Globalization, Poverty and Role of Infrastructures

By Alastaire Sèna ALINSATO†

Abstract. The aim of this paper is to complement the theoretical and empirical literature on the globalization-poverty nexus. Based on a simple model of social welfare, the paper demonstrates that the different types of globalization have different effects on social welfare. The main empirical findings suggest that globalization contributes to poverty reduction but with a larger magnitude in the presence of infrastructures instruments. It follows that good quality of infrastructure is a necessary condition for a higher globalization effect on poverty reduction. The empirical evidence also supports the idea that globalization driven by the reduction in information access cost and the removal of barriers to their dissemination has the greatest impact on poverty reduction. Finally, the study discusses the economic policy implications and suggests in particular investment in adequate ICT and energy infrastructures for globalization to contribute significantly to the reduction of poverty.

Keywords. Globalization, poverty, Infrastructure, Instrumental variables.

JEL. H54, I32, F15, F41, O15.

1. Introduction

The global economy has experienced over the last decade a process of globalization characterized by an increasing degree of market opening and greater integration between countries (Nissanke & Thorbecke, 2008). Despite this strong globalization of economies, its impact on poverty reduction remains undetermined, making the impact of globalization on poverty as key debate in both academic and political circles.

Globalization is supposed to impact poverty through multiple channels that affect wage levels, employment, technology transfer, production and household’s consumption (Goldberg & Pavcnik, 2004). Nissanke & Thorbecke (2008) and Bourguignon (2004) in particular show that globalization directly impacts poverty through changes in relative prices and indirectly through economic growth. Trade reforms can positively affect the well-being of the poor by changing relative prices to the consumers and producers (Harrison & Macmillan, 2006). Davis and Mishra (2004) develop a model in which they show that if the imported goods and those produced by the poor are not substitutable, then open up trade by reducing tariffs on imports will help increase the real income of the poor. This effect associated with an increase in prices of goods produced by the poor (agricultural products) will contribute to a significant reduction of poverty. However, the gains from globalization to the poor are not that straightforward. Important divides are registered in the literature leaving the debate opened (Asongu, 2013; Round, 2007; Neutel & Heshmati, 2006; Kose et al, 2006; Sinszindre 2005; Agenor 2002).

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Some of these divides can be explained by the non-uniqueness of globalization. Globalization is a polysomic concept which in practice can take many forms. Moreover Harrison (2007) points out, that the effect of globalization on the poor depends on how it’s been measured. Globalization understood as volume of exports and FDI flows would be beneficial for the poor while globalization understood as tariffs disarmament and volume of imports would be detrimental to poverty.

Chen and Ravallion (2004) and Round (2007) confirms the point by showing that many countries have implemented trade reforms, economic liberalization measures, privatization and deregulation policies and are missing the positive fallout of globalization on poverty. This ambivalent effect depending on the nature of the globalization has fueled skepticism among public policymakers and stimulated debates among researchers on the suitable policies for an economy to gain from its integration to the global economy. Sindzingre (2005) Nissanka and Thorbecke (2008) and many other authors argue that globalization can have a positive effect on developing economies only in the presence of effective institutions. Thus, the effect of globalization on poverty depends on the type of political regime and the structures of the local political economy, the consistency and the reliability of market institutions (Acemoglu et al., 2001a, 2001b; Rodrik et al., 2002; Sacks & Warner, 1995; 2001).

Along with the institutions, the availability and the quality of infrastructures become an important point of the transmission of globalization to poverty. Several authors argue that infrastructures facilitate the interaction between communities and economies, and thus increase their likelihood to exchange goods and services and to take advantage of international trade (Winters, 2014; Osmani, 2005; Esfahani & Ramirez, 2003). Infrastructures support increase in income through specialization, economies of scale and ensure full participation in the global economy. The importance of infrastructure in globalization is also supported by the works of the new economic geography. The latter argues that factors such as the cost of land, cost of transport, the search for economies of scale, proximity to markets can push the geographic concentration or contrary to their dispersion (Krugman & Venables, 1990). Infrastructures for international trade are critical in that they reduce transport costs and facilitate market proximity. Consequently, the presence of transport, energy, education, irrigation, telecommunication infrastructures accelerates the transmission the globalization effects to poverty reduction (Zheng & Kuroda, 2013; Khandker & Koolwal, 2010; Golub et al., 2007).

This study seeks to participate in the debate by trying to derive the type of globalization as well as infrastructures that best suit with poverty reduction goal. The rest of the paper is organized as follows. Section 2 provides a short overview of the theoretical and empirical literature while section 3 derives a simple model of the differentiated effects of the different types of globalization on social welfare. Section 4 discusses the methodology. Our empirical findings are gathered in section 5. Section 6 contains concluding remarks.

