Does Foreign Direct Investment Lower Income Inequality?
New Evidence and Discussion on the Role of Service Offshoring (Captive Centers)[1]

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Responsibility for the information and views set out in this report lies entirely with the author.

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Abstract

In this paper, I estimate the impact of FDI on income inequality for a large sample of countries in different stages of economic development. I use a new dataset on income inequality and extended control variables to provide some evidence that the observed rise in the Gini coefficient across developing and developed countries over the 1990 – 2013 period could be partially attributable to FDI. The FDI-induced inequality effect does not hold for low-income countries and it is less strong in high-income countries, compared to middle-income economies. Whilst I cannot provide sound evidence of a harmful effect of captive centers on within-country income inequality, service offshoring is intensive in highly qualified workers, which could contribute to widen the gap between unskilled and skilled workers in developing countries. Expanding equal access to education becomes paramount at the edge of automation.

Resumen

En este documento, estimo el impacto de la IED en la desigualdad de ingresos para una amplia muestra de países en diferentes etapas de desarrollo económico. Utilizando una nueva base de datos del coeficiente Gini y numerosas variables de control, proporciono evidencia respecto a que el aumento observado en la inequidad del ingreso en los países en Desarrollo y desarrollados durante el período 1990 – 2013 podría ser parcialmente atribuible a la IED. El efecto de desigualdad inducida por la IED no se aplica a los países de bajos ingresos y es menos fuerte en los países de ingresos altos, en comparación con los países de ingresos medianos. Aunque no puedo proporcionar pruebas sólidas de un efecto nocivo de los centros cautivos en la desigualdad de ingresos dentro de los países, la deslocalización de servicios es intensiva en trabajadores altamente calificados, lo cual razonablemente podría contribuir a ampliar la brecha entre los trabajadores no calificados y los trabajadores calificados en los países en desarrollo. Extender el acceso a la educación es crucial en los inicios de la automatización.

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[2] Palabras Clave: IED; servicios globales; deslocalización internacional; inequidad de ingreso; centros cautivos.

I. Introduction

Over the past two decades, deepening globalization has coincided with growing income inequality in both developed and developing countries. Concerns over the possible relationship between foreign direct investment (FDI) and within-country income inequality are frequently present in current political discourse, leading media reports and academic debates. Moreover, several economists have emphatically stressed the potential harmful effect of offshore services in terms of job losses and welfare implications.[3] Still, the impact of increased capital flows intensive in high-skilled labor into developing countries has captured relatively less attention.

Estimating the impact of FDI on income inequality is important for several reasons. Recent econometric analysis suggests that income inequality has a negative impact on economic growth (Cingano, 2014). Moreover, an unequal society may lead to unsustainable macroeconomic policies and lower the ability of the state to ensure law and order, provide basic social services and develop good institutions, all of which also impact negatively on economic growth (Addison & Cornia, 2001). In addition, growing inequality strongly obstructs much needed progress in poverty reduction. Finally, people care about relative incomes and prefer to live in a more equal society (Figini & Görg, 2011; Sylwester, 2005).

Accordingly, if FDI increases income inequality, it may be that its positive effects on economic growth are later offset by lower growth rates and other economic, political and social negative effects. These issues are particularly worrisome for developing countries. In these countries, economic growth and socio-political stability are highly important for alleviating poverty, enhancing public services such as education and health care, and reducing the productivity gap with developed economies. Moreover, as most developing countries are dependent on inward FDI to stimulate economic growth, the question whether FDI affects income inequality in these countries is of great importance.

One important aspect of the new trends in FDI, is the impact on the skill premia in the country-source of offshoring. The significance of international offshoring and fragmentation of tasks has been growing around the world in recent years; the flourishing ease with which hundreds of diverse activities and tasks could be offshored to a distant location nowadays, has prompted amplifying research in the impact on the skill premia in both the country-source of offshoring and the country-host. Naturally, most research has been focused on developed countries, while the patterns of skill premia in the diverse developing world have attracted relatively less attention. Lack of extensive reliable data on service offshoring obliges the

[3] See, for example Geishecker and Görg (2011); Grossman and Rossi-Hansberg (2008); Levy (2005).

researcher to estimate the FDI-income inequality relationship before discussing its possible effects on the country-source.[4]

The theoretical framework behind the FDI-inequality relationship is unclear. Increased FDI can either raise or lower the relative demand of high-skilled labor, and thus help to raise or lower income inequality, respectively. An increase in the relative demand for high-skilled labor would cause an increase in both the wages and employment levels of high-skilled labor relative to those of low-skilled workers (Figini & Görg, 2011). Despite the theoretical ambiguity, there is some evidence that FDI inflows enhance inequality between skilled and unskilled workers, particularly in developing host countries. However, cross-country research is very limited, and results are inconclusive. Moreover, most studies focus on the effect of FDI on inequality on one specific country, income group or geography. The evidence that is available does suggest that the FDI-inequality relationship might depend on the level of economic development of the country and the motivation of FDI (Figini & Görg, 2011; Gopinath & Chen, 2003; Tomohara & Yokota, 2011).

The purpose of the research is to expend upon previous research and obtain new evidence on the effects of FDI on income inequality. To do so, the report will address the following: i) What is the effect of FDI on income inequality? ii) Is the effect different depending on the level of economic development of a country? (iii) Is the effect different depending on the level of attractiveness of the country to establish captive centers within the offshore services industry? To answer these questions, I conduct a comprehensive econometric analysis of the effects of FDI on income inequality in host countries for a large sample for the period 1900 – 2013.

The most important feature of the paper is that I investigate the impact of FDI on income inequality for a large sample of countries in different stages of economic development. This allows for a reliable assessment of whether the effect of FDI on inequality is dependent on the income level of a country. A second contribution is that I use a new database for measuring income inequality (SWIID) which provides researchers with data that maximizes comparability for the broadest possible sample of countries and years (Solt, 2014).

The paper consists of six sections which are organized as follows. Section II presents the theoretical background and empirical evidence which motivates the empirical analysis. Section III introduces the methodology, describes the data and presents the cross-country results. Section IV provides a sensitivity analysis using panel data estimations. Section V discusses the findings and provides some policy recommendations. Finally, section VI summarizes the findings and concludes.

[4] Generally, countries do not collect detailed data on FDI within the global offshoring market frame and companies have little incentive to disclose this information (Fernandez-Stark et al., 2011).

II. Definitions and Literature Review

II.1. Introduction to the Offshore Services Industry

Structural changes in the world economy precipitated by the information and communication technology (ICT) revolution in the early 1990s have facilitated the international unbundling of the internal business activities of multinational corporations (MNCs), thereby creating the offshore services industry, a new and rapidly growing sector in developing countries. For almost three decades now, MNC, such as General Electric, Unilever, and Bayer, began to relocate many of their routine business activities to lower-cost locations. They established the first 'captive centers' through their subsidiaries in developing countries, which allowed them to reduce costs of back-office finance and accounting services, such as payroll and document management. In this paper, service offshoring refers to a company's decision to transfer certain activities, which were hitherto carried out inside the company, to another unit of the firm in a foreign location (captive offshoring), as per this business model entails FDI, while offshore outsourcing accounts for international trade.

II.2. Introduction to Income Inequality and its Determinants

Although highly debated in recent economic literature, income inequality is not a new issue. Almost a half a century ago, Simon Kuznets (1955) provided the most seminal contribution to the inequality literature, which became famous as the ´Kuznets inverted U curve'. In brief, after a certain threshold of economic development, income distribution becomes more equal. A downside to Kuznets' work on income inequality is the lack of empirical evidence, even though some scholars deliver empirical evidence for the inverted U-curve (Gallo, 2002).

The recent rising rates of within-country income inequality have brought this issue under the attention of many scholars again. One important contribution is Milanovic (2000), who proposes an augmented Kuznets' hypothesis: while income-size distribution is determined by income per capita, political factors such as a large state sector and government transfers could promote a greater reduction of income inequality in the long term (Milanovic, 2000). Other scholars argue that education is a major determinant of income inequality (Glomm & Ravikumar, 2003; Gregorio & Lee, 2002). Empirical findings also suggest that good institutions, such as democracy and labor market regulations promote a more egalitarian

distribution of income (Acemoglu, 2003; Acemoglu et al., 2015).[5] Finally, cross-country data shows that bad institutions, such as corruption, can have a significant harmful effect on inequality (Gupta et al., 2002).

In recent years, much of the debate over rising inequality has focused on the consequences of globalization. According to the traditional trade theory represented by the Heckscher-Olin model, countries export goods that intensively use their abundant factors of production and import goods that intensively use their scarce factors. Based on this principle, Stolper and Samuelson (1941) predict that trade would increase demand for low-skilled labor in developing countries and narrow income inequality, while in developed countries it would increase the demand for high-skilled workers and raise inequality. Nonetheless, there is evidence of specific developing countries which suggests that trade liberalization increases rather than lowers inequality (Kremer & Maskin, 2006).

