Analysis of Resident's Income Distribution from China

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Summary: Income distribution and economic growth are the two important topics in the development of human society. Since 1970s, the Chinese reform and opening has made Chinese distribution mechanism take the first step toward the distribution according to work performance basic on market economy from average distribution system and brought the rapid development of economy. However, with the deepening of reform, the unfairness of income distribution is also becoming more and more serious and has developed into a restriction of Chinese future economy. Therefore, having a correct understanding about the reasons for the enlarged gap of citizen's income and adopting effective measures to eliminate the negative effect are very significant to the process of reform and the positive interaction between income distribution and economic growth.

Basic on this, author has analyzed the relationship between Chinese economic growth and income distribution in the transition period by empirical methods and pointed out the major reasons for the evolution of overall structure of citizen's income gap and evolution itself. Through the empirical analysis on present situation, author has proposed related policies hoping to construct a positive cycling mechanism of income distribution and economic growth in the transition period of China.

Key words: income gapIncome distribution economic growth.

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Introduction

From the hypothesis of "rational person" in the economic theory, income is the most stimulating factor for human behavior. Therefore, reasonable and proper income distance can stimulate people's competitive awareness and thereby put the society forward. However, how to classify a income difference as being reasonable? Obviously, if there were a wide income gap in the citizens of a society, the stability of this society would be greatly challenged and the normal operation of economy would be possibly affected to a further extent hindering the growth of economy. Therefore, income distribution gap and economic growth forms a kind of dialectic relation and can be also regarded as a game between the both.

The opening and reform of China brings the sharp economic growth which has strengthened national comprehensive power, boosted the international status of China and largely bettered people's life. Meanwhile, during the process of industrialization, urbanization and modernization, original income distribution structure has experienced great changes. In fact, Chinese economic reform just starts with the reform of distribution relation. In the early period of opening and reform, the production contract responsibility system, which was firstly carried out in

the country, was featured by breaking the system of "equal share" as the goal. The nationwide reform of distribution system has injected new power to the growth of Chinese economy and improved the whole economic efficiency. From this sense, the reform of economic system in distribution area has served as the impulsion for the sharp increase of Chinese economy.

However, in recent years, while the reform in market economic system is being pushed to the depth, at one hand, it brings the rapid growth of economy; at the other hand, due to variation of individual ability, quite a number of people living in bottom level earn decreasing income not to mention an increase; unbalance of income distribution gradually deteriorates resulting in the rising trend of social antinomy and increasing embodiment of social conflict which makes disharmonious and unstable factors to the reform and development. According to the investigation of the World Bank, the rapid development of China hasn't equally benefited all the citizens. The Gini coefficient of China has risen to the present 0.45 from the 0.33 in 1980 indicating that the unbalance in income is worse than Russia or USA. But, some scholars think that we can't follow international standard blindly without any change. From specific situation of China, the current national income gap is still acceptable and recognized by society.

(I) Evolution of Overall Income Distribution Pattern of Residents in China

One of the common methods to describe the income distribution pattern in the academic circle is to divide residents into equal or unequal parts according to the income level rank, and respectively calculate the proportion (income owned by residents in different groups) of overall income of all residents, and judge evolution of income distribution pattern by observing changes of these proportion. Seen from the angle, income of residents in China is generally distributed by cone. Compared with the first half of 1990s, the highest income group's share of the total income has increased in the second half, and other group's income share has all slightly decreased, which means wealth is further centralized to the high income earners, namely, the income distribution gap enlarges.

Gini coefficient and Theil index can be used to further describe the income gap, and of the use of Gini coefficient is more common. Due to difference of data source and calculation, different scholars have different calculation results. However, all study results have indicated that the income gap of residents in China has been increased after the implementation of

Table 1. Income distribution of Residents in Different Income Groups in China of the Overall Income Percentage distribution of Income

Year	Lowest	Lowest	The 2nd	The 3rd	The 4th	Highest	Highest
	10 %	20 %	20 %	20 %	20 %	20 %	10 %
1990		6.4	11.0	16.4	24.4	41.8	24.6
1992	2.6	6.2	10.5	15.8	23.6	43.9	26.8
1995	2.2	5.5	9.8	14.9	22.3	47.5	30.9
1998	2.4	5.9	10.2	15.1	22.2	46.6	30.4

Materials resource: Zeng Guoan: (Evolution, Current Situation Evaluation and Adjustment Strategies Selection of Income Gap of Residents in China at the end of 1970sy, published by Economy Evaluation, 2002, May).

the reform and open policy.. It is commonly regarded that the Gini coefficient in the end of 70s to 80s was below 0.3, over 0.3 in the middle of 80s, and about 0.4 in 1993. However, after entering 21st century, the measure results of the income gap problem of the residents in China and its relationship with economic growth done by most institutions or our scholars were all above 0.4, more than warning line internationally accepted, so as to cause the great concern of government, society and the academic circle. And discussion and exploration of the problem has become increasingly hotter.

(II)Evolution of Specific Pattern of Income Distribution of Residents in China

i. Evolution of income gap of residents between and in cities and towns of China

(i).Evolution of income gap of residents between cities and towns

From the implementation of open and reform policy, income gap between residents in cities and towns has experienced two phrases:

Table 2. Change of Income Gap of Residents in Cities and Towns
Net income of Resident Families in Villages Net income of Resident Families in Towns

Year	(B/A) Absolute number (Yuan)	(A) Indexes (1978 = 100)	Absolute number (Yuan)	(B) Indexes (1978 = 100)	Disposable Income Ratio
1978	133.6	100.0	343.4	100.0	2.57
1980	191.3	139.0	477.6	127.0	2.50
1985	397.6	268.9	739.1	160.4	1.86
1986	423.8	277.6	899.6	182.5	2.12
1987	462.6	292.0	1002.2	186.9	2.17
1988	544.9	310.7	1181.4	182.5	2.17
1989	601.5	305.7	1373.9	182.5	2.28
1990	686.3	311.2	1510.2	198.1	2.20
1991	708.6	317.4	1700.6	212.4	2.40
1992	784.0	336.2	2026.6	232.9	2.58
1993	921.6	346.9	2577.4	255.1	2.80
1994	1221.0	364.4	3496.2	276.8	2.86
1995	1577.7	383.7	4283.0	290.3	2.71
1996	1926.1	418.2	4838.9	301.6	2.51
1997	2090.1	437.4	5160.3	311.9	2.47
1998	2162.0	456.2	5425.1	329.9	2.51
1999	2210.3	473.5	5854.2	360.6	2.65
2000	2253.4	483.5	6280.0	383.7	2.79
200l	2366.4	503.8	6859.6	416.3	2.90
2002	2475.6	528.0	7702.8	472.1	3.11
2003	2622.2	550.7	8472.2	514.6	3.23

