

# SUSTAINABILITY OF ECONOMIC GROWTH AND INEQUALITY IN INCOMES DISTRIBUTION

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*The problem of inequality in incomes distribution is a present one, much discussed. Economic growth is considered an essential force to reduce the level of poverty by increasing the labor demand and finally the wages within the economy. But the extent to which poverty is reduced as a result of economic growth depends mostly on the initial inequalities in income and on how the distribution of income changes with economic growth. A lot of researches are focused on studying the evolution of inequality in incomes distribution and others have attempted to explore the relationship between income inequality and economic growth. There are also studies which try to identify the main factors which have impact on inequality in incomes distribution. The objective of this study is to put in discussion another possible factor that affects the variability on inequality of incomes distribution – economic growth variability. As background research, until now, we did not find any studies which are investigating this possible relation between inequality of incomes distribution and economic growth variability. To provide some empirical evidences for a positive impact of social output volatility on inequality of incomes' distribution we are involving a small sample of 27 developing countries for an observation time span between 1995 and 2006. The values of the Gini coefficient reported in World Income Inequality Database are used as dependent variable. As a first step in testing our research hypothesis, we are involving a static panel data model with pooled ordinary least squares (OLS), fixed effects (FE) and random effects (RE) estimators. The F statistics tests the null hypothesis of same specific effects for all countries. If we accept the null hypothesis, we could use the OLS estimator. The Hausman test can decide which model is better: random effects (RE) versus fixed effects (FE). The FE model was selected because it avoids the inconsistency due to correlation between the explanatory variables and the country-specific effects. For a robustness assessment, we also apply the so-called GMM-System estimation. According to our results, an increase in the volatility of the social output (a decrease in the sustainability of the growth processes) leads to a greater inequality in incomes distribution. Such outcome appears to be robust to the changes in estimation methodology.*

*Keywords: inequality, inequality in incomes distribution, inequality factors, economic growth, economic growth volatility,*

*JEL Classification: O15, Q01*

## **I. Introduction**

Inequality is a feature of contemporary society which has lately led to the initiation of extensive debate on how it should be addressed. Themes are diverse but can be grouped in two directions – one to address the level of inequality and the other aiming the factors that influence the level of inequality. As follows:

– *inequality is positive, negative or both depending of the circumstances.* If it is positive should be increased and if negative should be eradicated. Or should we find an optimal level of inequality – the duality case. Moreover, *if the level of inequality has an influence on economic growth* to what extent is that level;

- *is there a relationship between the dynamics of economic growth and inequality*. How the economic growth and why not, its fluctuation correlates with the level of inequality. Why first of all a relationship with economic growth? Because economic growth is generally accepted as an indicator of welfare growth, while inequality as an indicator of social security which is being reflected indirectly, in many countries, by the issue of eradication/reduction of poverty;
- in what way global economic growth was passed over the regions/states. In recent years economic growth led to an increase or decrease in inequality between states. As a phenomenon, inequality has the same trend or has been manifested differently depending on the degree of development of states (developed, developing, and underdeveloped);
- in what way economic growth of states has impacted the members of their populations. There was a decrease, continuity, or an increase of inequality. The conclusions differ depending on the degree of development of states (developed, developing, and underdeveloped);
- what *other factors* influence the level of inequality, and what is the place, based on importance, of the economic evolution (increase / decrease / economic fluctuations) among them.

Without proposing to sentence the issues raised we will make a short review of the literature to point out a few opinions and research on these issues.

A lot of researches are focused only on studying *the level and the evolution of inequality* in incomes' distribution. Many analysts claim that world income inequality fell sharply in the second half of the 20<sup>th</sup> century especially because of globalization (Omerod 2000: 42-45; Wright 2000: 34-38; Wolf 2001: 25). There are also opinions that cross-country income inequality is rising (Wade 2001). After using seven different popular indexes for global income inequality estimation Xavier (2002) concluded that in general during the last two decades within countries disparities have increased slightly, but at cross-country level they have declined substantially.

Regarding the *desired inequality level*, an increase is driven by the worsening situation of the poor or by the improvement situation of the rich. If the first situation is undesirable, being a potential promoter of social tension and political instability, the second one is disputed, the general opinion being that an excessively equal income distribution can be bad for economic efficiency.

From the point of view of the *relation between inequality level and economic growth*, some studies suggested that countries with a more equal income distribution tend to have higher levels of income (Galor and Zeira 1993, King and Levine 1993, Banerjee and Newman 1993, Persson and Tabellini 1994, Aghion and Bolton 1997, Galor 2000 etc.; after Tabassum and Majeed 2008: 727-743).<sup>19</sup> Forbes (Forbes 2000: 869) concludes that over short and medium time intervals, increases in inequality tend to precede increases in growth. He emphasizes that these estimates do not directly contradict the previously reported long-run negative relationship across countries. Later, Tabassum and Majeed (2008: 727-743) concluded that it might be possible that more inequality facilitates economic growth for a short time period but overtime, it has strong negative effect on economic growth due to credit market imperfection.