Within the effects of globalization on inequality, the role of foreign direct investment is relatively less explored than trade or financial integration, for instance. The lack of research on the effect of FDI on income inequality is worrisome not only because it is one of the most important channels of international integration, but also because during the past three decades developing countries have assigned a critical role to FDI to foster economic development: from 1990 to 2013, the share of FDI stocks as a percentage of GDP grew by almost 18 percentage points in developing countries (UNCTAD, 2018).

Moreover, during the past two decades, developing countries (e.g. India, Philippines, Costa Rica, Uruguay) have invested significant resources in assuring the level of infrastructure, human capital and institutions required to attract captive centers from MNC. Despite the offshore services industry provides developing countries the opportunity to upgrade into service-sector exports, which provides potential gains for sustainable economic growth, the central input for the industry are highly skilled members of the workforce (Fernandez Stark & Gereffi, 2016). This is especially true for captive centers, which employ predominantly tertiary level students and graduates (Messenger & Ghosheh, 2011). Accordingly, the industry might also pose an inevitable threat to economic growth and social stability through the skill premia. An unequal society is not only outrageous and troubled, but it also leads to unsustainable macroeconomic policies, inability from the state to develop good institutions, social crisis, and ultimately, economic stagnation (Addison & Cornia, 2001; Cingano, 2014; Sylwester, 2005).

[5] Democracy might be captured or constrained by elite classes, it may benefit only the middle class, or it may create new economic opportunities to the previously excluded, thereby widening inequality (Acemoglu, 2003).

II.3. Theoretical Framework

The theoretical effects of FDI on income inequality are complex, provided that there are many possible opposing effects derived from the distribution of human capital, as well as its supply and demand (Te Velde, 2003). According to the workhorse of traditional trade theory, the Heckscher-Olin model, capital flows to developing countries with abundant low-skilled workers should promote specialization in less-skilled intense activities, raising the relative demand for unskilled labor (Te Velde & Morrissey, 2004).

The growing rates of income inequality among developing countries have challenged the consistency of the Heckscher-Olin model and induced the emergence of alternative predictions on the effect of FDI on income inequality. Within this literature, the most seminal contribution is based on an endowment-driven FDI model championed by Feenstra and Hanson (1997). The theory also departs from a North-South model to examine the potential effects of FDI inflows on wages in both the host and parent countries. Here, a final good is produced from a continuum of intermediate inputs that vary in the relative amounts of skilled and unskilled labor required. The South has a comparative advantage in the production of inputs that require intensive use of unskilled labor and the North specializes in inputs that are relatively intense in skilled labor. The availability of relatively low-cost labor in the South encourages multinational enterprises (MNEs) from the North to undertake vertical FDI by offshoring labor intensive parts of the production process to the South. However, even if the activities offshored to the South are, from the North's perspective, ones that are relatively unskilled-labor intensive, from the South's perspective these activities are relatively skilled-labor intensive (Feenstra & Hanson, 1997). Hence, inward FDI would increase the relative demand of skilled labor in the host country, widening wage inequality.[6]

The North-South model applies namely to host countries where offshoring is rapidly increasing. Nonetheless, endowment-driven models are theoretically less useful for analyzing the impact of FDI on inequality in developed countries, granted that vertical FDI is often a consequence of large wage differentials between the source and the host country (Herzer & Nunnenkamp, 2011). Other countries, particularly developed economies, receive more horizontal FDI, which might have different distributional effects. The reason is that horizontal FDI is motivated by the attractiveness of host-country markets (Chintrakarn et al., 2012). Arguably, this type of FDI is less encouraged by the necessity of lowering labor costs, which is a critical determinant of vertical FDI.

According to Basu and Guariglia (2007), FDI-induced inequality may rather persist in developing countries unless low-skilled workers are able to accumulate enough human capital required to handle modern technologies. Theoretically, in an environment where the poor are unable to access modern FDI-

[6] The econometric results for Mexico over the period 1975 – 1988 support this hypothesis: vertical FDI promotes an increase in the relative demand for skilled labor, raising wage inequality (Feenstra & Hanson, 1997).

based technologies because of low initial human capital, FDI could exacerbate inequality. Only if the poor can make a transition to the modern sector, i.e. schooling increases, inequality would decline and the correlation between FDI-inequality might be negative (Basu & Guariglia, 2007).

In brief, theory suggests that FDI may increase the local demand for skilled or unskilled labor, depending on the level of economic, technological and educational development of the host economy, which impacts on the distribution of human capital. Moreover, while the tasks that are relocated from richer to poorer countries are typically not skill intensive from the perspective of the skill-rich country, they are from the perspective of the skill-poor country. As a result, offshoring makes labor demand more skill intensive in both poorer and richer countries, thus increasing inequality in both groups of countries (OECD, 2012).

Due to the type of worker employed by the offshore services industry, impact on income inequality might be even worse: at the very minimum, the offshore services industry requires high-school graduates, and on average, tertiary students (Messenger & Ghosheh, 2011). Hence, for developing countries, an increase in FDI or captive centers performing technical and professional services operations (e.g. IT, F&A) would mean that a proportion of the high-skilled workers will be earning higher wages. The increase in their proportion will cause an increase in the weighted average wage of the high-skilled workers, and accordingly an increase in the skill premium (Khalifa & Mengova, 2015). Further, while most offshore locations entered the Global Value Chain (GVC) through the establishment of low value-added operations (e.g. customer support or telemarketing), developing have also designed a handful of strategies to upgrade in the offshore services GVC, which means attracting higher value-added offshore operations, such as knowledge activities that demand an ever more qualified labor force (Fernandez-Stark et al., 2011). Briefly, in developing countries, upgrading trajectories within the offshore services GVC might worsen the inevitable negative effect of FDI on income inequality.

The non-uniformity of the theoretical models highlights the need for more empirical research to identify the effect of FDI on inequality. More importantly, it motivates the researcher to address if the different theoretical predictions are in line with the level of economic development and/or maturity in the offshore services industry of the country on which they are primarily based.

II.4. Empirical Evidence from Cross-Country Studies

The empirical evidence on the impact of FDI on income inequality from cross-country studies is surprisingly limited and inconclusive. There are very few cross-country studies that address the FDI-inequality link, even though some provide indications that the distributional effects differ between advanced and developing host countries.

Gopinath and Chen (2003) analyze time-series data on FDI and wages for 15 developed and 11 developing countries and find that inward FDI is associated with higher labor shares in GNP in both samples, but an F test reveal that FDI effects differ significantly between them. Although limited by data and not further discussed, the authors also find some evidence of a widening gap between skilled and unskilled workers in developing countries due to FDI flows.

Using a sample of 59 countries for the period 1960 – 1996, Reuveny and Li (2003) find a positive effect of FDI on income inequality and estimate that a rise in FDI by one standard deviation raises the Gini coefficient by 2.17%. The scholars argue that both in developing and developed countries, the gains of FDI are often concentrated in already benefited industries. Similarly, using pooled data from 1993 to 2002 for 119 countries, C. Choi (2006) finds that income inequality increases as inward flows of FDI rise, without distinguishing between developed and developing countries.

To test the non-linear theoretical framework, Figini and Görg (2011) use a panel of more than 100 countries for the period 1980 to 2002. After splitting the sample between developing and developed countries, they find that in the former subset of countries wage inequality increases with FDI inward stock, but this effect decreases with further increases of FDI. For developed countries, wage inequality decreases with FDI inward stock, but there is no robust evidence of a non-linear effect (Figini & Görg, 2011)

More recently, Herzer and Nunnenkamp (2011) estimate the FDI-income inequality link for a sample of ten European countries over the period 1980 to 2000 and find a non-linear effect. Using panel cointegration they conclude that, in average, FDI has a positive short-run effect on income inequality, but a negative effect in the long run. In addition, the long-run causality runs in both directions, suggesting that an increase in FDI reduces income inequality and that, in turn, higher inequality leads to lower FDI inflows. Finally, in relative low-income countries such as Ireland and Spain, FDI widens income inequality. In these cases, the Feenstra and Hanson (1997) model might be more appropriate (Herzer & Nunnenkamp, 2011).

Focusing on a sample of Latin-American countries, (Chintrakarn et al., 2012) analyze data using country-specific and panel co-integration techniques to assess the long-run impact of inward FDI stocks on income inequality among households in Bolivia, Chile, Colombia, Mexico and Uruguay during the period from 1980 to 2000. The results report a significant and positive effect of FDI stocks on income inequality, contributing to widen income gaps in almost all countries, except for Uruguay.

