

GLOBALIZATION IMPACT ON INCOME INEQUALITY DISTRIBUTION (EUROPEAN UNION)

Ana Mihajlovska

International Balkan University, ana.mihajlovska@ibu.edu.mk

ABSTRACT

The conclusions presented on the effects of increasing globalization and the inequality of income distribution is not consensual. With this paper it is intended to contribute to the clarification of this relationship, particularly with regard to the effects of the economic aspect of integration at the European Union (EU) during the period of 1995 to 2018.

In this sense, an adequate review of theoretical and empirical literature is carried out, as well as the realization of an econometric application. The 19 EU countries considered in the sample were divided into two subsamples, "North" and "South" countries, taking into account a benchmark for the level of real GDP per capita. In a complementary way, it is still an objective of this paper to try understand if the Great Recession, initiated in 2008-09, has impact on globalization on inequality and through what mechanisms, since the literature reports persistent effects of periods of recession on inequality.

The main results suggest that, since 1995, international trade has decreased the inequality in income distribution in the two groups of countries, while the financial globalization, through the entry of FDI, has provoked this inequality in the group of "Northern" countries. Regarding to the effect of the crisis in 2008-09 financial report, it is concluded that: on one side, economic globalization, after the crisis, eased the inequality in the income distribution in both groups of countries; on the other hand, after the recession, social integration contributed to the worsening of this inequality, both in the countries of the "North" and in the countries of the "South".

KEY WORDS

INCOME INEQUALITY; GINI COEFFICIENT; GLOBALISATION; EU; KOF

JEL CLASSIFICATION CODES

D63, F62

1. INTRODUCTION

The question intended to answer with this work of study is related to the evaluation of the impacts of increasing globalization on income distribution inequality, taking the countries of the European Union as a reference. It is also intended to assess the possible impact of the Great Recession, initiated in 2008-2009. In parallel with the evolution of globalization, which since the 1970s has increased considerably in all its dimensions (Potrafke, 2015), we have seen in the last few decades an increase in inequality of income

distribution, in both developed countries and developing, something that has been a matter of widespread concern, the United Nations (UN), on its agenda for 2030, included the goal of reducing inequality within and between countries. Which leads us to the question of the extent to which the globalization process can affect the inequality of income distribution.

After following sections 2 and 3 which are talking about the problem statement of this study and the aims and objectives, in section 3, the methodology, as well as the variables chosen for the empirical application are presented. section 4 of this dissertation focuses on the review of relevant theoretical and empirical literature for understand the relationship between globalization and inequality in income distribution. Section 5 presents the results and findings as well as an analysis of the evolution of globalization indicators and inequality of income distribution for the sample countries and for the period under analysis. Finally, the discussion and conclusion of this work are found in section 6 and 7.

2. INEQUALITY IN INCOME DISTRIBUTION

Inequality in income distribution can be assessed using various indicators, which can lead to some discrepancies. Some of these measures are, for example, the interquintile ratio or S80 / S20 index, and Theil index. However, the most used measure is the Gini coefficient (Erauskin and Turnovsky, 2019). This is based on the Lorenz curve, which assesses the distribution of income / wealth across the population, and varies between 0 (all individuals receive the same income) and 1 (all income is concentrated in one single individual). It is calculated through the ratio between the area that is between the curve of Lorenz and the diagonal line, which corresponds to the equal distribution of income, and the total area below this diagonal (Groves-Kirkby, Denman and Phillips, 2009).

3. GLOBALIZATION

The concept of globalization, according to Crafts (2004, p. 45), can be understood as the “Process of integration of goods and capital markets across the world in which barriers to international trade and foreign investment are reduced”. This process started in the 19th century, with the international trade growth associated with the reduction of customs tariffs, having been particularly stimulated, in the middle of the 20th century, by the creation of pro-competition institutions, such as the General Agreement on Tariffs and Trade (GATT), currently World Trade Organization (WTO), and, more recently, the reduction of transport and transmission of information between countries. Financial globalization was enhanced after the collapse of the Bretton Woods system, by the development of the financial sector and increasing capital mobility (Kang-Kook, 2014). The indicators most frequently used to assess the economic dimensions of globalization are the degree of openness, which measures the impact of openness to international trade, and indicators related to FDI, such as the FDI / GDP ratio, which measure the effect of financial globalization. In the last decades, the political and social dimensions of globalization, created a need for a more comprehensive indicator. For example, the index KOF is a composite index that measures its economic, political and social aspects (Dreher, Gaston and Martens, 2008), and that, by distinguishing the different aspects of integration. According to Villaverde and Maza (2011), it is the measure of globalization that allows a more reliable analysis. In this sense, it will be this broader definition of globalization that will be taken into account in this paper.

