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INEQUALITY, TERTIARISATION AND INSTITUTIONAL ARRANGEMENTS DURING CHINA'S GROWTH MIRACLE SINCE 1990S

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Abstract- This paper studies how income inequality evolves in the process of China's growth since 1990s. We showed that the Kuznets inverted U curve has not appeared in China yet. In addition, we pointed out that the tertiarisation process plays the key role in shaping income distribution. The paper presented an institutional analysis on the phenomenon of slow tertiarisation in China, pointing out that the institutional innovations will be crucial for the sustainable development of China.

Keywords- growth-inequality nexus, tertiarisation, institutional arrangements, China economy, economic transition

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Introduction

This paper studies the growth-inequality nexus based on China's economic performance since 1990s. There are several theoretical and empirical questions the paper hopes to discuss. Firstly, Chinese economy has already experienced more than 30 years' high growth rates since 1980s. Whether this performance can sustain and how long it can sustain generates many debates. To answer these important questions, we have to understand the crucial problems that block China's economic growth. This paper tries to present a consistent analysis on the issue from the perspective of growth-inequality nexus. Secondly, the paper aims to do an analysis on how the inequality is shaped during a dynamic structural change and how institutional arrangements are related.

The analysis will be based an empirical study on the influential factors of income inequality in China since 1990s. There are several reasons for choosing the time zone for analysis since 1990s: firstly, the 1980s for China is the early reform period which mainly focus on rural areas. Till 1990 when China completed "the 7th five-year plan", the tertiary industry (especially private) had not really begun to develop. Thus if we include this period into the analysis, the effect of tertiary industry will be affected. Secondly, we will have to face the problem of heterogeneous data quality since the only data available for this period is published by Chinese government which is different from our data set from 1990s.

This research is different from the static view on the determinants of income/wealth distribution since the process of economic growth is dynamic that nearly all the variables of the economy will change during this long-run process. We are interested in how these changes affect the evolution of income/wealth distribution and which factor has the dominant effect. The issue of income inequality in China should be paid more attention than usually thought for another reason: there are many so-called "style facts" of economic growth recognized in western economic performance. One of the facts is that in the long run balanced growth the functional income distribution (wL/rK) remains roughly constant [1]. This is obvious unsettled in China since the Gini index shows that the income inequality has been continuously becoming larger. This may be or should be related to some other style facts which have not appeared in China either, like the Kuznets inverted U-shaped relation between income inequality and GDP per capita as well as the structural transformation from agriculture to service.

As expected, the empirical results of the paper showed that the Kuznets "inverted U" curve has not appeared in China yet. Also, the paper pointed out that the tertiarisation process (meaning the development of the tertiary industry comes to the stage of dominating the economy) is closely related to income distribution and the slow tertiarisation process has played the major role in explaining the increasing income inequality since 1990s in China. Then the paper presented an institutional analysis on the phenomenon of slow tertiarisation in China. The paper put forward that continuous reform on the "three" key institutional arrangements will be crucial for the sustainable development of China in the future: the political institution, the double-track economic institution and the urban-rural dual-sector institution. This research is meaningful for understanding the challenges faced by China to jump over the "middle-income trap".

The issue that how income inequality is influenced during economic growth is a very important economic problem and the economics field has been discussing it for quite a long time. It is a very interest-

ing phenomenon that the classical economics tends to argue that the income inequality will become increasingly larger [2] whereas the neoclassical economics tends to support the opinion that the income inequality will become flattened with continuous economic growth [3-5]. The former stand is based on functional distribution theory and the later is usually applied with personal distribution theory. These two distribution theories, however, are not the curial cause for the ideas' difference. This debate hasn't reached a solid conclusion yet, although few economists continue to debate it. In the more recent economic history, the earliest well-known empirical and theoretical study on the problem of how income inequality is affected during economic growth comes from Kuznets [6] whose discussion applies to both personal and functional distribution concepts.

Kuznets' research is based on the historical data for US, England and Germany. His argument leads to the well-known result that there is an "inverted U" relationship between national income and income inequality. This "inverted U" curve means that during the early period of development when the transition happens from the pre-industry to the industry civilizations, the income inequality widens; then the widening trend will become stabilized for some time and will reach the period of narrowing at the later stage of development. Kuznets pointed out that the "inverted U" curve mainly comes from the effect of economic structural change with the rise in the income share of the poor group in the non-agricultural sector.