II.5. Service Offshoring and Income Inequality

The empirical effects of service offshoring on income inequality has been studied much less so far than offshoring of manufacturing activities.[7] Furthermore, attention to the link between these phenomena has turned towards developed countries, i.e. sourcing economies within the offshore services.[8]

Focusing on offshore services, Geishecker and Görg (2011) found a negative effect of services offshoring in a British industry on the real wage of low- and medium- skilled workers, and a positive effect on the real wage of skilled workers. This is consistent with the Grossman and Rossi-Hansberg (2008) model that recognizes that, in sourcing countries, high-skilled workers can be seen as winners and medium- and low-skilled workers as losers from offshoring. Similarly, (J. Choi, 2018) founds that in the US, unbundling both services and manufacturing tasks (aggregated) explains about 12 to 21% of the rising income inequality of that country during the period 2002 to 2011.

More recently, Ebenstein et al. (2015) finds that the most significant low-income offshore destinations (including manufacturing and services) are not associated with larger downward pressure on US worker wages than offshoring to other low-income regions. Further, a one percent increase in offshore employment of US affiliates in China was associated with a .02 percent decline in wages (Ebenstein et al., 2015).

III. Econometric Analysis

The empirical analysis will examine the relationship between FDI and income inequality in a large sample of countries. This section presents the empirical model, describes the data and presents the baseline results.

III.1. Empirical Model

As there is no consensus of any theoretical framework to guide empirical studies on the relationship between FDI and inequality, the baseline model is postulated according to the specification of previous studies within the FDI and inequality literature:

[7] Focusing on manufacturing offshoring, Feenstra (2008) suggests that the polarization of the labor force during the 1990s and 2000s in United States could be explained not only by skill-biased technological change, but also by the growing importance of service outsourcing, where middle-skilled routine tasks are increasingly outsourced to low-wage countries such as India (Pavcnik, 2011).

[8] According to (Everest Group, 2018) sourcing economies in the offshore services GVC include: United Kingdom, United States, Nordic States, Western Europe, Australia, and Japan.

$$\text{Gini} = \propto + \beta_1 FDI\ Stocks/GDP + \beta_2 \log(GDP\ per\ capita) + \beta_3 Trade + \beta_4 Human\ capital + \beta_5 Labor\ market\ regulation + \beta_6 Institutions + \beta_7 Democracy + \beta_8 Inflation + \beta_9 Transfers\ and\ Subsidies/GDP + \varepsilon$$

The dependent variable is represented by the Gini variable and the main independent variable is inward FDI stocks measured as a percentage of GDP (hence forth referred to as FDI), to control for the size of the host country. Following common practice (see, e.g. (Chintrakarn et al., 2012) I use FDI stocks rather than FDI flows because stocks capture long-run effects more effectively due to the accumulation of flows (Chintrakarn et al., 2012). If β_1<0, this means that income inequality will decline with higher levels of FDI and, conversely, if β_1>0, an increase in FDI will boost income inequality.

While most previous studies focus on wage disparity within the manufacturing sector, I intend to provide a more complete picture on inequality using income inequality as the dependent variable and including FDI in services within the main independent variable. [9-10] This contribution is meaningful because the service sector is the dominant activity in worldwide FDI and its distributional effects may impact significantly in the overall results. [11] In this regard, stylized facts show that the leading activities within FDI in services are finance, trade and business, which are most likely intense in relatively high-skilled labor in comparison with the type of labor required in manufacturing FDI.

Following the literature on income inequality, I add a set of control variables to the regression model. To allow for a meaningful regression analysis, these are carefully selected according to suggestions from previous empirical evidence on the FDI-income inequality relationship and data availability. The term ε is the error term.

III.2. Data and Descriptive Statistics

To assess the impact of FDI on income inequality, I use a cross-sectional dataset for 96 countries covering the period 1990 – 2013. The sample comprises economies from largely heterogeneous income groups, including: high-income (34), upper-middle-income (29), lower-middle-income (22) and low-income (11). Countries were selected exclusively according to data availability and are presented in Table 1.

[9] Lindert and Williamson (2001) argue that focusing on wage inequality limits the perspective on both the scope and the source of the rise in inequality, ignoring self-employment income, property income, profits, and executive compensation.
[10] The inclusion of FDI in services follows the approach of Chintrakarn et al. (2011), Herzer and Nunnenkamp (2011) and Herzer et al. (2012).
[11] In 1990 services FDI accounted for almost a half of global FDI stock. In 2012, the share of services FDI to global stock rose to nearly two thirds (UNCTAD, 2013, 2014).

Table 1. Countries included in the sample, by income group

High-income countries: GNI per capita of USD 12,746 or more.
Australia, Austria, Belgium, Canada, Chile, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Rep., Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States.
Upper-middle-income countries: GNI per capita between USD 4,126 and USD 12,745.
Algeria, Argentina, Azerbaijan, Brazil, Bulgaria, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Iran Islamic Rep., Jordan, Kazakhstan, Latvia, Lithuania, Macedonia FYR, Malaysia, Mauritius, Mexico, Panama, Peru, Romania, Russian Federation, South Africa, Thailand, Tunisia, Turkey, Uruguay, Venezuela RB.
Lower-middle-income countries: GNI per capita between USD 1,046 and USD 4,126.
Armenia, Bolivia, Cote d'Ivoire, Egypt, El Salvador, Georgia, Ghana, Guatemala, Honduras, India, Indonesia, Mauritania, Moldova, Morocco, Nigeria, Pakistan, Philippines, Senegal, Sri Lanka, Ukraine, Vietnam, Zambia
Low-income countries: GNI per capita USD 1,045 or less.
Bangladesh, Ethiopia, Kenya, Madagascar, Malawi, Mali, Rwanda, Sierra Leone, Tanzania, Uganda, Zimbabwe

Source: Author.

To measure income inequality, I use the Gini coefficient averaged for the period 1990-2013. Despite this is not an ideal measure of inequality, it is the most commonly presented in empirical research. The indicator is an estimate of the Gini in household disposable (post-tax, post-transfer) income (Solt, 2014). The source of the Gini coefficient, the fifth version of The Standardized World Income Inequality Database (SWIID) is one important contribution of the paper.[12] The major advantage of this database is that it maximizes comparability for the broadest possible sample of countries and years, being ideal for large samples on cross-national research, which is the interest of this paper.[13] To the best of my knowledge, this is the first empirical research that analyses the relationship between FDI and inequality on a large sample of countries using exclusively the SWIID database.[14] The data on FDI come from UNCTAD's FDI statistics and it is measured as the FDI stocks as a share of GDP. Table 2 indicates sources for control

[12] The SWIID Database, Fifth Edition, incorporates data from the United Nations University's World Income Inequality Database, the OECD Income Distribution Database, the Socio-Economic Database for Latin America and the Caribbean generated by CEDLAS and the World Bank, Eurostat, the World Bank's PovcalNet, the UN Economic Commission for Latin America and the Caribbean, the World Top Incomes Database, and the University of Texas Inequality Project

[13] The comparability issue of the Gini coefficient is largely solved employing a custom missing-data algorithm that minimizes reliance on problematic assumptions by using as much information as possible from proximate years within the same country (Solt, 2014).

[14] Herzer et al. (2012) use data available from both the University of Texas Inequality Project and the Standardized World Income Inequality Database (SWIID) focusing only on Latin American countries.

variables; these are calculated as averages over the 1990 – 1994 five-year period.[15] Finally, averaging is done to avoid having the results swamped by very short-run changes of the independent variables.

Table 2. Control Variables: Indicators and Source

Control Variables	**Indicator**	**Database / Publisher**
GDP per capita	GDP per capita	WDI[(a)], The World Bank
Trade	Sum of exports and imports as a percentage of GDP	WDI, The World Bank
Human Capital	Averaged years of schooling in the population between 15 and 64 years	Barro and Lee (2013)
Labor market regulation	Index that covers minimum wage, hiring and firing regulations, centralized collective bargaining, mandated cost of hiring, mandated cost of worker dismissal, hours regulation and conscription. Designed to measure the extent to which these restraints are present upon economic freedom. Scale from 0 to 10, 0 reflecting most restrictive regulations and 10 reflecting the less restrictive regulations	EFWI[(b)], Fraser Institute
Institutions	Index of property rights. The indicator measures the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws, and analyses the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and business to enforce contracts. The more certain the legal protection of property, the higher a country's score.	Index of Economic Freedom, Heritage Foundation
Democracy	Level of institutionalized democracy. Conceived as three elements: presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders; existence of institutionalized constraints on the exercise of power by the executive; and guarantee of civil liberties to all citizens in their daily lives and in acts of political participation.	Polity IV
Inflation	Measured as the most recent year inflation (in percentage)	EFWI, Fraser Institute
Transfers and subsidies	General government transfers and subsidies as a share of GDP	EFWI, Fraser Institute

Source: Author. **Notes:** [(a)] World Development Indicators; [(b)] Economic Freedom of the World Index.