4. EMPIRICAL RELATIONSHIP BETWEEN GLOBALIZATION AND INCOME INEQUALITY DISTRIBUTION

Using the KOF index, with a sample of 101 developed and developing countries and an analysis of the period from 1970 to 2005, Villaverde and Maza (2011) concluded that, in general, globalization promotes the economic growth of countries, confirming the results of Dreher (2006) and, indirectly, the convergence of income between them. Dreher and Gaston (2008), also using the KOF index, found evidence that globalization would have led to an increase in inequality in income distribution in OECD countries during the period 1970 to 2000. On the other hand, Jaumotte, Lall and Papageorgiou (2013), for a sample of 51 developed and developing countries during the period from 1981 to 2003, considered the contribution of growing globalization not very relevant from the point of view of the income distribution. Potrafke (2015) considers that globalization has been responsible for increasing the inequality of this distribution within countries, especially developing countries. Dorn, Fuest and Potrafke (2018) analysis of 140 countries, between 1970 and 2014, also concluded this positive relationship between globalization and inequality.

As can be concluded, the influence of globalization on the inequality in the distribution of performance has been extensively investigated; however, the results presented are not consensual. In order to explain these effects, we will focus our study on the mechanisms inherent to this relationship.

5. FINANCIAL GLOBALIZATION AND INEQUALITY: FOREIGN DIRECT INVESTMENT (FDI)

It is expected that financial globalization, namely through the inflows of funds FDI, is associated with an increase in income inequality in the country where the investment is made, since it is responsible for the introduction of what in the literature usually is called skill-biased technology. This mechanism favors and increases demand by more qualified workers in that country, which translates into a salary increase for these workers in relation to the others (Alderson and Nielsen, 2002; Lee, 2006; Dreher and Gaston, 2008; and Jaumotte et al., 2013). Lee (2006), through empirical evidence regarding the 14 oldest members of the European Union, during the period 1951 to 1992, concluded that FDI was responsible for increasing inequality in the distribution of income in the countries in the sample, through the mechanism mentioned above. Jaumotte et al. (2013) concluded that the flow of FDI inflows, between 1981 and 2003 had, on average, an effect that led to an increase in inequality in the distribution of income, both in developed and developing countries, due to be carried out in intensive sectors in technology and skilled labor. However, the authors consider that this effect is likely to vary from the type of sector and the disappearance of workers' acquirement for more education and qualifications. According to Kuznets (1955), countries see their level of inequality increase up to a certain level is reached (tipping point). From this, it is expected that this inequality will decrease.

The impact of FDI on income inequality in Central European countries and Eastern Europe was analyzed by Mihaylova (2015), who found that FDI has potential to influence this inequality, but its effect is dependent on the absorption ability of the economy that receives it. If workers in the country concerned invest little in human capital and if the level of economic development is low, then FDI tends to increase inequality in income distribution. On the contrary, high levels of human and development capital can lead to an egalitarian effect. To this end, improvement in the quality of education is necessary - which translates into an increase in the more qualified workforce -, investment in activities with high added value and promoting increases in productivity which, in turn, contribute to a level of highest development in the recipient country (Mihaylova, 2015). Still, in this line of thought, Wu and Hsu (2012) also concluded that the impact of FDI on inequality income distribution depends on the absorption capacity of the host country and that, if it is low, this impact is negative, that is, in the sense of increasing this inequality. Baek and Shi (2016) also concluded that this effect depends on the level of economic development, according to which

greater financial openness tends to increase inequality in the case of developing countries, while in the case of developed countries; this inequality tends to be reduced. Regarding the effect of the entry of FDI in developing countries, Harrison and Rodríguez-Clare (2010) mention in their work that foreign companies present higher productivity levels than domestic companies and therefore pay higher wages, inducing an increase in income inequality. However, when controlling for the characteristics of workers, they verify that these companies tend to hire more educated and qualified labor, hence the wage gap. They conclude, therefore, that there is no clear effect of increasing inequality resulting from FDI, since there is no evidence that companies with foreign participation pay higher wages to workers than domestic companies would pay.