The later empirical studies have serious controversies on Kuznets "inverted U" hypothesis. Deininger and Squire [7] presented a review on relative discussions. They tested the hypothesis with panel data covering 108 countries from 1960s to 1990s. Generally speaking, the Kuznets hypothesis can find more proof from developed countries than developing countries. Barro [8] also tested the validity of Kuznets "inverted U" curve with a group of panel data covering roughly 100 countries over 30 years since 1960s [8]. He found that the Kuznets curve appeared as an empirical regularity but this relationship couldn't explain most of the variations in inequality across countries or over time. Aghion, et al. [9] made a review on the discussions on the effect of growth on earnings inequality, esp. the situation in OECD countries from 1970s to 1990s. They concluded that economic growth does not necessarily bring a reduction in inequality. Mah [10] made an empirical research on how the inequality of South Korea was determined from 1975 to 1995. Since South Korea in this period transited from an agricultural economy to a developed economy, he found a support for Kuznets hypothesis and the turning point is between 5000 USD to 6000 USD.

An issue needs to be noted is that Kuznets didn't discuss the change of inequality after an economy completed the structural transition. Thus it is not reasonable to doubt the "inverted U" curve with applying data of limited time range from mature developed economies. Understanding how growth affects income inequality in these economies is also important and there are some studies focusing on the determinants of income inequality for such economies. We should look at these results but separate them from the Kuznets hypothesis. Unfortunately, most traditional studies mixed this crucial difference.

There are several different angles in the literatures studying China's income distribution. Zhao, et al. [11] argued that the Kuznets curve didn't have the statistic support from China's regional income distribution. Wu and Perloff [12] analyzed China's income distribution from 1985 to 2001. They showed that the rising income inequality between rural and urban areas in China accounts for most part of the increasing inequality. Wang and Fan [13] analyzed Chinese regional income inequality from 1980s. They pointed out that the larger regional income inequality mainly came from the increased income inequality among rural income levels in different areas. They argued that more capital lead by market power flew to eastern area of China which caused the greater regional inequality. The factors of human capital and policy design also take effect. Wan, et al. [14] discussed the relative problems concerning growth-inequality nexus, using panel data of provinces of China from 1987 to 2001. They failed to find the evidence for the Kuznets curve but found an opposite U curve. Their results showed that the fiscal expenditure on supporting rural development and urbanization significantly reduced the income inequality and more openness increased the inequality. Further, they found that the growth of non-state-owned economy has a negative effect on income distribution. This is also consistent with the argument of Song, et al. [15] that provinces with more private firms have much higher income inequality.

Materials and Methods

I apply time series OLS method as the basic estimation method. The method of applying the panel data from provinces of China, in my view, has several problems: firstly, China is a very unbalanced economy. The coastal provinces are much more advanced than the inner land. This means that the cross section or the panel method will possibly bring the problems of measurement errors, heterogeneity and omitted variable bias.

Measurement errors: so far there isn't any official statistics on each province's level of income inequality. Also in China's political institution, the data reported by different local governments are not of the same level of reflecting the truth. The measurement errors could lead to an estimation bias. From the point of my view, there is no way to resolve this problem.

Omitted variable bias and heterogeneity: since different provinces are staying at different development stages, the determinants for the growth may be different. Thus the problem of the omitted variable bias and heterogeneity will easily appear.

[Eq-1] is estimated to examine whether the Kuznets "inverted U" curve appeared in China during the past 30 years:

$$\text{Gini Coefficient (t)} = \beta_1 \log (\text{GDP}) (t) + \beta_2 \log^2 (\text{GDP}) (t) + \beta_3 \text{market capitalization (t)} + \beta_4 \text{inflation} + u(t) \quad (1)$$

where u(t) is the conventionally assumed error term. If β_1 is positive and β_2 is negative, it means that the Kuznets hypothesis is valid.

Since China is a transitional economy, based on Kuznets' hypothesis, structural change should be the main impetus behind the change of income inequality. To examine the determinants of income inequality, [Eq-2] is estimated:

$$\text{Gini Coefficient (t)} = \beta_1 \log (\text{GDP}) (t) + \beta_2 \text{industrial growth rates difference (t)} + \beta_3 \text{government expenditure (t)} + u(t) \quad (2)$$

where u(t) is the conventionally assumed error term and the crucial factor:

Industrial Growth Rates Difference = (growth rates of primary industry + growth rates of secondary industry) / 2 - growth rates of the tertiary industry.