1. Overview of theoretical and empirical literature

The first temptation to device a theoretical link between globalization and poverty began with the Stopler-Samuelson theorem, which states that trade liberalization, will lead to relative wages adjustment. When a developing country, abundant in unskilled labor opens up to international trade, real wages of the unskilled labor will gradually grow and the real wage of skilled labor will decrease. Unskilled labor being the most abundant factors in developing countries, the consequence is that the poor, generally unskilled labor will see their real wages adjusted upwards and will be better off. From this theorem many authors...
concluded that globalization would benefit the poor (Bhagwati & Srinivasan, 2002).

However, changes in the wage distribution didn’t support the Stolper-Samuelson predictions. Davis and Mishra (2006) impressively demonstrated that the Stolper-Samuelson theorem is worse than false; it is dangerous. They showed that Stolper-Samuelson holds in a case where the partner countries produce same goods or very close substitutes. However, they argue that the openness affects the poor through price. The decrease in customs duties and tariffs in connection with the trade openness results in a decrease in prices of goods poor people import and if the openness results in higher prices of goods produced by the poor, globalization will then be beneficial to the poor.

The relative competitiveness of the sector in which the poor are employed can also explain the extent to which globalization can affect poverty. Based on a specific-sector framework the proponents of this analysis argue that openness will initially exert a downward pressure on the prices of previously protected sectors, which eventually will result in a decline in the demand for labor. Since the labor cannot be easily relocated, it’ll finally result in poverty increasing (Harrison, 2007).

Easterly (2007) analyzing the link between globalization and poverty in a neoclassical growth context shows that globalization can have two effects on the poor. In a situation of different factor endowments but similar productivity, globalization by promoting free movement in the production factors will lead to an equalization of capital return. This would benefit poor countries that receive important influx of capital. However, if the income difference is rather caused by an exogenous factor other than the difference in factor endowments, globalization in the best case will have no effect on the poor; and in the worst case, will worsen poverty, due to capital movement from the low return to the higher return.

In all, on a theoretical basis and under particular conditions, arguments supporting positive effect of globalization on poverty are legion. The transmission channels of globalization to poverty include economic growth, capital accumulation, prices, wages and productivity.

The empirical verifications of these theoretical predictions are rarer. The literature is quite abundant in the understanding of the inequality effect of globalization (Goldberg & Pavcnik, 2004). However, recent years have seen more active literature on this field. The main lesson learnt so far is that the opinions are divided. Harrison (2007) in its collective work 'Globalization and Poverty' 'makes an enlightening presentation of this. Globalization produces both winners and losers among the poor. However, the common trend that emerges from the various studies suggests that the effect changes depending on the type of globalization or how globalization is measured.

It is widely reported in the literature that globalization benefits the poor as long as it relates to exports and FDI flows. Tests in many regions of the developing world revealed that (Topalova, 2007; Goh & Javorcik, 2007; Balat & Porto, 2007; Hanson, 2007; Goldberg & Pavcnik, 2007). At the same time, financial globalization has proven harmful to poor people in the sense that it results in much more income volatility for poor countries. The latter in absence of strong institutions and appropriate complementary policies are more vulnerable to financial crises (Bhagwati & Srinivasan, 2002).

The empirical literature also puts a major emphasis on the role of institutions and complementary policies especially on social safety net and inequality reduction policies to enable poor people to share the benefits of globalization (Bhagwati & Srinivasan, 2002). Sound infrastructures policy plays also a key role of leverage effect in the transmission of globalization to poverty (Winters, 2014; Zheng & Kuroda, 2013; Khandker & Koolwal, 2010; Osmani, 2005).
Overview, globalization could benefit poor people depending on whether the emphasis is put on the right type or nature of globalization or on the appropriate infrastructures – physical or institutional – for its various effects on poverty reduction depend on its main manifestation. Similarly, sound institutions and inequalities reduction policies associated with policies in strengthening infrastructural capacity have proven necessary for the transmission of globalization to poverty reduction.

2. Methodology and Data

2.1. Methodology.

The methodology of the paper is organized into two stages. In the first stage we provide a simple derivation of the differential effects of the various manifestations of globalization on poverty and in a second stage, we provide an empirical test of the effect of different measures of globalization on poverty.

2.1.1. The differentiated impact of globalization on social welfare

We start from the assumption that the phenomenon of globalization is not unique but multiple. Globalization understood as increasing preponderance of financial, economic, environmental, political, social and cultural processes worldwide, goes beyond the traditional flow of goods and services to cover the aspects of capital flows, technology transfer, knowledge and information sharing to migration. This complexity explains the many different ways globalization is measured in the literature (Harrison, 2007; Bardhan, 2006). In the following, we call those different ways, the different manifestations, natures or types of globalization.