On the other hand, Alderson and Nielsen (2002) present empirical evidence that 10 of the 16 OECD countries in the sample between 1967 and 1992 showed an inverted trend relative to the Kuznets curve. After countries have reached some level of GDP per capita, in line with a reduction in income inequality, it was observed that in many countries cases, this inequality increased again - “the great U-turn” (Alderson and Nielsen, 2002: p. 1244). This change in the pattern proposed by Kuznets (1955) can be derived from the effect of FDI, as the outflow of direct investment originates the movement of workers from the industrial sector to the services sector, characterized by lower wages and a more unequal income distribution. Still, the output of capital causes a loss of productive capacity in the domestic country. In this way, the low marginal labor productivity, makes the labor factor cheaper (wages lower), and the marginal productivity of capital increases. Finally, the demand for workers less qualified in the domestic country decreases, since it is possible to reallocate tasks to workers’ residents in the countries where the investment is made, in which wages are lower. Thus, this reduction in demand for less qualified workers in the most will lead to a reduction in their income, therefore, for an increase in inequality (Alderson and Nielsen, 2002). Erauskin and Turnovsky (2019) mention two other channels through which financial liberalization influence on the distribution of income in the country of origin – reduces the costs of borrowing from abroad and the costs of investing abroad. As there are two activities carried out by the wealthiest members of the population, the inequality will tend to increase. However, making investments abroad relocates resources outside the domestic economy, which increases unemployment, reduces returns to domestic capital, increases wages and thus contributes to a decrease in inequality, contrary to the increase mentioned above. On the contrary, decreasing costs of borrowing abroad will stimulate the domestic economy, increase returns to capital, lower wages and, therefore, inequality tends to increase. According to the authors, the impact of financial globalization on the inequality in income distribution depends on the combination of the above. Erauskin and Turnovsky (2019) found that the global effect of financial liberalization between 1970 and 2015 increased inequality in income distribution, both in the debtor economy and in the creditor. In order to assess the influence of FDI on the inequality of income distribution in the short and long term, Herzer and Nunnenkamp (2013) looked at data from 8 European countries between 1980 and 2000. They concluded that in the long run, on average, income distribution becomes less unequal due to the effect of inflows and outgoing FDI and, on the other hand, that greater inequality leads to less FDI. However, in the long term, the effect of FDI flows is towards increasing inequality.

6. GLOBALIZATION AND INTERNATIONAL TRADE (GOODS AND SERVICES)

According to the Heckscher-Ohlin theory, openness to international trade should reduce the wage gap between the most and least skilled workers in developing and developed countries, resulting with a reduction in the inequality of income distribution. In fact, “The experience of East Asia in the 1960s and 1970s supports the theory that greater openness to trade tends to narrow the wage gap between skilled and unskilled workers in developing countries” (Wood, 1997: p. 33). On the other hand, in an advanced economy, where qualified labor is relatively abundant, this inequality is expected to increase. The argument is then that international trade will negatively affect the relative price of the most import abundant factors in each type of country. The countries of the “North” are considered to be the most and therefore more

abundant in skilled labor, while “South” countries are less developed and, of course, less abundant qualified workers. Trade will increase workers' wages more in “Northern” countries, increasing wage inequality, while in “Southern” countries; there is a tendency to reduce inequality due to the increase in the wages of less qualified workers. However, empirically, it was found that, in Latin American countries, during the 1980s and 90, greater openness resulted in greater inequality. Wood (1997) presents several events between 1980 and 1990 to explain this difference, such as greater capital and labor mobility more qualified workforce, skill-biased technological progress and the entry of countries abundant in low-skilled work (especially China), which expanded their exports. Latest empirical evidence reviewed by Winters, McCulloch and McKay (2004) contradicts the theory, by revealing that trade liberalization has led to an increase in wage gap between more and less skilled workers in East Asia. Mah (2013), when empirically analyze the impact of international trade on distribution inequality China's income between 1985 and 2007 also showed that there was an increase in this inequality. Goldberg and Pavcnik (2007) concluded, after analyzing several studies, that the openness to trade has not had an equal effect in developing countries. Through his empirical study, Kang-Kook (2014) concluded by an egalitarian effect of international trade in the distribution of income, however dependent on the level of human capital. The evidence presented through a cross-country model for 47 countries, during the period from 1976 to 2004, showed that this effect is greater in countries with a higher level of education, since the benefits associated with international trade law can be more easily spread by individuals with higher levels of human capital. In the same sense, Majeed's (2013) empirical study also mention of a conditional relationship depending on the level of economic development. In relatively rich developing countries, there is an egalitarian effect on trade international, while in the poorest developing countries, the opposite is true. This conditionality can, on the other hand, be found in Bergh and Nilsson (2010), who verified that trade liberalization, is associated with an increase in inequality of income distribution, mainly in richer countries. Still, Baek and Shi (2016), based on a sample of developed and developing countries, concluded that an increase in the intensity of international trade is capable of aggravating the inequality in developed countries, whereas in developing countries checks for attenuation. Regarding to the countries in transition, Franco and Gerussi (2013) found that, during the period 1990-2006, the variable associated with international trade was not relevant from the view of the impact on inequality of income distribution across countries. They concluded that imports from developed countries contributed inequality increase in countries with a lower level of development, in the short term, and for the decrease, in the long term. This increase, according to the authors, is related to the fact that the entry of goods from countries with technological levels, higher prices lead to increased demand for more skilled workers in the countries least developed. In this way, a spillover effect is generated, through which companies begin to adopt some of these technologies, which means that, in the long run, this inequality decreases. The authors also tested the role of education and, like KangKook (2014), verified that it is a channel capable of contributing, in the long run, to the diffusion benefits associated with international trade, especially in the case of exports developing countries and also imports from those countries. However, in the short term, the trend is to contribute to an increase in inequality.