Here tertiary industry is just another expression of service industry. GDP is reported in constant prices with unit of Billions RMB Yuan; Government expenditure is reported as percentage of GDP; Market

capitalization is reported as percentage of GDP of the publicly listed companies.

In regressions (1) and (2) I include market capitalization, inflation and government expenditure as the additional variables which influence the Gini coefficient. The factor of market capitalization has been rarely applied in such regressions but its influence on income inequality should be clear as a progress of financial market. Inflation and government expenditure are usually treated as negatively influencing inequality and positively influencing inequality respectively.

There isn't any Chinese official Gini index available for the past 30 years and the existing calculations on Chinese Gini index are rather diversified. Measurement error is not a problem that can be avoided and there will be different estimation results if applying Gini coefficients from different studies. Based on a critical attitude, I chose the Gini index calculated by Cheng [16] as the main sample for estimating income inequality of China. His study results have been frequently discussed and introduced in literatures. Gini coefficients reported in Cheng's study are from 1981 to 2004, except the coefficient for 1991. For the consistency of data standard, I left the Gini coefficient for 1991 for blank. Gini indexes from 2005 to 2010 are chosen from three sources: Gini coefficients for 2005 and 2006 are chosen from Chen and Dai [17]. Gini coefficients for 2007, 2008 and 2009 are reported by The World Factbook of Central Intelligence Agency, USA. It is generally accepted that the Chinese Gini index in 2010 is above 0.5, according to a report made by Xinhua Agency published on May 21st, *China Economic Information Daily*. We set it as 0.5. The data are reported in [Table-1].

Table 1- China Gini Index between 1992 and 2010

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Gini		0.3993	0.4183	0.43	0.4169	0.3946	0.3964	0.4001	0.4124	0.4275
Year	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Gini	0.4331	0.4297	0.443	0.4419	0.4573	0.4624	0.415	0.469	0.48	0.5

The basic attitude of choosing the data for Gini index in [Table-1] is based on the fact that during the past 5 years Chinese people have been feeling the worsening trend of social justice and equality. The Gini coefficients in [Table-1], although come from different sources with different calculation processes, can approximately describe China's income inequality change.

Although in January 2013 the Chinese government (National Bureau of Statistics) published the Gini index they calculated from 2003 to 2012 with the equality situation getting better and better since 2008, their calculation without issuing the calculation details is highly doubtful. But in order to see whether the empirical result is robust with changing the Gini data, I also performed regressions with changing the data from 2003 into the ones issued by the National Bureau of Statistics, P.R. China. The results are reported in [Table-8].

Table 2- China Gini Index between 2003 and 2012

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Gini	0.479	0.473	0.485	0.487	0.484	0.491	0.49	0.481	0.477	0.474

Source: National Bureau of Statistics

Data for the industrial growth rates are counted from the data provided by Annual Statistics Reports, National Bureau of Statistics, P. R. China. Other data for the period 1991-2010 comes from the *World Bank website Open Database for China* and the website of International Monetary Fund: *WEOD*, April 2012.

Result

The main regression results reported below [Table-3] to [Table-7] are based on the Gini index in [Table-1]. We start by checking the data stationarity by unit root tests. The results are presented in [Table-3] with the method of Augmented-Dickey-Fuller (ADF) unit root tests.

Table 3- Results from ADF Unit Roots Test for the data from 1991 (1992) to 2010

Series	Prob.	Observations
Gini coefficients	0.7869	19
Market capitalization	0.2432	20
Log (GDP)	0.9834	20
Inflation	0.3674	20
Government expenditure	0.9214	20
Industrial growth rates difference	0.0454	20

Note: Null hypothesis is unit root. Lags' numbers are 0 in the ADF equation necessary to eliminate AR errors.

As shown above, only the variable "industrial growth rates difference" is stationary. But a deeper observation shows that three other variables seemingly non-stationary are trend stationary:

Series	Prob.	Lag length
Log (GDP)	0.0718	4
Government expenditure	0.02	3
Market capitalization	0.01	4

Note: Results from ADF Unit Roots Test with a constant and linear trend.

