscal burden on peasants culminated in abolition of the multi-century–long agricultural tax in 2006 and, more recently, the elimination of tuition fees for primary education in rural areas. A system of fiscal transfers to needy regions also is being proposed (Caizhengbu, 2007).

China's enormous and rising demand for natural resources, including energy, in recent years also may have assisted some of the less developed (but resource-rich) provinces such as Nei Mongol and Shanxi (Xinhua Net, 2004; Wu, 2005). However, the equalizing effects of such developments are likely mitigated by new waves of reforms stemming from China's entry into the WTO, including the opening of the service sectors (retail and financial) to foreign investment and competition. The latter moves likely will benefit the rich (more urbanized) more than the poor (more rural) provinces. Equally, as Tsui (2007) and Chan et al. (2008) have observed, the system of provincial and other local governments and the *hukou* system, which remains largely unreformed, present another major barrier to greater economic efficiency and equity.

When examined side by side, Figures 5 and 6 reveal interesting regional growth patterns in the two different periods and the reshuffling of "leaders" and "laggards," perhaps reflecting differing sets of forces at work. While many coastal provinces were expectedly in the high-growth category throughout the period between 1995 and 2006, the provinces registering the highest rates of growth, namely Sichuan and Hubei in 1995–2000 and Nei Mongol in 2000–2006, were mostly distant from the coast.

Our CVs of per capita GDP computed from the *de facto* and *de jure* population data present two different pictures of regional economic disparities in China during the 1990s. The *de facto* provincial population data appear to indicate perhaps gently rising IPI in 1990–1995, which then began to be reined in during the mid-1990s and has been largely stable since that time. This picture is in accord with the close relationship we posit exists between migration and government policies on the one hand, and relative stability in regional disparities on the other. The second picture, based on per capita GDP standardized by the *de jure* population, paints an alarmist scenario of persistently rising regional inequality, beginning in the mid-1980s and continuing throughout the 1990s and well into the 21st century, despite voluminous inter-regional migration and government intervention. However, our study has shown that any purported increase in IPI after the mid-1990s is more a statistical artifact than reality. In the second, mistaken view of "divergence," surging migration is often discarded as a possible equalizing force; it is rather perceived as a response to rising disparities and ineffective government intervention on behalf of the poorer provinces. Migrant workers under

[51]Reduction of the rural-urban income gap tends to reduce regional disparities because most poor provinces are largely rural.

[52]According to the NBS, investment in the non-coastal region in basic industries and infrastructure by the central government increased from 47.5 percent of the nation's total in 2002 to 53.0 percent in 2006 (NBS, 2007b).

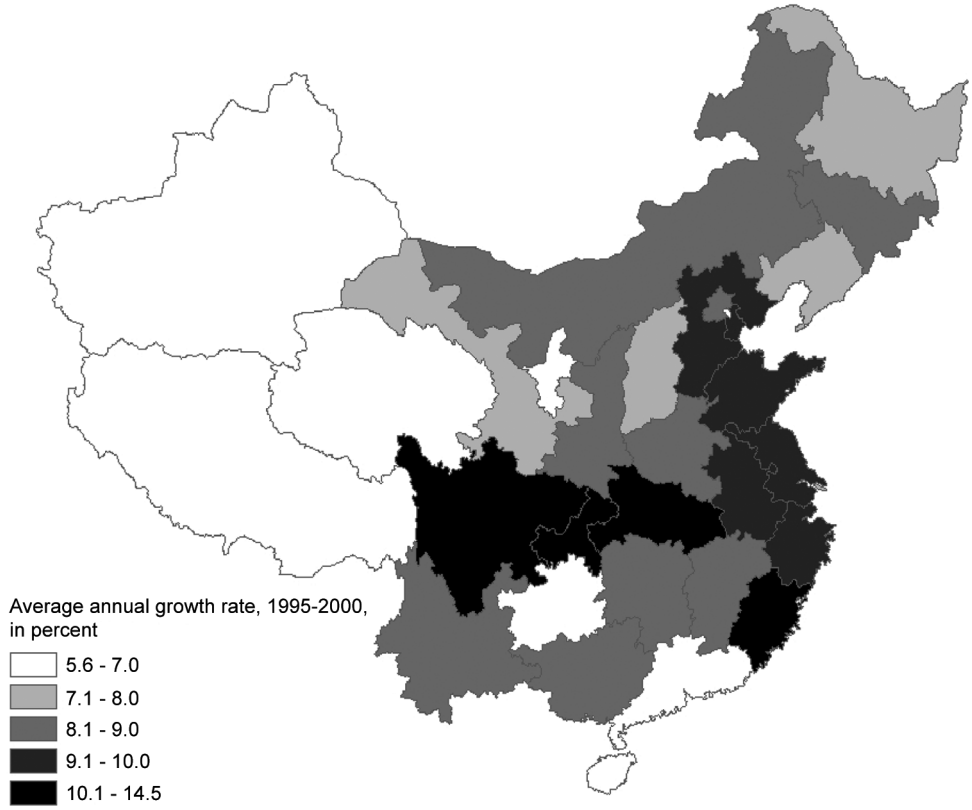

Fig. 5. Rate of growth in per capita GDP by province, 1995–2000. Chongqing is included in Sichuan province. The grouping of growth rates is based on the natural breaks method.

