



# Modeling income inequality and openness in the framework of Kuznets curve: New evidence from China

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## ABSTRACT

This article tests the relationship between openness and income inequality in openness Kuznets curve framework. The Auto Regressive Distributed Lag (ARDL) estimator is employed to establish the long run relationship between openness and income inequality. We add to the literature by noting that Kuznets curve fits the relationship between openness and income equality in the case of China. This evidence is new and in line with the Kuznets hypothesis that income inequality rises with the increase of openness and then starts fall after a critical point.

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## 1. Introduction

The government of China adopted a gradual policy of opening to the outside world in 1978. Since then the trade to GDP ratio raised from 8.5% to 67% and average tariff rates reduced from 49.5% to 8.5% along with 10% annual GDP growth. Indeed, this policy is one of the most important policies in the modern history of international economics which paved a way for economic growth of China. The literature shows that there is a positive relationship between trade openness and economic growth of China (Jin, 2004).

However, this economic growth and openness is accompanied with the increase in income inequality in the country. The Gini coefficient, a measure of income inequality, witnessed several peaks and troughs over the last six decades and went up from 22 in 1952 to 46 in 2009 (see Fig. 1).

The Great Famine in early years, the Cultural Revolution with transitional phase to reforms from 1966 to 1978 and opening up to trade from 1985 to 2007 produced the peaks in the Gini coefficient. On the other hand, the land reforms in early periods, post famine recovery in early sixties and rural reforms from 1978 to 1984 were the major reasons of reduction of Gini coefficient. But Gini coefficient has been taking a sharp and apparently endless rise since 1985. This was the period of

opening up to trade, foreign direct investment and higher financial development. Therefore, there is a view that the openness is one of the causes of income inequality in China. But a closer look tells that the income inequality is increasing with decreasing rate and the marginal effect of openness on Gini coefficient is decreasing over the time (see Fig. 2).

It is evident from Fig. 2 that there may be curvilinear relationship between openness and inequality. Therefore, it is possible that the openness variables may replace the economic growth in the Kuznets curve framework and income inequality may reduce as the openness reaches its turning point (Lee, 2010). The Kuznets curve postulates that the income inequality rises at the initial stage of economic growth and then improves after a certain point of economic growth. Dobson and Ramlogan (2009) and Lee (2010) note that openness may better be replaced the economic growth in the framework of Kuznets curve. In this paper, for the first time, the openness–inequality relationship is tested in the framework of Openness Kuznet's Curve for China over a time period of 1952–2009. We take five different variables to proxy the openness. This further adds to the novelty of this paper. The rationale for choosing China is quite obvious that China is perhaps the best example of the rising income inequality along with the increase in openness.

The rest of the article is distributed into five main sections. Section 2 connects the study with the previous literature on openness and income inequality nexus. In Section 3, the detailed discussion on selecting the data and construction of variables for the empirical testing is presented. The empirical model and econometric strategy have been discussed in Section 4. The empirical results have been reported in Section 5, and finally in Section 6 conclusions have been drawn.

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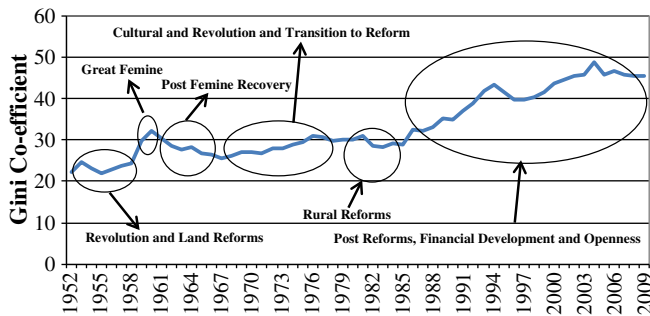


Fig. 1. Income inequality in China.

## 2. Literature review

Investigating the link between income inequality and openness is not a unique idea. It is a heated and long debated issue (Fischer, 2003). A number of studies are available in the literature which connects the income inequality and trade openness. Specifically, Wood (1997), Rama (2003), Anderson (2005) and O'Conner and Lunati (2008), discuss the recent theories and empirical evidences regarding the linkages between openness and income inequality. However, these review papers present inconclusive discussion and provide contradictory point of views on the subject.

Generally, the literature on the openness–inequality nexus provides at least three schools of thought. First, the standard trade models have a stance that the trade openness should reduce the wage gap between skilled and unskilled labors. Therefore, it should become a source of reducing income inequality (Mundell, 1957; Rybczinsky, 1955; Stolper and Samuelson, 1941). Some recent studies back this view with their empirically tested models (Ben-David, 1993; Grossman and Rossi-Hansberg, 2008; Reuveny and Li, 2003; Srinivasan and Bhagwati, 1999).