Based on a bigger range of data Barro (2000: 5-32) found that the empirical results are sensitive to the specific choice of sample of countries. In poor countries higher inequality tends to slow down growth and in richer places encourage growth. The same conclusion was made by Castelló-Climont (2007). From this perspective Subarna and Heyse (2006) concluded that developing countries with higher income inequality do not grow at a slower rate than developing countries with a more equal income distribution.

A lot of researches approach the problem from the reversed perspective – *the relation between economic growth and inequality* (how economic growth affects the level of inequality). Kuznet (1955: 1-28) suggested that, at low levels of per capita income, inequality increases in the initial

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<sup>19</sup> The first country that notified the European commission was Great Britain, on 24<sup>th</sup> November 2011, then Ireland on 15<sup>th</sup> December, on 21<sup>st</sup> December Germany, followed by Belgium, Luxembourg, Malta, Austria, France and Nederland on 22<sup>nd</sup> and 23<sup>rd</sup> December 2011.

phase of development and then decreases in the course of development. Later research, based on other data, found no evidence for Kuznets hypothesis (Deininger and Squire 1997: 38). Recently García (2007) concluded that unlike the Kuznets hypothesis of the 1950s, we can-not expect the growth process to autonomously bring about a reduction of inequality – “redistribution will remain a policy concern even in affluent societies”.

From the literature review we can conclude that the empirical findings are largely inconclusive, so it cannot be stated with certainty the different hypothesis. In general, the inconsistency of the results is put mostly on data quality, limited availability of data, period length, sample selection and estimation technique.

There are also studies which try to identify *the main factors which have impact on inequality in incomes' distribution*. Dobrotă (1997: 273) enumerates among causes: inequality in wealth, differences in ability, differences in attitude, different qualifications, different number of hours worked, the different positions on goods markets, discrimination, the degree in which government is involved in redistributing income, unemployment, etc.. Examining the long-run determinants of income inequality Roine et al. (2008) found that economic growth disproportionately benefits “the rich”; financial development is also significantly pro-rich, particularly in the early stages of a country’s development; openness to trade has no clear distributional impact; tax progressivity significantly reduces top income shares; government spending has almost no effect on inequality at all. Afonso et al. (2007) found that public policies significantly affect income distribution, notably via social spending, and indirectly via high quality education/human capital and via sound economic institutions. Hesmati (2004) studying the different factors that affect the global income inequality concludes that the factors having the highest impact on inequality across countries are political and capital market factors, and within-country inequality land reform, expanding education and active regional policy, and that the within country redistribution has little impact on the global inequality. Kaasa (2003) grouped the factor described in the literature into five groups: economic growth and the overall development level of a country, macroeconomic factors, demographic factors, political factors, historical, cultural and natural factors.

In the following study we want to put in discussion another possible factor that affects the variability of inequality of incomes distribution – economic growth variability. As background research, until now, we did not find any studies which are investigating this possible relation between inequality of incomes' distribution and economic growth variability.

## II. Data and methodology

For this analysis we looked at a small sample of 27 developing countries for an observation time span between 1995 and 2006. For these countries we took into consideration the values of two indicators: GDP and Gini coefficient. The GDP values were obtained from the “World Development Indicators” of the World Bank and are used to reflect the output volatility. For the description of inequality we use the values of the Gini coefficient reported in “World Income Inequality Database” of United Nations, which is one of the most popular representations of income inequality. To study the correlation between the proposed indicators as methodology we used a descriptive model in which the output volatility is the independent variable and the values of the Gini coefficient are the dependent variable. A formal description of our research hypothesis can be synthesized as:

$$GINI_{i,t} = \beta_0 + \beta_i X_{i,t} + \delta_t + \eta_i + \varepsilon_{i,t} \quad (1)$$

Where:

- the dependent *Gini Index* variable is linked to a set *X* of the considered explanatory variables;
- $\eta_i$  is the unobserved time-invariant specific effects;
- $\delta_t$  captures a common deterministic trend;

–  $\varepsilon_{it}$  is a random disturbance assumed to be normal, and identical distributed (IID) with  $E(\varepsilon_{it})=0$ ;  $\text{Var}(\varepsilon_{it})=\sigma^2>0$ .