Materials resource: National Bureau of Statistics: "China Statistical Yearbook 2009".

decrease to increase. Firstly, 1978-1985 is the first phrase. Since the government increased the collection price of agricultural products during the process, and promoted household contract responsibility system in villages, to greatly increase the income of farmers and decrease the income gap of residents in cities and villages. And 1986 until now is the second phrase, and the relative income gap has continually enlarged. However, it decreased once from 1994 to 1997, and reached the lowest in 90s. After that, the income gap had continually increased again, and the trend of increase has lasted until now. Figure 1 reflects the change of ratio of per capita income of residents in cities and towns from 1978 to 2003, and the ratio generally has evolved according to u-type path.

(ii). Evolution of Gini Coefficient of residents in cities and towns in China

On measurement of income gap in cities and towns, as well as that between cities and towns, many scholars have offered different

Table 3. Change of Gini Coefficient of Residents in Cities and Towns

Year	Gini Coefficient of residents in cities	Gini Coefficient of residents in towns
1978	0.16	0.2124
1980	0.16	0.2407
1981	0.15	0.2406
1982	0.15	0.2317
1983	0.15	0.2461
1984	0.16	0.2439
1985	0.19	0.2267
1986	0.19	0.3042
1987	0.20	0.2889
1988	0.23	0.3053
1989	0.23	0.3185
1990	0.23	0.3099
1991	0.24	0.3072
1992	0.25	0.3134
1993	0.27	0.3292
1994	0.30	0.3210
1995	0.28	0.3415
1996	0.28	0.3229
1997	0.29	0.3285
1998	0.30	0.3369
1999	0.30	0.3361
2000	0.32	0.3536

Materials resources: National Bureau of Statistics, transferred by Hu Ridong and Wang Zhuo: "Demonstration Study on Income Distribution Gap, Consumption Need and Transfer Payment", published in Qualitative Economy &Economy Technology Study, 2002 (4).

measurement results. Although National Bureau of Statistics haven't systematically measured income gap of residents nationwide, they have comprehensively investigated the income gap of residents in cities and towns.

We can intuitively see from table that evolution path of income gap of residents between cities, towns and villages is different from that of overall income gap of residents nationwide. The income gap of residents in cities, towns and villages is smaller than that between cities, towns and villages. However, both have the obvious increase trend in the long run. Gini coefficient of residents in villages has always been above than that in cities and towns, and its fluctuation is relatively smaller, with a more classical increase trend. From this, it can be seen that income gap of residents in villages has always larger than that in cities and towns.

iii. Evolution of regional income gap in China

From the implementation of reform and open policy, no matter among residents in different rural areas, or different urban areas, both income gaps extend. And it is especially reflected in the expansion of gap between the east and middle and west regions. It can be seen from Table 4, through development of

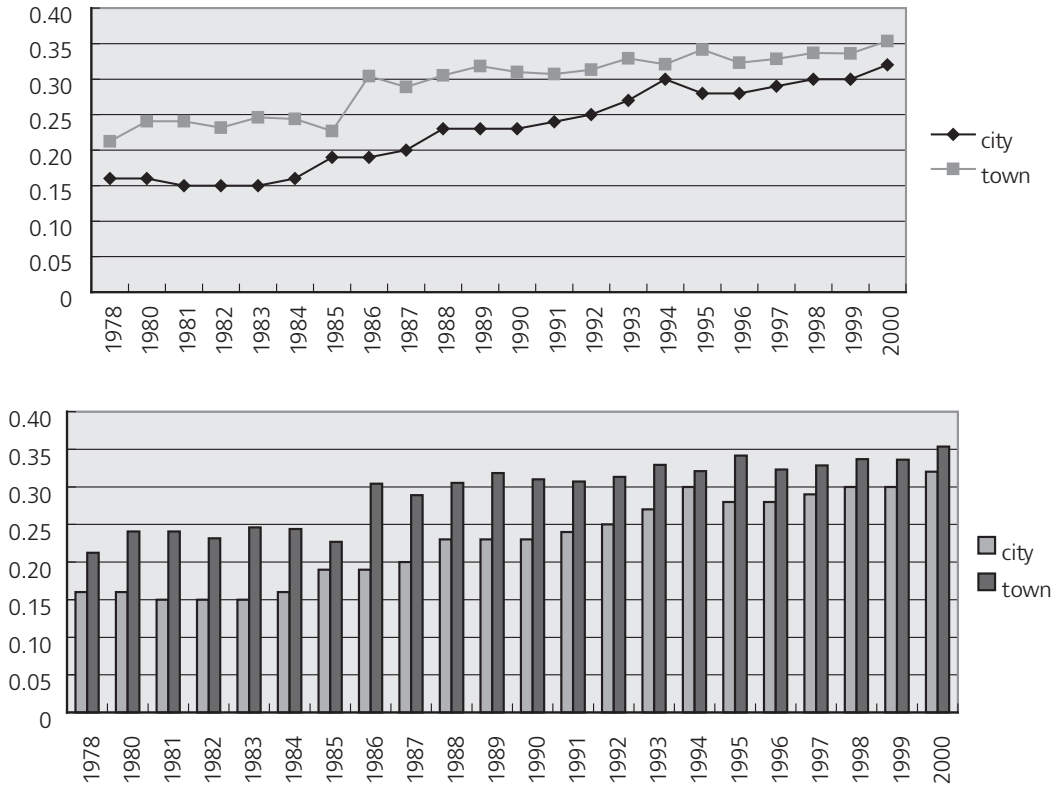

Figure 1. Change of Gini Coefficient of Residents in Cities and Towns

Table 4. Regional Comparison of Per Capital Income Gap of Residents in Villages and Towns (Unit: Yuan)

