Foreign Direct Investment and Wage Inequality: An Empirical Analysis of the Emerging Economies from 1970 to 2015

by

Ana Filipa Rodrigues Brito

up200801324@fep.up.pt

Dissertation

Master in International Business

Supervised by

Aurora A.C. Teixeira

2017

Bibliographic note

Ana Filipa Rodrigues Brito was born in Guimarães, in 1990. In 2013, has completed the degree in Management in the University of Porto and is currently in the last stage of completing the master in International Business.

She started her professional career in 2012, in the marketing department of Menina Design Group as marketer and assistant to the manager. Later on, in 2014, she worked at Lidl as district manager. Currently, she is working at Typographia as head of the Expansion department.

Acknowledgments

To Aurora Teixeira, this dissertation's supervisor, a special thank you for your help and patience.

To Pedro Basto, my partner, I am incredibly grateful for your understanding and support throughout this period.

Abstract

Globalization and rising wage inequality has been a world's reality since the 1970s and a reasonable amount of studies have dealt with this topic. Although wage inequality has been prevalent and acute in emerging economies (EEs), which have been important recipients of foreign direct investment (FDI), the empirical evidence on the impact of FDI on wage inequality in EEs is scarce and usually focused on given countries in isolation.

The present study aims at contributing to fill in this gap by analysing the impact of FDI, proxied by FDI inward flows and FDI stocks, on wage inequality, proxied by the Gini coefficient, the S90-S10 ratio, the S80-S20 ratio and the Industrial Pay Inequality index (UTIP-UNIDO index), on EEs resorting to fixed-effect panel data comprising 39 EEs over a period of 45 years (1970-2015), controlling for countries' openness to trade, economy dimension, human capital and corruption.

Globally, our empirical study suggests that FDI increases inequality in EEs, at a decreasing rate over time, with its impact being larger on wages than on income. Notwithstanding, we found that in the last two decades FDI reduced the gap between higher and lowest income earners. We further found that the impact also varies according to the country development level: 1) FDI reduces wage inequality (proxied by the Gini coefficient) in low-income countries and increases it in high income; 2) FDI increases wage inequality (proxied by the Industrial Pay Inequality index) in all groups of incomes, with higher effect on higher income countries.

Keywords: globalization; foreign direct investment; wage inequality; inequality; emerging economies

JEL-Codes: F21; F62; D63

Resumo

O crescimento da desigualdade num contexto de globalização é uma realidade desde a década de 1970 e um número considerável de estudos tem tentado explicar este fenómeno. Não obstante a desigualdade salarial ser frequente e elevada nas Economias Emergentes (EEs), e sendo estas importantes recetores de investimento direto estrangeiro (IDE), os estudos sobre a relação do IDE com a desigualdade salarial são ainda escassos e focados, usualmente, num único país.

Este estudo pretende suprir esta falha da literatura analisando o impacto do IDE, medido pelos influxos e stocks de IDE, na desigualdade salarial, medida através de quatro indicadores diferentes - coeficiente de Gini, o rácio S90-S10, o rácio S80-S20 e o índice de Desigualdade de Salários Industriais (índice UTIP-UNIDO) - via estimação de modelos em painel de efeitos fixos, com base em 39 EEs ao longo dos últimos 45 anos (1970-2015) e controlando para o feito do grau de abertura dos países, a dimensão da economia, o capital humano e a corrupção.

Os resultados sugerem que, em geral, o IDE aumenta a desigualdade a uma taxa decrescente ao longo do tempo, tendo um impacto superior ao nível da desigualdade de salários do que de rendimentos. O impacto varia também de acordo com o nível de rendimentos do país, sendo que o IDE reduz a desigualdade de rendimentos, medida através do coeficiente de Gini, nos países com baixos rendimentos e aumenta a desigualdade salarial nos países com níveis de rendimentos mais elevados. O IDE aumenta a desigualdade salarial, medida através do índice de desigualdade de salários industriais, em todos os níveis de rendimentos dos países, sendo o efeito superior nos países de nível de rendimentos mais elevado.

Palavras-chave: globalização; investimento direto estrangeiro; desigualdade salarial; economias emergentes

Códigos JEL: F21; F62; D63

Index

Index of figures

Index of tables

1. Introduction

Globalization and trade liberalization are important factors for countries' economic growth (Anwar, 2010; Oladi, Gilbert and Beladi, 2011). According to data from the UNCTAD, the world level weight of FDI inflows in gross domestic product (GDP) has increased fivefold,[1] since 1980 until 2015. So that multinational enterprises (MNEs) have become the main players of global economy growth (Dunning and Lundan, 2008). Additionally, exports grew, in 1986 relatively to 2013, from around 2,5 trillion US dollars to 23,3 trillion US dollars (UNCTAD).[2]

In the late 1970s, the study of the globalization's impact on societies' wellbeing became relevant with the observation of the deterioration of the position of unskilled labour and the rise of the wage gap between qualified/skilled and unqualified/unskilled workers in the US and an unemployment phenomenon of unskilled workers in Europe caused by several moves of trade liberalization and the appearance of newly industrializing countries (Pflüger, Blien, Möller and Moritz, 2013).