Table 3 presents the summary statistics for the sample. The mean of the Gini coefficients for the sample is 37.284 which range from 22.765 for Slovenia to 59.208 for South Africa. The mean of FDI is 12.418, which ranges from 0 for Azerbaijan to 83.549 for Zambia.

[15] Except for labor market regulation, which correspond to the 2000 – 2004 period, property rights and transfers and subsidies, both corresponding to the 1995 – 1999 period. Unfortunately, data of these variables for most of the countries in the sample is only available for these periods.

Table 3. Descriptive Statistics, Cross-Country Regressions

Variable	Observations	Mean	Std. Dev.	Min	Max
Gini	96	37.2845	8.4126	22.7652	59.2082
FDI (% of GDP)	96	12.4181	15.6493	0	83.5498
GDP per capita (natural log)	96	7.7727	1.5734	5.0806	10.6010
Trade (% of GDP)	96	67.6014	42.2528	14.9336	321.6584
Human capital	90	7.0337	2.6707	0.89	12.2
Labor market regulation	96	6.1377	1.3156	3.3272	9.1680
Property rights	96	58.5025	20.6652	10	90
Democracy	96	4.3399	9.8176	-68.2	10
Inflation (%)	95	139.0239	706.4999	-4.52	6134.79
Transfers and subsidies (% of GDP)	89	10.9633	8.9886	.5	34.1

Source: Author.

III.3. Baseline Results

The model is estimated using ordinary least squares (OLS) and instrumental variables (IV) techniques on a cross-section of 96 countries over the 1990 to 2013 period. The OLS technique allows for the estimation of the long-run effect of the initial stock of FDI as a share of GDP on averaged income inequality between 1900 and 2013. The IV technique addresses potential endogeneity of the institutions variable, an issue that has been largely discussed in the inequality literature (Chong & Gradstein, 2007). To check unusual or influential outliers that might seriously affect the parameter estimates I use partial-regression plots for each independent variable. Using the *avplot* command in Stata, I identify four influential outliers that are excluded from the regression analyses reported below.[16]

Column (1) of Table 4 reports the results of the OLS specification with robust standard errors. The estimation of the baseline model shows that FDI has a positive impact on inequality, significant at the five percent level. The coefficient on FDI implies that an increase by one standard deviation in the FDI-to-GDP ratio (15.62 on a scale of 0 to 100) from its sample mean would increase the Gini coefficient approximately by 0.14 points, keeping the remaining variables constant. Most of the control variables are also found to be statistically significant, excluding the log of GDP per capita, trade and labor market regulation.

To address concerns that inequality may itself influence the quality of institutions leading to simultaneity bias, the property rights variable is instrumented using the percentage of Protestants in the population in 1980. The IV estimation results of the baseline model are presented in column (4) of Table 4. The sign and statistical significance of all right-hand side variables are in line with the OLS results, except for property rights, which once instrumented fails to achieve statistical significance. Thus, the IV estimation suggests that in the OLS specification, the effect of the property rights variable is downward biased. In

[16] The potential outliers are South Africa, Chile, Singapore and Zambia. *Avplots* of variables that present influential outliers are presented in Figures A.1 to A.7 of Annex A.

other words, inequality has a negative effect on property rights, which is captured by the OLS estimation. When this effect is controlled for by the IV estimation, the findings suggest that there is no effect of institutions on income inequality. In line with the OLS results, FDI continues to impact positively on the Gini coefficient. Thus, there is further evidence of a harmful effect of FDI on income inequality. The coefficient and significance on FDI in the IV specification are slightly lower.

Cross-country heterogeneity represents a further econometric concern to be addressed. The notion that the impact of FDI on income inequality depends on the level of economic development of a country allows for the presence of absorptive capacities, i.e. the existence of conditional factors that contribute to a country's ability to absorb the efficiency of FDI and reduce inequality. Absorptive capacity can be found in several studies in the FDI and inequality literature. To illustrate, Alfaro et al. (2010) interact FDI with financial markets to test for the significance of financial markets in enhancing the positive externalities associated with FDI. Similarly, Farkas (2012) examine the contribution of FDI to economic growth depending on the level of human capital and the development of financial markets. Focusing on the impact of FDI on inequality, Wu and Hsu (2012) study the absorptive capacity of different types of infrastructure to find that as more FDI flows into countries with a higher degree of infrastructure, FDI helps to reduce inequality, provided that it is engaged in to make use of an abundance of skilled workers (Wu & Hsu, 2012)

The OLS results of the interaction term model with robust standards errors are presented in columns (2) and (3) of Table 4. The coefficient of the interaction term from column (2) shows that as GDP per capita increases, the impact of FDI on income inequality is negative. In line with the FDI-inequality literature on developed countries, this finding suggests that as the level of economic development of a country increases, FDI contributes to reduce income inequality. One possible explanation behind this coefficient is that countries with a higher level of economic development are also at an advanced stage of technological progress. In turn, advanced technology is more widespread, which enables more workers to use the technology required by foreign companies and benefit from increased wage premium (Figini & Görg, 2011).

I perform a second robustness check and include to the baseline model an interaction term between FDI and a dummy variable for each income group, according to the categorization of the World Bank: low-income economies, lower-middle-income economies, upper-middle-income economies and high-income economies. OLS results show that all interaction terms are insignificant, suggesting that the effect of FDI on income inequality does not vary according to the stage of economic development of the country.[17] These unsatisfactory results might be a consequence of small sample, for which in the next section I present a sensitivity analysis using panel data estimations.

[17] Results are not reported in the paper to save space.

Table 4. FDI and Income Inequality, Cross-Country Regressions

Dependent variable	**Gini Coefficient**				
Estimation method	**OLS**			**2SLS**	
Model specification	Baseline model	Interaction terms	Interaction terms without outliers	Baseline model	Interaction terms without outliers
	(1)	(2)	(3)	(4)	(5)
FDI Stocks (% of GDP)	0.093**	0.349***	0.454	0.085*	0.445
	(0.039)	(0.119)	(0.315)	(0.038)	(0.307)
GDP per Capita (Natural Log)	-0.230	-0.289	-0.046	-0.473	-0.145
	(0.658)	(0.740)	(0.703)	(1.256)	(1.387)
Trade	-0.013	-0.023	-0.017	-0.011	-0.015
	(0.018)	(0.014)	(0.018)	(0.017)	(0.018)
Human capital	-0.608*	-1.141	-0.551*	-0.573*	-0.520*
	(0.306)	(0.356)	(0.303)	(0.304)	(0.320)
Labour market regulation	-0.152	-0.356	-0.027	-0.219	-0.081
	(0.378)	(0.429)	(0.388)	(0.452)	(0.500)
Property rights	-0.080*	-0.044	-0.076**	-0.057	-0.060
	(0.036)	(0.044)	(0.035)	(0.116)	(0.124)
Democracy	0.331***	-0.132	0.340**	0.329**	0.334**
	(0.143)	(0.234)	(0.145)	(0.151)	(0.163)
Inflation (%)	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Transfers and subsidies (% of GDP)	-0.548***	-0.582***	-0.543***	-0.548***	-0.544***
	(0.081)	(0.087)	(0.081)	(0.080)	(0.087)
FDI*GDP per Capita (Natural Log)		-0.029**	-0.042		-0.041
		(0.014)	(0.033)		(0.322)
Number of observations	82	86	82	81	81
R-squared	0.717	0.682	0.722	0.718	0.724

Notes. Standard errors are in parentheses. *** denotes significance at the 1 percent level, ** denotes significance at the 5 percent level, * denotes significance at the 10 percent level. FDI=Foreign Direct Investment; GDP=Gross Domestic Product.

Source: Author

IV. Sensitivity Analysis

In this section, I provide a sensitivity analysis of the results obtained from the cross-section approach by using panel data estimation.