Through a theoretical model and under several assumptions, Andersen and Sørensen (2011) analyzed the influence of the process of integration of goods and services on the labor market and, consequently, the distribution of income in countries. The authors explore the effects of this process on the incomes to be considered in the wage negotiations, namely rents associated with limited entry into the markets (for example, barriers to entry), and income from specialization, resulting from greater productivity compared to competitors (comparative advantages). As this process goes on, the rents associated with protectionism gradually decrease, which facilitates entry into the markets and leads to increased competitiveness and thus less pressure for wage increases and less inequality in income distribution. On the other hand, in a more advanced state of integration, that is, in more economies open, this process will promote an increase in specialization income, resulting from the exploitation of comparative advantages, and lead to an increase in this inequality. From this in this way, although, initially, there may be a convergence of income, to lower high levels of integration, a trade-off between integration and equality emerges, in the form of U, in that the gains derived from greater integration are obtained at the expense of

greater inequality. In order to assess the impact of international trade on inequality in income distribution in the short and long term, D'Elia and De Santis (2019), through data relative to 35 OECD member countries for the period 1995-2016 concluded that there was an attenuation of this inequality in low and middle income countries, both in short and long term.

7. METHODOLOGY

This section presents a descriptive analysis of the relationship between globalization and inequality in the income distribution for the countries of the European Union, for the period 1995-2018. Due to data restrictions and in order to avoid bias in results, some countries were excluded, namely Bulgaria, Croatia, Cyprus, Slovakia, Hungary, Lithuania, Malta and Poland. The United Kingdom was not considered in the analysis, as, at the time of this work, it no longer belongs to the EU. Like this the group of countries included in this study is composed of: Germany, Austria, Belgium, Denmark, Slovenia, Spain, Estonia, Finland, France, Greece, Ireland, Italy, Latvia, Luxembourg, the Netherlands, Portugal, the Czech Republic, Romania and Sweden. Then, a division was made into 2 groups, according to the average level of real GDP per capita for the period considered. On the one hand, countries of the “North”, above € 28,000 per capita (Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Luxembourg, the Netherlands and Sweden) and, on the other hand, the countries of the “South”, below € 28,000 per capita (Greece, Portugal, Estonia, Latvia, Slovenia, Czech Republic, Romania, Spain and Italy). This separation seeks to distinguish countries between s intra-EU, equivalent to the “North” and “South” countries, in light of the theories in the literature, e.g., Heckscher-Ohlin theory (cf. Wood, 1997). Regarding globalization indicators, alternative indicators were chosen, mentioned in the previous section: the degree of trade openness, Foreign Direct Investment (FDI) and the composite KOF index, which is subdivided into dimensions: economic, political and social aspects of globalization. The higher the value of the KOF index, the higher the country's level of globalization. To assess inequality in distribution income, the Gini Coefficient was chosen for disposable income, as already mentioned, as the most reliable unit of measurement. The data was collected from the Eurostat, from UNCTAD and the KOF Swiss Economic Institute.

8. RESULTS AND FINDINGS

In this section, the results obtained for several models are analyzed. The base model considers the KOF index separated into its three components: economic, social and political. Then, the economic component is broken down into two dimensions - degree of openness, and FDI (inbound and outbound) flows. Finally, an estimate is presented to assess whether, and how the 2008-09 Great Recession affected the impact of globalization on inequality of income distribution.

9. BASIC MODEL

The empirical analysis started from a base model that seeks to relate globalization to inequality of income distribution, as already mentioned. Based on the study of Dreher and Gaston (2008), the three dimensions of the composite globalization indicator, the KOF index, in the sense of its relation to income inequality. Estimations made can be found in Table 6, either for the total sample of countries or for each of the groups' countries, “North” and “South” countries.

