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GLOBALISATION AND WORLD ECONOMIC POVERTY: THE SIGNIFICANCE OF HIDDEN DIMENSIONS

Hanna G. Adamkiewicz–Drwiłło
Department of Economic Sciences, Gdansk University of Technology
e-mail: had@zie.pg.gda.pl

Abstract: The aim of our research is to examine how individual dimensions of globalization affect economic poverty in the World. For this, regression models are estimated with FGT_0 or FGT_1 poverty measures as dependent variables and KOF indices of globalization as dependent variables. The poverty indices are estimated for 119 countries' income distributions assuming log-normality and using Gini estimates from the WID2 database and GDP/capita from The World Bank database for the years 1990-2005. It has turned out that the "partial" impact of selected dimension of globalization on poverty is either linear or nonlinear, ceteris paribus. The nonlinear impact is of the U-shaped form or the inverted U-shaped form. Our results contradict some typical 'linear' findings when poverty measures are regressed only on one dimension of globalization. In other words, when some crucial dimensions of globalization are neglected in regression analysis the conclusions about impact of globalization on world poverty could be misleading.

Keywords: globalisation, poverty, world distribution of incomes

INTRODUCTION

The aim of the study is to obtain an answer to the question: Does globalisation and its components (dimensions) affect economic poverty in the world, and if so, in what manner?

Assuming that poverty is identified on the basis of an absolute poverty line, the above issue is explained by the following two hypotheses:

Hypothesis 1. The higher the general level of globalisation, the smaller the scale and depth of world economic poverty.

Hypothesis 2. The multi-dimensional approach reveals that the growth of globalisation in a single dimension initially reduces, and subsequently increases both the scale and depth of poverty, *ceteris paribus*.

Assuming that poverty is identified on the basis of a relative poverty line, the above-stated questions may be answered as follows:

Hypothesis 3: As globalisation grows, the scale and depth of world poverty progress along a bell-shaped curve.

Hypothesis 4. The multi-dimensional approach reveals that the influence of globalisation in single dimensions on the scale and depth of poverty is either linear or non-linear (U-shaped or bell-shaped), *ceteris paribus*.

The studies are encouraged by a number of circumstances. In political disputes between the supporters and opponents of globalisation, poverty assessments are important arguments. Moreover, it turns out that the evaluations of the influence of globalisation on world poverty tend to be radically different.

Ravallion (2010) points to three major causes of these discrepancies. The first one is the ambiguity of poverty identification, resulting from the use of different poverty lines, and the second one is the incomparability of the used statistical data in the analysis of poverty. The third cause, according to Ravallion, is the diversity of methodologies in studying poverty and globalisation.

The analysis presented in this paper reveals an additional cause consisting in the omission of important dimensions of globalisation. If a researcher is interested in the influence of just one selected dimension of globalisation on poverty, they may arrive at completely different conclusions than the ones they would have reached by taking into account more dimensions. The problem is well known to econometrics [Maddala, 2008, pp. 199-201].

The further structure of the paper is as follows. The second part provides a description of the methods used and the sources of data. The third part presents the results of empirical research on the relationship between economic poverty and dimensions of globalisation. Part four of the paper contains conclusions.

RESEARCH METHODOLOGY AND SOURCES OF STATISTICAL DATA

The fundamental difficulty in studying the influence of globalisation on economic poverty is the absence of data concerning national revenue distribution, allowing the estimation of poverty measures. The World Bank does publish evaluations of these indexes, but they are hardly credible, as they are calculated using incomparable statistical data. For this reason, the presented study employs the author's own approach, in order to obtain credible assessments of poverty in the global distribution of revenues.

It may be assumed that revenues in individual countries are subject to two-parameter log-normal distribution $\Lambda(\mu,\sigma)$ [Sala-i-Martin, 2006]. The unknown parameters μ and σ may be estimated on the basis of identity:

$$x = \exp\left\{\mu + \frac{\sigma^2}{2}\right\} \tag{1}$$

$$G = 2\Phi\left(\frac{\sigma}{\sqrt{2}}\right) - 1 \tag{2}$$

[Kleiber, Kotz, 2003, p. 117], where G refers to Gini index, $\Phi(\cdot)$ refers to the standardised normal distribution, and mean x refers to GDP per person.