IV.1. Empirical Model and Specification

The sample is an unbalanced panel consisting of 96 countries and five non-overlapping time periods: 1990-94, 1995-99, 2000-2004, 2005-2009 and 2010-2013. The sensitivity analysis is based on the following baseline model:[18]

$$\begin{aligned}\text{Gini} = \propto + &\beta_1 FDI\ Stocks/GDP_{it} + \beta_2 \log(GDP\ per\ capita)_{it} + \beta_3 \log(GDP\ per\ capita)_{it}^2 + \beta_4 Trade_{it} \\ &+ \beta_5 Human\ capital_{it} + \beta_6 Labor\ market\ regulation_{it} + \beta_7 Institutions_{it} + \beta_8 Democracy_{it} \\ &+ \beta_9 Inflation_{it} + \beta_{10} Transfers\ and\ Subsidies_{it} + \alpha_i + \mu_{it}\end{aligned}$$

The dependent and explanatory variables of this model are identical to the baseline model estimated in section 3, apart from the institutions variable, which is represented by an index of political stability and absence of violence from the World Bank World Governance Indicators.[19] A further alteration is the addition of the squared term of GDP per capita (natural log) to test for a non-linear relationship between economic development and income inequality modelled by Kuznets (1955). Hence, it is expected that β_2 is positive and β_3 is negative. The α_i captures all unobserved country-specific effects (unobserved heterogeneity), to control for time-invariant effects on income inequality, such as geographical, demographic and ethnical fractionalization features. Finally, μ_{it} is the remaining error term.

The model is estimated with three different panel data methods: pooled OLS, random effects and instrumental variables. Each of these methods relies on different assumptions, for which they have advantages and limitations. The pooled OLS specification relies on the assumption that there is a zero correlation between α_i and all the explanatory variables, which means that any time-invariant country-specific effect that affects income inequality is not correlated with the explanatory variables. In this analysis, this assumption is rather problematic, given that geographic, demographic and ethnic fractionalization features that might affect income inequality for any given country are intuitively related with the some of the explanatory variables of the model, such as the level of economic development, the years of education

[18] The model was also estimated including a full set of time dummies to control for the impact of common global shocks, but F-test yields that these are jointly insignificant. Thus, they were not included.

[19] The property rights index from the Index of Economic Freedom constructed by Heritage Foundation included in the cross-section model does not enter significantly in any of the various panel data specifications.

and the quality of institutions. One advantage of pooled OLS is that it increases the sample size, for which it provides more precise estimators and more powerful test statistics (Wooldrige, 2009). In addition, it allows for the inclusion of variables that do not change substantially with time, an important feature for a model in which six out of ten explanatory variables present small within-country variation (Table 5). The major problem with pooled OLS is that by lumping together different countries at different times, it camouflages the country-specific effect that may exist among the countries of the sample. In this case, the estimated coefficients might be biased as well as inconsistent (Gujarati & Porter, 2009).

Table 5. Descriptive Statistics, Panel Data Estimation

Variable		Mean	Std. Dev.	Min	Max	Observations
Gini	Overall	37.27	8.752	18.967	61.219	N = 471
	Between		8.305	22.860	59.204	n = 96
	Within		2.698	24.980	49.583	T = 4.906
FDI (% of GDP)	Overall	30.235	33.070	0	276.090	N = 477
	Between		25.368	1.922	168.037	n = 96
	Within		21.309	-91.946	176.545	T-bar = 4.968
GDP per capita	Overall	8.268	1.628	4.811	11.592	N = 477
(Natural log)	Between		1.558	5.326	11.091	n = 96
	Within		.487	6.948	9.796	T-bar = 4.968
GDP per capita	Overall	71.015	26.976	23.153	134.396	N = 477
squared (Natural log)	Between		25.848	28.574	123.175	n = 96
	Within		7.921	52.744	94.718	T-bar = 4.968
Trade	Overall	79.264	49.562	14.933	410.246	N = 476
	Between		47.362	22.244	360.799	n = 96
	Within		14.987	-6.400	159.781	T-bar = 4.958
Human capital	Overall	8.076	2.741	.89	13.18	N = 450
	Between		2.630	1.366	12.694	n = 90
	Within		.811	6.018	10.458	T = 5
Labor market regulation	Overall	5.797	1.381	1.837	9.168	N = 375
	Between		1.159	3.655	8.478	n = 96
	Within		.715	2.995	7.799	T-bar = 3.906
Political stability	Overall	47.916	27.885	.709	100	N = 384
and absence of violence	Between		27.125	6.137	98.508	n = 96
	Within		6.896	20.977	75.738	T = 4
Democracy	Overall	5.491	8.743	-83.6	10	N = 479
	Between		6.454	-36.35	10	n = 96
	Within		6.220	-50.668	41.841	T = 4.989
Inflation	Overall	49.234	407.416	-4.52	6134.79	N = 451
	Between		176.823	.124	1231.003	n = 96
	Within		364.815	-1179.399	4953.021	T-bar = 4.697
Transfers and subsidies	Overall	11.0596	8.596	0	37.2	N = 429
(% of GDP)	Between		8.184	.536	29.165	n = 94
	Within		2.535	2.452	4.252	T-bar = 4.563

Source: Author.

As with pooled OLS, a random effects analysis does not allow correlation between α_i and the explanatory variables. While the latter is more precise in the structure of the error terms α_i and μ_{it}, this specification imposes the strict exogeneity assumption in addition to a zero correlation between α_i and all the explanatory variables. On the other hand, like pooled OLS, it allows for the inclusion of variables that do not change substantially with time. In addition, it is unlikely that the country-specific effect (α_i) is uncorrelated with the explanatory variables. In fact, the Hausman test suggests that the null hypothesis of zero correlation between the α_i term and the explanatory variables cannot be rejected. Thus, fixed effects would be preferred. However, precise estimates from fixed effects require substantial within-country variation of the explanatory variables and small within-country variation of any dependent variable measurement error (Carter, 2007).

In addition, when there is endogeneity among the explanatory variables, it is likely that there is substantial bias in OLS and the random effects estimators and that both yield misleading inferences (Baltagi et al., 2003). In the presence of potential endogenous variables, such as the institutions variable, I also estimate the model using an instrumental variables (IV) technique, being the preferred method. As mentioned in the previous section, institutional quality and income inequality reinforce each other, given that while poor institutions quality leads to higher inequality, income inequality may cause subversion of institutions by the politically powerful high-income elite (Chong & Gradstein, 2007). Moreover, there is evidence that income inequality encourages social discontent and socio-political instability (Alesina & Perotti, 1996) which is precisely what the institutions variable of the sensitivity analysis measures. To address simultaneity bias concerns, the variable political stability and absence of violence is instrumented using the percentage of Protestants in the population in 1980 and an index of ethnolinguistic fractionalization.

While the first instrument validity was already discussed, the relevance of the second instrument comes from the theory that in ethnically heterogeneous societies, it has been common for the groups that come to power to fashion government policies that expropriate (or kill) the ethnic losers, restrict their freedom of opposition, and limit the production of public goods to prevent those outside the ruling group from also benefiting and getting stronger (La Porta et al., 1999).

Hence, ethnic fractionalization is associated with political instability. After the first-stage regression the F test on both instruments is above 10, which confirms the instrument relevance. In reference to the exclusion restriction, is plausible that ethnic fractionalization is exogenous, i.e. that it does not affect income inequality by any other channel than institutions. A check for this criterion is to test whether the instruments are uncorrelated with the structural error term, with an over-identification test. The Sargan test does not reject the null hypothesis, for which there is no indication of having endogenous instruments.

IV.2. Sensitivity Analysis Results

Column (5) of Table 6 reports the results of the IV estimation method. [20] The coefficient of FDI is positive and statistically significant at the one percent level. More precisely, the parameter suggests that a ten-percentage point increase in the FDI-to-GDP ratio would increase income inequality approximately by about 0.48 points, ceteris paribus. The coefficient of FDI reported by pooled OLS is slightly lower, but still positive and significant at the ten percent level. Hence, the harmful effect of direct foreign investment on inequality is suggested by both cross-country and panel data estimations, as FDI always enters with a positive and statistically significant coefficient. Most of the control variables are also found to be statistically significant in, except for labor market regulation and the instrumented variable, political stability and absence of violence.[21] Similar to cross-country estimations, the IV panel data specification suggests that the effect of this variable is downward biased.