this scenario are thus considered to be a response to the problem of widening disparities rather than a contributor to the solution of narrowing disparities.

Reality Checks

Do the average per capita GDP data based on *de facto* population and the derivative inequality indices provide an accurate picture of the real situation? We pose this question because our findings of a cessation in the widening of regional disparities do not seem to reconcile with the popular impression of large (and perhaps widening) economic gaps between rich and poor (including regional inequality) in the recent public media, often supported by anecdotes of extreme wealth and poverty. Does the contrast simply reflect the discrepancies between our "objective data" and the "subjective" judgments embedded in public opinion (see UNDP, 2005, p. 13). Three useful points can be made to show that the two claims are not necessarily in contradiction.

First, the data used in this paper do not allow us to address the relative magnitude of IPI over a longer historical period. Our analysis merely shows that the IPI rose from 1990 to 1995 and started to plateau thereafter; the analysis in our study of the 1990s is based on three

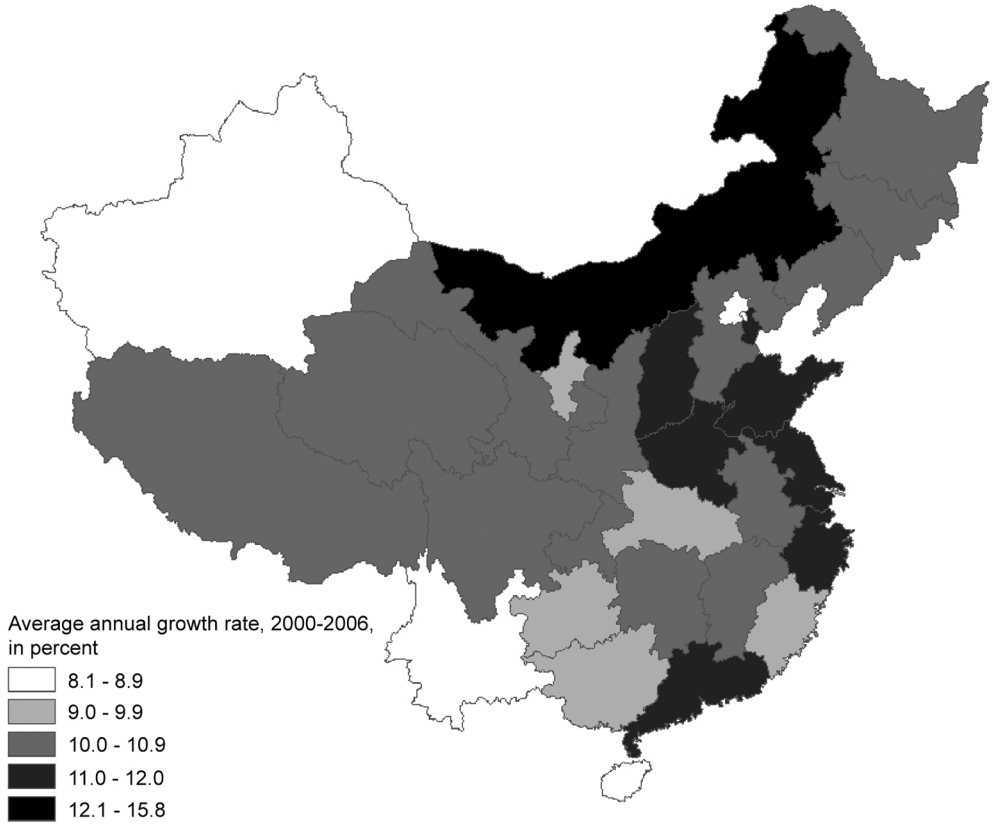

Fig. 6. Rate of growth in per capita GDP by province, 2000–2006. The grouping of growth rates is based on the natural breaks method.

benchmark years, and may not reveal the ups and downs of regional inequality between individual years. Tsui's (2007) examination of data for a much longer time span, has demonstrated that interprovincial Gini coefficients in 1994–1998 were near their highest level for the entire period between 1952 and 2000. The World Bank (2005) also has shown that China's overall inequality in the early 21st century is at a very high level. Thus, the public perception of a large income gap between rich and poor does not seem misplaced in the context of this longer time scale.