For simplicity sake, we assume that there are two different types or manifestations of globalization. The objective for the society is to maximize the welfare it derives from its participation in the global economy. Let \( q_1 \) the exchange flow associated with the globalization type \((G_1)\) and \( q_2 \) the exchange flow associated with the globalization type \((G_2)\); these could include such things as capital, information goods and services, cultural or technology flows, etc. Consider \( U(q) \) a social welfare function of the participation of the society or the country in the global economy.

\[
U(q) = \prod_{i=1}^{2} (q_i - c_i)^{\gamma_i} 
\]

(1)

with \( \gamma_1 + \gamma_2 = 1, (q_i - c_i) \geq 0 \). \( U(q) \) is increasing, concave and differentiable for \( q_i \geq 0 \).

\( c_i \) is the subsistence level of \( q_i \). \( c_1 \) and \( c_2 \) are null only if the society is completely self-sufficient or autaric. \( p_i \) is equal to the unit price \( q_i \). \( p_i \) encompasses or the social and economic cost the society bears to enjoy \( q_i \). It includes for example, the necessary investment in infrastructure, the institution building cost, and the different opportunity costs. In the literature many authors reported the importance of these to harness globalization gain (Bardhan, 2006; Timmer, 2004; UNCTAD, 2004; Bigsten et al. Durevall, 2003). We can assume that \( p_i \) depends on the level of globalization to complexity the analysis, but we prefer for the sake of simplicity of the analysis to assume that \( p_i \) is the minimum cost any country supports to enjoy globalization gain.

After linearization, the 1st order conditions give::

\[
L = \gamma_1 \ln(q_1 - c_1) + \gamma_2 \ln(q_2 - c_2) + \lambda (l - p_1 q_1 - p_2 q_2) 
\]

\[
L_{q_1} = \frac{\gamma_1}{q_1 - c_1} - p_1 \lambda = 0
\]

(2)
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\[ L_{q_2} = \frac{y_2}{q_2 - c_2} - p_2 \lambda = 0 \]  
(3)

\[ L_{\lambda} = I - p_1 q_1 - p_2 q_2 = 0 \]  
(4)

from (2) and (3) we get:

\[ \frac{y_1}{q_1 - c_1} = p_1 \lambda \]
\[ \frac{y_2}{q_2 - c_2} = p_2 \lambda \]

\[ \Rightarrow \frac{y_1}{y_2} \frac{q_2 - c_2}{q_1 - c_1} = \frac{p_1}{p_2} \]

\[ \Rightarrow p_1 y_2 (q_1 - c_1) = p_2 y_1 (q_2 - c_2) \]

\[ \Rightarrow (q_1 - c_1) = \frac{p_2 y_1 (q_2 - c_2)}{p_1 y_2} \]

\[ \Rightarrow q_1 = \frac{p_2}{p_1} \frac{y_1}{y_2} (q_2 - c_2) + c_1 \]  
(5)

and

\[ q_2 = \frac{p_1}{p_2} \frac{y_2}{y_1} (q_1 - c_1) + c_2 \]  
(6.1)

(5) and (6.1) in (4) gives

\[ I = p_1 q_1 + p_2 \left[ \frac{p_1}{p_2} \frac{y_2}{y_1} (q_1 - c_1) + c_2 \right] \]  
(6.2)

\[ I = p_1 q_1 + \frac{p_2}{p_1} \frac{y_2}{y_1} p_1 (q_1 - c_1) + p_2 c_2 \]  
(6.3)

\[ \Rightarrow I - p_2 c_2 = p_1 q_1 + \frac{y_2}{y_1} p_1 (q_1 - c_1) \]  
(6.4)

\[ \Rightarrow I - p_2 c_2 = p_1 q_1 + y_2 \left( \frac{p_1 q_1}{y_1} - \frac{p_1 c_1}{y_1} \right) \]  
(6.5)

Replacing \( y_2 = 1 - y_1 \) in (6.5) we get:

\[ \Rightarrow I - p_2 c_2 = p_1 q_1 + \frac{p_1 q_1}{y_1} - \frac{p_1 c_1}{y_1} - p_1 q_1 + p_1 c_1 \]  
(6.6)

Multiplying (6.6) by \( \frac{y_1}{p_1} \) gives:

\[ \frac{y_1}{p_1} (I - p_1 c_1 - p_2 c_2) = q_1 - c_1 \]  
(7.1)

\[ \Rightarrow q_1^* = c_1 + \frac{y_1}{p_1} (I - p_1 c_1 - p_2 c_2) \]  
(7.2)
\[ q_2^* = c_2 + \frac{1 - \gamma_1}{p_2} (I_p c_1 - p_2 c_2) \]  