In summary, in support to the cross-section findings, focused on the long-run effect of FDI on income inequality, Table 6 shows that in comparison, the estimates are very stable in panel data estimations. Hence, in response to the first research question of this paper, there is robust evidence that FDI increases income inequality. The existence of a non-linearity relationship predicted by Figini and Görg (2011) could not be validated, granted that in line with cross-country estimations, the FDI squared variable enters insignificantly in all panel data specifications.[22]

The second and third question of interest of this paper are still to be addressed: ii) is the effect of FDI on income inequality different depending on the level of economic development of a country? iii) does the effect of FDI on income inequality varies dependent on the attractiveness of a country as an offshore location? Simple cross-country OLS provided no evidence on the existence of a different impact at any level. I expect that a larger sample size provided by a panel data approach allows for the estimation of different slopes of FDI conditional on the level of income of the country and luckily, on the level of attractiveness as an offshore services location. To address the second research question, I add to the baseline model interaction terms of FDI multiplied by each group of income, represented by a dummy variable. The grouping of countries fits the World Bank classification, including: high-income countries, upper-middle income countries, lower-middle income countries and low-income countries. [23] The reference group is low-income countries. [24] This procedure would allow for a reliable test of the validity

[20] Eight observations identified as potential outliers are removed from the model in all estimation methods and specifications.
[21] In pooled OLS and random effects, the coefficient on labor market regulation is positive and significant at the ten and one percent level, respectively. This would suggest that less restrictive regulations of the labor market, including minimum wage and hiring and firing regulations, tends to increase inequality. Hence, protecting the working population through labor market regulations tends to reduce inequality.
[22] The FDI squared variable interacted with different income groups is also insignificant.
[23] Table 1 provides data on the income thresholds of each income group.
[24] Changing the reference group does not alter the results.

of the different theoretical predictions behind the FDI-inequality link. To address the third research question, I add to the baseline model interaction terms of FDI multiplied by different groups of service offshoring locations, represented by a dummy variable. The grouping of countries is constructed by the author based on the Global Services Location Index (GSLI) from A.T. Kearney ranking: the first ten countries leading the 2017 GSLI integrate the 'Mature Offshore Services Locations'; the reference group is composed by the remaining economies.

Results from all panel data estimation methods suggest that the impact of FDI on income inequality in high-income countries is statistically significant different from the reference category (low-income countries). The statistically significant difference also holds for lower-middle-income countries and upper-middle income countries.

Column (6) of Table 6 shows that the coefficient on FDI for low-income countries is negative and statistically significant at the five percent level, meaning that in low-income countries FDI would reduce income inequality. In these countries, a ten-percentage point increase in the FDI-to-GDP ratio lowers income inequality by 2 points approximately, ceteris paribus. With respect to the following group in terms of income, lower-middle-income economies, the estimated marginal effect is positive and statistically significant at the one percent level, and the coefficient suggests that a ten-percentage point increase in the share of FDI on GDP increases the Gini coefficient by 1.67 points approximately, holding all other things constant. The estimated marginal effect of FDI on upper-middle-income group is slightly negative and statistically significant at the ten percent level25. In these countries, a ten-percentage point increase in the FDI-to-GDP ratio would reduce income inequality by about 0.16 points, ceteris paribus. However, this result should be treated with caution, not only because the low economic significance but also because with random effects the marginal effect of FDI on income inequality becomes positive and significant at the one percent level, meaning that in these economies a ten-percentage point increase in the FDI-to-GDP ratio would increase income inequality by 0.19 points.

Given the ambiguity in results, I created a new dummy variable which includes both lower-middle-income economies and upper-middle economies and I interacted it with the FDI variable. [26] I re-estimated the model and both the random effects, and IV estimation provides a positive and significant at the five percent level interaction term, which suggests that in middle-income economies FDI increases income inequality. Finally, in high-income countries the effect of FDI on income inequality is positive and statistically significant at the five percent level, suggesting that a ten-percentage point increase in the share of FDI on GDP would increase the Gini coefficient by about 0.41 points, holding everything else constant.

[25] The slope of the coefficient is slightly positive. However, the estimated marginal effect is negative.
[26] Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of USD 4,125.

Table 6. FDI and Income Inequality, Panel Data Regressions

Dependent variable	**Gini Coefficient**					
Estimation method	**Pooled OLS**		**Random Effects**		**Instrumental Variables**	
Model specification	Baseline model	Interaction terms	Baseline model	Interaction terms	Baseline model	Interaction terms
	(1)	(2)	(3)	(4)	(5)	(6)
FDI Stocks	0.037*	-0.205**	0.020*	-0.249***	0.048***	-0.200**
(% of GDP)	(0.022)	(0.088)	(0.011)	(0.857)	(0.015)	(0.092)
GDP per Capita	14.853***	6.441***	4.442**	3.029	14.944***	7.298**
(Natural Log)	(3.495)	(3.060)	(2.104)	(2.940)	(2.611)	(3.290)
GDP per Capita squared	-0.823***	-0.348***	-0.312**	-0.219	-0.855***	-0.419**
(Natural Log)	(0.202)	(0.166)	(0.124)	(0.164)	(0.158)	(0.189)
Trade	-0.024*	-0.019	-0.008	-0.005	-0.030***	-0.024**
	(0.140)	(0.013)	(0.010)	(0.010)	(0.011)	(0.011)
Human capital	-0.862***	-0.843**	-0.793***	-0.732***	-0.796***	-0.718***
	(0.315)	(0.339)	(0.250)	(0.260)	(0.228)	(0.239)
Labour market	0.571*	0.627*	0.898***	0.864***	0.412	0.450
regulation	(0.333)	(0.377)	(0.229)	(0.214)	(0.307)	(0.311)
Political stability and	-0.074***	-0.068***	-0.043***	-0.024	-0.044	-0.040
absence of violence	(0.024)	(0.021)	(0.016)	(0.017)	(0.045)	(0.044)
Democracy	0.059	0.066	0.053	0.033	0.265**	0.335**
	(0.059)	(0.066)	(0.043)	(0.043)	(0.121)	(0.117)
Inflation (%)	0.051**	0.034	0.019*	0.020*	0.053***	0.035*
	(0.019)	(0.025)	(0.009)	(0.009)	(0.020)	(0.018)
Transfers and	-0.517***	-0.475***	-0.196***	-0.165***	-0.576	-0.521***
subsidies (% of GDP)	(0.834)	(0.081)	(0.526)	(0.060)	(0.075)	(0.066)
FDI*Lower-middle-		0.385***		0.301***		0.367***
income		(0.123)		(0.096)		(0.099)
FDI*Upper-middle-		0.191*		0.268***		0.184*
income		(0.104)		(0.092)		(0.099)
FDI*High-income		0.233***		0.266***		0.241**
		(0.090)		(0.085)		(0.094)
Lower-middle-income		-6.400		-3.273		-7.199***
countries		(4.434)		(3.166)		(2.353)
Upper-middle-income		2.185		0.716		1.351
countries		(4.504)		(3.514)		(2.732)
High-income		-2.637		-5.592		-4.870
countries		(4.808)		(3.719)		(3.476)
Number of observations	286	286	286	286	278	278
R-squared	0.666	0.707	0.584	0.648	0.669	0.716

Notes. Standard errors are in parentheses. *** denotes significance at the 1 percent level, ** denotes significance at the 5 percent level, * denotes significance at the 10 percent level. FDI=Foreign Direct Investment; GDP=Gross Domestic Product.

Source: Author.

According to these results, the effect of FDI on income inequality does depend on the level of economic development. In countries with the lowest level of economic development, such as Ethiopia, Malawi and Bangladesh, foreign investment seems to contribute to lower income inequality. For this group of countries, the traditional economic theory belonging to the Heckscher-Olin model seems to apply. Provided that the ratio between low-skilled and high-skilled workers is very small, FDI contributes to reduce income inequality by raising the relative demand for unskilled cheap labor.

However, in countries belonging to the lower-middle-income group, such as India and Philippines, an increase of FDI stocks is harmful for income inequality. The theoretical argument behind this relationship might be the North-South model of vertical FDI developed by Feenstra and Hanson (1997). The availability of relatively cheap labor in these countries encourages MNEs to send labor intensive stages of the manufacturing and services production processes. Even though these activities are relatively unskilled-labor intensive by the standards of the source country, they are relative skilled-labor intensive activities by the standards of the host country. In turn, inward vertical FDI or offshoring raises the demand and wages of skilled workers, increasing income inequality in lower-middle-income host countries.

With respect to upper-middle-income economies, such as Argentina, Lithuania and South Africa, providing an explanation for effect of FDI is more complex, given that while OLS estimates an inequality-reducing impact, the random effects method estimates inequality-widening impact. Nonetheless, the interaction term of FDI and middle-income countries renders a positive effect of FDI on income inequality, which is reasonably explained in the same line of reasoning of the paragraph above.

Further, the sensitivity analysis suggests that in high-income countries such as Netherlands, Japan and United States, FDI tends to increase income inequality. This result is in line with the view of Driffield and Taylor (2000) who argue that because foreign-owned companies possess a productivity advantage over domestic firms in the host country, an increase in FDI tends to raise the demand for local wages for skilled workers at the expense of unskilled labor. The disproportional increase in the demand of skilled workers is reinforced by domestic companies that need to employ high-skilled labor to imitate MNEs and survive in the market. Hence, horizontal FDI can still promote greater income inequality in advanced economies. However, the marginal impact of FDI on income inequality is less than half than the one for lower-middle-income countries, which suggest the existence of absorptive capacities among high-income countries.

