

中國大陸經濟發展與地區所得分配

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摘 要

自從 1978 年中國大陸採行改革開放制度以來，經濟發展之速度另人矚目。在此種快速成長的速度下，人們不禁會產生一個疑問：「中國大陸區域發展之間，所得分配的狀況是如何變化呢？」為回答此一問題，本研究使用中國大陸的省級所得資料，來檢視不同省分之間所得分配的變化情況。此外，我們也將中國大陸畫分成六個地區，然後再檢視這六個地區之間所得分配的變化情況。利用吉尼係數、變異係數、及集中度係數等不同衡量所得分配的指標，我們得到以下幾個結論：第一、不論在同省分或地區之間，總所得分配有惡化現象；第二、雖然總所得分配有惡化現象，但個人所得分配則呈現象，不論在不同省分或地區之間都是如此。第三，不同區域之間所得分配較不同省分之間來平均。

Economic Development and Regional Distribution Patterns in China*

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Abstract

Mainland China has achieved remarkable economic development since the government chose its most recent open-door policy since 1978. One interesting question arises: "When China grew at such a high rate, what is the income distribution on the Mainland?" To answer the above question, we apply income data on provincial level to analyze changes in income distribution patterns among provinces. Moreover, Mainland China is divided into six regions in this study so that their income distribution patterns among regions could be checked. By applying different indices for income inequality, e.g. the Gini coefficient, coefficient of variation, CR4, and CR10, income distribution is computed for total income and per capita income among thirty provinces and six regions. Our main findings are as follows: First, total income inequality has widened in China, either among provinces or regions. Second, although total income distribution is worsening, per capita income distribution is getting better, either among provinces or regions. Third, the income distribution among regions is even than that among provinces.

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1. Introduction

China has achieved remarkable economic development since the government chose its most recent open-door policy in 1978. The average real growth rate of per capital GDP from 1978 to 1993 is about 7.65%. This high growth rate is atypical for a large country like China, with a population nearly 1.2 billion.

One interesting question arises: "When China grew at such a high rate, what is the income distribution on the Mainland?" This question is particularly meaningful for a country like China not only because of its enormous geographical size, but because of its original disparity among regions. Although China was a pure planned economy before 1978, economic situations among regions had a large discrepancy owing to their different endowments. For instance, North Eastern area is traditionally a rich region endowed with abundant crude oil and other minerals.

After 1978, in addition to overall rapid economic growth in the Mainland, the economic development among regions is also different. By opening its local market and trading with foreign countries by applying an open-door policy, the PRC Government wants to attract foreign investment from abroad. Therefore, both Guangdong and Fujian provinces are important because they are near Hong Kong and Taiwan, respectively. Meanwhile, the PRC Government has chosen a so-called "imbalance policy" and tries to prosper seashore regions first and then interior regions.^(註一) Consequently, Guangdong and Fujian provinces and other provinces along the seashore are indeed performing excellent in economic growth as compared to other areas.

Unfortunately, income distribution patterns among all provinces and regions in China

註一：The imbalance policy states that provinces along the coast will be developed first, then along rivers (Yangtze and Yellow) and along border, finally interior provinces.

after 1979 have not yet been systematically studied owing to insufficient data. Griffin and Griffin (1984) was the seminal paper discussing income distribution in China, in which they analyzed the impact of rural reforms to income distribution since 1979.(註二) Zhu (1991) applied a household survey data from Henan province to examine income disparity after rural reforms. Knight and Song (1991, 1993) analyzed the determinants of income distributions for urban and rural areas in China. Applying a household survey data, Hussain, Lanjouw, Stern (1994) compared income inequality in urban and rural China and examined sources of inequality from inter- and intraprovinces. Most of these studies applied either survey data on family income or county-level data. Lin and Liu(1992) checked income distribution only for certain provinces, but neither for the entire country nor for different regions.(註三)

In this study, we apply income data on provincial level to analyze changes in income distribution patterns among provinces since it is generally agreed that income distribution inequality among provinces is very significant in China. Also, Mainland China is divided into six regions in this study so that their income distribution patterns among regions could be checked for the past sixteen years.

More specifically, three issues are addressed in this study. First, with the overall growth of China's economy, has total income among provinces and regions distributed more evenly or not? Also, has per capita income distribution among provinces and regions followed the well-known U-shape rule, in which income distribution worsens when an economy starts to grow and then gradually becomes even?(註四) Second, whether income distributes more evenly inter-regions or intra-regions is of concern. Finally, verifying whether the well-known "imbalance policy" works or not is also of primary interest.

註二：Griffin and Saith (1981) might be the first field study on income distribution in China. But there was no data for personal income in China before 1979, so Griffin and Saith did not report personal income distribution on their paper.

註三：For a brief survey about studies on income distribution in China, see Hussain, Lanjouw, and Stern (1994).

註四：Kuznets(1955) provides further details.

This study follows a standard approach and separates the thirty provinces of Mainland China into six regions: Central North (Hwabei area), North East (Dongbei area), Central East (Hwadong area), Central South (Zhungnan area), South West (Xinan area), and North West (Xibei area).

Income inequality can be measured by several ways, e.g., Gini coefficient, coefficient of variation, and Theil index.^(註五) In addition to Gini coefficient and coefficient of variation, this study also applies the index of concentration ratio to show a total income concentration among provinces and regions.

Section two compares the economic development performances among provinces from 1978 to 1993. Also, several indices of income distribution are calculated for both total income and per capita income. Section three examines the change of income distribution patterns among regions. Section four concludes this study.

2. Economic Development and Income Growth

Since Mr. Deng Xiao-Ping regained his power in 1978, China Government firmly chose its open-door policy and applied the so called "socialistic market economy". They gradually shifted from a planned economy to a market economy and released price control item by item. Moreover, the PRC Government introduced private property rights to the market, such as land ownership.^(註六) Finally, rural reforms started in 1979 were also crucial. Combining with all of the above factors, China economy has achieved a remarkable record since 1979.

In order to get consistent provintial income data, we collected total nominal GDP figures from *China Statistic Yearbook* in varies years and some from provintial statistic year books.^{(註}

註五：For a survey on this topic, see Lin (1994), Ch.2.

註六：Although people in China are only allowed to have the right to use the land, but not the right to own, Cheung (1995) thinks that it is 'the' most important factor to account for the high growth rate in China for the past sixteen years.