Table 1. Estimation results for the base model: KOF index and inequality

	Total sample	“North”	“South”
ln(real GDPpc) t-1	-18,27124 (-2,471794)	-46,17107 (-2,576643)	-43,49403 (-2,935555)
(ln(realGDPpcreal)t-1)^2	0,863957 (2,263359)	2,269999 (2,630199)	2,229264 (2,763092)
Unemployment rate	0,057047 (2,264011)	0,122417 (1,876767)	0,101623 (2,396782)
KOF_Ec	-0,056692 (-1,708248)	0,135061 (1,660667)	-0,098047 (-2,488310)
KOF_So	0,043173 (1,521708)	0,027064 (0,290918)	0,120345 (1,058298)
KOF_Po	0,081285 (1,233523)	0,001986 (0,039705)	-0,012925 (-0,386868)
Direct taxes t-1	-0,002250 (-0,116222)	-0,002121 (-0,060251)	0,005346 (0,209682)
Social transfers t-1	-0,170220 (-3,249749)	-0,135284 (-1,782131)	-0,296717 (-2,857225)
Basic education	0,083697 (3,511839)	0,075549 (2,374241)	0,153672 (4,151436)
Gini Coefficient t-1	0,539038 (10,37555)	0,572190 (7,904433)	0,403242 (4,631513)
No. countries	19	10	9
No. observations	313	172	141
R² adjusted	0,950014	0,816787	0,968131
F-Statistics	124,5373	20,54723	112,9202
Prob (F-Statistics)	0,000000	0,000000	0,000000

The three estimates presented in Table 6 reveal an R adjusted above 80%, being that for the total sample and the group of countries in the “South” this value is above 95%, which indicates a high quality of fit of the model. In addition, the probability associated with the F-statistic confirms that the relationship between the dependent variable, coefficient of Gini, and all independent variables is statistically significant. Regarding the variables that capture globalization, only the economic component, KOF_Ec, proved to be statistically significant for all countries and for both subgroups, being, therefore, the dimension that seems to be responsible for the behavior of the composite KOF index. In the total sample, economic globalization helps to decrease the inequality of income distribution, as well as in the group of countries from the “South”. So, in the “Northern” countries, economic integration contributes to the worsening inequality, as expected, since both international trade and FDI is expected to act in this direction, through the mechanisms already mentioned in the most developed countries (“North”). In the case of “Southern” countries, it is expected, as already mentioned in above, that opening to foreign trade should work towards reducing inequality and that the FDI acts in the opposite direction. Bearing in mind that the sign of the coefficient is negative, the benefits associated with economic integration seem to have outweighed the harm, for this set of countries. Regarding the control variables, the negative sign of the variable in (real GDP) – higher GDP, less inequality –, and positive of the variable in (real GDPpc) two – from a certain level real GDPpc, its growth leads to an increase in inequality –, counteract the effect of Kuznets. On the contrary, they support the conclusions of Alderson and Nielsen (2002) regarding OECD member countries, who argue that the relationship between GDP growth and inequality is expressed in the form of U, not in the form of an inverted U. The sample is formed only by developed countries, already in the descending phase of the Kuznets curve, showing an impact on U only for very high levels of GDP per capita, above € 39 111. The variable Unemployment rate has

statistical significance and the value of its coefficient is positive, which means that the higher unemployment in a country, the greater the inequality of income among individuals, which is in line with expectations. This follows from the fact that least qualified workers are, in principle, the most likely to lose their jobs, fueling the unemployment rate; running out income or with lower income in the unemployment situation, this is reflected, necessarily meaning greater average inequality. The coefficient associated with the variable Social transfers has statistical significance and negative sign in all estimates, which means that greater support for the poorest classes from the governments has a positive impact on inequality, that is, in the sense of its decrease, as expected. The maximum level of education at the level of Basic Education is also statistically significant and, therefore, must be considered in the analysis of inequality in the income distribution in the European Union. The positive coefficient of the Basic Education variable shows that, the higher the percentage of population with only Basic Education, the greater the existing inequality. Naturally, less educated individuals are allocated to lower-paid jobs, while more skilled workers perform better paid functions. In addition, several studies mentioned in the chapter 4 conclude that a lower level of education does not allow widespread dissemination of positive aspects associated with globalization, capable of reducing this inequality (e.g., Wu and Hsu, 2012; and Mihaylova, 2015).