Equations (7.2) and (7.3) represent the equilibrium demands of exchange flows associated with types \( G_1 \) and \( G_2 \) of globalization. \( (I_p c_1 - p_2 c_2) \) can be interpreted as the residual income after financing the minimum and consumption of \( c_1 \) and \( c_2 \). \( q_1^* \) and \( q_2^* \) represent the “additional exchange flow” associated with \( G_1 \) and \( G_2 \). These quantities are negatively correlated with the price and positively correlated to the importance of the flow in the social welfare function. In our case, if \( \gamma_1 \) increases, it implies that \( q_1^* \) is relatively more important than \( q_2^* \). The society will consume more \( q_1^* \) and less of \( q_2^* \) (all other things equal). As \( U(.) \) is strictly increasing, if \( q_1^* > q_2^* \) then \( \frac{\partial U(.)}{\partial q_1} > \frac{\partial U(.)}{\partial q_2} \), and the society derives more satisfaction from the consumption of \( q_1^* \) than \( q_2^* \).

This result shows that the different manifestations of globalization do not provide the same gain for the society and it becomes necessary to investigate empirically the different effects of the different types of globalization on the social welfare.

2.1.2. Empirical strategy

Our empirical strategy proceeds in two steps. First, we estimate a baseline model by OLS with different globalization measures and in the second steps we provide an alternative IV estimation, in which the quality of infrastructure is used as instrument to globalization. The objective is to access the relevance of infrastructure in achieving the benefits of the various manifestations of globalization.

As the result of the difficult access to poverty data, we use a cross sectional and we specify the social welfare as function of the exchange flow derive from the participation in the global economy and a set of control variables. We measure the social welfare by the level of poverty. From Andres (2006), Neutel and Heshmati (2006) and Heshmati (2004), we can assume:

\[ Pov_i = \gamma_0 + \gamma_1 Global_i + \gamma_2 Emp_i + \gamma_3 PubExp_i + \gamma_4 Inf_i + \epsilon_i \]  

Where \( Pov_i \) measures the poverty incidence in country \( i \). \( Global_i \) measures the integration level of country \( i \) in the global economy. Following KOF index of globalization measures developed by Dreher (2006) and updated by Dreher, Gaston and Martens (2008), we use two groups of globalization manifestations. The economic globalization as the first group, which includes: i) the economic flow measured by the composite index of trade flows, transfer and FDI and ii) restrictions as measured by the composite index of hidden barriers, the average level of tariff in international trade. The second group includes: iii) the social globalization measured by the flow of information (internet, TV and trade in newspaper) and iv) the cultural proximity measured by the composite index of the number of McDonald, trade in book, number of ikea. This various measure will allow accessing the effect of the different type of globalization on poverty. \( Emp_i \) refers to the level of employment in the total labor force, \( PubExp_i \) refers to public spending and is measured by the ratio of public spending to GDP; \( Inf_i \) refers to the level of inflation in the economy \( i \); \( \epsilon \) denotes the error term.

Robustness of the analysis will be ensured with: (i) use of alternative specifications; (ii) modeling with Heteroscedasticity and Autocorrelation Consistent (HAC) standard errors and; (iii) Ramsey’s Regression Equation Specification Error Test (RESET) for validity of model specification. Since we are modeling with Ordinary Least Squares (OLS), the four basic concerns of this approach are tackled. While, autocorrelation in the residuals and heteroscedasticity are tackled with HAC standard errors, the assumption of linearity is verified with Ramsey’s RESET.
As stated above, given the research problem under consideration, OLS only provide a baseline of the globalization-poverty nexus. Corresponding estimates have to be compared with models that instrument the nexus with infrastructures quality indicators.

To do this, the paper adopts a Two-Stage Least Squares (2SLS) Instrumental Variable (IV) estimation technique. IV estimation solves the issue of endogeneity and hence, avoids the inconsistency of estimated coefficients by OLS when the exogenous variables are endogenous (correlated with the error term in the main equation). The intuition behind this is that we have at least two reasons to suspect the presence of endogeneity: i) there is possibility of existence of unobserved common factors (not observed correlation) that explain poverty as well as the level globalization. Because these factors are not observed they are in the error terms and therefore are correlated with the globalization measure; ii) while globalization affects the level of poverty, it is not excluded that the poverty level also determines the conditions of openness and integration into the world economy; thus leads to a simultaneity. The 2SLS are appropriate to control for the endogeneity to appreciate the importance of infrastructure in the globalization-poverty nexus.

