E C O N O M I C S B U L L E T I N

The Impact of Economic Globalization on Income Distribution: Empirical Evidence in China

Xiaofei Tian
Hebei University

Baotai Wang
University of Northern BC

Ajit Dayanandan
University of Northern BC

Abstract

This study investigates the impact of economic globalization, as characterized by increasing international trade and foreign direct investment (FDI) flows, on income distribution in China. The Gini coefficients - the conventional measure of income inequality - are used in this study and the empirical investigation is conducted within the unit root and cointegration framework. The empirical results show that economic globalization tends to improve income inequality in China. Therefore, the worsening of income inequality in China must be caused by other factors.

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1. Introduction

Since 1978 when the economic reform and open-door policy were initiated, China has made great strides in promoting economic growth and reducing its poverty. The World Bank estimates that the poverty rate (head count ratio) in China fell dramatically from 84 percent in 1981 to 15.9 percent in 2005 (See, Chen and Ravallion, 2001, 2008). The impressive success of China in promoting economic growth and reducing poverty in the last three decades is eclipsed by the increase in income inequality during this period: the Gini coefficient – a commonly used measure for income inequality – has climbed from 0.16 in 1978 to 0.47 in 2006, higher than that in the US or in any other developed country. The increasing income inequality in China has diminished the positive economic impacts and has raised controversy whether economic globalization has contributed to economic and social instability within the country. In order to mitigate the increasing income inequality in China, several social assistance programs were initiated by the Government of China but their impacts were not profound.

Economic globalization as characterized by increasing international trade and foreign direct investment (FDI) flows has brought great impacts and led to dramatic changes to the China's economy. However, the impact of globalization on income distribution still remains as a highly controversial issue and less researched area. The objective of this study is thus to investigate empirically the impact of economic globalization on income distribution in China.

Although growth of per capita GDP has often been viewed as an important determinant of income distribution, ignoring the role of trade liberalization and FDI flows could hamper the validity of these results. Studies on this issue so far have mainly focused on the international trade effects. See, for example, Beyer et al. (1999), Harrison and Hanson (1999), Mahler et al. (1999), and Barro (2000), among others. One traditional view regarding the impact of international trade on income distribution is based on the argument by Stolper and Samuelson (1941) that the returns to laborers tend to increase with trade liberalization in developing countries whose labor endowments are abundant. However, one of the popular counter views is that trade liberalization benefits mostly the rich because the rich groups in the economy are most able to take advantage from trade liberalization. This view is also supported in the sense that more liberal governments have more liberal trade policy and less re-distributional policies (see, for example, Splilimbergo et al. (1999)).

Studies on the impact of the FDI flows on income distribution appear to be relatively limited so far. The early work by Mundell (1957) hypothesized that when the FDI flows from developed countries to developing countries increase, labor productivities in the latter will rise and so will the real wage. Thus the FDI flows to developing countries should improve income distribution in general. This argument is supported by the empirical results from India (Wang and Ajit, 2007). However, Feenstra and Hanson (1997) argued that the FDI flows normally increase the demand for skilled labors, but not for unskilled labors, in developing countries and thus increase the real wage of skilled labors relative to that of unskilled labors, and consequently the income

inequality in these countries could deteriorate with the FDI inflows. This argument is supported by the empirical results from Mexico (Feenstra and Hanson, 1997) and South Korea (Mah, 2002).

The rest of the paper is organized as follows. In Section 2, the methodology applied in this empirical investigation is briefly discussed. This is followed by a description of the data in Section 3. The empirical results are reported and discussed in Section 4, and concluding remarks are made in Section 5.