As poverty measures, two indexes FGT_0 and FGT_1 will be employed, from the FGT_α family, defined as follows:

$$FGT_\alpha = \frac{1}{n}\sum_{j=1}^{n}\left(\frac{z - x_j}{z}\right)^\alpha I(x_j < z) \tag{3}$$

with z referring to the poverty line, $x_1,\ldots,x_n$ to revenues in a society composed of n persons, and the indicator function $I(x_j<z)$ amounts to 1 if the condition $x_j < z$ is met, and zero, if the condition is not met [Foster, Greer, Thornbecke, 1984].

If $\alpha = 0$,FGT_0 equals the fraction of the poor, and measures the scale of poverty. On the other hand, if $\alpha = 1$,FGT_1 measures the depth of poverty or the degree of impoverishment of the society as a whole.

It can be easily show that in a log-normal distribution, the measures of poverty FGT_0 and FGT_1 respectively amount to:

$$FGT_0 = \Phi\left(\frac{\ln z - \mu}{\sigma}\right) \tag{4}$$

$$FGT_1 = \Phi\left(\frac{\ln z - \mu}{\sigma}\right) - \frac{x}{z}\cdot\Phi\left(\frac{\ln z - \mu - \sigma}{\sigma}\right) \tag{5}$$

After estimating the poverty measures FGT_0 (4) and FGT_1 (5) with respect to each country separately, the scale and depth of poverty in the global revenue distribution will be calculated as weighted means, weights being the given country's share in world population.

Gini index evaluations were mostly obtained from the WIID2 database. In order to achieve the maximum comparability, the analysis was limited to countries where the Gini index was estimated on the basis of revenue data obtained from surveys covering the entire territory and population of a given country. In the case of countries where time series of Gini indexes contained gaps, interpolations were performed using polynomials of the adequate-order.

Eventually, 119 were selected for the analysis[1]. The research period covered the years 1990-2005. The total number of people living in the selected countries under analysis was a very large part of the world population as a whole, in the order of 88-93%.

The data on GDP per capita were taken from World Development Indicators reports 1990-2005. They are expressed in international USD (purchasing power parity included) in fixed prices for 2005.

Two versions of poverty lines were adopted as bases for calculating poverty indexes. In version *a* it was the absolute poverty line *z* = 2$per day per person (730$ per day per person). In version *b* it was the relative poverty line amounting to half of the world's average revenue: *z* = GDP per capita/2. Correspondingly, poverty indexes FGT_{0a}, FGT_{0b} were calculated, measuring the scale of poverty as a percentage of the poor, and indexes FGT_{1a}, FGT_{1b}, measuring the depth of poverty, or impoverishment of society as a whole.

Globalisation in world countries was measured using KOF indexes presented in reports for 1990-2005 [Dreher et al. 2008]. The following symbols were adopted:

OGI - Overall Globalisation Index

Economic globalisation indices:

- *AFL- Actual Flows,*
- *RES- Capital Account Restrictions,*

Social globalisation indices:

- *PER -Personal Contacts,*
- *INF -Information Flows,*
- *CUL-Cultural Proximity,*

Political globalisation index:

- *POL*

Globalisation indices concerning the world as a whole were calculated as unweighted arithmetic means.