Unfortunately, the interaction term with 'Mature Offshore Services Locations' yields insignificant results, suggesting that the effect of FDI on income inequality does not vary according to the stage of maturity of the country as an offshore services location. These disappointing results might be a consequence of the wide range of activities grouped in the independent variable, which gathers. all type of industries and very dissimilar FDI motivations.

V. Discussion

Over the past two decades, the possible relationship between globalization and income inequality has been at the heart of economic debate. Within the various channels of globalization, the role of FDI is relatively less explored. Moreover, the theoretical framework behind the FDI-inequality link is rather ambiguous and cross-country empirical evidence is inconclusive, although recent studies suggest that the effects of FDI on inequality vary according to the level of economic development of a country.

The present paper contributes to clarifying these uncertainties. I examine the relationship between FDI and income inequality for a sample of 94 countries over the period 1990 to 2013 by employing cross-section and panel data estimations. To make a significant contribution to the existing literature, I attempt to correct for the severe measurement issues from cross-country inequality data using a new database that maximizes comparability among different countries and years. Moreover, I include an extensive number of control variables, focusing on those suggested by previous studies on the FDI-inequality relationship, such as institutions and transfers and subsidies. Finally, the large sample allows for an identification of different impacts of FDI depending on income levels.

The results suggest that on average inward FDI tends to increase income inequality in host countries. The intuition behind this effect is that FDI raises the relative demand for higher-skilled labor, which in turn leads to an increase in both the wages and employment levels of high-skilled workers relative to those of low-skilled workers.

A further matter of interest of this paper is to estimate whether the effect of FDI on income inequality varies according to the level of economic development of a country. Data panel estimations suggest that among low-income countries, FDI tends to decrease income inequality. According to the IV estimates, for a country like Malawi, in which the share of FDI on GDP increased from 7.32% to 19.67% over the sample period, this would imply a Gini decrease of about 2.47 points (ceteris paribus), a modest part of the actual decrease at 14.22 units during the studied period. Among lower-middle-income (and upper-middle-income) countries, FDI tends to increase income inequality, as well as among high-income economies, although the estimated effect for the former group is much higher than the one for the latter group. To further describe the different size of the effect, for a country like India, who increased the share of FDI on GDP by 10.89 percentage points over the sample period, the estimated marginal effect on lower-middle-income countries implies that the Gini coefficient increased by 1.82 points approximately (ceteris paribus), which is a substantial part of the actual increase at 5.15 points. However, for a country like United States, in which the share of FDI on GDP increased by 14.24 percentage points over the sample period, the estimated marginal effect on high-income countries implies that the Gini coefficient increased

by only about 0.58 points (ceteris paribus), which is nonetheless also a significant part of the actual increase at 2.82 points in United States.

What could explain the notable differences between low, middle and high-income economies? From the point of view of low-income countries, FDI might lessen income inequality because as low-skilled labor is predominant, FDI takes part largely in low-skilled sectors. In lower-middle-income (and upper-middle-income) countries the availability of abundant low-skilled labor also encourages MNEs to invest in low-skilled sectors; however, under the human capital structure of developing countries, these sectors are still intense in relatively high-skilled labor. Thus, inward FDI widens the income gap between high-skilled labor and "actual" low-skilled labor. Finally, in high-income economies, the positive impact of FDI on income inequality might be lower because these countries are at a higher stage of technological, educational and social development. These features might enable a relatively modest gap between low-skilled and high-skilled workers, which in turn facilitate a more balanced distribution of wage premiums from FDI.

The inequality-widening effect of FDI previously predicted by Feenstra and Hanson (1997) apparently holds for many developing countries. This finding is worrisome because during the past decades, developing countries have assigned a critical role to FDI to foster economic growth. Further, even though the estimations do not evidence a dissimilar effect depending on the level of maturity in the offshore services industry, it is reasonable to argue that offshore services operations might benefit an already selected group of the population, i.e. those above certain threshold of economic and social resources enough to complete secondary education and in most cases, follow a tertiary degree. In addition, incentives to attract offshore operations frequently include subsidies to train near-hires or employees of those operations, further benefiting a privileged group of workers. Hence, service offshoring would reasonably compromise social stability and economic growth through its inevitable harmful impact on income inequality.

Econometric results from this paper suggest that economic growth driven by FDI is exclusionary and unequal, especially in countries that have embraced globalization in a one-sided manner by simply clearing the investment door and providing training incentives for MNC which favor an already advantaged group of workers. As indicated by Lambregts et al. (2015) it seems clear that relying solely on foreign investments of MNCs cannot benefit everyone.

To reduce the harmful effects of FDI on inequality whilst continuing to gain the benefits of participating in the offshore services industry and upgrading in its value chain, developing countries should guarantee equal access to education and provide adequate support to making educational potential less dependent on personal and social circumstances. Finally, focusing on unskilled workers is paramount at the edge of automation.

VI. Conclusion

Estimates using a new and more reliable dataset on income inequality and extended control variables provide some evidence that the observed rise in the Gini coefficient across many developing and developed countries over the past fifteen years could be partially attributable to the impact of FDI. The FDI-induced inequality effect does not hold for low-income countries and it is less strong in high-income countries, compared to middle-income countries.

The results of this paper are based on various estimations methods using cross-section and panel data. Cross-country estimations suffer from small sample issues and time-invariant omitted variable bias, for which they provide less precise estimates. Regarding panel data estimations, it is very likely that the country-specific effects are correlated with the explanatory variables and that, in turn, pooled OLS and random effects are inconsistent. Unfortunately, precise estimates from fixed effects require substantial within-country variation of the explanatory variables and they could not be obtained. Hence, despite the efforts to present unbiased and consistent findings, it might still be possible that these issues persist.

The research presented in this paper could be extended along several dimensions. First, provided that the Gini coefficient is highly persistent, it would be important to consider a dynamic equation using a regression model with a lagged dependent variable. Second, it would be interesting to distinguish the impact of different sectors of FDI: it is likely that the manufacturing sector is relatively less intense in high-skilled labor than the service sector (service offshoring), which has significantly grown in the past two decades, particularly in developing regions such as Southeast Asia, Eastern Europe and Latin America and the Caribbean. Research along these lines is still impeded by persistent data limitations, which indicates the necessity of further efforts on data collection.

Third, to obtain a full assessment of the economic effects of service offshoring on developing countries the negative impact of FDI on income inequality should be compared to the positive role of captive centers in promoting economic development, through for example spillovers. However, the contribution of backward and forward linkages to raising the level of the competitiveness of local companies is rather limited for captive centers (Sass, 2011).[1] Despite mobility of trained employees who might either go to work at local companies, or set up their own companies is relatively more present in service offshoring – particularly in computer and related services – 'spin-offs' are generally limited to skilled labor, further widening the gap between unskilled and skilled workers.

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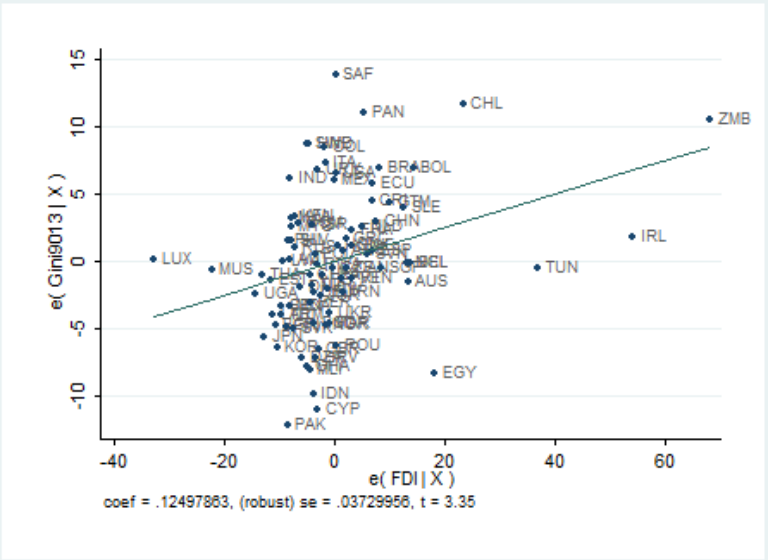
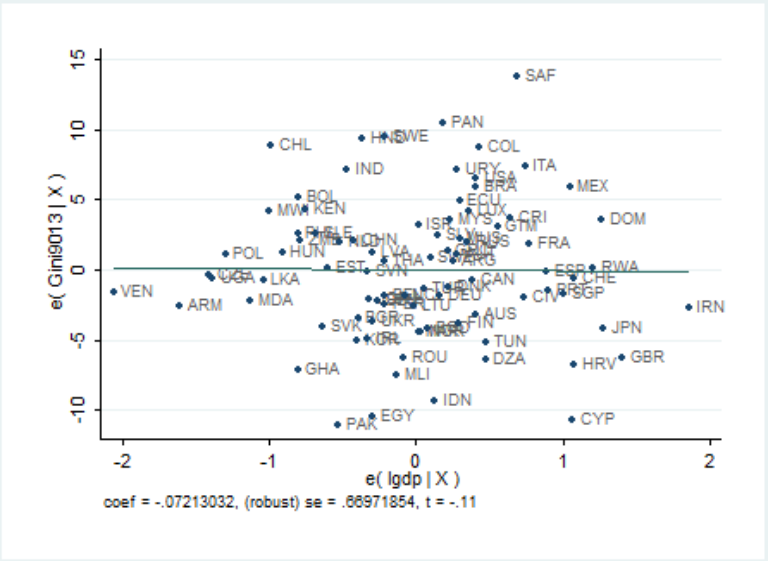
Annex A. Partial-Regression Plots