As a first step in testing our research hypothesis, we are involving a static panel data model with pooled ordinary least squares (OLS), fixed effects (FE) and random effects (RE) estimators. The F statistics tests the null hypothesis of same specific effects for all countries. If we accept the null hypothesis, we could use the OLS estimator. The Hausman test can decide which model is better: random effects (RE) versus fixed effects (FE). The FE model was selected because it avoids the inconsistency due to correlation between the explanatory variables and the country-specific effects. For a robustness assessment, we also apply the so-called GMM-System estimation. The GMM-System methodology – as proposed by Arellano and Bover (1995: 29-51), Blundell and Bond (1998: 115-143) and Windmeijer (2005: 25-51) – is involved because estimators like fixed and random effects, IV or standard GMM may yield to biased results. Also, since a small panel sample may produce “downward bias of the estimated asymptotic standard errors” in the two-step procedure (Baltagi 2008: 154) we use the “Windmeijer correction” for the estimated standard errors. More exactly, Windmeijer (2005: 25-51) observes that part of downward bias which can appear for the standard errors in small samples is due to extra variation caused by the initial weight matrix estimation being itself based on consistent estimates of the equation parameters. In order to correct this bias, it is possible to calculate bias-corrected standard error estimates which take into account the variation of the initial parameter estimates. We employ a version of this correction applicable for GMM models estimated using an iterate-to-convergence procedure.

The GMM-System tries to simultaneous estimate the Equation 1 together with a re-specification designed to eliminate the country-specific effects by using first differences of the involved variables as:

$$\Delta GINI_{i,t} = \beta_i \Delta X_{i,t} + \delta_t + \eta_i + \Theta \Delta Z_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where:

–  $Z$  is a set of instruments for the dependent and explanatory variables.

The system-GMM approach estimates equations (1) and (2) simultaneously, by using lagged levels and lagged differences as instruments. The presence of both lagged levels and differences is justified by Arellano and Bover (1995: 29-51) and Blundell and Bond (1998: 115-143) which showed that lagged levels can be poor instruments for first-differenced variables, particularly if the variables are “persistent”. For comparison purposes, we are reporting the results of a dynamic GMM (Arellano and Bond 1991: 277-297).

### III. Empirical results

After applying the Hausman test we reached the results reported in Table 1. The values of the Hausman tests confirm the viability of the inclusion of the fixed effects. It appears that the level of GDP is positive and statistic significant associated with the *GINI* index.

Table 1. Inequality in incomes distribution and economic output volatility: a static panel data model

Explanatory	Fixed Effects	t-Statistics	Significance
GINI(t-1)	0.24	4.05	***
Real GDP volatility (10 years variance coefficient – standard deviation / average)	0.26	2.16	**
Cross-section <i>F</i> test	6.23 (p=0.00)		
Cross-section <i>chi-square</i>	144.79 (p=0.00)		
Period <i>F</i> test	2.63 (p=0.00)		
Period <i>chi-square</i>	28.84 (p=0.00)		
Cross-section / Period <i>F</i>	5.68 (p=0.00)		
Cross-section / Period <i>chi-square</i>	173.40 (p=0.00)		
R <sup>2</sup>	0.90		
Observations (balanced)	297		
t-statistics (heteroskedasticity corrected) in round brackets. ***/**/*- statistically significant, respectively at the 1%, 5%, and 10% level.			

Source: made by authors

Table 2 shows the results of the extended model. The most important result is that the output volatility variable remains positive and statistically significant, displaying some robustness to the changes in methodology. However, the estimation of relative importance of output volatility to be sensitive to such changes and the statistical significance decline in the GMM-System framework.

Table 2. Output volatility and incomes inequality: a GMM-System and dynamic GMM estimation

Explanatory	Dynamic GMM	GMM-System
GINI (t-1)	0.07*** (6.90)	0.74*** (4.57)
Real GDP volatility	0.18*** (5.02)	0.21* (1.65)
M1		-2.18 (0.03)
M2		0.56 (0.57)
Sargan	0.54	1.00
Observations (balanced)	270	270
t-statistics (heteroskedasticity corrected) are in round brackets. The null that each coefficient is equal to zero is tested using the second-step robust standard errors. ***/**/*- statistically significant, respectively at the 1%, 5%, and 10% level.		

Source: made by authors

M1 and M2 are tests for first-order and second-order serial correlation in the first-differenced residuals, asymptotically distributed as  $N(0, 1)$  under the null hypothesis of no serial correlation (based on robust two-steps GMM estimators). Sargan is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$ , under the null of instruments' validity (two-steps estimators). White period instrument weighting matrix and White period standard errors & covariance (no degree of freedom correction) are used for dynamic GMM.

#### IV. Conclusion

We can conclude, according to our results, that social output volatility has a positive impact on inequality of incomes' distribution. The results clearly indicate that an increase in the volatility of the social output (a decrease in the sustainability of the growth processes) leads to a greater inequality in incomes' distribution.

The clear observation that spans is that for a developing country to have a sustainable development it must make efforts not only to increase its GDP but also to maintain a continuous trend of its increase. It matters not only the level achieved but also how it is achieved. Although in a given period of time the economy shows permanent positive results in GDP terms, if it has variations, although it remains positive, the country development is not a sustainable one from the point of view of inequality evolution.

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