2. Methodology

To investigate the impact of globalization on income distribution, the following cointegration model is specified:

$$g_t = \beta_0 + \beta_1 y_t + \beta_2 w_t + \beta_3 x_t + \beta_4 z_t + \varepsilon_t \qquad (1)$$

where g, y, w, x, and z denote, respectively, the Gini coefficient, per capita GDP growth[1], the ratio of total trade values to GDP, the ratio of FDI inflows to GDP, and the percentage of government spending on social insurance[2]; ε is the error term and β_i, $i = 0,1,2,3,4$, are the coefficients. The sign of β_1 is positive (negative) if economic growth tends to deteriorate (improve) income inequality levels. According to the Stolper-Samuelson argument (1941), the sign of β_2 is expected to be positive (negative) if the country under investigation is a capital (labor) abundant country. As for the sign of β_3, there are different arguments as outlined in the introduction section. According to Mundell's hypothesis (1957) that income inequality may be reduced with the increased FDI flows, the sign of β_3 should be negative. But according to the argument made by Feenstra and Hanson (1997) that the increased FDI inflows may benefit the skilled labors more than unskilled labors, the sign of β_3 should be positive. The percentage of government spending on social insurance is a policy variable included in the model and the sign of β_4 should be negative if this policy variable is effective to help reducing income inequality.

Direct application of conventional regression techniques to Equation (1) is not appropriate since most macroeconomic time series variables are non-stationary so as to make conventional hypothesis-testing procedures based on the t, F, and χ^2 test

[1] An alternative for investigating the cointegration relationship is to use the unemployment rate. However, we are unable to find the consistent time series data of the unemployment rate for the whole country at the moment. Given the Okun's relationship between unemployment and growth of GDP, it is quite appropriate to use per capita GDP growth.

[2] Government spending on social insurance has many categories, including the medical and housing allowances and other social welfare spending. This is the time consistent data that can be found from the National Bureau of Statistics of China and then used as a proxy of the government efforts made to correct inequality in this empirical study.

statistic unreliable. In order to avoid the possibility of spurious results, our empirical investigation follows the tradition of testing for unit roots and testing for cointegration in macroeconomic time series, which started gaining popularity in the early 1980's.

In this study, the most widely used ADF unit-root test (Dickey and Fuller, 1979) and the Johansen and Juselius multivariate cointegration approach (Johansen and Juselius, 1990) are applied. Furthermore, we also conduct a residual-based cointegration test (Gregory and Hansen, 1996) to check whether or not there is a shift in parameters (i.e., a structural break) in this system during the investigation period.

3. Data

The annual data of the Gini coefficient for the period of 1979 to 2006 are collected from various studies (See, for example, Chan and Wang, 2001; Luo, 2005) and from the National Bureau of Statistics of China (NBSC: http://www.stats.gov.cn/). The data show that the Gini coefficient has almost constantly increased from 0.194 in 1978 to 0.470 in 2006. (See Figure 1)

The annual data of per capita real GDP growth, total GDP, the total trade values, the FDI inflows, and the percentage of government spending on social insurances are collected from the NBSC, the People's Bank of China (PBC: http://www.pbc.gov.cn/), and the China Customs (CC: http://www.customs.gov.cn/) respectively. Then the required ratio variables in this study are computed based on the collected data. Growth of per capita GDP fluctuates during the investigation period yielding an average growth rate of 8.5%. The trade/GDP ratio is about 11% in 1979 and increases to 66.9% in 2006. The FDI inflows/GDP ratio constantly increases from almost 0% in 1979 to 2.6% in 2006. Finally, the percentage of government spending on social insurance remains at a very low level (less than 2% of its total spending) until 1996, and then it increases rapidly and reaches more than 10% in 2006.

4. Empirical Results

The results of the standard ADF unit-root tests are summarized in Table 1. The ADF test results show that for all variables, except the per capita real GDP growth, in the level form, the null hypothesis of a unit root cannot be rejected at the conventional significance levels when a constant is included in the test, but the null hypothesis of a unit root is rejected for all these variables in first difference form. These results suggest that all time series variables (except the per capita GDP growth which is $I(0)$) in this study are $I(1)$ series, so they are all stationary in the first difference form. When both a constant and a slope are included in the test, similar results are obtained for all these variables.

