

IV Estimation of Trade and Inequality

Abstract

The debate on the merits of International Trade has been going for well over a century. Even today when there is an unprecedented wave of trade liberalization going on in the world, this debate continues. According to Edwards (1997), This debate has traditionally revolved around two questions: (i) Does freer trade result in faster economic growth? And (ii) how does freer trade affect social conditions, including income distribution? In this paper we try to tackle the 2nd question. We examine the effect international trade has on the intra country income distribution. We test of there is any empirical validity of any such linkage (between trade-GDP ratio and Gini coefficient of income inequality) via an instrumental variable estimation of cross-country regressions.

Keywords: Trade, Inequality, IV estimation, Gini Coefficient, Constructed Trade and GDP ratio.

Introduction

There has been a lot of discussion on whether trade between countries on a global level is good or bad. There are a lot of prominent economists on both sides of this debate. Intra country inequality is a good indicator of a country's prosperity. Learning how international trade affects this inequality may allow us to settle this century old debate once and for all.

Aim of the Study

It can be hard to measure a country's internal inequality in a meaningful manner. We in this paper try to overcome this problem by using ginicoefficient as a proxy for inequality. The Gini index is a measurement of the income distribution of a country's residents. This number, which ranges between 0 and 1 and is based on residents' net income, helps define the gap between the rich and the poor, with 0 representing perfect equality and 1 representing perfect inequality. It is typically expressed as a percentage, referred to as the Gini coefficient. We try to find out if more participation in global trade impact this coefficient significantly.

Review of Literature

Edwards(1997) analysis of the relationship between trade policy and income distribution using new comparative data sets strongly suggests that, for the developing countries, there is no evidence linking openness or trade liberalization to increases in inequality. These results held even while using alternate measures of trade and inequality.

Chakrabarti (2000) investigated the effect of international trade on intra-national distribution of income. He discusses merits of international debate in this light. But was unable to find conclusive evidence in a form as to solidify the position of either side of the debate.

Ghose (2001) in his very policy centric paper, has found that inter-country inequality has indeed been growing, but international inequality has been declining at the same time. The reason being that that while the growth of per capita income in a large majority of the developing economies has been slower than that in high-income industrialized economies, it has been substantially higher in a few populous low-income economies of the Asia-Pacific region.

Model and Methodology

Empirical analyses of the link between trade and income distribution become particularly challenging because of the endogenous nature of trade. This problem has been addressed in this paper by estimating the relationship between countries' Gini coefficient of inequality and trade-GDP ratio using instruments based on countries' geographic characteristics (size and proximity) and factor accumulation (physical and human capital accumulation and population growth).

The basic idea behind the empirical analysis in this paper can be summarized using a simple two-equation model. First, the average income inequality in country i is a function of international trade and other factors:

$$G_i = \alpha + \beta T_i + \varepsilon_i$$



Parmod Kumar

Lecturer,
Deptt.of Economics,
G.H.S.Govt.P.G. College,
Sujangarh, Churu,
Rajasthan

Here i is used to index countries, G_i is a measure of intra-country income inequality, T_i is a measure of international trade and ϵ_t captures other influences on its income inequality.

Second, a country's international trade is a function of its proximity to other countries and its size :

$$T_i = \gamma + \delta S_i + \phi P_i + v_t$$

Here S_i measures country i 's size, P_i is a measure of its proximity to other countries and v_t captures other influences on its international trade. Cross-country regressions of income inequality (measured by Gini coefficients) on international trade are estimated by Instrumental Variable (IV) method using Frankel and Romer's constructed trade-GDP ratio as an instrument. The constructed trade-GDP ratio (τ) is a series of values of trade-GDP ratio predicted by an equation that takes the form of 2nd equation. Frankel and Romer calculated this series for 150 countries in 1985. The residuals in the two equations, ϵ_t and v_t , may be correlated. For instance, a country's infrastructure or its government policies toward competition are likely to affect its international trade as well as its income distribution. But that does not pose any problem for IV estimation.

Data sources

Gini Coefficient data : World Development Indicators

Actual Trade-GDP Ratio : Ratio of imports plus exports to GDP(Penn World Table)

Constructed Trade-GDP Ratio (Pure Geography) : Aggregate fitted values of bilateral trade equation with geographic variables (Frankel and Romer (1999)).

Constructed Trade-GDP Ratio (Factor Accumulation) = Aggregate fitted values of bilateral trade equation with geographic variables, physical and human capital accumulation, and population growth (Frankel and Romer (1996)).

Countries Used in regression : Algeria Argentina Australia Austria Bangladesh Barbados Belgium Bolivia Brazil Bulgaria Cameroon Canada

Chile China Colombia Costa Rica Czechoslovakia Denmark Dom.Rep. Egypt Ethiopia Finland France Germany Ghana Greece Honduras India Indonesia Iran Ireland Israel Italy Japan Jordan Kenya Korea.R. Luxemborg Madagascar Malawi Mexico Morocco Nepal Netherlands New Zealand Nigeria Norway Pakistan Panama Paraguay Peru Philippines Poland Portugal Romania Rwanda South Africa Soviet Union Spain Sri Lanka Sweden Switzerland Taiwan Tanzania Thailand Tunisia Turkey Uganda UK Uruguay USA Venezuela Yugoslavia

Results

In this section we present the results of both OLS and IV regression of Log Linear Version of the equation 1.