And the rest two variables are non-stationary but stationary with 1st difference:

Series	Prob.	Lag length
Gini coefficients	0.0011	0
Inflation	0.0293	0

Note: Results from ADF Unit Roots Test with 1st difference.

Since the regressions' models are OLS regression, non-stationary and trend stationary are not crucial for OLS regression assumptions [18] except the potential problem of spurious regression. We can resolve the worry of spurious regressions here with checking the cointegration relationship. The unit root tests on the two equations' residuals prove that the residuals are stationary (not reported). Thus the non-stationary variables are cointegrated and the problem of spurious regression is avoided.

The results of regression (1) and (2) are presented in [Table-4].

Table 4- OLS estimation results with time series data from 1992 to 2010

Variable (1)	Coefficient	Variable (2)	Coefficient
Log (GDP)	0.025 **	Log (GDP)	0.041***
	(0.009)		(0.003)
$Log^2(GDP)$	0.003 **	Industrial growth rates difference	0.896***
	(0.001)		(0.225)
Market capitalization	-0.000 ***	Government Expenditure	0.005***
	(0.000)		(0.002)
Inflation	0.002***		
	(0.001)		
Adjusted R^2	0.81		0.81
No. Obs.	19		19

*Note: The dependent variables for both regressions are the Gini coefficients. ** means statistically significant at 5% level.*** means statistically significant at 1% level. Values within the parentheses below the estimated coefficients denote the standard errors.*

Some additional tests are also shown to support the results [Table-5]: Breusch-Pagan-Godfrey tests are performed to test heteroskedasticity. The results show that this problem doesn't exist in these two regressions. The Ramsey RESET tests are performed for these OLS regressions and the results show that the functional forms are appropriate. Residual Breusch-Godfrey LM tests and Durbin-Watson tests are checked for the autocorrelation problem. The results show that our regressions don't suffer from such a problem.

The OLS regression requires the error term obeying the Gaussian distribution. We performed the Jarque-Bera tests. The results accepted the null-hypothesis that the residuals obeying the Gaussian distribution. From the skewness and kurtosis values, we can see that regression (2) is better than regression (1) in this standard since samples from a normal distribution have an expected skewness of 0 and an expected kurtosis of 3. The critical values of Jarque-Bera test for 20 observations are 2.13 for 10% significance level and 3.26 for 5% significance level, using 10000 replications [19].

Table 5- Additonal tests

	Equation (1)	Equation (2)
Breusch-Pagan-Godfrey (F-Statistics)	1.29	0.57
Ramsey RESET Test (F-Statistics)	1.47	0.55
Breusch-Godfrey LM tests (Prob.:Chi-Square (2))	0.10	0.47
Durbin-Watson Statistics	1.46	2.13
Jarque-Bera Test	1.46	2.38
(P-Value)	0.48	0.30
(Skewness)	-0.14	-0.86
(Kurtosis)	1.67	3.12

Note: Chi-Square (2) for Breusch-Godfrey LM tests means that there is no serial correlation up to 2 lagged periods.

There are many OLS regressions suffer from the problem of endogeneity or the OLS estimations will not be consistent. For the regressions here, considering that there are many other variables that could explain some part of the Gini coefficients besides the explanatory variables here, the "other variables" may also be correlated with the existing explanatory variables. Further, the level of income inequality may also affect economic performance and thus causes the endogeneity problem.

I apply instrumental variables to resolve the problem in the above two regressions. Since the autocorrelation problem is proved to be non-existed and the regressors in the OLS structure are contemporaneous time series, I choose the lagged variables of the regressors as instrumental variables. Similar choices are taken by Barro [8]. In order to make the test more trustable, I choose two kinds of instrumental variables: the first group takes one-period lagged values as the instrumental variables and the second group takes two-periods lagged values the instrumental variables.

The results from 2SLS regressions show that after adding such instrumental variables, the coefficients of the second regression testing the effect of industrial structural change are still significant [Table-7]. The estimation result from adding instrumental variables for the first regression testing the Kuznets hypothesis, however, becomes non-significant [Table-6].

Taking the lagged value as instruments in time series regressions can be seen in many literatures. But considering that the appropriateness of the instrumental variables is always worried about, I also tested the relationship between the instrumental variables and error term using over-identification restrictions test for regression (2).