The Johansen-Juselius multivariate test for the cointegration relationships is subsequently performed to investigate the possible cointegration relationship among the variables and the results are summarized in Table 2. At the 5% significance level, both the trace test statistic and the maximum eigenvalue test statistic reject the null hypothesis

that the number of cointegrating vectors is zero, in favor of the alternative that there exists one cointegrating vector. The cointegrating coefficients are then normalized based on the Gini coefficient. It can be seen from the lower part of the table that the normalized cointegrating coefficients of per capita GDP growth, the trade/GDP ratio, the FDI/GDP ratio, and the percentage of the government spending on social insurance are, respectively, 0.127, -0.2859, -0.6404, and -0.2756. According to the signs of these cointegrating coefficients, an increase in per capita GDP growth deteriorates income distribution (i.e., increasing the Gini coefficient), but increases in the trade/GDP ratio, the FDI/GDP ratio, and the policy variable – the percentage of government spending on social insurance will all tend to improve the condition of income distribution (i.e., decreasing the Gini coefficient).

Based on these empirical results, it seems quite clear that the practice of economic openness does not contribute any negative impacts to income distribution in China. Rather it helps improving income inequality. These results support the classical view regarding the role of the international trade that the returns to laborers tend to increase with trade liberalization in developing countries whose labor endowments are abundant and Mundell's hypothesis (1957) that the FDI flows from developed countries to developing countries are likely to increase labor productivity so will the real wage, and thus the FDI flows to developing countries should improve income distribution.

For the question why income inequality has been worsened in China, we feel that the imbalanced development in different regions is one of the main reasons for the worsening of income inequality in China. Since 1978, particularly since the early 1990's, China's economy has grown very rapidly but quite imbalanced. While the large cities and coastal regions have developed quickly, the west and other internal regions remain less developed and fall even more behind than before. Because of the lack of basic infrastructures for capital investment in these regions and also because of the higher returns to capital and labor in the coastal regions, the skilled labors and capitals in less developed regions continue to move to major cities and coastal regions[3], and this movement further enlarges the gap in income distribution. As a result, the faster the economy grows, the larger the income inequality in different regions, and the higher the country's Gini index. This may well explain why the cointegrating coefficient of per capita GDP growth is positive. Although the government has implemented some policies to help and support the west regions, the policy effects are so far not strong enough to change this trend.

Finally, Studies using Monte Carlo experiments (See, for example, Gregory and Hansen, 1996) show that when a shift in parameters takes place, standard tests of cointegration may lose power and falsely signal the absence of equilibrium in the system. To explore the possibility of one time shift in the parameters of the cointegrating vector, we carry out the Gregory-Hansen test which explicitly takes into consideration the structural change in the cointegration vector. Three models are used for testing a structural break, namely a shift in intercept but the trend is not included, a shift in

[3] Before 1978 when the economic reform began, the laborers were not allowed to move from one region to another in China.

intercept and the trend is included, shifts in both intercept and slope (full structural break). The test results, reported in Table 3, clearly reveal that there is no evidence of structural change in the cointegration relationships in the Gini model for China.

5. Conclusions

Using annual data for the period of 1978 to 2006 for China, we have examined the impact of recent economic globalization as proxied by increased trade values and FDI flows on income inequalities in China. The ADF unit-root test indicates that most variables in the cointegration equation are non-stationary at levels but stationary in difference form. The Johansen-Juselius cointegration analysis shows that one equilibrium relationship exists in this Gini model. Regarding the impact of globalization on income inequality, the empirical results show that both trade liberalization and the FDI inflows have played a consistent role to improve income distribution in China, which confirm that the worsening of income inequality is not the result of economic globalization and thus the open-door policy and efforts made to integrate with the global economy is not a contributing factor towards increasing inequality in the country. The empirical results also show that the government spending on social insurance tends to reduce income inequality while economic growth has not contributed positively to reduction of income inequality.

These results raise substantial issues towards the worsening of income inequality in China and have important policy implications. As discussed in the previous section, the imbalanced development is likely to be the cause for the worsening and thus different development strategy and relevant policy options should be considered in order to reduce inequality.