七) Moreover, we also noticed that real total GDP may be more meaningful since inflation rates were quite different among provinces during the time period. But, unfortunately, it is difficult to obtain consistent figures of provincial inflation rates for all provinces in China. Therefore, we have to use nominal GDP, in stead of real GDP, to compute income distribution between provinces.

Table 1 shows that in 1978, per capita GDP in China was RMB\$363, while it increased to RMB\$2,678 in 1993. Per capita GDP has grown 6.38 times since 1978, and the average annual nominal growth rate is 14.25%. The inflation rate goes up and down and the average rate is 6.60%. Therefore, the real growth rate of per capital GDP during the past sixteen years is 7.65%. This high growth rate may not be the highest record in the world history of economic development, but it is surely unique if one considers the enormous population of China.

註七：Since both Henan and Tibet's income statistics started from 1986, we used their social values of total output as bases to obtain estimated total GDP from 1978 to 1984.

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Table 1. Per Capita Income(GDP): by Provinces

Unit:RMB\$

Region	Province	1978	1979	1980	1981	1982	1983	1984	1985
Central North	Beijing	1250	1339	1538	1514	1655	1920	2240	2600
	Tienjing	1142	1258	1382	1421	1474	1572	1853	2183
North East	Hebei	362	416	424	423	469	523	605	715
	Shanxi	363	428	435	478	537	586	729	791
	Neimong	318	344	359	401	466	516	607	739
	Liaoning	682	722	807	814	869	990	1175	1372
	Jilin	381	417	503	545	657	754	852	948
Central East	Heilonjiang	558	591	690	697	745	819	937	1025
	Fujian	271	296	341	405	440	466	560	703
	Shanghai	2485	2530	2719	2792	2854	2946	3244	3671
	Jiangsu	427	337	539	583	641	713	841	1049
	Zhejiang	330	416	470	525	588	634	787	1027
	Anbui	241	263	284	338	363	413	501	615
	Jiangxi	273	323	340	367	400	425	480	590
	Shandong	327	361	413	469	528	586	730	839
	Guangdong	365	402	470	534	613	651	792	978
	Guangxi	223	244	275	314	351	360	395	467
Central South	Hainan	277	283	292	341	413	442	575	707
	Hubei	330	407	426	464	503	543	673	804
	Hunan	285	341	363	391	426	407	517	622
	Henan	231	264	315	202	483	430	478	576
	Sichuan	252	297	328	325	378	418	492	595
	Guizhou	174	202	217	240	276	301	369	418
South West	Yunan	223	245	266	292	335	360	414	483
	Tibet	433	449	419	459	464	462	710	892
	Sichuan	303	331	322	331	355	374	435	501
South West	Gansu	346	356	385	365	389	460	512	605
	Qinghai	431	460	475	425	488	624	664	811
	Ningxia	349	345	403	424	449	501	579	695
	Xingjiang	316	366	413	456	498	599	655	823
Total	Average	363	397	448	468	536	580	682	811

Table 1. Per Capita Income(GDP): by Provinces(Continued)

Unit:RMB\$

Region	Province	1986	1987	1988	1989	1990	1991	1992	1993
Central	Beijing	2759	3063	3712	4199	4536	5366	6303	7595
North	Tienjing	2389	2654	3095	3326	3591	3926	4678	6151
	Hebei	776	914	1139	1305	1358	1543	1841	2473
	Shanxi	828	884	1056	1227	1379	1467	1745	2144
	Neimong	791	890	1124	1212	1326	1470	1716	2180
North	Liaoning	1554	1819	2195	2379	2465	2725	3279	4473
East	Jilin	1224	1176	1476	1509	1612	1724	2080	2630
	Heilongjiang	1117	1289	1499	1670	7860	2055	2372	2950
Central	Fujian	766	924	1236	1432	1532	1801	2265	3264
East	Shanghai	3984	4364	5137	5459	5804	6664	8645	11673
	Jiangsu	1188	1392	1750	1886	1951	2149	2853	3954
	Zhejiang	1179	1396	1736	1883	1976	2308	2848	3949
	Anbui	697	790	955	1048	1071	1045	1252	1661
	Jiangxi	653	721	872	970	1101	1203	1430	1770
	Shandong	889	1042	1281	1441	1570	1863	2302	3127
Central	Guangdong	1111	1385	1853	2177	2356	2765	3549	4901
South	Guangxi	521	601	730	842	926	1055	1313	1193
	Hainan	771	909	1190	1350	1433	1601	2065	3212
	Hubei	886	1024	1212	1339	1472	1573	1816	2297
	Hunan	698	812	987	1066	1150	1274	1482	1889
	Henan	630	748	887	973	1036	1133	1369	1770
South	Sichuan	634	714	871	931	1059	1176	1347	1764
West	Guizhou	464	542	663	729	779	878	935	1198
	Yunan	513	600	746	864	1061	1145	1331	1705
	Tibet	838	851	955	1012	1271	1375	1480	1607
South	Sichuan	529	568	645	640	1128	1272	1447	1785
West	Gansu	680	759	898	999	1049	1131	1304	1528
	Qinghai	881	987	1266	1372	1481	1599	1829	2264
	Ningxia	792	873	1081	1225	1311	1445	1631	1989
	Xingjiang	910	1060	1353	1492	1680	2040	2418	3003
Total	Average	895	1030	1264	1395	1517	1701	2061	2678

Source:China Statistic Yearbook, varies years.

While the PRC economy grows rapidly, economic situations among provinces are quite different. Table 1 reveals that, in 1978, the top three provinces with the highest per capita income were Shanghai, Beijing and Tianjing, i.e. RMB\$2,485, \$1,250, and \$1,142, respectively.^(註八) The fourth province is Liaoning with a per capita income of RMB\$682. The rest of the top ten are Heilongjiang, Tibet, Qinghai, Jingsu, Jilin, and Guangdong. Several points are worth mentioning: First, except for the top three cities with a relatively higher income, the rest of the top ten provinces have an income not significantly higher than the other provinces. Secondly, the top ten richest provinces are located in almost all of entire China, instead of concentrating on a certain region. Finally, except the top three cities which developed much earlier than other areas, the other top seven provinces with a higher GDP are rich owing to their abundant natural resources, such as crude oil and minerals, e.g., Liaoning, Jilin, and Heilongjian.

When the economy opened to the market economy in 1978, the provinces along the coast gained easy access to foreign countries. Table 1 indicates that in 1985, Zhejiang jumped into the top ten richest provinces and ranked number six, while Jiangsu and Guangdong both gained higher ranks. In 1993, although the top three cities are still the richest places, the other top ten provinces have changed drastically. Zhejiang, Fujian, Hainan, and Shandong are new comers, while Guangdong jumps up to rank number four.

