Studies in Economics and Business Administration
https://www.mfacademia.org/
ISSN:0081-7872
Vol. 3, No. 1, 2023

Economic Globalization and National Income Inequality: An Empirical Analysis Using Transnational Panel Data

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Abstract:

The relationship between globalization and income equality has long been a focal point of scholarly attention. This study introduces the ratio of dependence on foreign trade as a measure of globalization within a panel data model to analyze its effect on the Gini coefficient across various countries. Both the random effects model and the fixed effects model were rigorously evaluated, with the robust fixed effects model ultimately deemed the optimal approach. Empirical findings indicate that the influence of economic globalization on income distribution is multifaceted and varies significantly. Theoretically, the effects of globalization on income inequality both between countries and globally are indeterminate, contingent upon the specific circumstances of individual nations and the particular dimensions of globalization in question. Increasing income inequality between countries can lead to social unrest and international issues, underscoring the importance and practical significance of studying income inequality. Consequently, the study offers differentiated policy recommendations tailored to the unique contexts of various countries. For policymakers, selecting development strategies that best suit their nation's specific needs is crucial for fostering economic development.

Keywords:

Inequality; Globalization; Fixed Effects Model.

1. Introduction

After the Second World War, the speed of world economic integration was accelerated. With the deepening of globalization, all economic activities were gradually separated from the boundaries of a country or region. This has undoubtedly provided more channels and systems for the transnational flow of assets and made the international market develop rapidly. Although this kind of capital flow improves the efficiency of resource allocation, it also has different effects on the income distribution of various countries, negative correlation, positive correlation, and zero correlation respectively.

2. Literature review

Globalization has become an unavoidable economic trend and an important factor to support economic growth. While bringing opportunities to all countries, the income inequality brought by globalization has become a problem that all type of countries must think about together. Therefore, the study of income inequality is very important and has practical significance.The impact of economic globalization on income inequality can be narrowed or expanded. According to the different research methods used by scholars, the conclusions are also different. On the whole, globalization does promote economic development. However, in the distribution of economic development results, different types of countries distribute different benefits in this process.

The existing literature mainly estimates the impact of globalization on income inequality through four methods: (1) Using income and population data to estimate various inequality indicators, and

decomposing the overall gap for interstate and intrastate through the traditional decomposition method [1]. (2) Using long-term data to analyze the income of different countries, combining the income gap with the degree of globalization in each period, and observing the impact of globalization on income inequality [2]. (3) Regressing the cross- country data with time series data, and putting different indicators of globalization into the regression model to analyze the impact of various factors on income gap [3]. (4) Using the Shapley value decomposition method to decompose the determinants of the income gap and estimating the relative and absolute influence of these factors on the total gap [4]

3. Data Analysis

3.1. Modeling and Research Methods

The lag is generally distributed in economic activities, the changes in foreign trade are difficult to have a simultaneous impact on inequality. Hence, it takes globalization with the last period as an independent variable and current inequality as a dependent variable, and then both sides of the equation are taken as natural logarithms. There are diverse conditions in different countries so that it will be divided into five types of countries: all countries, developed countries, developing countries, oil-exporting countries, and emerging countries.

This paper uses panel data in 86 countries from 1990 to 2017 analyze whether globalization has affected inequality. This is due to panel data is a kind of commonly used data when analyzing transnational data since which could control for individual country effects [5]. Given the inequality is theoretically slow to change in a country while the GINI coefficient changes too much sometimes because of statistical deviation or other reasons, so it takes the average value of 7 years as one period.

Table 1. The explanations of variables in model 3-1.

Letter	Meaning	Feature Selection	Explanation	Data Source
I	Inequality	Gini Index	Gini index is used to represent the degree of income distribution in different countries. The higher the Gini index, the higher the income distribution inequality.	World Bank
G	Globalization	Ratio of Dependence on Foreign Trade = $\frac{\text{export} + \text{import}}{GDP}$	The higher the degree of trade dependence, the higher the degree of globalization.	World Bank
i	Countries	/	86 Countries	/
t	Periods	/	28 years and 4 periods.	/
t-1	Last periods	/	3 Periods	/

3.2. Descriptive analysis

In Table 2, among all, developing and emerging countries, there are huge gaps between the median and the average globalization level, which indicates that their degrees of globalization are more polarized in these types of countries. The globalization levels in developed countries are higher than in other types of countries. In Table 3, the average value of the Gini coefficient in oil-exporting countries is the largest while that in advanced economies is the smallest. It can be typically interpreted that income distribution in developed countries is more equal, whereas there is a wide gap in income and distribution in oil-exporting countries and emerging countries.