The 2SLS estimation will entail the following steps:

First stage:
$$Global_i = \alpha_0 + \alpha_1 Instrument_i + \alpha_2 X_i + u_i \quad \quad (9.1)$$

Second stage:
$$Pov_i = \beta_0 + \beta_1 (Global_i) + \beta_2 X_i + v_i \quad \quad (9.2)$$

In equations (9.1) and (9.2), and $u_i$ and $v_i$ represent the error terms. We use as instrumental variables the quality of infrastructure; these variables like the quality of telecommunications infrastructure, rail infrastructure, airport infrastructure and energy infrastructure.

We proceed further with the IV analysis as following: (i) justify the choice of a 2SLS over an OLS estimation technique with the Hausman-test for endogeneity; (ii) verify the instruments are exogenous to the endogenous components of the main explaining variable (Globalization) and; (iii) ensure the instruments are valid and not correlated with the error-term in the main equation with an Over-identifying Restrictions (OIR) test.

2.2. Data and sources

We examine a sample of 133 developing countries with data from the WDI (pov, emp, pubexp, inf) the KOF index of globalization and the Global Competitiveness Index (infrastructure data).

In the regressions, we control for the macroeconomic environment (inflation, employment levels, public spending). The rationale behind these variables is that high level of inflation reduces the purchasing power and contributes to exacerbate poverty. Several arguments are advanced in the literature to support that an increase in inflation will result in increase in poverty (Albanesi, 2007; Cardoso, 1992; Ravallion, 1998; Braumann, 2004; Chaudhary, 1995; Erosa & Ventura, 2002) while a low level of inflation should help to reduce poverty (Lopez, 2004; Bulir, 1998). Employment is the first channel through which public policy can help to reduce poverty (Borgeraas & Dahl, 2010). Public spending is projected to increase aggregate demand and consumption, which in turn stimulates economic growth. It’s therefore helpful for poverty reduction. This view is widely supported in the literature (Benneth, 2007; Zaidi, 2005).

In the following paragraphs, we justify the rationale and the intuition behind the instrumental variables. The aim of the paper is to assess the effect of globalization on poverty and to appreciate the importance of infrastructure that nexus. Thus, we’ll focus on demonstrating how the quality of rail, telecommunications, airport
and energy infrastructures, are involved in the globalization-poverty nexus. The measures of these variables are from the Global Competitiveness Index. The higher the score, the better is the quality of the infrastructure.

### 3. Results

This empirical section addresses four main issues: (i) the ability of globalization to explain poverty conditional on other covariates (control variables); (ii) the ability of infrastructures to explain poverty beyond the globalization channel; (iii) the more efficiency of some types of globalization over others in reducing poverty and (iv) the instrumentality to infrastructure in the globalization-poverty nexus. The first issue is addressed by the significance and signs of estimated coefficients in the baseline model; the second depends on the outcome of the Sargan over-identification test; the third depends on the magnitude of the coefficients in the 2SLS-IV model while the fourth concern depends on the three preceding issues.

#### TABLE 1: Effect Of Globalization Poverty (2SLS-IV)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Dependent Variable incidence of poverty (1,2US$)</th>
<th>Equation 1 (2SLS-IV)</th>
<th>Equation 2 (2SLS-IV)</th>
<th>Equation 3 (2SLS-IV)</th>
<th>Equation 4 (2SLS-IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Globalization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Actual flow</td>
<td>-1.58</td>
<td>(0.009)**</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Restrictions</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-1.85</td>
<td>(0.001)**</td>
</tr>
<tr>
<td>Social Globalization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Information flow</td>
<td>-</td>
<td>-</td>
<td>-2.26</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>- Cultural proximity</td>
<td>-</td>
<td>-</td>
<td>-0.95</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.01</td>
<td>(0.706)</td>
<td>-0.05</td>
<td>-0.05</td>
<td>-0.76</td>
</tr>
<tr>
<td>Gov Expenditure</td>
<td>-0.69</td>
<td>(0.318)</td>
<td>-0.53</td>
<td>0.66</td>
<td>-0.22</td>
</tr>
<tr>
<td>Employment</td>
<td>0.22</td>
<td>(0.624)</td>
<td>0.29</td>
<td>-0.29</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>const</td>
<td>40.85</td>
<td>64.03</td>
<td>187</td>
<td>127</td>
</tr>
<tr>
<td>Hausman test</td>
<td>14.6744</td>
<td>(0.0003)**</td>
<td>5,33254</td>
<td>5.69606</td>
<td>7.1198</td>
</tr>
<tr>
<td>Sargan OIR test</td>
<td>1.81513</td>
<td>(0.6116)</td>
<td>4.3495</td>
<td>2.26265</td>
<td>2.25346</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.3990</td>
<td>(0.0006)**</td>
<td>0.4007</td>
<td>0.4010</td>
<td>0.3069</td>
</tr>
<tr>
<td>Prob &gt; Fischer</td>
<td>0.0006***</td>
<td>0.0000***</td>
<td>0.0000***</td>
<td>0.0000***</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>71</td>
<td>71</td>
<td>70</td>
<td>69</td>
<td></td>
</tr>
</tbody>
</table>