Table 6- 2SLS estimation results with instrumental variables for regression (1)

Variable	Coefficient 1	Coefficient 2
Log (GDP)	0.128	-0.035
	(0.192)	(0.102)
$Log^2(GDP)$	-0.01	0.01
	(0.024)	(0.013)
Market capitalization	0.002	-0.001
	(0.004)	(0.002)
Inflation	0.002	0.003
	(0.004)	(0.002)
Durbin-Watson	1.99	2.17
No. Obs.	19	18

Note: The dependent variable is Gini index. Time series data is from 1992 to 2010. The instrumental variables for the column of "Coefficient 1" are one-period lagged value for all regressors; The instrumental variables for the column of "Coefficient 2" are two-periods lagged value for all regressors. Values within the parentheses below the estimated coefficients denote the standard errors. None of the results are significant.

Table 7- 2SLS estimation results with instrumental variables for regression (2)

Variable	Coefficient 1	Coefficient 1
Log (GDP)	0.041***	0.041***
	(0.004)	(0.004)
Industrial growth rates difference	1.175***	0.903***
	(0.400)	(0.270)
Government Expenditure	0.005**	0.004**
	(0.002)	(0.002)
Durbin-Watson	2.12	2.10
No. Obs.	19	18

*Note: The dependent variable is Gini index. Time series data is from 1992 to 2010. The instrumental variables for the column of "Coefficient 1" are one-period lagged value Log(GDP)(-1), Industrial growth rates difference (-1) and Government Expenditure (-1); The instrumental variables for the column of "Coefficient 2" are two-periods lagged value Log(GDP)(-2), Industrial growth rates difference (-2) and Government Expenditure (-2); ** means statistically significant at 5% level. *** means statistically significant at 1% level. Values within the parentheses below the estimated coefficients denote the standard errors.*

The test is divided into three steps: (1) obtain the 2SLS residuals "û" with all the instrumental variables; (2) then regress the residuals "û" on all the instruments to obtain the R-squared value; (3) under the null hypothesis that all instrumental variables are uncorrelated with the original error term u(t), $nR^2 \sim$ Chi square distribution and check it with 5% critical value in the distribution.

Table 8- Robust test with changing the Gini data from 2003

Variable (1)	Coefficient	Variable (2)	Coefficient
Log (GDP)	0.031 ***	Log (GDP)	0.041***
XC	(0.007)		(0.004)
$Log^2(GDP)$	0.002 **	Industrial growth rates difference	0.629**
XC	(0.001)		(0.274)
Inflation	0.002***	Government Expenditure	0.005**
XC	(0.001)		(0.002)
Adjusted R^2	0.84		0.82
Durbin-Watson	1.11		0.92
No. Obs.	19		19

Note: The dependent variables for both regressions are Gini coefficients with changing the Gini coefficients from 2003 to 2010 into the data reported by the National Bureau of Statistics

The R^2 we get is 0.1 with 18 observations. The 0.05 critical value for the Chi-square distribution with 3 degree of freedom is 7.815. Thus

from the result achieved by the above steps we accept the null hypothesis which means that all the instrumental variables are uncorrelated with the original error term.

For seeing whether the empirical results of regressions (1) and (2) are robust with changing the Gini data, I also performed regressions with only changing the Gini data from 2003 into the data issued by the National Bureau of Statistics, P. R. China. The results are reported in [Table-8].

Discussion

Based on limited observations, the empirical results initially (with instrumental variables estimation results not significant) proved that the Kuznets "inverted U" hypothesis didn't appear in China from 1992 to 2010. This result is also supported by the regression result reported in [Table-8]. In regression (1), after changing the Gini coefficients from 2003 to 2010 into the data reported by China National Bureau of Statistics, the regressor "Market capitalization" is not significant anymore but the other results are generally similar. To be noted, [Eq-2] is not a proper structure for identifying Kuznets inverted U-shape hypothesis since the regressor $\log^2(GDP)$ is not significant in that structure. From the results of estimating [Eq-1], it seems that China is still staying at the first half the "inverted U" curve that the income inequality is still increasing as GDP grows. Market capitalization and inflation don't show much influence on Gini index. But from the regression on [Eq-2], surprisingly, the industrial growth rates difference nearly has 90% of the explaining power on both regressions with and without instrumental variables. Although this doesn't mean that 90% of the variation in income inequality is caused by this factor, it means that when industrial growth rates difference increase by 1 unit, Gini coefficient in China will decrease by nearly 0.9 units. Government expenditure, although usually thought as important, didn't play a big role in China. Another 4% comes from GDP growth. It is obvious that for the 20 years, higher GDP achievement has a positive effect on the increment of Gini index. I also tried to change the formula of the regressor "industrial growth rates difference" to the other possibilities like differences between the secondary industry and the tertiary industry and between the average growth rate of the sum of secondary and tertiary industries and the primary industry. The results are still significant but either of two factors' influence will reduce to less than 50% (not reported). So the factor of industrial growth rates difference I used here has the biggest explaining power to see the economic structural effect on this issue. Table 8 shows the explaining power of the industrial growth rates difference is robust. After changing the Gini coefficients from 2003 to 2010 into the data reported by the China National Bureau of Statistics, the results are still significant with just lowering the coefficient of the industrial growth rates difference to 63%, which still shows a major role of the factor in explaining inequality.