Significantly, in 1993, all the top ten provinces are along the coast, except Beijing which is developed much earlier than other places. The "imbalance policy" apparently works very well. This aspect is discussed in detail later on.

Before computing total income distribution among provinces, population distribution must be known first so that he will not be confused by the population effect. Population

註八：These three places are cities instead of provinces. In China, however, the three cities are classified as provinces; their statistics are shown as provincial level.

Table 2. Population Distribution:by Provinces

Unit: %

Region	Province	1978	1979	1980	1981	1982	1983	1984	1985
Central	Beijing	0.91	0.92	0.92	0.92	0.93	0.93	0.94	0.95
North	Tienjing	0.76	0.76	0.76	0.76	0.77	0.77	0.77	0.77
	Hebei	5.28	5.26	5.26	5.28	5.30	5.30	5.31	5.31
	Shanxi	2.53	2.55	2.52	2.52	2.52	2.53	2.55	2.56
	Neimong	1.91	1.91	1.91	1.91	1.92	1.93	1.93	1.93
North	Liaoning	3.50	3.50	3.55	3.55	3.55	3.55	3.54	3.53
East	Jilin	2.25	2.25	2.25	2.24	2.23	2.22	2.21	2.20
	Heilongjiang	3.27	3.27	3.26	3.25	3.25	3.24	3.23	3.21
Central	Fujian	2.56	2.56	2.56	2.57	2.58	2.58	2.59	2.60
East	Shanghai	1.15	1.17	1.17	1.17	1.17	1.17	1.17	1.17
	Jiangsu	6.10	6.08	6.05	6.03	6.02	6.00	5.97	5.95
	Zhejiang	3.92	3.91	3.90	3.89	3.88	3.88	3.87	3.86
	Anhui	4.93	4.95	4.98	4.98	4.96	4.95	4.94	4.94
	Jiangxi	3.33	3.33	3.33	3.32	3.31	3.32	3.35	3.36
	Shandong	7.48	7.45	7.43	7.43	7.41	7.40	7.39	7.38
Central	Guangdong	5.29	5.31	5.32	5.34	5.34	5.38	5.40	5.41
South	Guangxi	3.56	3.58	3.60	3.63	3.64	3.65	3.69	3.71
	Hainan	0.55	0.56	0.56	0.56	0.56	0.57	0.57	0.57
	Hubei	4.78	4.77	4.77	4.76	4.75	4.73	4.72	4.72
	Hunan	5.40	5.38	5.38	5.38	5.39	5.39	5.38	5.38
	Henan	7.38	7.41	7.42	7.43	7.44	7.47	7.49	7.31
South	Sichuan	10.14	10.07	10.00	9.96	9.91	9.86	9.76	9.75
West	Guizhou	2.81	2.81	2.83	2.84	2.84	2.84	2.84	2.84
	Yunan	3.23	3.23	3.23	3.24	3.25	3.26	3.26	3.27
	Tibet	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
South	Sichuan	2.81	2.82	2.84	2.84	2.87	2.87	2.87	2.87
West	Gansu	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
	Qinghai	0.38	0.38	0.38	0.38	0.39	0.38	0.39	0.39
	Ningxia	0.37	0.38	0.38	0.38	0.39	0.39	0.39	0.40
	Xingjiang	1.29	1.30	1.31	1.30	1.29	1.29	1.30	1.30
Total	Population (millions)	955	969	980	994	1001	1020	1031	1042

Table 2. Population Distribution:by Provinces(Continued)

Unit: %

Region	Province	1978	1979	1980	1981	1982	1983	1984	1985
Central North	Beijing	0.97	0.99	0.99	0.98	0.97	0.97	0.97	0.95
	Tienjing	0.77	0.77	0.77	0.77	0.76	0.76	0.76	0.77
North East	Hebei	5.31	5.31	5.30	5.30	5.42	5.41	5.40	5.28
	Shanxi	2.56	2.56	2.57	2.57	2.55	2.56	2.57	2.51
	Neimong	1.93	1.92	1.92	1.91	1.90	1.90	1.90	1.86
	Liaoning	3.52	3.51	3.50	3.49	3.45	3.42	3.41	3.37
	Jilin	2.19	2.17	2.16	2.16	2.15	2.14	2.13	2.13
Central East	Heilongjiang	3.20	3.18	3.17	3.16	3.12	3.11	3.11	3.04
	Fujian	2.60	2.60	2.56	2.57	2.58	2.58	2.59	2.60
	Shanghai	1.16	1.16	1.16	1.15	1.13	1.12	1.11	1.08
	Jiangsu	5.92	5.90	5.89	5.89	5.96	5.95	5.95	5.81
	Zhejiang	3.84	3.83	3.82	3.79	3.73	3.71	3.69	3.59
	Anbui	4.93	4.95	4.98	4.98	4.98	5.00	5.02	4.92
	Jiangxi	3.38	3.38	3.37	3.38	3.35	3.36	3.37	3.31
	Shandong	7.38	7.40	7.38	7.36	7.48	7.40	7.41	7.21
	Guangdong	5.42	5.42	5.43	5.43	5.50	5.60	5.57	5.49
	Guangxi	3.73	3.73	3.74	3.74	3.73	3.73	3.75	3.51
Central South	Hainan	0.57	0.57	0.57	0.58	0.58	0.59	0.59	0.58
	Hubei	4.71	4.70	4.71	4.71	4.73	4.74	4.75	4.72
	Hunan	5.38	5.38	5.42	5.42	5.38	5.36	5.39	5.26
	Henan	7.54	7.58	7.61	7.66	7.61	7.62	7.63	7.46
	Sichuan	9.74	9.73	9.69	9.65	9.52	9.48	9.47	9.26
South West	Guizhou	2.84	2.84	2.88	2.92	2.88	2.87	2.87	2.84
	Yunan	3.29	3.29	3.29	3.29	3.28	3.29	3.30	3.24
	Tibet	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
South West	Sichuan	2.87	2.87	2.87	2.88	2.92	2.92	2.93	2.87
	Gansu	1.96	1.96	1.96	1.96	1.96	1.96	1.99	1.96
	Qinghai	0.40	0.40	0.40	0.40	0.39	0.38	0.39	0.39
	Ningxia	0.40	0.40	0.41	0.41	0.41	0.41	0.42	0.41
	Xingjiang	1.31	1.31	1.31	1.31	1.32	1.33	1.36	1.34
Total	Population (millions)	1057	1073	1090	1107	1134	1148	1159	1212

Source:See Table 1.

distributions among provinces remained quite stable from 1978 to 1993, as shown in Table 2. Sichuan had the largest population size, with 10.14% at 1978. Then, the percentage gradually dropped to 9.26% in 1993. Shandong was the second largest province with 7.48% of population in 1978, and dropped to 7.21% in 1993. Moreover, Henan increased from 7.38% to 7.46% from 1978 to 1993.