Secondly, the *geographical scales* of the two discourses are likely quite different. Our CV-based analysis is based exclusively on provincial *averages*, whereas the general perceptions are likely drawn from observations made at a variety of geographical scales, a good portion of which is probably at the inter-personal or inter–income group levels. It is possible that the provincial averages mask some extremely rich and poor cases in different provinces.

Thirdly, GDP is simply an indicator of economic *output*, and does not address or capture the distributional side of the output. In other words, even if the relative dispersion (i.e., CV) of provincial per capita GDP (*output*) has more or less been the same (as in the case for 1995–2006), this does not necessarily mean that the relative dispersion of provincial per capita *personal income* (or consumption, as a proxy) is more or less the same. It can be more

Table 10. Interprovincial Disparities in Education (CV), 1990–2003[a]

Group	1990	1995	1999	2003
		Weighted		
Group 1	0.386	0.064	0.058	0.052
Group 2	0.303	0.061	0.053	0.048
		Unweighted		
Group 1	0.478	0.128	0.110	0.097
Group 2	0.284	0.124	0.106	0.094

[a]The calculation is based on the Education Index, compiled for the Human Development Index by the United Nations. *Sources*: Compiled by the authors from UNDP, 1999, 2002, and 2005.

skewed, as evidenced by popular accounts of actual personal or regional income or consumption.[53] This is an important aspect that should not be overlooked given the serious institutional stratification (especially the *hukou*-based rural and urban distinction) in the present social and spatial structures of China (Li, 2005; Chan, 2008a).

Limitations of the CV

More generally, there are significant limitations in using per capita GDP as the general, principal indicator of development. In the Chinese case, it is even more problematic, as both the Chinese provincial GDP and population statistics are fraught with definitional traps and over- or underreporting problems (some quite serious), partly because of the enormous technical problems in national accounting at the local level and partly because of the political nature of these statistics (they are tied closely to local officials' careers; see Holz, 2002; Xinhua Net, 2005; Chan, 2007). There is also the issue of properly deflating the provincial GDP over time (Naughton, 2002; Tsui, 2007). Still, there is much talk about provinces overreporting their GDP growth rates. It is well known that the national growth rate based on aggregating the provincial growth rates (using the old GDP figures) was invariably higher than the rate provided by the NBS. The accuracy of CVs based on per capita GDP is quite sensitive to any of those problems, as partly illustrated in this paper.[54]

GDP is an economic indicator that does not capture the social aspect of well-being or development, as researchers have long recognized (see Lyons, 1997; UNDP, 2005; Fan and Sun, 2008). To move beyond the narrow confines of GDP, a preliminary, brief attempt based on a provincial education index compiled by the United Nations (UNDP, 1999, 2002, 2005) is presented here in Table 10. Not unlike our CV_{df} of per capita GDP, the computed CVs pertaining to education also exhibited a parallel drop in the 1990s, but one that was more pronounced and had occurred earlier, in the first half of the decade.[55] If we accept the thesis of an eventual reversal or a leveling of China's spatial inequalities (as in the well-known

[53]A preliminary study based on NBS income and consumption data by Yan (2001) showed that both personal income and consumption are increasingly concentrated within the higher income groups of the urban and rural populations.

[54]This paper has not addressed the accuracy of provincial GDP and population data. For a discussion of related issues, see Rawski (2001), Holz (2002), Qiao (2002), and Chan (2003).

[55]Our results are consistent with Wang and Zhang (2003), based on provincial education data.

Williamson inverted-U curve), it would not be unreasonable to hypothesize that the rapid spread of basic education in many poor provinces (in 1990–1995) would pave the way for subsequent more rapid economic development (most obviously in 1995–2000), partly through the mechanism of long-distance migration.[56] The sequence of individuals' personal development suggested by this scenario—obtaining a basic education, then (for some) engaging in migration, and finally achieving higher incomes—is not unfamiliar in many parts of China and elsewhere in the world. It is consistent with the central role of human capital in development, which includes not only education but also equally importantly, migration—which provides employment opportunities and accumulation of job skills (UNDP, 2005). While China has made great strides in spreading basic education to the poor provinces over the past two decades, the new front in the battle against inequality is access to higher education. Wang and Chan (2005) and Wang (2005), for example, have shown that the exam score–based college admission system for recruiting students into China's top universities in 1999 and 2000 continues to strongly favor candidates from large cities and coastal provinces.