Income Of Residents In Villages					
Year	1985	1990	1995	2000	2003
Net The highest region	Shanghai 806	Shanghai 1907	Shanghai 4246	Shanghai 5596	Shanghai 6654
The lowest region	Gansu 255	Gansu 431	Gansu 880	Xizang 1331	Guizhou 1565
HighestLowest (Times)	316	3.42	4.83	420	4.25
In Cities And Towns					
Disposable Highest region	Shanghai 1075	Guangdong 2303	Guangdong 7439	Shanghai 11718	Shanghai 14867
Income of Lowest region	Shanxi 560	Henan 1109	Inner Mongolia 2846	Shanxi 4724	Ningxia 6530
Residents Highest/ Lowest (Times)	1.92	2.08	2.61	2.48	2.28

Materials resources: Luoshougui and Gao Ruxi: Change Study on Regional Difference of Economy Development and Residents in China since Implementation of Reform and Open Policy, published in Management World, 20005, (11).

about 20 years, no matter in villages or towns, the highest per capita income of residents has always been in the east China, while the lowest in the west China. Besides, regional income gap of rural residents has been higher than that in cities and towns no matter seen fro absolute amount or development trend.

iv. Summarization

The analysis has demonstrated that there is commonality of different income gap pattern of residents in China since implementation of reform and open policy that is the trend of increase is shown and also has the variety at the same time.

The overall income distribution pattern of residents in China generally is shown as the cone. Besides, since the second half of 1990s, the wealth has concentrated to the high-earner at high speed, and the income gap of residents has continually enlarged. The income gap of residents in cities and towns mainly experiences changes of two phrases: the implementation of economy system reform in villages since 1978 has decreased income gap of residents in cities and towns. However, it has increased since 1986. Although the income gap of residents in cities, towns and villages is smaller than that between residents in cities, towns and villages, it has risen straight up relatively obviously. And the fluctuation was small, and Gini coefficient of rural residents has always been larger than that of residents in cities and towns. Regional income gap of residents has been mainly reflected by the expansion of that in east and middle and west China. The regional income gaps of residents in cities and towns, and villages have been all increasingly expanded, and regional income gap of rural residents has always been larger than that of residents in cities and towns. Evolution path of income gap of staffs in

a variety of careers is similar with that of residents in cities and towns, and both have experienced the process that it decreased firstly, and then expanded; and there was the slight decrease in expansion. The income gap of industries is reflected most obviously among industries of agriculture and intelligence. Income distribution pattern of all structures all demonstrate that urban and rural gap is the main aspect of income gap of residents in China. Therefore, it is the most basic method to increase income of rural residents to solve the income gap problem in China.

Analysis of Causes of Income Distribution Gap of Residents in China

(I). Dual structure factor

China has vast territory, large population and it is currently at the important transition stage of economic system reform; so the dual structure characteristics highlight it. The economy of cities and towns in China differs a lot in labor productivity, management systems, economic patterns and other aspects, resulting in obvious income gap of residents in cities and towns. Seen from labor productivity, a large number of villages are manual labor forces basically, the labor productivity is very low, resulting in the stagnation or low increase of income of rural residents; and in towns it is the big machine industry. The study of income distribution gap problem and economy growth in China shows the labor productivity is relatively high, resulting in great increase of income of urban residents, so as to make the income levels of rural residents fall far behind. See from the management system, household registration system, and local protectionism, etc., result in the segmentation of labor, capital and commodity markets in cities and towns, and limit the rational flow and combination optimized of production elements in cities and towns, resulting imbalance of capital, labor force, and technology development, etc of cities and towns. And the imbalance of agriculture and non-agriculture industry, and rural and urban industry in development opportunity and conditions further result in the income gap of agricultural and non-agricultural people and residents in rural and urban places. Seen from economy shape, economy shape of cities and towns is basically market economy, and takes up considerable proportion in natural economy shape in rural areas. Economy shape transition time and degree of rural areas falls behind, obstructing optimization configuration of labor force, and the labor productivity of rural areas can not rapidly been increased, so as to make the slow increase of income of rural residents and continual larger income gap of residents in cities and towns.

(II). Policy element

Policy cause of income gap expansion of residents in China is mainly for the incomplete income distribution policies, mainly reflected in three aspects: policy preference, omission and fatigue. Imperfect of income distribution strategies result in unequal development opportunities, and unfair market competition, resulting in confused income distribution order, and income gap expansion of social members. Income distribution policy in China is mainly reflected in preferential policy in regions. At the beginning of the reform and open policy, the country implemented the preferential policies and investment to the eastern coastal state, and gave the concessions to the foreign capital admission, tax and financial aspect, etc. to promote the economy system reform of the east, so as to rapidly increase the industrial technology level of regions. However, reform in the middle

and west is much later than that in the east. When they started the reform and open policy, they have fallen behind in infrastructure, and capital and technology, etc. Therefore, compared with the east, development of the middle and west was "be born congenitally deficient and be unfavorable after being born". Policy omission refers that there are many loopholes of policies themselves, the compensation is not in place, and the policies go out of form resulted in the operation, resulting in the confused income distribution order. After the implementation of reform and open policy, we break the egalitarian income distribution mode, and connect the employee salaries in enterprises to economy benefits; salaries of employees in government organizations and institutions base on the national financial allocations, supplemented by self-financing policy. However, government organizations and institutions don't grasp production resources, so they are likely to marketize the administrative power and industry advantage for "self-collection capital". Many institutions with resource advantages seek and set rent for the excessive profits of groups and individuals. For the "income-generation" activities of government organizations and institutions, the state lacks the effective measures to standardize and direct strategies, resulting in bonus distribution of all units out of control, and confused income distribution order, and exacerbating unequal social distribution. Policy fatigue is mainly to tax policies, referring to imperfect tax policies, and it is hard to achieve the goal of stabilize the income gap and decrease the stabilization between the rich and poor. The tax policies in China currently have a variety of shortcomings, and can't play the adjustment role in income distribution which should be. Firstly, the taxes undertook by the high-earners and low-earners are not equal. In study of relationship of income distribution gap problem and economy growth, before the implementation of personal income tax, the income tax threshold is too low so that the middle-income and low-income classes undertake a certain proportion of tax. To those high-earners, with a variety of income channels and invisible income, they undertake a little tax duties for the classification collection; and the public fund consumption and post consumption make them not need to pay personal income tax. In addition, interest tax doesn't play a role in regulating gap of the rich and poor. Since most rich invest money in the industries, real estate and stocks, and less in savings while the middle and low-earners save the balance after deducting the cost of living. In this sense, interest tax actually plays the role to the middle-earners and low earners. Secondly, our tax management is not strict enough, and it is difficult to investigate the tax evasion, making a large number of taxes which should be handed in go into personal pockets which actually reduces the resources reallocated by the government. And all these make the role of tax policy in regulating income distribution discounted in China.