Before we analyze income distribution among provinces and among regions in China, here we like to compare the growth rates of per capita income and of total income for different provinces. In this case we may see how is the economic performance for each province in the past fifteen years.

Table 3 shows the annual growth rate of per capita income for each province. One may see in Table 3 that Shanghai, Beijing, and Tienjing are the top three areas with the highest per capita income for the past fifteen years. However, the story is totally different in terms of growth rate. In fact, the top three provinces with the highest growth rate of per capita income are Guangdong, Fujian, and Zhejiang, with average annual growth rates 18.91%, 18.04%, and 18.00%, respectively. All of the three provinces are along the southeast coast area. On the other hand, Shanghai, Beijing, and Tienjing have relative low growth rates comparing to other provinces.

Originally, per capita income for people in Guangdong, Fujian, and Zhejiang were in the middle income level in the rank of 10, 24, and 15 at the year of 1978. However, after a quick growth, the ranks of the three province jumped to 4th, 8th, and 7th at the year of 1993.

The above results have provided us a very important implication that the fast income growth in China are mainly in the coastal provinces with originally middle income level. After economic development in 1979, those provinces catching up faster are the provinces with middle income. In this case, even though we might see the overall income distribution could be even, but the income discrepancy among top income areas and low income areas could be even worse. We will give more explanation on this point on Section 4.

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Table 3 Annual Growth Rate of Per Capita Income(GDP):by Provinces

Region	Province	1978		1983		1988		1993		Average Annual Growth Rate	
		Per Capita Income	Rank	Per Capita Income	Rank	Per Capita Income	Rank	Per Capita Income	Rank	%	Rank
Central	Beijing	1250	2	1920	2	3712	2	7595	2	12.79	20
North	Tienjing	1142	3	1572	3	3095	3	6151	3	11.89	24
	Hebei	362	12	523	15	1139	16	2473	14	13.67	16
	Shanxi	363	11	586	11	1056	19	2144	18	12.57	21
	Neimong	318	18	516	16	1124	17	2180	17	13.70	15
North	Liaoning	682	4	990	4	2195	4	4473	5	13.36	18
East	Jilin	381	9	754	6	1476	9	2630	13	13.74	12
	Heilongjiang	558	5	819	5	1499	8	2950	12	11.75	26
Central	Fujian	271	24	466	19	1236	13	3264	8	18.04	2
East	Shanghai	2485	1	2946	1	5137	1	1673	1	10.87	28
	Jiangsu	427	8	713	7	1750	6	3954	6	16.00	7
	Zhejiang	330	15	634	9	1736	7	3949	7	18.00	3
	Anhui	241	26	413	26	955	21	1661	26	13.73	13
	Jiangxi	273	23	425	24	872	25	1770	22	13.27	19
	Shandong	327	17	586	11	1281	11	3127	10	16.24	5
Central	Guangdong	365	10	651	8	1853	5	4901	4	18.91	1
South	Guangxi	223	28	360	28	730	28	1193	30	11.83	25
	Hainan	277	22	442	22	1190	15	3212	9	17.75	4
	Hubei	330	15	543	13	1212	14	2297	15	13.81	11
	Hunan	285	21	407	18	987	20	1889	20	13.44	17
	Henan	231	27	430	23	887	24	1770	22	14.54	8
Nouth	Sichuan	252	25	418	25	871	26	1764	24	13.85	10
West	Guizhou	174	30	301	30	663	29	1198	29	13.75	13
	Yunan	223	28	360	28	746	27	1705	25	14.43	9
	Tibet	433	6	462	20	955	21	1607	27	9.13	30
Nouth	Sichuan	303	20	374	27	645	30	1785	21	12.55	22
	Gansu	346	14	460	21	898	23	1528	28	10.42	29
	Qinghai	431	7	624	14	1266	12	2264	16	11.69	27
	Ningxia	349	13	501	17	1081	18	1989	19	12.30	23
	Xingjiang	316	19	599	10	1353	10	3003	11	16.19	6

About the total income distribution, the story is a kind of similar with per capita income, since the population distribution in China is quite stable in the past years. In 1978, Shanghai was the richest place. But Shanghai's rank dropped to 9th in terms of total income, because of its relatively low growth rates for both per capita income and population, as Table 4 shown. On the other hand, Guangdong is catching up quickly, both for per capita income and for population growth. In fact, Guangdong's total income jumped up from 9th in 1978 to the 1st in 1993.

Since the population distribution in China is more stable comparing to the speed of economic development, the growth rate of provincial total income is also more even comparing to per capita income. For example, Table 4 shows that the variance of the average annual growth rates of total income for each province is smaller than that of per capita income shown in Table 3.

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Table 4 Annual Growth Rate of Per Capita Income(GDP):by Provinces