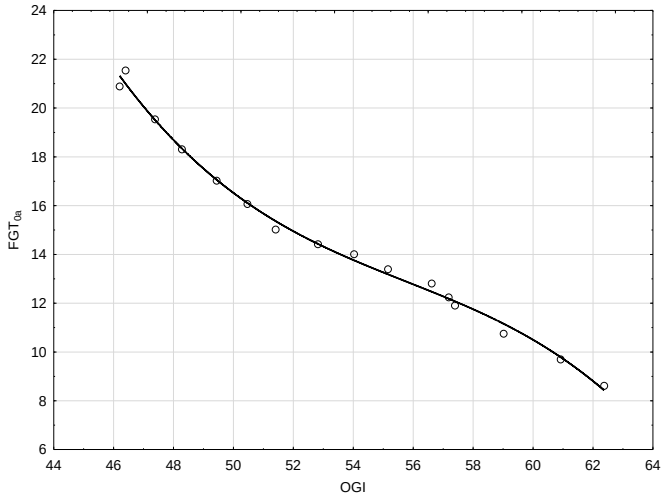
RESULTS

The choice of the poverty line (absolute or relative) may determine the assessment of the influence of globalisation on the scale of world economic poverty. Using the United Nations' absolute poverty standard, designed mainly for the analysis of developing countries, shows that as globalisation progresses, the scale of world economic poverty decreases (Fig. 1) A totally different conclusion

[1] A detailed description of the data interpolation process and the produced results were presented in a study by Kot and Adamkiewicz-Drwiłło (2013).

may be reached when using the relative poverty line applied to developed countries (Fig. 2).

Figure 1. Globalisation and the scale of world poverty (absolute poverty line)



Source: own study

Figure 2. Globalisation and the scale of world poverty (relative poverty line)

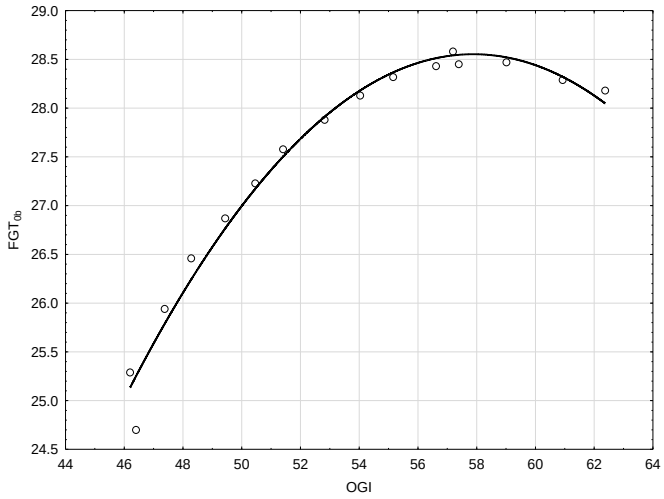


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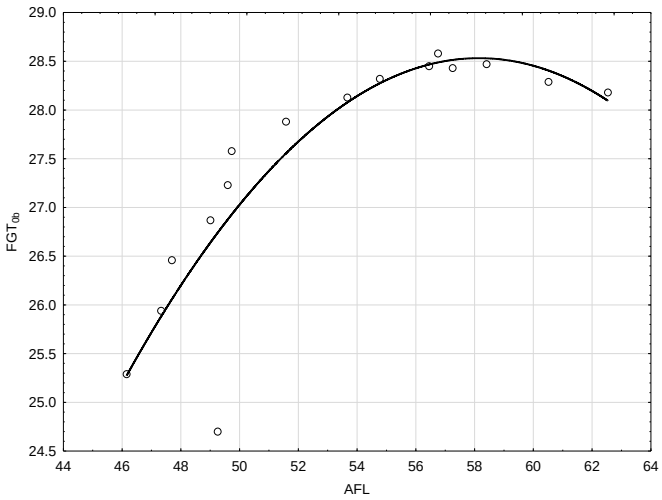
Figure 3 illustrates the influence of actual financial leverage (AFL) on the scale of world poverty (relative poverty line).

Figure 3. Influence of a single dimension of globalization on the scale of poverty



Source: own study

It is evident that facilitating cash flows initially leads to the increase of the scale of poverty, and next to its drop when the AFL index rises above 58, *ceteris paribus*.

In order to obtain the correct image of the discussed relationships, the parameters of the poverty measure regression function were estimated against specific dimensions of globalisation. The results obtained using the method of backward stepwise regression are shown in Table 1.