(III). Market mechanism factor

The income distribution gaps of residents in China caused by market mechanism are mainly reflected in two aspects: firstly, influence of market mechanism on individual; secondly, influence of market mechanism on imbalance of regional economic development. Distribution according to work implemented with market pricing mechanism strictly differentiates simple and complex labor, and creative and non-creation labor forces; distribution according to production factors implemented according to markitizaion draws income levels of owners with relatively sparse capital, technology and other elements, and ordinary labor force. Meanwhile, economy

structure adjustment and competition of labor force brought by marketizaion will inevitably brings the unemployment and being out of work, so directly leading to the larger of income distribution gap. And "Matthew Effect" brought by market mechanism, making the rich richer, and poor poorer strengthens the increase trend of regional income gap of residents in China. On the one hand, east China has owned advantages, such as capital, technology, talent and market credit, etc. Even if west China falling behind grows at the same speed with the east, the east can lead over the west; on the other hand, since the east regions have higher productivity element yield, its economy grows at high speed while the west can not absorb adequate production elements needed by development. Therefore, the regional gap of residents continually increases.

(IV). Legal factor

A large number of illegal incomes are generated by the incomplete legal system implemented at present and non-strict enforcement of laws, etc, so as to increase the income gap of residents in China. Some people amass a large number of personal wealth through forgery and fake traffic, smuggling and distribution of smuggled goods, land speculation, bribery and corruption and other illegal back doors. According to the measurement and calculation of Chen Zongsheng, and Zhou Yunbo (2002) on illegal income of residents in China from 1988 to 1997, the main illegal and abnormal incomes have greatly influenced on income difference nationwide, in cities and towns and villages, up about 15 % to 30 %.

Analyzed from the 4 reasons above, income distribution gap expansion of residents in China is both inevitable result and can be controlled.

Empirical Analysis on the Influence of Income Distribution Difference of Chinese Residents on Economy

Section 1. Empirical Examination and Analysis of Influence of Overall Income Difference of Chinese Residents on Economy

1) Establishment of model

Common model of examining the influence of income distribution difference on economic growth:

$$\text{Economic growth}_{it} = A + B;$$
$$\text{initial economic development level}_{it} + C;$$
$$\text{initial income distribution status}_{it} + D;$$
$$\text{relevant variable of influencing mechanism}_{it} +$$
$$+ \text{Edummyit} + \varepsilon_{it}$$

Where:
A is a constant term;
B, C, D and E – indicate the initial economic development level, initial income distribution status, related variable of influencing mechanism and the marginal effect of dummy on the economic development of the country in country i during period t;
ε – error term.

The explanation of this equation in economics is: reviewing what kind of influence initial income distribution status will have on economic growth through influencing mechanism under different initial economic levels. Former researches show that the influence of income distribution difference on economic growth may probably have opposite results under different economic levels. Therefore, economic level must be taken into consideration when reviewing the relation of the two. An equation can reflect the ways and extents different influencing mechanisms affect economic growth in. Dummy variables (Oumy) may

refer to a regime, level of democracy, market structure and so on.

In the times of knowledge economy, the importance of human capital is evident without doubt. The competition between countries is mainly basic on knowledge, talent and technology. The innovative ability determined by the amount of human capital has already become the main drive to the economic development of each country. For this consideration, China puts "boosting the country through scientific and educational advances" into basic national strategy. Therefore, among various mechanisms, such as politics-economy mechanism, social stability mechanism, market scale mechanism and human capital investment mechanism, human capital investment mechanism is the one fitting China the most. So, in the specific model setting, we will introduce the level variables of human capital to review the role of human capital in Chinese economic growth.

Besides, to reduce the bias error of omitted variables, we will also introduce investment variables. Comparing to consumption and export, investment has the greatest drive to economic growth for the existence of multiplier effect. In recent years, Chinese economic growth relies more on fixed assets investment and foreign trade and the proportion of consumption in GDP is lower than average level in the world. As for income distribution, the connection to domestic market is greater. Therefore, we should introduce investment variable into the model, not consumption or foreign trade variables.

In summary, the equation of this section should be:

$$\text{Growth}_t = \alpha_0 + \alpha_1 \text{IECO}_t + \alpha_2 \text{IDISTR}_t + \\ + \alpha_3 \text{EDUt} + \alpha_4 \text{INVT}_t + \alpha_5 \text{INST}_t + \varepsilon_t \qquad (1)$$

Thereinto, Growth refers to economic growth;
IECO means initial economic development level;
IDISTR means initial income distribution status;
EDU means human capital level;
INVT means investment;
INSTI means system virtual variable;
α_0 is constant term;
α_1, α_2, α_3, α_4 and α_5 are the marginal effects of related variables on the economic growth of that period;
ε is error item.

2) Selection of indicators and data

In the selection of specific indicators, the growth rate of Chinese per capita GDP is treated as the indicator to measure economic growth and the logarithm value of per capita GDP (after inflation) in the last period is treated as the indicator to measure current economic development level. The per capita GDP growth rate here is with the per capita GDP of last year as base.

As for human capital, other countries adopt per capita education year as the indicator to measure the reserve of human capital. As China is in extreme short of the data of this aspect, we will treat the proportion of national education expenditure in GDP of that year as a proxy variable. The increase in national education expenditure can reflect the increased investment of a country to education or human capital, which will promote the economic growth. Besides, we will adopt the promotion of fixed assets investment in GDP of that year as investment indicator.