Table 2. Sample observations on the degree of globalization

Types of countries	samples	mean	median	min	max	standard error
All countries	344	0.583	0.455	0.057	2.661	0.425
Developing countries	148	0.462	0.377	0.057	1.684	0.309
Developed countries	112	0.909	0.836	0.241	2.661	0.464
Oil-exporting countries	28	0.341	0.341	0.119	0.620	0.110

Emerging countries	68	0.401	0.323	0.069	1.496	0.308

Table 3. Sample observations on the Gini coefficient

Types of countries	samples	mean	median	min	max	standard error
All countries	344	37.232	35.375	15.400	65.760	9.840
Developing countries	148	39.714	39.000	15.400	65.760	9.869
Developed countries	112	29.726	30.024	15.429	44.980	5.061
Oil-exporting countries	28	44.597	42.943	32.590	63.943	8.111
Emerging countries	68	44.227	43.829	28.114	63.943	8.354

3.3. Result Analysis

Table 4. The result of random effects regression (Dependent variable: nature logarithm of Gini coefficient)

	All countries(1)	Developed countries (2)	Developing countries (3)	Oil-exporting countries (4)	Emerging countries (5)
$\ln(G_{i,t-1})$	-0.612 (0.02)***	-0.055 (0.03)**	-0.073 (0.03)**	0.087 (0.05)*	0.089 (0.02)***
Constant	3.544 (0.03)***	3.370 (0.03)***	3.570 (0.05)***	3.888 (0.09)***	3.890 (0.05)***
R-Sq: overall	0.1531	0.0636	0.0088	0.0012	0.0007
Chi2-Test	12.97***	4.86**	6.24**	3.35*	17.08***
Countries	86	28	37	7	17
Periods	3	3	3	3	3
Samples	258	84	111	21	51

Note: The standard error of each coefficient is in brackets; the number above the brackets is the coefficient of the independent variable; * is the significance at the 10 percent level, ** is the significance at the 5 percent level, and *** is the significance at the 1 percent level.

The results are in Table 4 and 5. However, there are some distributional assumptions imposed in the random effects setup. Hence, it is suggested that the fixed effects model in this situation is to be preferred since different regions have diverse national conditions and it may cause some biases when using the random effects model. Meanwhile, because the heteroscedasticity in the model is significant so that it needs to estimate Heteroskedasticity-Robust Standard Error to reduce the interference of heteroscedasticity [5]. There are diverse economies, political systems, and other conditions in different countries, and hence the state fixed effects are in the model. In contrast, time fixed effects are not in the model since the number of periods is 4 so that it is unlikely to be a big trending problem causing spurious correlations. Besides, there is no evidence to prove the relationship between inequality and globalization in all countries as different types of countries have various development situations.

Table 5. The result of fixed effects model through robust.

	All countries (1)	Developed countries (2)	Developing countries (3)	Oil-exporting countries (4)	Emerging countries (5)
$\ln(G_{i,t-1})$	-0.035 (0.03)	-0.050 (0.03) *	-0.088 (0.05) *	0.092 (0.03) **	0.088 (0.02) ***
Constant	3.567 (0.03) ***	3.372 (0.01) ***	3.555 (0.06) ***	3.895 (0.04) ***	3.897 (0.03) ***
Sq:within	0.0191	0.0538	0.0899	0.2159	0.3617
F-Test	1.37	3.72 *	2.84 *	9.72 **	16.33 ***
State fixed effects	YES	YES	YES	YES	YES
Time fixed effects	NO	NO	NO	NO	NO
Countries	86	28	37	7	17
Periods	3	3	3	3	3
Samples	258	84	111	21	51

In the developed countries model, the globalization level has a negative correlation with the Gini

coefficient. As the globalization degree increases by 1%, the Gini coefficient will reduce by 0.05%. This is statically significant to 10%. This can be explained by the fact that the trade between rich and poor countries may be more diverse than economists' assumptions. Also, assuming low-level workers in the developed countries tend to be more skilled than low-level workers in the developing countries, as the preference toward high-quality goods boosts due to the rising living standard in most developed countries, the demand for goods produced by low-skilled workers in developed countries will increase and so do the wages of the workers.

With regard to developing countries, the relationship between inequality and globalization is typically negative within 10% of the significance level. With the 1% growth in the degree of globalization with the last period, the current inequality level decreases by 0.08%. In order to export products of comparative advantage, the foreign capitals and local capitals set up more factors in the local state. An increasing number of farmlands are replaced by industrial lands, while wages in factories are many times higher than those in farming. This step will punish and attract farmers and unemployed workers to take part in industrial activities. Again and again, the income of people with low income will rise sharply in the process of globalization so that reducing the gap in income distribution.