Although the factor of industrial growth rates difference proves to be closely related to income inequality, very few literatures paid attention to this. The result also proves the argument of Kuznets [6] that the industrial structure update has a major role in shaping the trend of income inequality. The difference between the empirical results here and the Kuznets' argument lies in the role of tertiary industry. Kuznets [6] divided the industrial structure into agricultural and non-agricultural which means he didn't talk about the specific role played by the tertiary industry. In our estimation structure, the tertiary industry plays a determinant role in affecting industrial growth rates difference since the larger the growth rate of tertiary industry, the smaller the difference will be. This also means that the role and effect of tertiary industry on the change of income inequality should be paid more attention. Although the other direction that reducing the sum of the growth rates of the primary and secondary industries can also reduce the degree of industrial growth rate difference, this is not the case we should consider since it is the direction opposite to growth promotion.

The economic structure of China has experienced a big change during the past 20 years. In 1990, 73.6% of the population was still living in rural areas producing 27.1% products of GDP. These numbers updated to 27.1% for rural population and 11.3% for GDP contribution in 2009 [20]. The growth rates of secondary and tertiary industries are also very high.

From [Fig-1], we can see that the growth rates of tertiary industry in China during the past 20 years are generally lower than the growth rates of secondary industry. It is reported that by the end of 2011, the employment share of tertiary industry reached 35.7% which is bigger than that of secondary industry (29.5%) and primary industry (34.8%) (*China People's Daily*, 2012.6.5). But the state sector still kept 77% of total urban employment in tertiary industry in 2007 which contrasts 15% in manufacturing [21]. For output, according to China National Bureau of Statistics, in 2011 the tertiary industry's contribution to GDP is 43.1% which is much less than that of developed economies where the ratio is usually larger than 70%. This ratio is even lower than the countries in the similar development stage like India. Considering the bubble in China's real estate market and real estate is a big part of tertiary industry, the tertiary industry is even smaller in China if the bubble effect is omitted.

Also, the international growth experience of the developed economies shows that the growth rate of tertiary industry will be higher than that of secondary industry when an economy enters the stage of tertiarisation. Obviously, China hasn't reached this stage. However, China has already reached the stage of high middle-income level according to World Bank and should have already entered the period of tertiarisation. So far, however, the goal is still far from reach.

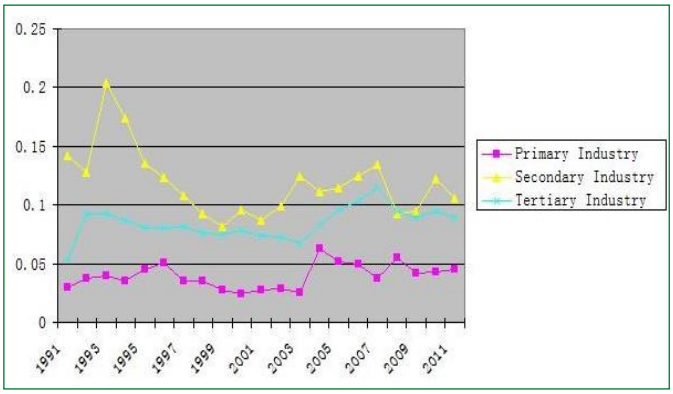

Fig. 1- Industrial output growth rates between 1991 and 2011, China

Note: The column line shows the output growth rates and the row line shows the time range.