The original data of the above indicators is from "China Statistical Yearbook" of related years, "China Financial Yearbook" and "Compilation of Statistical Data in Past 50 Years". Except investment indicator which is basic on the data from 1980 to 2003, other indicators are basic on the data from 1979 to 2003. Because of the lack of original data, the per capita disposable income /net income of people in 1979 is

replaced by the average value of the data of 1978 and 1980; supposing the disposable income of urban residents has the same growth rate with the income for life consumption from 1981 to 1984. According to the growth rate of the income for life consumption, basic on the per capita disposable income of urban households in 1980, we can figure out the per capita disposable income of urban residents from 1981 to 1984.

3) Empirical Inspection and Result Analysis

1. Test of variables stationarity

As most of economic data is unreliable in time and will lead to a regression, and the estimation equation of this paper is basic on the data of time sequence, we firstly need to perform a unit root inspection and cointegration test to all time sequences in order to judge whether sequences and linear combinations are stable. Only when the sequence passes the inspection, we can make estimation of equation and analyze its results by OLS method. First of all using Eviews software sequence unit root tests. Here is a selection of AugmentedDickey-Fuller (ADF) examination method .According to the results from using of Dickey-Fuller(ADF) testing method, Growth, IECO, IDISTR, EDU and INVT are non-stationary variables. But after a unite root test is made on their first-order difference sequence, they are found stationary. Therefore we can conclude that they are first-order non-stationary sequence (namely first-order integration) so as to process cointegration test and make corrections.

Although the sequences are not stationary themselves, they can still be used to have estimation equation if their linear combination is stationary. Since the above sequences are first-order integrations, namely integrations of the same sequences between sequences, so we can make a cointergation test on them to judge stationary or non-stationary linear combination of them. The method of cointegration test used here is processing ADF unite root test on residual error of regression equation formed by these sequences. That is to say there is cointegration relation between the sequences and the regression equation is still meaningful if its residual error sequence can pass the unit root test.

Firstly regress the equation with OLS method, equation (2) will be derived:

$$\begin{aligned} Growth &= 0.5750 - 0.0913IECO - \\ &\quad (2.5380) \quad (-2.1260) \\ &\quad - 0.0780IDISTR + 5.8721EDU + \\ &\quad (-1.95610) \quad (1.3478) \\ &\quad + 0.3612INVT + 0.1263INSTI \\ &\quad (1.2005) \quad (2.800) \end{aligned}$$

$R^2=0.4230SE=0.0384$, the figures in brackets are t-statistics of variables.

Meanwhile, residual sequence can be obtained directly with Eviews software to which an ADF unite root test is made and the results as follows will be got (Table 5).

It's thus clear that the residual sequence of regression equation (2) rejects null hypothesis

Table 5.

		t-Statistic	Prob.*
Augmented Dickey-Fuler test statistic		-4.363093	0.0002
Test critical values	1 % level	-2.685718	
	5 % level	-1.959071	
	10 % level	-1.607456	

under the significance level of 1 % which proves that the residual sequence is stationary and there is a long-term cointegration relationship existed between the above variables. Therefore, equation (2) represents a long-term function of explanatory variables on explained variables.

If a further observation is made on the coefficient signs before the variables in equation (2), we can find IECO, namely the initial level of economic development, is negatively correlated with economic growth, which complies with the result of many scholars from empirical studies such as Persson and Tabellini in 1194 and Deininger and Squire in 1998. It proves further improvement of economic growth was more difficult when economy development entered to a higher stage. In recently years, China's GDP growth rate is high, but the fact is its real increase is not that great after considering per capita factor and inflation factor. Seeing the performance from 1978 to 2003, the overall level of industrialization and per capita amount of capital of China were both low, national production function still owned the nature of fixed rate of return, so the growing ability of marginal economy reduced. The relation between human capital and economic growth was accordant with the conclusion predicated by us: the two was positive correlation, which conforms to the driving function of human capital on economic growth introduced above. Therefore, from long-term view, education investment is able to greatly promote growth of national economy (the coefficient before EDU is 5.8721), the government should not grudge investment on education. The coefficient of INVT is positive, so it shows the fixed capital investment was positively correlated with economic growth of China, which also accords to the economic growth mode of investment-driven of China. Meanwhile, its' obvious that system dummy variable INSTI is positively correlated with economic growth, which expresses that the comprehensive reform of market economy system after 1992 had greatly improved China's economic level.

IDISTR namely the relation of initial income distribution situation and economic growth is the core content of this study. Seeing from the evaluated result, they were negatively correlated, that is to say the more unequal the initial income distribution was, the slower the economic growth was, seeing from long-term view. Further, since equation (2) has 24 samples and five independent variables, so we can find from the table that t005 (18) = 1.734, and the t-statistic of IDISTR is "-1.9561", so IDISTR rejects null hypothesis under the significance level of 10 %. As a result, initial income distribution situation was significantly negatively correlated with economic growth in the rate of 90 %. This result indicates that increase of income gap has huge negative influences on long-term economic growth which should not be ignored although it is one of inevitable results of economic system reform.

2. Error correction model

The unite root test shows the above variables are non-stationary, so some improvements can be made on equation (2) through further error correction model.

The two steps method which is the most commonly used error correction model advanced By Engle and Granger in 1981 is substantially to establish a new equation using first-order difference of original explanatory variables as new ones and add first-order lagged variables of negative and positive sign of residual term of the original equation and finally evaluate the new equation with OLS method. Then the original equation of this paper is changed into equation (3):

$$d(Growth)_t = \beta_0 + \beta_1 d(IECO)_t + \beta_2 d(IDISTR)_t + \\ + \beta_3 d(EDU)_t + \beta_4 d(INVT)_t + \beta_5 d(INSTI)_t + \\ + \beta_6 ecm_{t-1} + \varepsilon_t$$

The difference term in equation (3) reflects influences of short-term fluctuation from explanatory variables on explained variables. In the equation ecm_1 is the difference term of equation (2) that is the error correction whose coefficient represents the strengthen adjusting the disequilibrium back to equilibrium when short-term fluctuation deviates from long-term equilibrium and causes disequilibrium. Equation (4) will be got when OLS evaluation is made on equation (3) with Eviews:

$$d(Growth) = 0.0363 - 0.5776d(IECO) - \\ - 0.0420d(IDISTR) - 4.8530d(EDU) + \\ + 0.7915d(INVT) + 0.652d(INSTI) - \\ - 03898ecm_{-1}$$

The coefficient of error correction is (-0.3898), it expresses the system will pull disequilibrium back to equilibrium status with its adjustment strengthen when the short-term fluctuation of coefficient deviates from long-term equilibrium.