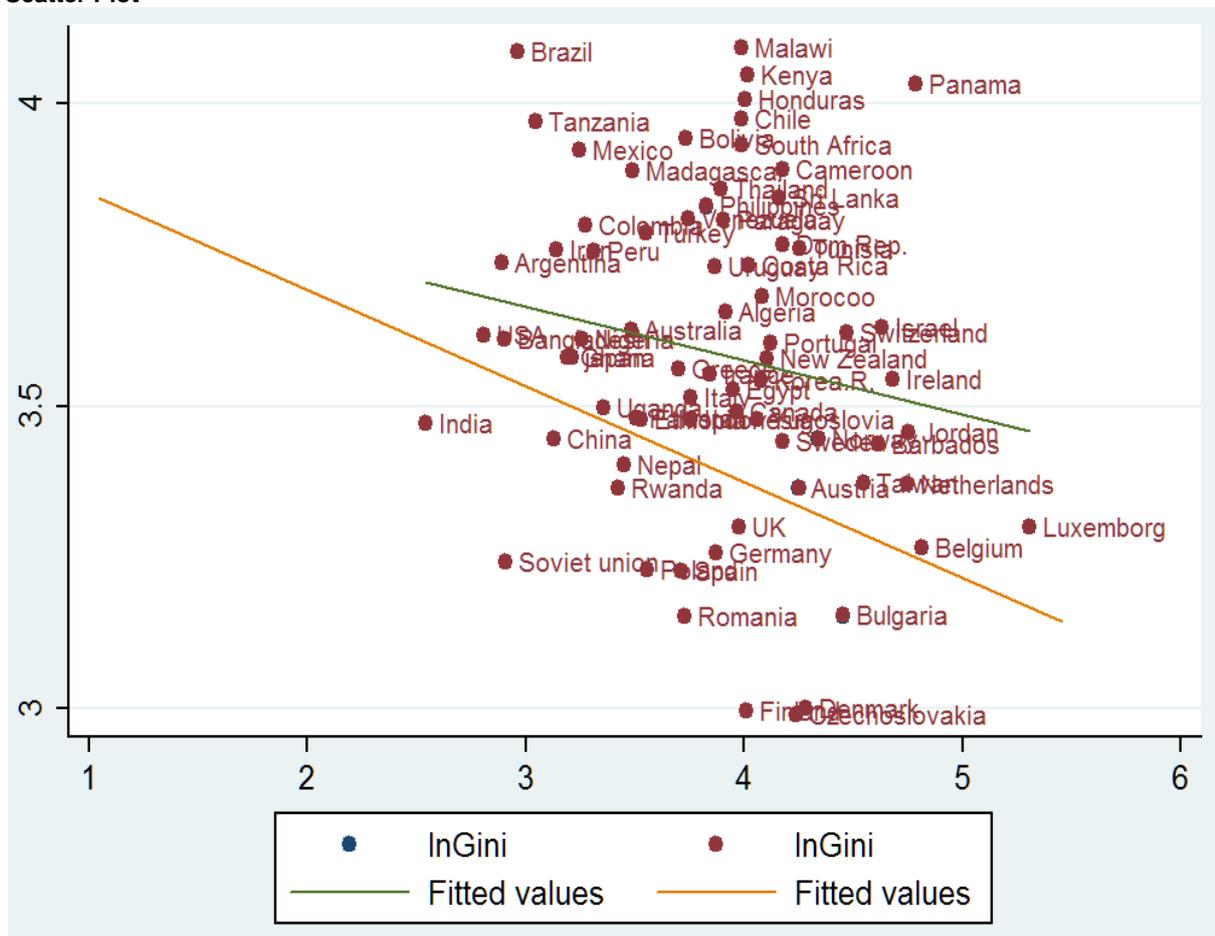
$$\text{Log}(G_i) = \alpha + \beta \text{Log}(T_i) + \epsilon_t$$

Estimation	OLS	IV
Constant	3.932719	4.51364
Log trade-GDP	-.0893582	-.2404669 *
95% confidence interval (Int)	[-.2015914 .0228749]	[-.3802233 - .1007106]***
Sample size	73	73
Adjusted Rsquared	0.04	0.03**

Inferences Drawn

1. Trade and inequality show an inverse relationship with statistically significant coefficients (both OLS and IV). So a greater world trade reduces income inequality in a country significantly.*
2. The changes in international trade can explain the changes in inequality by 3%.**
3. A one percent increase in international trade is expected to result in a 0.24%* lowering of intra country inequality.
4. We can say with 95% certainty that absolute value lies between [-0.38,-1].

Scatter Plot



This is the scatter plot and the fitted lines. Green Line corresponds to a fit line between LnGini and LnTrade.

Orange line is a fit line for LnGini and LnTau1.(IV variable, not shown in graph)

Conclusion

In this paper we investigated how intra country inequality is affected by participation in International Trade. 1980s were a time when the income inequality was very large in many countries. This was also the time when international trade was booming. We discussed the role trade played in mitigating this growing income inequality. There is no conclusive evidence so as to make one side of the debate stronger. Our Empirical analysis does reveal

that Trade had an statistically significant inverse effect on Gini coefficient of our 73 sample countries.

References

1. Edwards, Sebastian. "Trade Policy, Growth, and Income Distribution" *Economic Development And International Trade*, 1997
2. Chakrabarti, Avik. "Does Trade Cause Inequality?" *Journal Of Economic Development*, Volume 25, Number 2 December 2000
3. Ghose, Ajit K.. "Global economic inequality and international trade" *Employment Paper International Labour Office*, 2001
4. Christopher Dougherty. *Introduction to econometrics*