* ** *** significativity at 10%, 5% and 1% respectively ; () p-value; OIR : over identified Restriction

The Hausman endogeneity at the end of each regression test the null hypothesis of the OLS estimates efficiency and consistency. Hence, the rejection of the null
hypothesis points to the inconsistency of OLS owing to endogeneity and lends credit to the choice of the 2SLS estimation strategy as means of assessing the instrumentality infrastructure in the globalization-poverty nexus. The probability associated with the statistics of Sargan over-identification test allows us to consider the instruments as valid instruments for globalization. The quality of rail, energy, telecommunications and quality of airport infrastructures are validated as instruments of globalization. Table 1 reports regressions of poverty on globalization using 2SLS and table 2 in the appendix presents the corresponding OLS values.

As concern the first issue, globalization has a negative effect on poverty. Globalization through its different flows contribute to reduce the poverty incidence. To address the second issue, OLS specifications provide a baseline and we compare their corresponding estimates with those of 2SLS. The resulting conclusion is that, infrastructures are instrumental in the positive effect of globalization on poverty reduction. This is because, in the absence of infrastructure quality instruments (OLS specifications), the corresponding magnitudes of the globalization-poverty nexus are lower and sometime less signifiative. The direction of the relationship also reinforces a part of the literature. In general, greater globalization contributes to poverty reduction (Dollar & Collier, 1999; Dollar, 2004; Dollar & Kraay, 2001). For the third concern is achieved through the different magnitude among the estimated parameters. The magnitude varies according to the measure and therefore the type of globalization. The information flows (-2.26) tends to be the more efficient globalization on poverty reduction, followed by restrictions (-1.85), actual flow of goods, services and FDI (-1.58) and finally cultural proximity (-0.95). These results suggest that the most beneficial effect of globalization on poverty in developing countries refers to the sharing of information and knowledge. Through the mass media and internet development, countries have costless access to the necessary information for innovation and development. The access to internet democratizes information and gradually removes various barriers and property rights and thus allows developing countries to develop new processes and introduce innovations in their system of production and consumption. It thus highlights an aspect of the digital economy, Rifkin (2014) describes as cooperative economy in the sense that the information is accessible at almost zero marginal cost. Bernstein and Cashore (2000); Coleman and Grant (1998) argue that development requires greater access to innovation and reducing barriers to their dissemination. Our results support that idea.

The second most beneficial effect of globalization for developing countries refers to the restriction of trade. This might seem paradoxical and contradictory to the concept of globalization itself. However, this result finds many echoes in the literature. Indeed, some authors estimate that in its first stage globalization could be harmful to developing countries if they didn’t take the necessary steps to be able to hold the international competition. Thus, the unfettered trade liberalization could be damaging for the poor (Agenor, 2003). Our results show that restrictions can be good for poor; it’s just a call on controlled and gradually openness so as to protect the more vulnerable. The actual flows measured as a composite index of goods, services, transfers and FDI flows comes at the third rank in the ability of globalization to reduce poverty. This result provides support to some development in the literature that consider sees free trade as an important leverage to benefit from globalization (Goldberg & Pavcnik, 2004; Nissanke & Thorbecke, 2008; Bourguignon, 2004). However its rank shows the ambiguity he is the subject in the globalization-poverty nexus.
Finally to a lesser extent, cultural proximity as a measure of globalization contributes to poverty reduction. However, its scope is very limited relatively to other types of globalization. In the literature, linguistics distance is considered as an obstacle to trade and exchange. Therefore linguistic similarity would be a catalyst for trade and exchange and the promotion of the best practices everything that can result in poverty reduction (Arbia et al. 2010; Felbermayr & Tubal, 2010).

Table 3 in appendix, highlights the weight of the various infrastructure as instrument to globalization. Telecommunications infrastructures have a significant effect whatever the type of globalization; then come the energy infrastructures. Airport infrastructures are significant in the case of cultural proximity while the coefficient associated with the rail infrastructures is significant only in the case of actual flows. This suggests that priority should be given to telecommunications infrastructures and those relating to energy.