Table 1. FGT_{0a} as RES function

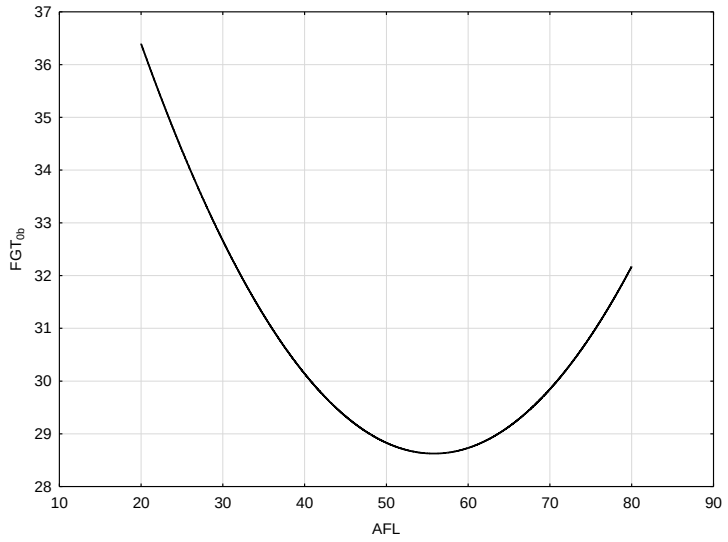
Variable	FGT_{0a}	FGT_{1a}	FGT_{0b}	FGT_{1b}
const	102.8290	29.51880	-9.08878	-8.64788
	(7.006647)	(3.131659)	(2.470877)	(1.820636)
AFL			-0.67639	-0.41988
			(0.069983)	(0.051566)
AFL^2			0.00606	0.00391
			(0.000678)	(0.000499)
RES	-2.2278	-0.49059		
	(0.235223)	(0.105134)		
RES^2	0.0174	0.00361		
	(0.002534)	(0.001132)		
PER			-0.22257	-0.14108
			(0.023819)	(0.017550)
INF	0.1093	0.03984	0.64179	0.40960
	(0.028410)	(0.012698)	(0.040387)	(0.029758)

Variable	FGT_{0a}	FGT_{1a}	FGT_{0b}	FGT_{1b}
INF^2			-0.00540	-0.00357
			(0.000348)	(0.000257)
CUL	-0.3356	-0.13642	-0.24359	-0.24400
	(0.064151)	(0.028672)	(0.068256)	(0.050294)
CUL^2			0.00486	0.00431
			(0.001018)	(0.000750)
POL			1.41230	0.80691
			(0.084820)	(0.062498)
POL^2	-0.0029	-0.00122	-0.00999	-0.00585
	(0.000383)	(0.000171)	(0.000666)	(0.000491)
R^2	0.9982	0.9976	0.9999	0.9998

Source: own study

The presented results show that in the model for FGT_{Ob}, the AFL index appears in the form of a second-degree polynomial next to four other indexes that are also in the form of second-degree polynomials, except for the PER index reflecting international personal contacts. When these additional variables have average values, fractional influence of AFL on the scale of poverty will be illustrated by a parabola described by the following equation: $FGT_{0b} = 0.00606AFL^2 - 0.67639\ AFL + 47.5$. The function is presented in Fig.4.

Figure 4. Fractional influence of a single dimension of globalization on the scale of poverty



Source: own study

The above figure reveals the relationship between AFL and poverty that is completely different that in Fig. 3. Facilitation of cash flows between countries is

initially accompanied by the decrease of world economic poverty, and subsequently by its rise, after AFL exceeds the value of 58.

FINAL CONCLUSIONS

The study produced a few important findings:

- Individual dimensions of globalisation have a varied influence on the scale and depth of world economic poverty. Results given in Table 1 show that for each poverty line, there is a separate set of factors. Nevertheless, within a given poverty line, the same sets of factors determine both the scale, and the depth of poverty.
- The influence of globalisation – in its individual dimensions – on the scale and depth of poverty is non-linear.
- Disregarding important dimensions of globalisation may lead to incorrect conclusions about its influence on world economic poverty.
- All four hypotheses presented in the paper have been confirmed.

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