Source: Data collected from the Annual Statistics Reports, National Bureau of Statistics, P. R. China.

From the empirical results, we know that the tertiarisation process is crucial for China's income inequality performance. Meanwhile ter-

tiarisation is also the request of industrial update during growth. This means tertiarisation is a crucial factor in the growth-inequality nexus. Then what is blocking China's steps of tertiarisation?

I would like to argue that the basic reason for slow tertiarisation in China is deeply rooted in its institutional arrangements. The marketing economy in China now is far from a real competitive market. To the opposite, China is a very high rent-seeking economy. From the point of my view, there are three crucial institutional arrangements to be primarily responsible: the political institution, the double-track economic system and the urban-rural dual economy.

Firstly, the political institution of China needs to be reformed to raise the law-ruled level of the society and the double-track economic system protects the monopoly power and distorts the economy. Now the country is a very high rent-seeking economy with its political and economic institutions. This makes the private economy to face the competition of State Owned Enterprises (SOEs) with very unfair conditions which leads Chinese economy to a very strange combination: the private economy is forced to develop labor-intensive industries which are mainly in the secondary industry. They firstly entered the low-end tertiary industry in the early reform period as the owner of some small businesses like tiny restaurants and education service which have smaller scale compared to those in primary and secondary industries. However, tertiary industry is both capital intensive and labor intensive. The industries of finance, transportation and real estate, for example, are important parts of tertiary industry. Most of these industries are capital-intensive and are occupied by SOEs. Lin and Li [22] also argued that in China most of the capital-intensive enterprises are SOEs. The private economies are very difficult to compete with them without equal treatment by institutions. Many tertiary capital-intensive industries are still monopolized with entry limitation. Most 70% of the commercial loans of financial sectors are flowing to SOEs [20].

However, the SOEs entering the tertiary industry have very low efficiency. Lin [20] argued that the China SOEs existing with varieties of governmental supports and privileges are actually non-viable and endogenously bring the distorted banking system and the regulation of market access. SOEs have the lowest efficiency in China, using input-output method [23]. Lu [24] reported that the efficiency difference between SOEs and private economy had been keeping increasing, although the efficiency of SOEs also somehow improved. There are many literatures explaining the phenomenon which can be summarized as huge rent-seeking space enjoyed by SOEs. One argument is about the "soft budget constraint" which means that the SOEs don't have real budget constraint as private economies and thus their incentive to improve the efficiency is very low. Further, their investments with the loans are generating huge waste which also causes a big burden for the banking system. The private sectors are difficult to get sufficient and timely loans for development. This shapes monopolies in many fields. Besides, SOEs (and the state-related sectors which are "*tizhinei*") in China are low efficient but they can offer higher wages and welfare to the employees. This causes a high misallocation of both human resource and physical capital: the best talents compete to enter the SOEs but their high marginal productivity is limited by SOEs' institution. Meanwhile, the opportunities among the talents who are trying to enter the state-related sectors are not equal because of the rent-seeking activities which lead a mismatch between the high-payment (or welfare) jobs and the talents who own the relative qualified productivity. The system of SOEs also supported governmental interventions into the economy. Since the capital-intensive industries in tertiary industry are occupies by such SOEs, the growth rate of tertiary industry is highly depressed. To the opposite, the secondary industry grows faster because private economies are forced to concentrate on labor-intensive manufacturing industries and luckily, China indeed has a comparative advantage of labor-intensive industries compared to developed countries. This is why the growth rate of tertiary industry has been keeping lower than the secondary industry. However, the comparative advantage of such private enterprises in the secondary industry has been diminishing as Chinese economy grows and this leads to the structural problem more serious.

Further, SOEs have very low incentive to update their productivity as a response to market competition because they don't have much competition pressure. The lack of entrepreneurial spirit of SOEs blocks the efficiency update including technology innovation. Meanwhile, the private companies which are very sensitive to market competitions are lack of capital to burden the cost of technological innovation. The supports from governments for the private companies are also much weaker and thus are in shortage of many other "rents" compared to SOEs. There is indeed a competition between the private economy and state-owned economy in China. However, the competition is not fair which greatly reduces the competition pressure on SOEs. And since the competition is closely related to "rent", most private companies are also focusing on "*Guan Xi*" (relationship) building but not productivity promotion. The competition for rent-seeking further makes the rents more prevalent and more expensive which lead the economy more unfair. Murphy, et al. [25] argued that there are two reasons why rent-seeking is very costly to growth. The first reason is that rent-seeking activities exhibit very natural increasing returns which attract more and more resource to rent-seeking activities from productive activities. The second reason is that rent-seeking is prone to hurt innovative activities since innovations often need public supports like patterns and licenses. Both these two reasons obviously exist in China whose economic and political institutions limit the update speed of technology. The above arguments revealed the reasons why China is a fast-growing economy but lacks internationally competitive large companies. Also, the average wage rate of the whole economy is highly depressed and the domestic demand is thus insufficient.