4. Conclusion
The object of this paper has been to complement theoretical globalization literature with empirical evidence in a dual manner: on the one hand we have assessed the poverty reduction effect of globalization and; on the other hand, the instrumentality of infrastructure in the nexus. The main findings suggest that globalization contributes to poverty reduction but with a larger magnitude in the presence of infrastructures instruments. It follows that good quality of infrastructure is a necessary condition for a higher globalization effect on poverty reduction.

The appealing effect of globalization on poverty can be explained by at least three factors. Reducing the cost of access to information and the removal of barriers to their dissemination facilitates knowledge and innovations sharing and costless accessing. This has proven to accelerate production, value added and thus poverty reduction. Targeted and controlled restrictions could better protect the domestic economy and prepare it to benefit from greater openness. Exchange flows can result in lower consumption price, what is good for poverty reduction. Lastly, cultural proximity has proven to be a favorable asset to poverty reduction in some extent.

The study also finds that to harness the benefit of globalization, developing countries should give priority to telecommunications and energy infrastructures.
## APPENDIX:

### TABLE 2: Effect Of Globalization Poverty (OLS, baseline model)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Dependent Variable : incidence of poverty (1.2US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equation 1 (MCO)</td>
</tr>
<tr>
<td>Economic Globalization</td>
<td></td>
</tr>
<tr>
<td>- Actual flow</td>
<td>-0.11 (0.539)</td>
</tr>
<tr>
<td>- Restrictions</td>
<td>-</td>
</tr>
<tr>
<td>Social Globalization</td>
<td></td>
</tr>
<tr>
<td>- Information flow</td>
<td>-</td>
</tr>
<tr>
<td>- Cultural proximity</td>
<td>-</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.04 (0.001)**</td>
</tr>
<tr>
<td>Gox Expenditure</td>
<td>-0.89 (0.063)*</td>
</tr>
<tr>
<td>Employment</td>
<td>0.61 (0.073)*</td>
</tr>
<tr>
<td>cons</td>
<td>38.36 (0.221)</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.4147</td>
</tr>
<tr>
<td>Prob &gt; Fischer</td>
<td>0.0000***</td>
</tr>
<tr>
<td>Observations</td>
<td>89</td>
</tr>
</tbody>
</table>

*,**,*** significance at 10%, 5% and 1% respectively ; () p-value

### TABLE 3. First Stage Of The 2SLS

<table>
<thead>
<tr>
<th>Variables</th>
<th>Actual flow</th>
<th>Restrictions</th>
<th>Information flow</th>
<th>Cultural proximity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail infra</td>
<td>4.04 (0.050)**</td>
<td>-1.74 (0.292)</td>
<td>-0.97 (0.567)</td>
<td>-0.65 (0.825)</td>
</tr>
<tr>
<td>Airport infra</td>
<td>-0.004 (0.029)**</td>
<td>-0.00 (0.147)</td>
<td>-0.00 (0.352)</td>
<td>0.007 (0.038)*</td>
</tr>
<tr>
<td>Energy infra</td>
<td>2.87 (0.011)**</td>
<td>3.34 (0.008)**</td>
<td>2.80 (0.021)**</td>
<td>3.19 (0.156)</td>
</tr>
<tr>
<td>Telecomm infra</td>
<td>0.06 (0.028)**</td>
<td>0.07 (0.000)**</td>
<td>0.07 (0.015)**</td>
<td>0.11 (0.001)**</td>
</tr>
<tr>
<td>Inflation</td>
<td>0.01 (0.019)**</td>
<td>-0.01 (0.004)**</td>
<td>-0.00 (0.873)</td>
<td>-0.00 (0.179)</td>
</tr>
<tr>
<td>Gox Expenditure</td>
<td>0.02 (0.929)</td>
<td>0.21 (0.173)</td>
<td>0.59 (0.007)**</td>
<td>0.36 (0.255)</td>
</tr>
<tr>
<td>Employment</td>
<td>-0.01 (0.948)</td>
<td>-0.00 (0.990)</td>
<td>-0.25 (0.111)</td>
<td>-0.09 (0.685)</td>
</tr>
</tbody>
</table>