Unit:RMB \$million

Region	Province	1978		1983		1988		1993		Average Annual Growth Rate	
		Total Income	Rank	Total Income	Rank	Total Income	Rank	Total Income	Rank	%	Rank
Central	Beijing	108633	14	18213	14	40056	14	87449	15	17.98	2
North	Tienjing	8289	17	12346	19	25976	21	57404	22	17.47	4
	Hebei	18253	7	28273	8	65800	8	158256	8	17.48	3
	Shanxi	8771	15	15122	16	29582	19	65223	20	15.32	21
	Neimong	5800	24	10158	23	23523	22	49144	23	14.88	26
North	Liaoning	22796	5	35848	4	83739	5	182697	5	16.05	7
East	Jilin	8187	18	17074	15	34751	16	67895	18	15.58	16
	Heilongjiang	17426	8	27066	9	51795	12	108692	12	15.84	12
Central	Fujian	6625	22	12263	20	35028	15	104042	13	16.10	6
East	Shanghai	27292	1	35158	6	64952	9	152795	9	15.53	17
	Jiangsu	24875	2	43636	2	112352	1	278430	2	15.05	25
	Zhejiang	12354	12	25091	12	72284	7	171824	6	15.60	15
	Anbui	11347	13	30852	13	51215	13	99046	14	15.92	10
	Jiangxi	8682	16	14392	17	32031	17	71007	17	15.88	11
	Shandong	23359	4	44231	0	103046	3	273254	3	16.57	5
Central	Guangdong	18440	6	35724	5	109674	2	326107	1	15.93	9
South	Guangxi	7582	20	13403	18	29759	18	79670	16	15.40	20
	Hainan	1455	28	2570	28	7393	27	22579	27	15.14	23
	Hubei	15064	10	26198	10	62223	10	131403	10	15.09	24
	Hunan	14697	11	25675	11	58310	11	120426	11	15.43	19
	Henan	16280	9	32763	7	73576	6	160035	7	15.80	13
Nouth	Sichuan	24403	3	42039	3	91996	4	197976	4	15.48	18
West	Guizhou	4670	25	8719	26	20813	23	41236	25	14.51	28
	Yunan	6879	21	11971	21	26752	20	66953	19	15.25	22
	Tibet	786	30	8954	25	1978	30	3701	30	15.63	14
Nouth	Sichuan	8131	19	10948	22	20178	24	62090	21	16.05	7
	Gansu	6443	23	9149	24	19185	26	36298	26	19.48	1
	Qinghai	1564	27	2031	29	5520	28	10701	28	14.23	29
	Ningxia	1233	29	1993	30	4831	29	9884	29	14.88	26
	Xingjiang	3893	26	7882	27	19319	25	48771	24	10.88	30

3. Income Distribution among Provinces

The Gini coefficients of population distribution among provinces for 1978 and 1993 are 0.4435 and 0.4578, respectively. Their coefficients of variation were 0.7220 and 0.7127 for 1978 and 1993, respectively. By those data, we can conclude that population distribution of China has remained quite stable during the past sixteen years. (註九)

Income distribution can be computed by applying the following four indices: Gini coefficient, coefficient of variation (CV), CR4, and CR10. Their definitions are as follow:

$$Gini = \frac{1}{2n\mu} \sum_i^n \sum_j^n |X_i - X_j|,$$

$$CV = \frac{\sigma}{\mu},$$

$$CR4 = \frac{\sum_i^4 X_i}{\sum_j^n X_j},$$

$$CR10 = \frac{\sum_i^{10} X_i}{\sum_j^n X_j},$$

Where n is the number of provinces, μ is the total average of provinces, σ is the standard deviation among provinces, X_i and X_j are the total incomes for province i and j , respectively, $\sum_i^4 X_i$ is total income for the top four richest provinces, and $\sum_i^{10} X_i$ is total income for the top ten richest provinces.

Table 5 summaries the computed results of Gini, CV, CR4 and CR10 both for total

註九：One reason why the population distribution is so stable is that movement is highly restricted by the PRC Government. For example, if one wants to move into a city, he has to prove to both local governments that he has already secured employment in the new city where he plans to move to. The problem is that although obtaining an official agreement to move is difficult, many people still move into cities and try to get a job there. For instance, temporary population in Shenzhen city, one of the newest cities in Guangdong, is nearly 50% of the total population. So, we believe that the actual population distribution will not be as stable as the data shown at Table 2.

income and for per capita income of all provinces. As expected, the Gini coefficient gradually increases from 0.3695 in 1978 to 0.4031 at 1993, indicating that the income distribution among provinces has worsened during the past sixteen years in China. Meanwhile, CV also increased from 0.6688 to 0.7579, implying that total incomes among provinces have a larger discrepancy when income grows.

Table 5: Income Distribution: by Provinces

Year	Total Income				Per Capita Income	
	Gini	CV	CR4	CR10	Gini	CV
1978	0.3659	0.6688	0.2885	0.6011	0.3498	0.9701
1979	0.3601	0.6475	0.2810	0.5881	0.3355	0.9219
1980	0.3723	0.6705	0.2851	0.6022	0.3388	0.9092
1981	0.3688	0.6669	0.2883	0.5991	0.3324	0.8820
1982	0.3717	0.6691	0.2821	0.5994	0.3069	0.8104
1983	0.3671	0.6600	0.2802	0.5930	0.3096	0.7914
1984	0.3691	0.6647	0.2862	0.5936	0.3030	0.7499
1985	0.3707	0.6691	0.2903	0.5987	0.2954	0.7199
1986	0.3710	0.6681	0.2884	0.5977	0.2971	0.7110
1987	0.3793	0.6865	0.2949	0.6069	0.2929	0.6901
1988	0.3833	0.6973	0.3028	0.6095	0.2918	0.6678
1989	0.3842	0.7005	0.3049	0.6090	0.2893	0.6553
1990	0.3741	0.6852	0.3058	0.6000	0.2725	0.6301
1991	0.3804	0.7035	0.3135	0.6062	0.2843	0.6551
1992	0.3910	0.7309	0.3229	0.6155	0.2997	0.6906
1993	0.4031	0.7597	0.3315	0.6264	0.3191	0.7133

The Gini coefficient and CV show that income inequality within the total provinces has widened. However, what about the discrepancy among rich provinces and the poorer ones? Here, an examination is made to observe whether total income of the top four and the top ten richest provinces have enlarged the difference as compared the rest of the provinces. Table 5

reveals that the share of total income of the top four provinces (CR4) increases from 0.2885 in 1978 to 0.3315 in 1993. CR10 also increases from 0.6011 to 0.6264. Notably, income share for the top four provinces is increasing by 4.30% points; meanwhile, it only increases 2.53% points for the top ten provinces. This finding suggests that most of the inequality originates from the top four provinces, instead of the top ten.

Furthermore, three of the top four "provinces" are Shanghai, Beijing, and Tienjing; and the other one was Liaoning in 1978 and later replaced by Guangdong in 1993. The reason for a change in income inequality apparently originates from two possible sources: One is from the difference between provinces along the coast and interior provinces.(註十) The other possibility is from the difference between cities and rural areas.(註十一)

In addition to comparing total income distributions, Gini coefficient and coefficient of variation for per capita income are also computed.(註十二) Surprisingly, the Gini coefficient decreases rapidly instead of increasing, from 0.3498 in 1978 to the lowest 0.2725 in 1990 and then back to 0.3191 in 1993. CV exhibits the exact same pattern as Gini and drops sharply from 0.9701 to 0.6301 in 1990 and back to 0.7133 in 1993. This finding demonstrates that, although total incomes for rich provinces have increased more than the poor, per capita income has not. This finding implies that welfare for the poor provinces is not as low as shown in total income.(註十三)

註十：That is, the rich provinces located on the coast may attract more foreign capital so that labor productivity is increasing there. On the other hand, those rich provinces could simply attract more people to move in so that total income of those provinces increases.