Seeing from table 6, we can find the goodness of fit of equation (4) is obviously higher and the greatest difference of these two equations is that the coefficient of EDU is turned to negative from positive, compared to equation (2). Is that means increase of labor resource had no driving effect on economic growth in short-term? In fact, it was probably resulted from the selection of concrete index. Because of lack of data relevant with national average education years, this evaluation equation uses proportion of national education expenditure to GDP as substitute index. But these two indexes actually have differences. Average years of education is a stock index about labor resource level, and the latter is just a flow index. The improvement of labor resource level resulted from increase of educational expenditure has a certain delay effect. Additionally, educational expenditure is nonproduction expenditure, but only production expenditure is able to fast promote economic growth. So in short-term, the higher proportion of national education expenditure to GDP was, the less proportion of production expenditure correspondingly was, and thus economic growth was hindered. Therefore, the coefficient of

Table 6. Comparison of regression results of equation (2) and equation (4)

Equation (2)			Equation (4)		
Explanatory variable	Coefficient	t-statistic	Explanatory variable	Coefficient	t-statistic
Constants	0.5750	2.5380	Constants	0.0363	1.2173
IECO	-0.0912	-2.1260	d(IECO)	-0.5776	-1.5679
IDISTR	-0/0780	-1.9561	d(IDISTR)	-0.0420	-0.6969
EDU	5.8721	1.3478	d(EDU)	-4.8530	-0.7764
INVT	0.3618	1.2001	d(INVT)	0.7915	2.5963
INSTI	0.1263	2.8000	d(INSTI)	0.0652	1.1268
			ecm	-0.3898	-0.7500
R^2	0.4230		R^2	0.5629	
S.E.	0.0384		S.E.	0.0346	

EDU is positive in equation (2) which represents long-term rule, and negative in equation (4) which represents short-term rule.

The increase of absolute value of coefficient before IECO from 0.0913 to 0.5776 indicates that the negative correlation between initial level of economic development and economic growth was much less in long-term. Because a higher initial level of economic development can create better advantages for later development in the long run. The coefficient of INVT changes little, its effect on economic growth was similar in short-term and long-term. Then we observe the core variable of this paper, it's found that income distribution and economic growth was also negatively correlated in short-term, but its coefficient and t-statistic are both less than these of long-term equation. As a result, no matter how long functional time was, income inequality went against economic growth, and such a negative function got greater along with past of time. However, the t-statistic corresponded to IDIST in equation (4) is clearly less than critical value, which demonstrates that income inequality had little negative on short-term economic growth.

This section makes an empirical test on influences of overall income gap of Chinese residents on economic growth through investigation on various relevant variables of China from 1978 to 2003, and educes one of core conclusions of this paper: since the Reform and Opening, income gap of China's residents goes against economic growth in short-term and long-term, and such a negative function is more obvious in long-term but less obvious in short-term, that is to say such a negative effect has certain delay effect when functioning through some function mechanisms discussed above. Consequently, although the income distribution gap of China hasn't produced great influences on economic growth, we should not ignore it.

Section 2. Empirical test and evaluation of impacts on economic growth from income gap of residents in different phases

According to the theory of relation between income distribution and economic growth in the previous description, the impacts from income distribution on economic growth may be different, and even opposite, in different circumstances, because of differences in political economic systems, economic development levels and aging in affecting systems, etc., it has been proven that income gap of our overall residents made negative effects on economic growth from 1978 to 2003, in previous section. The question can be answered in this section what kinds of relation are between the income gap of Chinese residents and economic growth, in different economic development phases.

(I) Setting of model

A longer time-span of data is required to find out from the evidences how the relation between the income gap and economic growth is influenced by the economic development phases, however, the whole country can't be under study directly as an investigated object because of much limited annual statistical data in China, therefore, in this section, the model will be under study base on the provincial section data in different economic phases, rather than time-series data used in the previous section. Thus, the model setting in this section is basically as same as which was in the previous section, but there are still some changes between them. There are great differences existed between provincial economies because of vast territory, different resource conditions, geography positions, history development and other factors in China. Therefore, the industrial structure level variables and area dummy variables will be introduced into this model with the most significant difference. For the balance of this model, the human capital variables, which were used in previous section, will be removed, and

the investment variables, which have a direct relation with economic growth, will be retained, because the samples are limited (there are only 31 Grade One Administrative Divisions in China) and explanatory variables can't be too much. To sum up, Equation (5) is the estimated equation in this section:

$$\text{Growth}_i = \gamma_0 + \gamma_1 \text{IECO}_i + \gamma_2 \text{IDISTR}_i + \\ + \gamma_3 \text{INVT}_i + \gamma_4 \text{STUC}_i + \gamma_5 \text{Area}_i + \varepsilon_i$$

The Definitions here are as same as that in the previous section, including Growth, IECO, IDISTR and INVT, namely economic growth, the initial level of economic development, the initial level of income distribution and investment; STRUC means industrial structure level; Area refers to area dummy variables. γ_0 is a constant; γ_1, γ_2, γ_3, γ_4 and γ_5 are the marginal effects on economic growth from variables during the each period i, ε is an error term.

(II) Selection of indexes and data

Regarding the selection of study time, representative years were selected as far as possible from the first economic cycle and the latest economic cycle after the Reform and Opening up in China, in order to fully reflect the relation between income gap and economic growth in the different economic phases. Considering that anomaly in a single year may be influenced by some specific factors, I will select two economy average data of three years respectively from each phase. Even though economic system reforms have started in some provinces since earlier years after Reform and Opening up, there still existed very evident traces of the planned economy in most provinces, and it can not reflect the market rules. In 1982, this goal is proposed in the party's 12th congress that the industrial and agricultural output value will quadruple in the end of 20th century. The urban reforms were in full swing, base on "delegating powers to lower benefit levers" in the state-owned enterprises, while the country continued to push forward the rural reform. Therefore, this period is selected as the representative years in lower economic development phase, starting with 1982, to 1984. That period is selected as the representative years in higher economic development phases, from 2000 to 2002, when the data has been completed, because of the differences in release time and update speed of latest year data in different provinces.