JEPE, 2(S1), A. S. Alinsato, p.197-212.
**TABLE 4: Variables Definition And Sources**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition</th>
<th>sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual exchange flow</td>
<td>KOF index of composite indicator of Trade (percent of GDP), Foreign Direct Investment, stocks (percent of GDP), Portfolio Investment (percent of GDP) and income Payments to Foreign Nationals (percent of GDP)</td>
<td>KOF Globalization Index</td>
</tr>
<tr>
<td>Restrictions</td>
<td>KOF index of composite indicator of Hidden Import Barriers, Mean Tariff Rate, Taxes on International Trade (percent of current revenue), Capital Account Restrictions.</td>
<td>KOF Globalization Index</td>
</tr>
<tr>
<td>Information flow</td>
<td>KOF index of composite indicator of Internet Users (per 1000 people), Television (per 1000 people) and Trade in Newspapers (percent of GDP)</td>
<td>KOF Globalization Index</td>
</tr>
<tr>
<td>Cultural proximity</td>
<td>KOF index of composite indicator of Number of McDonald's Restaurants (per capita), Number of Ikea (per capita) and Trade in books (percent of GDP).</td>
<td>KOF Globalization Index</td>
</tr>
<tr>
<td>Inflation</td>
<td>Price variation rate (consumption price)</td>
<td>WDI</td>
</tr>
<tr>
<td>Gov Expenditure</td>
<td>Ratio of Gov expenditure (percentage of GDP)</td>
<td>WDI</td>
</tr>
<tr>
<td>Employment</td>
<td>Proportion of the active population in employment</td>
<td>WDI</td>
</tr>
<tr>
<td>Poverty</td>
<td>Incidence of Poverty</td>
<td>WDI</td>
</tr>
<tr>
<td>Rail Infrastructure</td>
<td>Quality of rail Infrastructure (Global Competitiveness survey)</td>
<td>GCI (Global Competitiveness Index)</td>
</tr>
<tr>
<td>Airport Infrastructure</td>
<td>seat km/week</td>
<td>GCI (Global Competitiveness Index)</td>
</tr>
<tr>
<td>Energy Infrastructure</td>
<td>Quality of energy Infrastructure (Global Competitiveness survey)</td>
<td>GCI (Global Competitiveness Index)</td>
</tr>
<tr>
<td>Telecomm Infrastructure</td>
<td>Mobile teledensity</td>
<td>GCI (Global Competitiveness Index)</td>
</tr>
</tbody>
</table>

* Source: Author

JEPE, 2(S1), A. S. Alinsato, p.197-212.
Table 5: Descriptive Statistics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Stand dev</th>
<th>Min</th>
<th>Max</th>
<th>Obs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual exchange flow (act_flo)</td>
<td>57.82832</td>
<td>18.25081</td>
<td>16.53</td>
<td>97.3</td>
<td>113</td>
</tr>
<tr>
<td>Restrictions (restric)</td>
<td>50.13825</td>
<td>15.19435</td>
<td>12.2</td>
<td>84.15</td>
<td>97</td>
</tr>
<tr>
<td>Information flow (inf_flo)</td>
<td>58.1208</td>
<td>16.66105</td>
<td>18.01</td>
<td>96.45</td>
<td>112</td>
</tr>
<tr>
<td>Cultural proximity (cul_prox)</td>
<td>18.74737</td>
<td>20.85723</td>
<td>1</td>
<td>86.34</td>
<td>114</td>
</tr>
<tr>
<td>Inflation (infl)</td>
<td>16.80139</td>
<td>98.69185</td>
<td>-3.704296</td>
<td>1096.678</td>
<td>123</td>
</tr>
<tr>
<td>Gov Expenditure (dep2)</td>
<td>21.78319</td>
<td>10.4431</td>
<td>0.0287864</td>
<td>62.3713</td>
<td>103</td>
</tr>
<tr>
<td>Employment (emploi)</td>
<td>59.03571</td>
<td>12.93639</td>
<td>33</td>
<td>86</td>
<td>112</td>
</tr>
<tr>
<td>Poverty (pov)</td>
<td>43.55639</td>
<td>34.35012</td>
<td>34.35012</td>
<td>87.72</td>
<td>133</td>
</tr>
<tr>
<td>Rail Infrastructure (qri_gc)</td>
<td>2.439067</td>
<td>0.9353315</td>
<td>1.19055</td>
<td>4.9</td>
<td>82</td>
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<tr>
<td>Airport Infrastructure (aas_gc)</td>
<td>374.0349</td>
<td>1181.626</td>
<td>0</td>
<td>10157.13</td>
<td>95</td>
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<td>Energy Infrastructure (qes_gc)</td>
<td>3.648723</td>
<td>1.309289</td>
<td>1.218866</td>
<td>5.909059</td>
<td>96</td>
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<tr>
<td>Telecomm Infrastructure (mts_gc)</td>
<td>99.9497</td>
<td>70.20594</td>
<td>1.42</td>
<td>370.5522</td>
<td>96</td>
</tr>
</tbody>
</table>

Source: Author

References


JEPE, 2(S1), A. S. Alinsato, p.197-212.
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