註十一：Knight and Song (1991) had provided a detail study about income distribution among urban and rural areas in China.

註十二：Here, CR4 and CR10 are neglected since applying average income to compute income concentration ratio is meaningless.

註十三：Income distribution in Taiwan has shown a similar phenomenon that household income distribution is worsen; however, discrepancy for per capita income is smaller between the 1970s and 1980s. The reason is owing to the change of family composition, i.e., labor force is more on the rich families but less in the poor. Chu(1991), Chu and Jiang(1994), and Lin(1994) provide further clarification. Studying family income distribution in China, Knight and Song (1991) had also found a same phenomenon that family income distribution is worse than that of individual's. Knight and Song also concluded that the larger Gini coefficient for family income distribution than for individual's is mainly because that there is a large variance of families' labor force in China.

The above finding that per capita income distribution among provinces is decreasing while total income distribution is widening, in fact, is consistent with other researchs.(註十四) One possible and trivial reason is that the population distribution among provinces had been changed in the past years in China in such a way that per capita income distribution and total income distribution changed in different directions. However, provincial population distribution in China was quite stable as shown in Table 2.

In fact, the answer for the above issue does relate to population size, but not to change of population distribution. As we mentioned before, although the top richest provinces were still Shanghai, Beijing, and Tienjing in 1993, most of the new rich provinces were those along the coast, such as Guangdong, Jiangsu, Shangdong, Zhejiang, and Fujian. Originally, per capita incomes of people in those provinces along the coast were in the middle of the whole China. Meanwhile, most of the coastal provinces had large population sizes. So, total incomes of those coastal provinces were not necessary less than the richest provinces even in 1979. Furthermore, when per capita incomes of those 'middle income' provinces were increasing at a faster speed and approaching to those high income provinces, per capita income distribution in China as a whole was getting even as we saw in Table 5. At the same time, since those new and rich coastal provinces had large population sizes and thus greater total incomes, total

註十四：Griffin and Griffin (1984) found that per capita income distribution was getting even after 1979. Zhu (1991) confirmed Griffin and Griffin's finding, and Zhu also found that income distribution among region was widen in China since 1979.

income distribution was widened.(註十五)

Table 5 also surprisingly reveals that the Gini coefficient for per capita income is consistently lower than Gini for total income; however, CV for per capita income is greater than that of total income. One reason to account for why the Gini coefficient for per capita income is lower is that rich provinces are generally more populated and, therefore, their richness could be attributed to population in addition to a higher per capita income. The inconsistency between Gini and CV may be simply because of the sensitivity of the correlation of per capita income and population.(註十六) However, further examining this issue would be a worthwhile task.

註十五：The following example could illustrate the above phenomenon. Assume INC1, POP1, and TOT1 represent original per capita income, population, and total income for ten areas, respectively, and INC2, POP2, and TOT2 are variables after income and population changed. Here we double population size for each area so that population distribution does not change at all. On the other hand, per capita income has also doubled while per capita income of the three 'middle-income' areas (Area 4, 5, 6) is doubled plusing one dollar.

	INC 1	POP 1	TOT 1	INC 2	POP 2	TOT 2
Area 1	10	1	10	20	2	40
Area 2	9	2	18	18	4	72
Area 3	8	2	16	16	4	64
Area 4	7	5	35	15	10	150
Area 5	6	8	48	13	16	208
Area 6	5	7	35	11	14	154
Area 7	4	4	16	8	8	64
Area 8	3	2	6	6	4	24
Area 9	2	2	4	4	4	16
Area 10	1	2	2	2	4	8
Gini	0.3000	0.3400	0.4211	0.2947	0.3400	0.4365
C.V.	0.5505	0.6901	0.8108	0.5424	0.6901	0.8473

According to the figures, the Gini coefficient of INC1 is 0.3000, while it is 0.2974 for INC2. It shows that per capita income distribution is getting even. However, the Gini coefficient TOT1 is 0.4211, while it is 0.4365 for TOT2. The coefficients of variations show a similar result. In this case we have shown that, keeping population distribution constant, it is possible to see that per capita income distribution and total income distribution change in opposite directions.

註十六：Chu and Lin(1985) have accurately explained the sensitivity on the Gini coefficient and coefficient of variation.

4. Regional Distribution Patterns

After investigating income distribution among provinces in China, another concern is to observe distribution patterns among regions since economic development among regions is quite different for many reasons. First, some regions are traditionally rich owing to their abundant endowments, such as crude oil and other mineral materials. Second, the PRC Government has not only chosen an "imbalance policy", but also attempted to initially develop provinces along the coast since it is easier for those provinces to obtain foreign investment, e.g., Guangdong and Fujian. Finally, transportation system among regions in China is extremely poor, thereby making it economically infeasible to transfer from one region to the other.

This study adheres to the standard mode and divides the thirty provinces of Mainland China into six regions: (1)Central North (Hwabei area), including Beijing, Tianjing, Hebei, Shanxi, and Neimong; (2)North East (Dongbei area), including Liaoning, Jilin, and Heilongjiang; (3)Central East (Hwadong area), including Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, and Shandong; (4)Central South (Zhungnan area), including Henan, Hubei, Hunan, Guangdong, Guangxi, and Hainan; (5)South West (Xinan area), including Sichuan, Guizhou, Yunan, and Tibet; and (6)North West (Xibei area), including Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang.(註一七) Figure 1 illustrates those six regions.

註十七：Mainland China is huge and there are different ways to define regions for different purposes. For instance, Sher (1994) divided the Mainland into three regions as East, Central, and South. Gu, Tang, and Fujita (1994) separated the Mainland into four regions as Core, Margin I, Margin II, and Margin III. Lin (1995) defined seven areas in the mainland as Southeast, Yangtze Delta, Bouhai Bay, Northeast, Along Yangtze River, Along Yellow River, and Interior. However, the definition applied in this paper is an official definition and is most generally accepted, for instance, Chiu Chen (1995).