Taking an even broader view, the CV, like any other single ("aggregate" or mean-based) inequality index, suffers from some non-trivial limitations when applied to China. Because of serious institutional barriers (mainly the *hukou* system), rural and urban population segments and labor markets operate as two largely separate "circuits" or strata (Chan et al., 1999; Fan, 2001; Cai and Wang, 2002; Yang, 2003; Li, 2004; Li, 2005). Given this duality, the change in the "average GDP" is often more a statistical phenomenon than real event; it means little to most of the rural population (including rural migrant labor) in real terms, as they are institutionally confined to certain low-end jobs and to a low, caste-like social stratum (Chan, 1994; Wang, 2005). It is therefore conceptually and statistically more meaningful to differentiate these two segments and treat them separately in the study of inequality.[57]

However, because of the *hukou* system and many elements associated with it, this exercise is impeded by the fact that rural-urban definitions in China and urban population weightings are just as complex and problematic as definitions of total population and GDP (see Chan and Tsui, 1992; Zhou and Ma, 2005; Chan, 2007). Full treatment of this topic lies beyond the scope of the present paper, but at the minimum, one can suggest that income data drawn from the NBS annual urban household surveys are reasonablly useful for studying the IPI within the urban-*hukou* population. Survey data for rural *hukou* holders, however, are often incomplete and problematic, as many migrate to jobs in the city and are often missed in both NBS's urban household surveys (because they are not considered "local residents") and rural surveys of their villages of origin (Lu and Wang, 2002; Chan, 2008b). Omission of this group is not trivial, as it represents a component that possesses a large capacity to alter rural-urban and interprovincial rural disparities. Inferences from these data thus must be made extremely cautiously, and are possible only in conjunction with a thorough understanding of Chinese rural-urban population and the composition of *de jure* and *de facto* population statistics.

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[56]Based on data from large surveys of rural migrant labor, Chan (2001, Table 5) has shown that labor in the poorest provinces in China's Western region participated more in long-distance migration in the immediate years before 1998 than in the period before 1993. Many more individuals were able to take advantage of long-distance migration to improve their economic conditions in 1998 than in 1993.

[57]Such segmentation has been undertaken by a number of scholars (e.g., Wang, 2002; Lu and Wang, 2002; Lin et al, 2004; Kanbur and Zhang, 2005; Liu, 2006; Sicular et al, 2007; Wan, 2007; Benjamin et al., 2008).

CONCLUSIONS

This paper has explored the complexity of China's provincial *de jure* and *de facto* population statistics in terms of their effects on the computation of CVs of per capita GDP and the assertion of widening regional disparities in IPI during the second half of the 1990s. Our study reveals that formerly prevailing views of increasing divergence for the 1995–2000 period are based on inadequately informed use of *de jure* provincial population series as a denominator, leading to significant overstatements of interprovincial inequality in 2000. Indeed, the *de jure* data can lead one to the erroneous finding that regional inequalities have risen continuously from the mid-1990s to well into the 21st century. Our calculations of CVs based on *de facto* population data in the 1990s and the period between 2000 and 2006 show that the level of regional economic disparity in China, after a gradual increase during the first half of the 1990s, most likely began to level off in the mid-1990s and has been stable since that time. The recent stability in regional inequality appears to reflect a variety of factors, especially long-distance migration, and should be viewed in the context of the limitations of the used data and index of inequality. Using *de facto* provincial population data, GDP statistics, and information pertaining to migration, this paper has presented a picture of migration and regional development in China over the past 16 years that is quite different from that presented in previously published studies. The analysis in this study also has illustrated the complexity of Chinese provincial population statistics as well as those pertaining to GDP.

We believe that migrant labor is an integral part of China's economic success story in the last two decades. China would not have become the "world's factory" were it not able to offer the plentiful supply of workers migrating from the countryside to its coastal, export processing–oriented industrial cities. In this context, the particular significance of migration in alleviating poverty and narrowing regional disparities has important policy implications.