Second, on the contrary, Stiglitz (1998), Hurrell and Woods (2000), Gordon et al. (2007), and Bergh and Nilsson (2010) find that the trade openness worsens the income equality; because trade may increase disparities in returns to education and skills. It is also possible that the openness marginalizes certain cluster of people or regions. Furthermore, the openness is not complemented by development of adequate institutions and governance (Stiglitz, 1998).

Third, several studies find nonlinear relationship between trade openness and income inequality (Aghion and Howitt, 1998; Barro, 2000; Bowman, 1997; De Santis, 2002; Feenstra and Hanson, 1996; Figini and Gorg, 1999; Ghosh et al., 2000; Mahler et al., 1999, and Savvides, 1998). Importantly, Bergh and Nilsson (2010) note that different dimension of economic liberalization influence income inequality at different level of development and the results may be sensitive to the exclusion of certain countries from the sample. Similarly the results may be sensitive to the measurement of trade openness. For example, Ma and Dei (2009) note that two different types of tariff reduction have different effects on wage inequality. Fischer (2003) has shown that the type of export good determines the effects of liberalization on inequality.

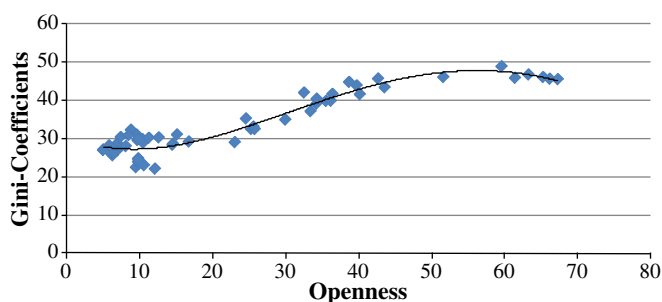


Fig. 2. Income inequality and openness in China.

The contradiction among the researchers is quite sensible; because different studies use different samples, different countries, different data and different methodologies. Since the different countries are in the different stages of development, therefore the conclusion of these studies should not be generalized for each country. Therefore, a time series analysis for a single country may provide a better framework to study the relationship. It would also allow examining the impact of different policies, development of trade relationship and other exogenous factors through time. Therefore some researchers use the time series data for several countries including China to test the openness–inequality nexus. However, according to best of our knowledge, the most of them are conducting to trace the impact of openness on the regional inequality of China (Kanbur and Zhang, 2005; Wan et al., 2007; Wei and Wu, 2003, and Xing and Zhang, 2004) and none of the studies tries to investigate the long run relationship between inequality and openness.

Thus, the current study contributes to the discussion on the estimation of long run relationship between openness and inequality in the framework of openness Kuznets curve for a rapidly growing country such as China. The obvious reason for selecting China is that it is one of the most important transitional economies that maintained the highest growth rate over the last 20 years. It is the best example of the positive connection between openness, economic growth and income inequality.

## 3. Data and variable construction

Gini coefficient is probably the most well-known measure of income inequality used in economic literature. Therefore, following the recent empirical works such as Kanbur and Zhang (2005), Liang (2006), and Ravallion and Chen (2007), the present article takes the natural logarithm of Gini coefficient as a proxy of income inequality (denoted by *gini*).

Openness is the major variable of interest on the right hand side of the regression. In order to proxy openness, several variables have been employed by the existing literature. For example, Kanbur and Zhang (2005), Wan et al. (2007) and Dobson and Ramlogan (2009) use exports plus imports to GDP ratio to measure the degree of openness. Barro (2000) and Ang (2010) point out that the trade ratios should enter positively in the income equality regression. It is a more relevant variable here in the scenario of a sharp increase in foreign trade of China over the last three decade.

However, it may be possible that change in technological progress, exchange rate and macroeconomic fluctuations reflect in the trade ratio and it would be an imperfect proxy for the policy variable (Dobson and Ramlogan, 2009). Therefore, tariff rate is more direct measure of country's openness since it is a policy variable. Kanbur and Zhang (2005) and Dobson and Ramlogan (2009) among others use tariff rates as proxy of openness. But these two studies have a slight difference. Kanbur and Zhang (2005) use effective tariff rate which is defined as the ratio of tariff revenue to total imports, while Dobson and Ramlogan (2009) use the average tariff rate. Importantly, Ma and Dei (2009) have shown that the two types of tariff reduction have completely different effects on inequality. Keeping this argument in mind, we will use both measures because they will serve to check the robustness of the results.

Rodriguez and Rodrik (1999) and Bergh and Nilsson (2010) note that the significant relationship between openness and inequality may not be robust when openness is measured using flow variables like foreign direct investment or trade to GDP ratio instead of policy variables like tariff rate. To overcome this problem, Bergh and Nilsson (2010) use the indices of overall globalization and economic globalization which are developed by Dreher et al. (2008) and Dreher (2006). The index of economic globalization includes the information of both flow variables, like trade, FDI and portfolio investment and policy variables like average tariff rates, capital account restriction or any

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