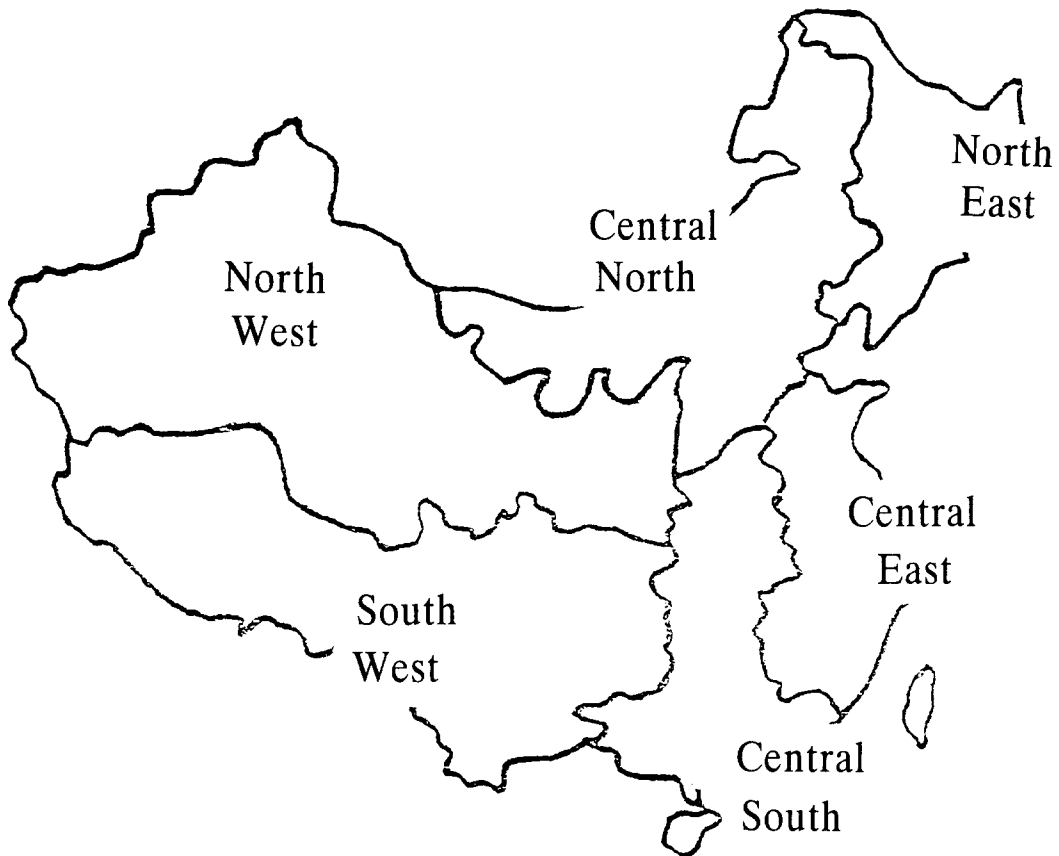


Figure 1. Six Regions in China

As indicated in Table 6, North East was considered to be the richest region from 1978 till 1993, while South West region is the poorest. In 1978, the average per capita income in the North East region was RMB\$562 which was 2.39 times as high as per capita income at South West region. The gap is smaller when the economy develops as a whole; however, it is still pretty large, for instance, RMB\$3,472 vs RMB\$1,646 in 1993. On the other hand, only two regions increase their ranks of per capita income, i.e. Central East region goes up from the third highest to the second highest, while Central South has risen from rank number five to

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rank number four.

The same as population distribution among provinces, population distribution among regions is quite stable during the past sixteen years, as shown in Table 7. Central South is the only region with a significantly increased population, from 0.2696 to 0.2902. The changes of population for all other regions are less than 1% point.

Table 6. Per Capita Income (GDP):by Regions

Unit:RMB\$

Year	Central North	North East	Central East	Central South	South West	North West	Total Average
1978	478	562	407	285	235	327	363
1979	537	598	423	330	272	353	397
1980	570	689	501	369	297	370	448
1981	587	705	553	369	305	375	468
1982	647	772	602	482	353	404	536
1983	719	871	654	491	386	456	580
1984	850	1010	779	573	457	519	682
1985	989	1143	941	692	544	620	811
1986	1065	1316	1039	771	582	679	895
1987	1204	1471	1201	917	662	756	1030
1988	1469	1770	1482	1138	809	911	1264
1989	1652	1911	1625	1282	881	978	1395
1990	1770	2038	1720	1390	1011	1241	1517
1991	1990	2238	1940	1566	1118	1407	1701
1992	2357	2658	2240	1914	1271	1625	2061
1993	3030	3472	3325	2389	1646	1986	2678

Note: Central North: Beijing, Tienjing, Hebei, Shanxi, and Neimong;
 North East:Liaoning, Jilin, and Heilonjiang;
 Central East: Fujian, Shanghai, Jiangsu, Zhejiang, Anhui, Jiangxi, and Shandong;
 Central South: Guangdong, Guangxi, Hainan, Hubei, Hunan, and Henan;
 South West: Sichuan, Guizhou, Yunan, and Tibet;
 North West: Shaanxi, Gansu, Qinghai, Ningxia, and Xingjiang.

Table 7. Population Distribution: by Regions

Year	Central North	North East	Central East	Central South	South West	North West
1978	11.39	9.02	29.47	26.96	16.37	6.80
1979	11.40	9.02	29.45	27.01	16.30	6.83
1980	11.37	9.06	29.42	27.05	16.25	6.86
1981	11.39	9.04	29.39	27.10	16.23	6.85
1982	11.44	9.03	29.33	27.12	16.19	6.87
1983	11.46	9.01	29.30	27.19	16.15	6.88
1984	11.50	8.98	29.28	27.25	16.08	6.90
1985	11.52	8.94	29.26	27.30	16.05	6.91
1986	11.54	8.91	29.21	27.35	16.06	6.94
1987	11.55	8.86	29.19	27.38	16.05	6.94
1988	11.55	8.83	29.14	27.48	16.05	6.95
1989	11.53	8.81	29.10	27.54	16.05	6.96
1990	11.60	8.72	29.27	27.53	16.87	7.00
1991	11.60	8.67	29.23	27.64	16.83	7.01
1992	11.60	8.65	29.19	27.64	16.83	7.10
1993	11.37	8.54	29.55	29.02	16.53	6.97

Again, the Gini coefficient and coefficient of variation are computed for the six regions. Table 8 summaries those results. In terms of total income, the Gini coefficient is increasing, from 0.2877 to 0.3506, which means that income discrepancy is greater. Coefficient of variation displays the same trend in which income distribution among regions is worsened.(註十八)

Checking the per capita income distribution in Table 8 indicates that the discrepancies in provincial data in Table 5 come up again. Both the Gini coefficient and coefficient of variation are decreasing instead of increasing, contradictory to total income distribution. The Gini and

註十八：It will be fruitful if we could decompose the change of regional income distribution into change within region and among regions. We are appreciated for an anonymous referee to raise this point, though our intuition is that most of the change should come from among regions since some regions, such as coastal regions, have being grown much faster than other areas.