Figure A. 1. Partial-Regression Plot of FDI, Cross-Country OLS



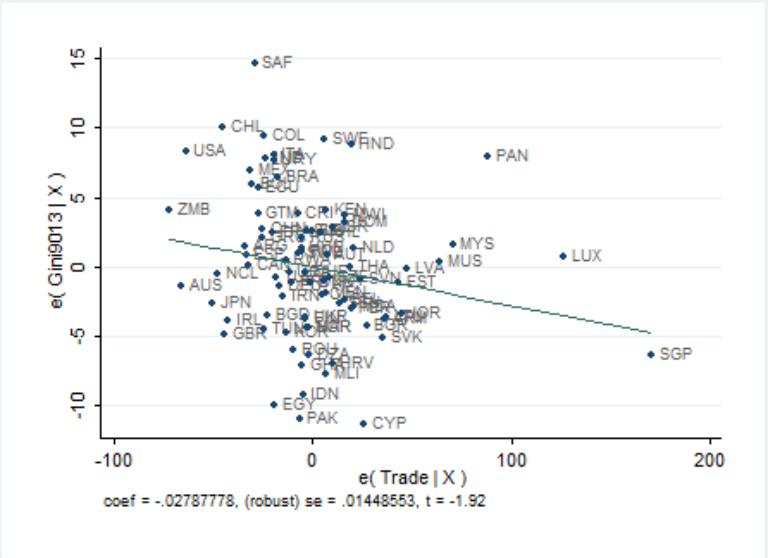
Source: Author

Figure A. 2. Partial-Regression Plot of GDP Per Capita (Natural Log), Cross-Country OLS



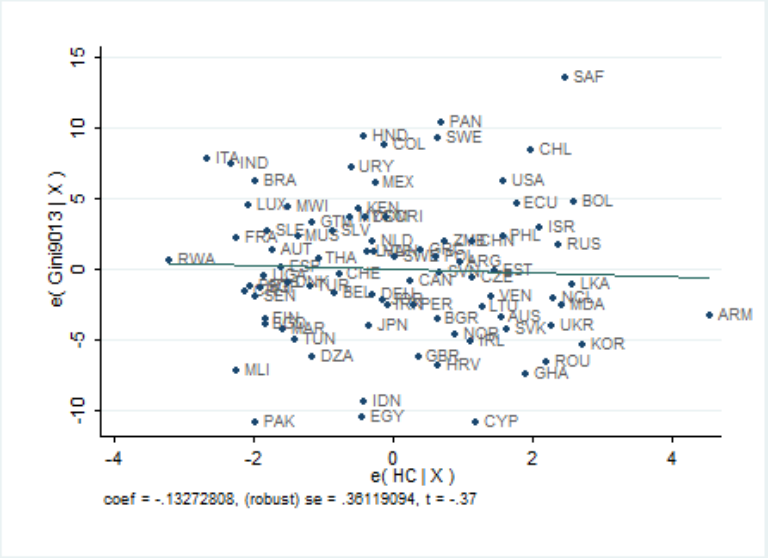
Source: Author

Figure A. 3. Partial-Regression Plot of Trade, Cross-Country OLS



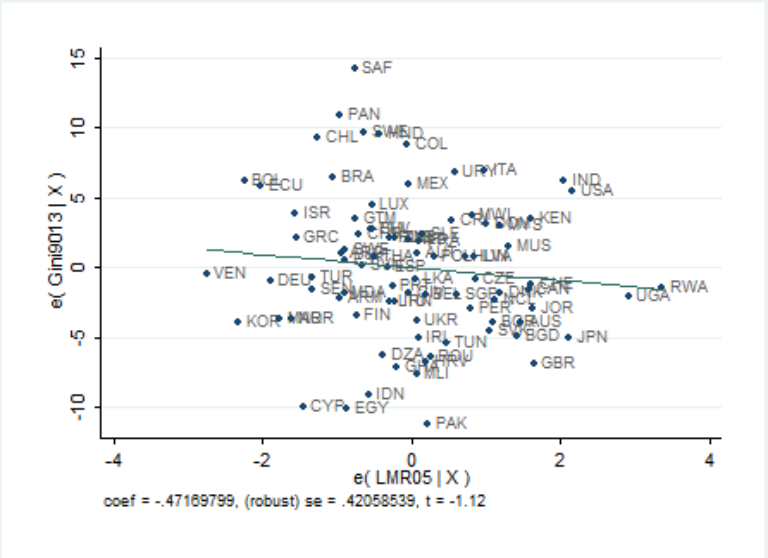
Source: Author

Figure A. 4. Partial-Regression Plot of Human Capital, Cross-Country OLS



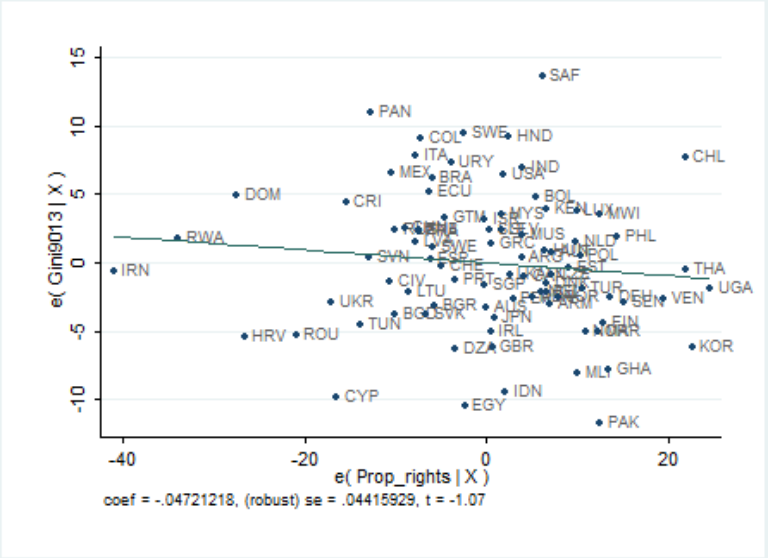
Source: Author

Figure A. 5. Partial-Regression Plot of Labor Market Regulation, Cross-Country OLS



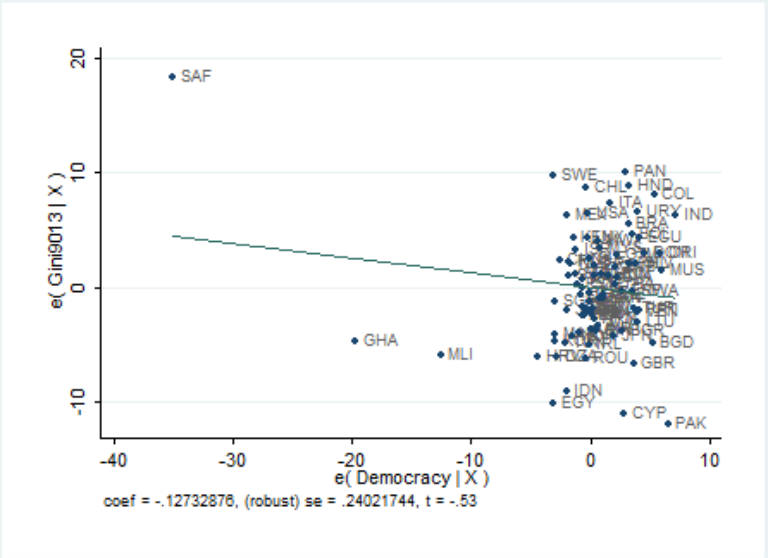
Source: Author

Figure A. 6. Partial-Regression Plot of Property Rights, Cross-Country OLS



Source: Author

Figure A. 7. Partial-Regression Plot of Democracy, Cross-Country OLS



Source: Author