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Figure 1 The Gini Coefficient for China

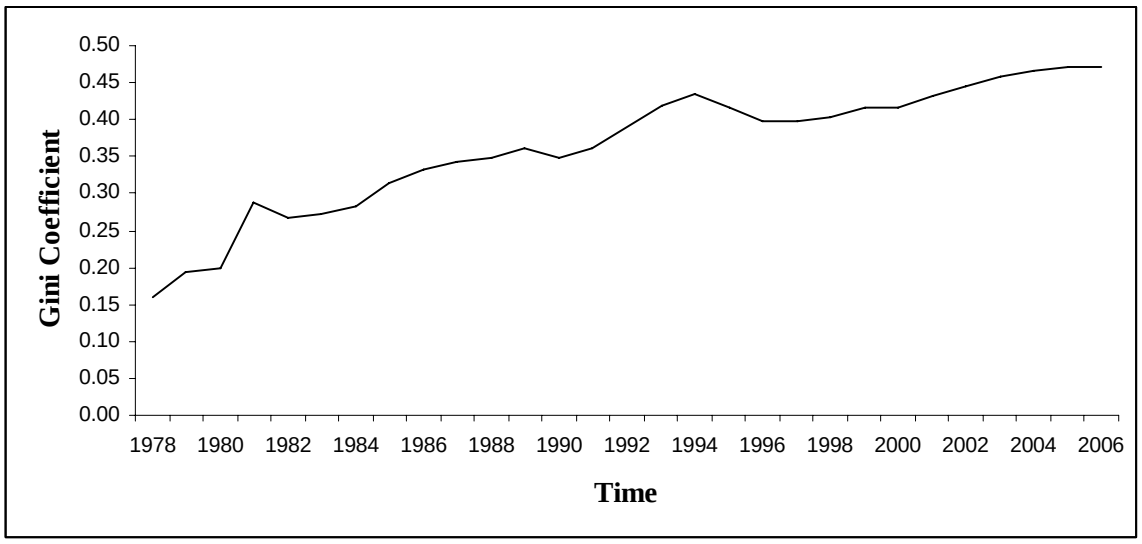

Table 1 Results of ADF unit root test

	Constant Only				Constant and Slope			
	Levels		1st difference		Levels		1st Difference	
Gini Index	-1.4975	[3]	-3.2848**	[1]	-2.6883	[1]	-3.6977**	[1]
Per Capita GDP Growth	-4.1084***	[5]	-4.8473***	[1]	-3.8892**	[5]	-4.7620***	[2]
Trade/GDP Ratio	-0.7924	[0]	-4.3783***	[3]	-1.0306	[0]	-4.5089***	[0]
FDI/GDP Ratio	-1.8761	[1]	-2.7502*	[0]	-2.0526	[1]	-3.4403*	[1]
% of G Spending on SI	-0.4516	[1]	-3.1069**	[0]	-1.0244	[4]	-3.3653*	[1]

Note: The computed t statistics for variables in levels and in first differences are presented in the Table. SI stands for the government spending on the social insurance. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively. The numbers in the brackets [ ] are the optimal lags, selected according to the Schwarz selection criterion.

Table 2 Results of the multivariate cointegration test

Hypothesis	Trace Statistic	5% Critical Value	Maximum Eigenvalue Statistic	5% Critical Value
$r \leq 4$	0.28	3.84	0.28	3.84
$r \leq 3$	7.88	15.49	7.60	14.26
$r \leq 2$	23.72	29.80	15.84	21.13
$r \leq 1$	43.05	47.86	19.34	27.58
$r \leq 0$	83.60	69.82	40.55	33.88

Estimated cointegrating coefficients normalized on the Gini coefficient

Gini Coefficient	Per Capita GDP Growth	Trade/GDP Ratio	FDI/GDP Ratio	% of Gov. Spending on SI
1	0.1271	-0.2859	-0.6404	-0.2756
	(0.136)	(0.049)	(0.281)	(0.137)

Note: r denotes the number of cointegrating vectors. The eigenvalues in ascending order are 0.0105, 0.2535, 0.4562, 0.5247, and 0.7898. Critical Values are based on MacKinnon-Haug-Michelis (1999). The optimal lag length in the cointegration test is selected according to the Schwarz selection criterion. Standard errors are presented in parentheses.

Table 3 Results of Gregory-Hansen test

	Break in intercept: No trend	Break in intercept Trend included	Full structural break
Break Date	1988	1996	1984
Minimum t-statistic	-2.2747	-3.3312	-3.1633
Critical value at 5%	-5.5600	-5.8300	-6.4100

Note: The computed minimum t test statistics and corresponding time points are presented in the Table. None of them is statistically significant.