CV drop from 0.1738 and 0.3228 to 0.1451 to 0.2829, respectively. Again, this result might imply that although total income among regions is worse, per capita welfare among regions is not as low as in total income.

Table 8. Income Distribution: by Regions

Year	Total Income		Per Capita Income	
	Gini	CV	Gini	CV
1978	0.5877	0.5669	0.1738	0.3228
1979	0.2792	0.5378	0.1617	0.3021
1980	0.2948	0.5772	0.1671	0.3168
1981	0.3072	0.6137	0.1678	0.3229
1982	0.3127	0.6083	0.1546	0.2921
1983	0.3033	0.5922	0.1625	0.3078
1984	0.3072	0.6012	0.1624	0.3090
1985	0.3144	0.6179	0.1503	0.2881
1986	0.3163	0.6205	0.1596	0.3058
1987	0.3248	0.6361	0.1552	0.2984
1988	0.3293	0.6450	0.1529	0.2946
1989	0.3332	0.6485	0.1530	0.2946
1990	0.3174	0.6222	0.1305	0.2491
1991	0.3209	0.6222	0.1275	0.2445
1992	0.3377	0.6647	0.1343	0.2609
1993	0.3506	0.6925	0.1451	0.2829

Moreover, the Gini coefficient of per capita income is observed to be smaller than that of total income, for instance 0.2877 vs 0.1738, which is the same as in Table 5. Therefore, we can conclude that per capita income distributes more evenly than total income both among provinces and among regions.

Meanwhile, the Gini coefficient of total income among regions (0.2877 in Table 8) is smaller than the Gini among provinces (0.3695 in Table 5). In China, it seems total income

distribution among a larger region will apparently be more even than that among a smaller region, such as within a certain province.(註十九)

Finally, an examination is made of the renowned "imbalance policy" in that the PRC Government intended initially to develop the coastal region since 1978. Here, the thirty provinces are divided into the coast region and the interior. Twelve provinces are along the coast: Beijing, Tienjing, Shanghai, Liaoning, Hebei, Shangdong, Jiangsu, Zhejiang, Fujian, Guangdong, Guangxi, and Hainan. Table 9 reveals that although population size is quite stable for the provinces along the coast around 51%, total share of GDP increases from 62.34% to 67.79% within sixteen years.

The discrepancy in per capita incomes is more significant between regions along the coast and interior. Per capita income for region along the coast increases from RMB\$464 to RMB\$3,698; meanwhile, it ranges from RMB\$292 to RMB\$1,931 for the interior region. Furthermore, per capita income for individuals in the interior region was 62.93% of their comrades who lived along the coast in 1978; this ratio gradually dropped to 52.22% in 1993. Above results suggest that "imbalance policy" undoubtedly works well.

註十九：Applying a household survey data in China, Haussian, Lanjouw, and Stern (1994) found that nationwide income inequality is mainly due to intraprovincial inequality, both for urban and rural areas in China. Using provincial data, Knight and Song (1993) decomposed the Theil index for per capita income distribution among counties in China and found that 39% of inequality is within-province inequality and 61% is among-province inequality.

Table 9. Income Distribution: Coast vs Interior

	GDP Share (Coast) %(1)	POP share (Coast) %(2)	Per Capita GDP(Coast) RMB\$(3)	Per Capita GDP(Interior) RMB\$(4)	GDP Ratio %(4)/(3)
1978	62.34	51.09	464	292	62.93
1979	60.69	51.09	491	332	67.62
1980	62.16	51.12	570	362	63.51
1981	63.47	51.17	611	369	60.39
1982	63.00	51.20	669	442	66.07
1983	61.90	51.24	730	475	65.07
1984	62.18	51.25	888	553	62.27
1985	62.55	51.25	1037	652	62.87
1986	62.69	51.24	1147	718	62.60
1987	63.53	51.27	1343	811	60.39
1988	64.19	51.20	1672	978	58.49
1989	64.59	51.13	1862	1068	57.36
1990	63.57	51.39	1978	1195	60.56
1991	64.79	51.41	2265	1303	57.53
1992	66.24	51.30	2982	1520	50.97
1993	67.79	52.35	3698	1931	52.22

Note: The provinces along the coast include Beijing, Tienjing, Hebei, Fujian, Shanghai, Jiangsu, Zhejiang, Liaoning, Shandong, Guangdong, Guangxi, and Hainan.

5. Conclusion

This study has investigated income distribution among provinces and among regions. Several hypotheses are tested in this study. First, according to global economic development, a typical format is that there is an inversed U-shape curve, i.e., income distribution worsens in the beginning of development and then turns even gradually. Whether China's development follows this rule would be an interesting observation. Second, whether income inequality is better within provinces or within larger regions is also important.

By applying different indices for income inequality, e.g., the Gini coefficient, coefficient of variation, CR4, and CR10, income distribution is computed for total income and per capita income among thirty provinces and six regions. Our main findings are as follow: First, total income inequality has widened in China during the past sixteen years, either among provinces or among regions. Second, although total income distribution is worsening, per capita income distribution is getting better, either among provinces or among regions. Third, the income distribution among regions is even than that among provinces. Finally, the famous "imbalance policy" works well in that the ratio of per capita income in interior provinces relative to per capita income in provinces along the coast has dropped from 62.93% to 52.22% during the past sixteen years.

Owing to lack of data, some crucial limitations for this study persist. For instance, this study demonstrates that population distribution is quite stable both among provinces and among regions. However, there is a significant labor movement from rural areas to cities and from poor provinces to rich provinces. Unfortunately, this variable cannot be controlled in this study. Moreover, nominal GDP is applied in this study since inflation rates for every province and for every region are not available. Since inflation rates for certain rich provinces, such as Guangdong and Shanghai, are relatively higher than other places, the degree of income inequality will be less than what is obtained here if real GDP is applied instead of nominal.

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