10. EFFECT OF COMMERCIAL GLOBALIZATION

After obtaining the estimates for the base model, it was decided to disaggregate the dimension economic performance of the KOF index, the only one statistically significant, in two of the variables it comprises: degree of openness, and FDI flows. Both are part of the most used in the literature to capture globalization (e.g., Wu and Hsu, 2012; Faustino and Vali, 2013; Baek and Shi, 2016; and D'Elia and De Santis, 2019), hence the relevance of this breakdown.

The degree of opening variable proved to be statistically significant for the two groups of countries. In the case of the “Northern” countries, it is significant at 5% and the negative value of its coefficient contradicts the predictions of the Heckscher-Ohlin theory, as it predicts that international trade leads to an increase in inequality in more developed countries. With regard to the countries of the “South”, the results are in line with those predicted by the theory in the sense that, in less developed countries and, therefore, more abundant in factor low-skilled labor, international trade increases the demand for these workers and, consequently, their wages. By reducing the wage gap between inequality decreases. It is concluded, then, from these results that a greater commercial opening tends to decrease the inequality in European Union countries. These results are in agreement, for example, with those obtained by Bergh and Nilsson (2010), and Faustino and Vali (2013). Control variables exhibit behavior similar to that of the base model.

11.EFFECT OF FINANCIAL GLOBALIZATION

FDI inflows show statistical significance at 10%, but only for the group of “Northern” countries. The benefits associated with FDI tend to be concentrated on industries where this is carried out, which tend to increase inequality. In fact, there is an increase in the demand for more qualified workers and, consequently, of their salary, in relation to other workers. So the signal positive of the coefficient is in agreement with the expected and, with Lee (2006) - the more financially developed the country, the greater the inequality income distribution. According to Eurostat statistics, financial activities and represented insurance around 75% of FDI entry positions in the European Union in 2015. Regarding the countries of the “South”, the variable was not statistically significant. Therefore, with regard to financial globalization, the results seem to depend and vary according to the group being analyzed. In addition to FDI inflows, outflows have also been considered the influence of globalization on the inequality of income distribution, namely, in the study by Alderson and Nielsen (2002), among others. The authors consider that FDI outflows

lead to increased inequality in developed countries. On the one hand, FDI outflows originate, in the country of origin, the movement of workers from the industrial sector to the services sector, characterized by higher wages and a more unequal income distribution. On the other hand, the demands for less qualified workers in the country of origin decreases, as these tasks are allocated to workers in destination countries, where wages are lower.

12. EFFECT OF THE 2008-09 GREAT RECESSION

With the objective of trying to understand if the Great Recession, initiated in 2008-09, persistently, the impact of globalization on inequality in the income distribution in the two groups of countries considered, another model was estimated, in which interaction variables were incorporated between the three dimensions of the index KOF and the Crisis variable. This variable assumes a value of 1 for the post-crisis period (years 2009 and following), and 0 for the pre-crisis period. The results are shown in Table 10.

Table 2- Estimation results: KOF index and inequality, before and after crisis

	“North”	“South”
ln(real GDPpc) t-1	-35,69615 (-1,880058)	-36,82021 (-2,659906)
(ln(real GDPpc real) t -1)^2	1,752075 (1,894612)	1,914171 (2,544512)
Unemployment rate	0,095107 (1,265975)	0,105412 (2,570530)
KOF_Ec	0,208169 (2,664614)	-0,076221 (-2,022858)
KOF_So	0,015647 (0,105974)	-0,151934 (-1,244535)
KOF_Po	0,009495 (0,298647)	-0,041279 (-1,203253)
Direct taxes t-1	0,004479 (0,119670)	0,013968 (0,501470)
Social transfers t-1	-0,104910 (-1,344488)	-0,221682 (-2,410344)
Basic education	0,073757 (2,124911)	0,146235 (4,096876)
Gini Coefficient t-1	0,374097 (4,678116)	0,265027 (3,026626)
Crisis * KOF_Ec	-0,178240 (-3,807776)	-0,113416 (-2,868669)
Crisis * KOF_Po	-0,016355 (-0,515799)	-0,012250 (-0,396239)
Crisis * KOF_So	0,353506 (3,211326)	0,391579 (3,134567)
No. countries	10	9
No. observations	172	141
R² adjusted	0,841038	0,971494
F-Statistics	22,54118	117,3739