After the time frame was confirmed, specific indexes can be selected. Economic growths are able to defined respectively by the compound average annual growth rate of per capita GDP (without the factors of inflation), from 1982 to 1984 and from 2000 to 2002.Following indexes can be set refer to practice in previous section: the Initial economic development level, the Initial income distribution ,the index of industrial structure level, namely that the right value of per capita GDP, urban and rural incomes ratio and agricultural output value proportion of GDP in previous term: in 1981 and in 1999. Specific investment indexes were the average proportion of three-years fixed asset investment in GDP, from 1982 to 1984 or from 2000 to 2002. Area dummy variables can be set as follows: 2 for eastern provinces, 1 for central provinces, 0 for western province.

There were only the data of 26 provinces/ autonomous regions/municipalities in the estimated equations of three years average from 1982 to 1984, except Taiwan, Jilin, Heilongjiang, Tibet, Hainan and Chongqing. The statistical data were incomplete in Jilin, Heilongjiang and Tibet; Hainan and Chongqing were respectively established as provinces / municipalities in 1988 and 1997. In the average equations of three years from 2000 to 2002, there were the data of 31 Grade One Administrative Divisions except Taiwan. It should be clear that the data of Hainan and Chongqing were included into the data of Guangdong and Sichuan provinces

in the equations of 1982-1984, while both of regions weren't established as administrative divisions at that time, despite of differences with equations in 2000-2002, but the inconsistencies of statistical standards in Guangdong and Sichuan between the two equations can't make influence on the estimated results, because of the different standard years of study between the two equations: it was in 1982 and 2000 respectively.

The raw data used in this section are from the database of China Economic Research Center, School of Economics in the Fudan University, *National Statistical Abstract 2003*, and *Statistical Yearbook of Fixed Asset Investment in China* for related years.

(III) Empirical test and result evaluation

By evaluating the above data with OLS method, two regression equations can be obtained, the regression results are listed in Table 9 now. Equation (6) is the egression equation for 1982-1984, and equation (7) is the regression equation for the period 2000-2002.

Next, the variables are analyzed individually. It is started from the initial level of economic development. It can be found through observation that coefficient of IECO is negative in equation (6), but is turned to positive in equation (7), and it seems contrary to the conclusion of the relation between the initial level of economic development and economic growth analyzed in previous section, the change of coefficient from negative to positive shows that economic growth rate in each province, was on a negative correlation of its initial level of development, at the beginning of the Reform and Opening up, the more economically developed provinces, the lower economic growth rate, and the more undeveloped provinces, the higher economic growth rate; However, this relation between economic growth and the initial level of economic development in provinces is reversed in the early 21st century, the more economically developed provinces, the higher growth rate, and the more undeveloped provinces, the lower growth rate. This phenomenon can also be explained by the neoclassical growth theory. In the early eighties of the twentieth century, China was still a large agricultural country with low production capacity, irrational allocation of production resources and a very low per capita ownership of capital, and its production model was an extensive labor-intensive type.

The primary industry's proportion to GDP was very high in various provinces (except three municipalities: Beijing, Tianjin and Shanghai). From 1982 to 1984, it was up to 1/3 as much

Table 7. Comparison of regression results of equation (6) and equation (7)

	Equation (6) (1982-1984)		Equation (7) (2000-2002)	
Explanatory Variable	Coefficient	t-statistic	Coefficient	t-statistic
Constants	0.5807	2.7164	0.0223	0.2728
IECO	-0.0658	-2.5790	0.0078	0.8530
IDISTR	-0.0323	-1.4015	-0.0015	-0.3335
INVT	0.0164	0.8582	0.0703	2.8344
STRUC	-0.1682	-1.7202	-0.0454	-1.0285
Area	0.0170	2.3862	0.0008	0.1488
R^2	0.3931		0.4785	
S.E.	0.0217		0.0123	

in the average proportion of the primary industry in GDP in the provinces national wide. Therefore, it can be considered at this phase, the production function of various provinces had basically fixed rate of return, with marginal diminishing in economic growth ability. Thus, it was negatively correlated between initial level of economic development in each province and its economic growth rate in 1982-1984. In the 21st century, the economic condition had a fully new look in many provinces (such as Shanghai and Tianjin),with the continuous development of economic reform, the capital of average per capita was plenty there, the level of industrialization substantially improved, allocation of production resources was in optimization, and the collaboration capabilities enhanced between various sections in the whole economy, with accurate and effective transmission of information, so that all made the rate of return in production increase and productivity greatly improved. However, there was no change in the economic development model of some provinces (including Anhui and Yunnan) at the same time, the production return rate can't increase there and their economic growth capacities were still diminishing marginal. The widening gap among the provinces was made by such a fast and a slow economic growth speed, so the situation has been formed step by step: the rich provinces will be richer and the poor provinces will be poorer. This is exactly one of the reasons why the income gap becomes bigger between regions in China at present.

However, our current level of economic structure is not high nationwide, although the production rate of return has already increased in some provinces, thus, the production rate of return hasn't increased by degrees nationwide. The national phenomenon was studied in previous section, and the provincial phenomenon is studied in this section. Therefore, there are no contradiction among conclusions of equation (6), equation (2) and equation (4).

Investment is positively correlated with economic growth in both of two economy phases. INVT coefficients and t-statistics show that investment makes much more significantly influences on the promotion of economic growth at present. Social investment was more oriented under government guidance, resulting in much repeated investment with low-level, because the planned economic system remained the dominant location in the 1980s. Therefore, investment can't push economic growth effectively, which displayed in equation (6) shall be shown that investment variable can't pass "t" test. The market economy system has been fully established now, the government has already faded out from the stage for direct regulation of the economy, most investment can be oriented under supplies and demands in the market, to achieve reasonable flow and optimized allocation in resources. Thus, investment is an important and irreplaceable role in the process of China's economic growth.