As argued above, the double-track economic institution as well as political institution blocked the natural growth of Chinese private economy. The urban-rural dual system also negatively influences the tertiarisation process. We can see this from several angles:

firstly, the house registration system ("*Hukou*") blocked the shape of a competitive labor market which distorted the labor price. The migrant laborers from rural area stay at a weaker situation in gaming wage contract. An even worse effect is that rural migrants are nearly impossible to enter SOEs to enjoy the higher income with welfare and most of them have to enter private economies with accepting very low wage rate. Only 7.3% of rural migrants are employed in the state sector in 2009 [26]. To summarize, the depressed low labor cost supports and stimulates the private economy in labor-intensive industries, especially in the manufacturing industry.

Secondly, since there is much welfare loss of rural laborers caused by the house registration system, the migration process from rural to urban areas is blocked. The amount of money they can transfer back to their rural families is also limited. From [Fig-1] we see that the growth rates of agricultural industry have been much lower than

the other two industries. One important reason is the slow and even repeated migration process of rural laborers since the quick and sustainable migration is one of the key conditions for raising productivity in agriculture during economic transition. The above logic means that the household registration system limited the income growth of around more than 60% of Chinese people who are still living in rural areas and who moved to urban areas without "*Hukou*". This also means that the national average education level is limited by the system. So from both the demand side and the supply side, the registration system restricts the conditions required for continuous tertiarisation.

The above arguments put forward the basic reasons behind the slow development of tertiarisation in China. Behind the high GDP growth rates, China is a highly distorted economy with such institutional arrangements. The economy is low efficient and actually weak. Hsieh and Klenow [27] estimated the effect of China's resource misallocation on TFP and they calculated that China's TFP will increase around 30%-50% if capital and labor in China are assumed to equalize marginal products to the extent like that in United States. Many studies already pointed out that the raising of TFP or efficiency is the only way that China can sustain its high growth rates and realize its growth potentials and this needs basic institutional reforms.

As a suggestion for China's future reform, the successful and quick tertiarisation is the goal that should be focused on. The paper argues that China's tertiarisation is slow because of three main institutional arrangements. Accordingly, the future reforms should focus on these institutions and this will also be a process of deprivation of rents.

To be more exact, the current institutional reforms should focus on the privatization for the main industrial update blocks, esp. liberalizing the tertiary industry; abolishing the system of household registration and building a high-quality law-ruled society. These reforms are connected with each other and should be promoted at the same time or the high growth rate of China will face unsustainable problem in the near future and the traditional problem of "middle-income trap" will appear. Although Chinese government has already paid attention to develop tertiary industry, there is one trap China should avoid: this paper doesn't mean that continuing tertiarisation with more state-owned economy can be a choice. The tertiarisation process must be completed with further economic liberalization. The Chinese government should not only look at the development speed of tertiary industry but also pay attention to the development path. This seems different from the arguments of Wan, et al. [14] and Song, et al. [15] that the private economy exerts a negative influence on China's income/wealth distribution. Their arguments are not wrong, however, from the static view. But from a dynamic viewpoint, continuing economic liberalization should be right choice.

Conclusion

The paper tested the Kuznets "inverted U" curve with economic data of China since 1990s. During this period China successfully transited from a poor economy to a high middle-income level economy. The estimation results initially show that China still stays at the first half of the "inverted U" curve.

The study shows that the industrial growth rates difference can explain most part of the income inequality change in China. The role of tertiarisation is very crucial for the change. We argued that the development of tertiary industry is slow in China because of three main institutional arrangements which are political institution, double-track economic system and rural-urban dual economy.

The study also shows that the proper economic institutional arrangements should be good for both sustainable growth and equal income/wealth distribution in the long run.

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