By reading the results in Table 10, and as in the base model, the only dimension of the globalization KOF index that proved to be statistically significant for both groups of countries was economic. Additionally, the sign of the coefficient associated with the variable KOF_Ec was expected, as in the countries of the "North" economic globalization tends to worsen the inequality of income distribution, whereas in the countries of the "South" tends to improve. Through the confrontation between the coefficient associated with the variable KOF_Ec and the coefficient of interaction variable between KOF_Ec and the Crisis, it can be concluded that economic globalization contributed less to increase inequality in the "North" countries in the post-crisis period (post-crisis coefficient = $0.208169 - 0.1778240 = 0.029929$) than before the 2008-09 crisis (pre-crisis coefficient = 0.208169). Conversely, the social dimension of globalization contributed to amplify inequality in the post-crisis, to the extent that it presents a coefficient with positive and statistically significant value (0.353506). This contribution, on the other hand, it is not found before the Great Recession. With regard to the countries of the "South", and making the same comparison of values that for the countries of the "North", it appears that economic globalization has contributed more to reduction of inequality in the post-crisis period (post-crisis coefficient = $-0.076221 - 0.113416 = -0.189637$) than before the Great Recession (pre-crisis coefficient = -0.076221). On the contrary, social globalization contributed to the amplification of inequality in the period post-crisis (0.391579). The conclusions regarding the effect of social globalization are consistent with those of Bergh and Nilsson (2010), who verified that this dimension was the driving force for increasing inequality, especially in middle and low-income countries income, since the benefits resulting from this type of globalization spread more difficultly, since only a limited group of people has access to information. Again, the control variables behave similarly to the previous estimates.

Regarding the countries of the "North", and through the analysis of the signal and the value of the coefficient of the variables Degree of openness and Crisis * Degree of openness, it appears that the opening to trade contributed more to reducing inequality in income distribution in the post-crisis period (post-crisis coefficient = $-0.012966 - 0.008792 = -0.021758$) than in the pre-crisis period (pre-crisis coefficient = -0.012966). Therefore, it can be considered that the international trade contributed to a more egalitarian impact of economic integration in the post-recession period, discussed above. In the case of the "Southern" countries, these variables show statistical significance. Still, social globalization proves to be statistically significant for both groups of countries and its effect was in the direction of worsening (positive sign of the coefficient of Crisis variable * KOF_So) of inequality in the post-crisis period, but not in the pre-crisis period. This contribution was greater in the countries of the "South" than in the countries "North". Once again, the control variables showed a transversal behavior to the several models. The results of the influence of the 2008-09 crises on how FDI impacted the inequality of income distribution.

In the case of the variable FDI outputs, in none of the groups there is statistical significance and, therefore, it is not possible to draw any conclusions about how the 2008- 09 shaped the impact of outgoing FDI flows on inequality of income distribution.

13. CONCLUSION

In summary, the results suggest that globalization in the goods and services market since 1995 has reduced the inequality of income distribution in the two groups of countries, while financial globalization, through the entry of FDI, has contributed to aggravate this inequality in the group of "Northern" countries. In this way, decision-makers' policy makers should focus primarily on policies that mitigate the impacts negative effects on inequality associated with the capture of FDI by the most economies the European Union. Still, and taking into account the current pandemic crisis, and consequent effects at the level, for example, of the reduction of globalization in the goods market and services, an increase in inequality can be expected, according to the results of this study. Thus, it is also imperative to consider these effects at the

time of making political decisions in order to avoid even more damaging consequences on the household income, already negatively affected by the reduction in working hours, or even for the loss of job.

Nevertheless, this study represents an important contribution to the literature, as which is based on a more comprehensive and current concept of globalization, seeking to understand the influence of each dimension (economic, political and social) on inequality income distribution. Additionally, dividing the sample into two groups of countries more homogeneous allowed for a more precise assessment of this relationship, having been considerable differences between them. Finally, and in an innovative way, it contributes, tentatively, to the empirical evidence that strong recessions can have an impact persistent mechanisms of transmission to inequality (Heathcote, Perri and Violante, 2010), namely, through the globalization channel. This theme deserves future investigation in order to understand through which mechanisms this exercise is influence. An improvement in data processing and application to developing countries development would also be relevant in this regard.