For oil-exporting countries, the coefficient of model 4 in the lag period is 0.03, and the significance level is 5%. The fitting degree of the model is ideal. This shows that there is a positive correlation between the development of economic globalization and income distribution in the oil-exporting countries, which indicates that the expansion of economic globalization aggravated the domestic income distribution in this type of country.

The regression results for emerging countries show that the globalization rate has a significant positive correlation with inequality. When the globalization rate (last period) increases by 1%, the inequality level increases by 0.09%. Globalization progress changes international trade structure as more resources enter the domestic market, and producers can seek business worldwide. People owning scarce resources, the wealthy, can take advantage of earning foreign exchange through exports. With further globalization, new markets bring new capital accumulation, and the export of high skilled or high value-added products increases. Thus, the income of residents mastering high skills or capital grows faster than that of low skilled labor, leading to a widening income gap. Education is not equally accessible to all classes. Therefore, inequality aggravates as low-income groups fail to gain skills and hardly match higher classes' increasing income.

3.4. Discussion

Overall, according to the data analysis result, it is plausible that the last period of globalization has a significant effect on the current inequality in four types of countries. Notably, the growth in the current globalization level will reduce the inequality degree in developing countries and developed countries, while the growth in the current globalization level will deepen the inequality degree in oil-exporting countries and emerging countries. However, these relations in oil-exporting countries and emerging countries are stronger than in developing countries and developed countries; in other words, these relations in oil-exporting countries and emerging countries are more convincing because of the significant level. At last, although there are some limitations in the model, it will be improved gradually in future researches.

4. Policies

Income inequality has been rising globally except in developed countries. Our regression results show that there is a negative correlation between globalization and inequality in developed countries and developing countries; conversely, there is a positive correlation in emerging countries and oil-exporting countries. Therefore, the final policies are given according to the different regression results.

Developed countries should continue their trend of increasing globalization since the results indicated there is an inverse relationship between globalization and domestic inequality. The reason for the decreasing globalization rate shown in the broken line graph is the de- industrialization in most developed countries due to the switch of economic structure. Therefore, the developed

countries should reduce their rate of deindustrialization using industrial policy to maintain globalization at a steady rate. Besides, the government should continue encouraging investment in education and retraining programs by providing loans and subsidies. The improvement on human capital will reduce the negative impacts brought by technology on domestic inequality, so the supply side policy is particularly essential.

The relation of them is negative and the slope of developing economics is steeper than that of advanced economics. Hence, these countries can develop their industries of comparative advantage or resource endowment based on the H-O theory [6]. For example, some straggling countries in Africa are rich in mineral resources while large population countries in Asia have abundant labor resources, and these countries can export minerals and labor-intensive goods respectively to participate in the globalization as possible. Likewise, the receipt or participation of foreign is quite a useful way to take part in globalization. Mahembe and Odhiambo conclude that accepting international aid can help straggling countries effectively lift out of indigence and stimulates economic growth in the long run [7].

In the face of such negative effects, oil-exporting countries should optimize energy production structure and consumption structure, reduce the proportion of high energy consumption and high pollution industries (Hooker, 2002) [8]. Based on continuing to develop energy resources with abundant reserves, oil -exporting countries should attach equal importance to development and conservation (Cooper, 2005) [9].

If emerging countries remain the current trend - a positive correlation between inequality and globalization - the problem of inequality will aggravate. Fiscal policies, such as re-distributional tax policy, improvements in transparency and accountability, once appropriately assessed to reflect domestic situations, can be useful for reducing inequality [10]. Therefore, governments reallocating resources and compensating the victims through appropriate policies like subsidies and lower taxation are necessary. Most emerging countries' spending on education is less than the OECD average [11]. More investment in education is indispensable to reduce inequality. Besides, retraining programs can be provided for workers to adapt to new working requirements and environments created by globalization, avoiding structural unemployment. Raising the minimum wage is also viable to prevent low-income workers from being exploited.

5. Conclusion

In conclusion, this research has evaluated how globalization has contributed to inequality changes in 86 countries from 1990 to 2017. The results show that the last period of globalization indeed has varied impacts on the current level of inequality around the world. The growth in the current globalization level will reduce the inequality degree in developing countries and developed countries while notably deepens the income gap in oil-exporting and emerging countries due to their particular characteristics in export structure and political background. The relation between oil-exporting and emerging countries is more convincing as the regression has shown a greater significant level. In the future, the model will consider more variables and robust improvements.

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