Regarding "STRUC", the industrial structure variable, it means the proportion of agricultural output in GDP, so the smaller STRUC value, the higher level of industrialization in the province. There is a negative correlation between economic growth and it in two equations, and it shows the lower level of industrialization of the province, the slower their economic growth. Similarly, coefficient is positive before the area dummy variable, and it shows the economic development conditions in the eastern provinces are better than that in the central and western provinces. These two points are in line with our judgments of experience.

IDISTR, the initial income distribution variable is finally analyzed. The estimated results from equations show that income gap in the two phases of economic growth are negatively correlated with economic growth, that no

matter what phases of economic development, the income inequality are not conducive to economic growth. Since the rural and urban income ratio as a proxy variable for measuring income gap, it is said more exactly that the economic growth can not benefit from the income gap between urban and rural areas in the phases of economic development. This conclusion is consistent with specific national conditions in China. China is a large country with 900 million peasants, so the expansion of urban-rural gap indicates that the relative income will be reduced in at least 70 % of the population in China, the wealth of society will be further concentrated by few people. The economic growth has no way to be discussed, when the income and living standards are under deterioration among 70 % of the population in one country. In addition, it will take some time to have significant performance that the initial income distribution makes a negative impact on economic growth, as the conclusion mentioned in the previous section. It can be found that there is no significant influence on economic growth from the initial income distribution in both of equations from the study on t-statistics of IDISTR in equation (6) and equation (7), as three-year average data were selected for short-term study in the section.

It was concluded from Study of Barro (2000) that income gap goes against economic growth in poor countries, but makes for that in rich countries; and Galor and Moav (2002) considered that income gap is beneficial to economic growth in the early phases of economic development, but adverse to economic growth in a higher level of economic development. It reflects that we must consider the specific national conditions as a comprehensive background, to obtain a conclusion in line with its actual conditions, while studying the relation between income gap and economic growth in different phases of economic development.

How to shrink the resident income gap of China in economic growth

The resident income gap is being enlarged in China and has attracted the attentions of government and economists. Income gap and social development are both inconsistent and uniform. When there is no income gap or the gap is too small, efficiency will be lost. The process of social economy shows that a certain income gap is often the symbol of improved production efficiency. To let part of people become rich first is the basic drive for economy growth and social advance, after all. But, when the income gap grows to be too large, social fairness is hard to be shown and there will be even social conflicts and problems damaging social stability. Therefore, to make efficiency consistent with fairness, we think that efficiency should be stressed in the original distribution of national revenue and fairness should be emphasized in re-distribution. To prevent resident income gap from getting larger, we should start with the following points:

1) Employment priority is the important point of development strategy

International experience shows that the mode of "development first and distribution second" doesn't work in the practice of Latin America while labor-intensive East Asian mode may fit China better. China is in possession of large amount of labor forces and labor price is very competitive in the world, so employment first should be regarded as the most important option in the future development strategy. We should make great efforts to develop labor-intensive industries, especially the labor-intensive mid-small enterprises, and try to create proper living environment for mid-small enterprises, and thereby create more employments for labor forces to participate in industrialized process and gain corresponding income. The strategy of employment first is the

guarantee to shrink income gap in the future. On the other hand, we must also promote the equality of labor factors. It includes: firstly, promote the fairness of employment, which calls for anti-monopoly, integration of town and countryside, establishment of labor market nationwide and promoting circulation of factors to achieve the fairness of income and exert the converging action of market power to income gap; secondly, promote the fairness of quality and status of labor forces, which mainly emphasizes liberal education. As long as the basic quality of labor forces is improved, the fairness of labor forces can have primary foundation. Town-countryside household registration system, which results in the unfairness of status, should be eliminated gradually. Only without non-discrimination in the position and education, the right to create and share values can be fair.

2) Establish anti-poverty welfare system

After the disassembly of original welfare system of Chinese cities, related welfare system is not yet perfect. When unemployment happens in large scale, problems of poverty will become more serious in the cities. Therefore, establishment and improvement of welfare system is a long-term mission. But, for the developing country like China, the establishment of welfare system can't rush, or it would raise the labor cost and thereby enlarge unemployment scale, which is disadvantageous to developing countries. Therefore, we should establish anti-poverty and compensation welfare system.

3) Establish compatible income distribution and re-distribution system of socialist market economy

In order to catch up with developed countries, some developing countries neglect the destructive influence of polarization on sustainable development of economy, as a result, they have to experience the process of "increase but without development" and lose the best opportunity to development. These lessons and experiences should be remembered and summarized seriously. As the largest developing country in the world, Chinese government is responsible for re-adjustment of income distribution and prevention of polarization, and meanwhile should take the important responsibility to promote the reform and transformation of functions. According to related principle, the government policy and function should be converted from direct interference to the re-distribution of market resources and a compatible income distribution and re-distribution system of socialist market economy should be built.

4) Establish and perfect multi-layer tax system and strengthen the collection and management of individual income tax

For the income gap formed in primary distribution, government should adjust it reasonably by tax. For the income from industrial monopoly, government should add to the collection of adjustment tax. For the income gap between individuals, government can refer to the experiences of other countries, establish and improve the system of personal graduated income tax which should be integrated with individual income declaration system and deducted from the source; develop new taxes, such as inheritance tax, donation tax and personal property tax and so on. The consumption tax from high consumption should be used to help with poverty. Taxpaying awareness should be improved in citizens and debugs of tax dodging and evasion should be solved.

5) Strengthen the punishment of illegal income

Perfect the law and regulation of individual income distribution and severely punish various

illegal profit gainers according to the law. Strengthen the punishment of crimes like tax dodging, tax evasion, production and sale of counterfeit goods, contraband, drug-trafficking and so on. Enhance public awareness and education of law in citizens to prepare people to fight with various crimes, timely eliminate and replace various illegal income resources and expose crimes to sunshine.

6) Enhance the investment in the education of undeveloped areas and carry out the policy of "help with poverty by science and education"

This job has been attached importance and certain achievements have been made, for example, the establishment of hope schools. Nation should increase the education investment in undeveloped areas and provide necessary teacher resources to improve the education conditions in poor areas and enhance the quality of workers. This is the important content of poverty relief and also the basic to help those areas get rid of poverty on long-term basic.

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