REFERENCES

- Alderson, A., e Nielsen, F. (2002). Globalization and the Great U-Turn: Income Inequality Trends in 16 OECD Countries. *American Journal of Sociology*, 107(5), 1244-1299.
- Andersen, T. M., e Sørensen, A. (2011). Product Market Integration, Rents and Wage Inequality. *Review of International Economics*, 19(4), 595-608.
- Asteriou, D., Dimelis, S., e Moudatsou, A. (2014). Globalization and income inequality: A panel data econometric approach for the EU27 countries. *Economic Modelling*, 36(C), 592-599.
- Baek, I., e Shi, Q. (2016). Impact of Economic Globalization on Income Inequality: Developed Economies vs Emerging Economies. *Global Economy Journal*, 16(1)
- Bergh, A., e Nilsson, T. (2010). Do liberalization and globalization increase income inequality?. *European Journal of Political Economy*, 26(4), 488-505.
- Crafts, N. (2004). Globalisation and Economic Growth: A Historical Perspective. *The World Economy*, 27(1), 45-58.
- D'Elia, E., e De Santis, R. (2019). Growth divergence and income inequality in OECD countries: the role of trade and financial openness. LEQS Paper N° 148, London School of Economics.
- Dorn, F., Fuest, C., e Potrafke, N. (2018). Globalization and Income Inequality Revisited. CESifo Working Papers No. 6859.50
- Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. *Applied Economics*, 38(10), 1091-1110.
- Dreher, A., e Gaston, N. (2008). Has Globalization Increased Inequality?. *Review of International Economics*, 16(3), 516-536.
- Dreher, A., Gaston, N., e Martens, P. (2008). *Measuring Globalization – Gauging its Consequence*, New York: Springer.
- Erauskin, I., e Turnovsky, S. J. (2019). International financial integration and income inequality in a stochastically growing economy. *Journal of International Economics*, 119, 55-74.
- Faustino, H. C., e Vali, C. (2013). The effects of globalisation and economic growth on income inequality: evidence from 24 OECD countries. *Argumenta Oeconomica*, 1(30), 13-31.
- Franco, C., e Gerussi, E. (2013). Trade, foreign direct investments (FDI) and income inequality: Empirical evidence from transition countries. *The Journal of International Trade & Economic Development*, 22(8), 1131-1160.
- Goldberg, P. K., e Pavcnik, N. (2007). Distributional effects of globalization in developing countries. *Journal of economic Literature*, 45(1), 39-82.

- Groves-Kirkby, C. J., Denman, A. R., e Phillips, P. S. (2009). Lorenz Curve and Gini Coefficient: Novel tools for analysing seasonal variation of environmental radon gas. *Journal of Environmental Management*, 90(8), 2480-2487.
- Harrison, A., e Rodríguez-Clare, A. (2010). Trade, Foreign Investment, and Industrial Policy for Developing Countries. in D. Rodrik & M. Rosenzweig (Eds.), *Handbook of Development Economics*, Vol. 5, Chapter 63, 4039-4214, Elsevier.
- Heathcote, J., Perri, F., e Violante, G. L. (2010). Unequal we stand: An empirical analysis of economic inequality in the United States, 1967–2006. *Review of Economic Dynamics*, 13(1), 15-51.
- Herzer, D., e Nunnenkamp, P. (2013). Inward and outward FDI and income inequality: evidence from Europe. *Review of world economics*, 149(2), 395-422.
- Jaumotte, F., Lall, S., e Papageorgiou, C. (2013). Rising Income Inequality: Technology, or Trade and Financial Globalization?. *IMF Economic Review*, 61(2), 271-309.
- Kang-Kook, L. (2014). Globalization, income inequality and poverty: Theory and empirics. *Social System Studies*, 28, 109-134.
- Kuznets, S. (1955). Economic Growth and Income Inequality. *The American Economic Review*, 45(1), 1-28.
- Lee, J.-E. (2006). Inequality and globalization in Europe. *Journal of Policy Modeling*, 28(7), 791- 796.
- Mah, J. S. (2013). Globalization, decentralization and income inequality: The case of China. *Economic Modelling*, 31, 653-658.
- Majeed, M. T. (2013). Inequality, Trade and Development: Evidence from Developing Countries. MPRA Paper No. 50337.
- Mihaylova, S. (2015). Foreign direct investment and income inequality in Central and Eastern Europe. *Theoretical & Applied Economics*, 22(2), 23-42.
- Potrafke, N. (2015). The Evidence on Globalisation. *The World Economy*, 38(3), 509-552.
- Villaverde, J., e Maza, A. (2011). Globalisation, Growth and Convergence. *The World Economy*, 34(6), 952-971.
- Winters, L. A., McCulloch, N., e McKay, A. (2004). Trade Liberalization and Poverty: The Evidence so Far. *Journal of Economic Literature*, 42(1), 72-115.
- Wood, A. (1997). Openness and Wage Inequality in Developing Countries: The Latin American Challenge to East Asian Conventional Wisdom. *The World Bank Economic Review*, 11(1), 33-57.
- Wu, J.-Y., e Hsu, C.-C. (2012). Foreign direct investment and income inequality: Does the relationship vary with absorptive capacity?. *Economic Modelling*, 29(6), 2183-2189.