Despite the encouraging story about the stabilization of regional disparities based on the use of "average" indices presented in this paper, we do not neglect to note that China's current major meaningful income gaps are the ones between the rural *hukou*-holders (the very poor in remote provinces or the poorest rural migrants in cities) and the richest *hukou*-holders in the cities, and the disparities already are at a very high level. Furthermore, the CV index used in this paper (and by many authors as well) is an aggregate average inequality indicator based on economic *output*, and thus most likely fails to capture many important aspects of China's multi-dimensional regional inequality. Many locales in the country's interior undoubtedly still lag far behind the coastal regions in many aspects, and many rural migrants living in the cities still must contend with undesirable, if not deplorable, situations (Chan and Buckingham, 2008; see also Smith and Himmelfarb, 2007). Conversely, the number of very wealthy urban households is rising rapidly, with an ever greater proportion of the wealth concentrated in a few hands.[58] A substantial part of China's current rural poverty is geographically based, encompassing disadvantaged locations, such as a harsh natural environment and/or poor access. These "geographical" barriers to development will take a long time to overcome, as the old Chinese fable of *yugong yishan* ("the old fool moving the mountain") may remind us. A more direct and effective approach to mitigating existing disparities is to further promote the migration of labor from poverty-stricken areas to the coastal region, while at the

[58]A recent study has estimated that the number of rich families with assets exceeding US$1 million rose from 124,000 in 2001 to 310,000 in 2006. This group controlled 21.1 percent of the wealth of the country in 2006, compared to 13.3 percent five years earlier (Fuhao, 2007).

same time allowing migrants to gradually settle in the selected destinations and become urban citizens with equal rights.

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Appendix 1. Unweighted Coefficients of Variation by Per Capita GDP, 1990, 1995, and 2000

Group	Indicator	Current prices			Constant 1990 prices		
		1990	1995	2000	1990	1995	2000
		***de facto* population**					
Group 1	CV	0.572	0.618	0.641	0.572	0.589	0.590
	Mean	1,837	5,154	8,313	1,837	3,135	4,845
	SD	1,052	3,184	5,325	1,052	1,847	2,860
Group 2	CV	0.286	0.399	0.408	0.286	0.397	0.401
	Mean	1,537	4,313	6,869	1,537	2,643	4,082
	SD	440	1,721	2,800	440	1,052	1,639
		***de jure* population**					
Group 1	CV	0.593	0.670	0.745	0.593	0.632	0.677
	Mean	1,864	5,311	8,710	1,864	3,263	5,086
	SD	1,106	3,561	6,489	1,106	2,062	3,441
Group 2	CV	0.288	0.405	0.425	0.288	0.392	0.416
	Mean	1,529	4,333	6,900	1,529	2,697	4,134
	SD	448	1,756	2,932	448	1,057	1,719

Appendix 2. Unweighted Coefficients of Variation by Per Capita GDP, 2000–2006

Group	Indicator	2000	2001	2002	2003	2004	2005	2006
		***de facto* population**						
		Current prices						
Group 1	CV	0.686	0.689	0.696	0.691	0.685	0.665	0.644
	Mean	8,520	9,308	10,315	11,793	14,026	16,203	18,534
	SD	5,842	6,411	7,182	8,145	9,607	10,770	11,942
Group 2	CV	0.402	0.398	0.405	0.417	0.411	0.420	0.421
	Mean	6,892	7,507	8,293	9,500	11,314	13,120	15,242
	SD	2771	2,987	3,355	3,961	4,645	5,544	6,414
		Constant 2000 prices						
Group 1	CV	0.686	0.687	0.691	0.676	0.677	0.666	0.655
	Mean	8,520	9,240	10,188	11,296	12,718	14,185	15,864
	SD	5,842	6,344	7,038	7,637	8,615	9,452	10,397
Group 2	CV	0.402	0.399	0.405	0.415	0.421	0.427	0.431
	Mean	6,892	7,470	8,224	9,174	10,327	11,580	13,028
	SD	2,771	2,982	3,331	3,805	4,351	4,942	5,621

(*appendix continues*)

Appendix 2. *Continued*

Group	Indicator	2000	2001	2002	2003	2004	2005	2006
				***de jure* population**				
				Current prices				
Group 1	CV	0.771	0.802	0.813	0.824	0.828	0.811	0.81
	Mean	8,923	9,930	11,029	12,680	15,065	17,437	17,278
	SD	6,880	7,966	8,963	10,451	12,481	14,138	14,075
Group 2	CV	0.429	0.429	0.438	0.453	0.450	0.460	0.46
	Mean	6,980	7,662	8,474	9,695	11,486	13,399	13,359
	SD	2,991	3,289	3,708	4,392	5,165	6,166	6,144
				Constant 2000 prices				
Group 1	CV	0.771	0.799	0.804	0.806	0.816	0.810	0.805
	Mean	8,923	9,859	10,893	12,144	13,664	15,283	17,234
	SD	6,880	7,874	8,756	9,796	11,146	12,374	13,870
Group 2	CV	0.429	0.429	0.436	0.449	0.458	0.465	0.472
	Mean	6,980	7,630	8,414	9,375	10,509	11,782	13,320
	SD	2,991	3,270	3,670	4,206	4,816	5,478	6,281