Since then a vast number of empirical studies (e.g., Chen, Ge and Lai, 2011; Nakamura, 2013; Zulfiu-Alili, 2014; Lee and Wie, 2015) evidence that FDI has led to an increase in wage inequality. One explanation behind this fact is that MNEs tend to pay a wage *premium* to skilled labor, which accentuates the wage gap in the host countries (see Aitken, Harrison and Lipsey, 1996; Feenstra and Hanson, 1997; Figini and Gorg, 2011; Hijzen, Martins, Schank and Upward, 2013; Autor, 2014). Other factors such as technology (Lee and Wie, 2015), public infrastructure (Pi and Zhou, 2014), and labour market characteristics (Kijima, 2006) might also influence the impact of FDI on wage inequality.

The empirical research on this subject has proven that international trade and FDI have influenced rising wage inequality in about 20% and, although globalization has led to economic growth, the individual gains from this might be small (WTO, 2008). Despite this fact, Helpman (2016) believes that, after reviewing the literature, globalization is not the primarily responsible for wage inequality, explaining only a small part of this phenomenon.

[1] In UNCTAD Statistics - http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=96740 , accessed on 8th January of 2017.
[2] Idem footnote 1.

However, according to Gopinath and Chen (2003) and Figini and Gorg (2011), the effect of FDI on wage inequality varies depending on the countries' development level. Specifically, for a developed country, FDI tends to lead to a decrease in wage inequality, whereas for a developing country, FDI usually widens the gap between the wages of skilled and unskilled workers.

The debate on the impact of FDI on wage inequality, albeit relevant for all types of economies, it is particularly pressing in the case of the so-called Emerging Economies (EEs). They are a quite important group of countries that, on aggregate, involve "about one fifth of global GDP and close to half the world's population" (OECD, 2011: 48). FDI is one of the largest components of EEs net capital inflows explained, to a large extent, by MNEs strategies to take advantage of these countries' relative low labour costs (Te Velde, 2006), taxation benefits, market size and others (Groh and Wich, 2012). EEs have consistently evidence relative high economic growth rates in the last decades but such growth has been accompanied with high (and, in some case, increasing) levels of income inequality (OECD, 2011).

Notwithstanding such situation, the extant evidence on the impact of FDI on wage inequality has overlooked EEs' heterogeneity, focusing on analysing individual countries, namely China (Chen et al., 2011), Indonesia (Lipsey and Sjöholm, 2004), and Mexico (Feenstra and Hanson, 1997), or a restricted geographical group of countries such as East Asian countries (Te Velde and Morrissey, 2004), which includes developed, emerging and developing economies, or performed a comparison between developed to developing countries, such as the study by Hijzen et al. (2013), which included Germany, Portugal and UK vis-à-vis Brazil and Indonesia.

Given the recognized heterogeneity of EEs (see Saccone, 2017), it is scientifically pertinent to uncover, for all the EEs, and among these, poorer and richer EEs, how FDI has impacted these countries' wage gap. To perform such analysis, in the present dissertation, and in line with similar studies, we resort to panel data econometric models, involving 39 EEs (as categorized by Saccone, 2017),[3] over the last two decades, 1996-

[3] List of EEs: Albania; Angola; Armenia; Azerbaijan; Bangladesh; Belarus; Bulgaria; Cambodia; Chile; China; Colombia; Dominican Republic; Ethiopia; Ghana; India; Indonesia; Kazakhstan; Latvia; Lithuania; Morocco; Mozambique; Myanmar; Nigeria; Peru; Philippines; Poland; Romania; Serbia; Montenegro; Sri Lanka; Thailand; Turkey; Turkmenistan; Uganda; U. R. Tanzania; Uruguay; Uzbekistan; Vietnam; Zambia [Note: three of the five BRICS (Brazil, Russia, India, China, South Africa) are excluded from this list: Brazil and South Africa given their too low growth rates, and Russia because of a level of per capita income slightly above the full sample mean]. Saccone (2017) considers the country Serbia and Montenegro,

2015. The model specification regresses wage inequality to FDI, controlling for other relevant wage inequality determinants that are usually referred in literature, such as level of economic development, degree of trade openness, human capital and corruption. We estimate the data through a fixed-effect panel and for the four different inequality measures (Gini coefficient, S90-S10 and S80-S20 ratios and Industrial Pay Inequality index) and separately for FDI inward flows and FDI stocks. Estimations were made separately by periods of time, countries' income level and world regions.

In terms of organization, the present dissertation is structured as follows. In the next section (Section 2) we do a thorough overview of the theories that relate FDI (or the globalization phenomenon) to wage inequality, perform a bibliometric analysis and an analysis of other relevant variables that can explain wage inequality. Section 3 explains describes the methodological approach and describes all variables used in the model. In Section 4, we analyse the empirical results of our panel. Finally, in Section 5 we describe and debate the main contributions and limitations of this dissertation proposal, as well as possible policy implications for the EEs.

although they became two separate countries in 2006. Due to data availability, we will consider them two separate countries.

2. Literature on foreign direct investment and wage inequality

2.1. Defining the main concepts

2.1.1. Wage inequality

Wage inequality is considered the wage differential between two or more groups of workers, as well as the distribution of wages within a group. It is usually measured as the difference of wages (or the ration) between skilled and non-skilled workers (see Lipsey and Sjoholm, 2004; Girma and Gorg, 2007; Chen et al., 2011; Zulfiu-Alili, 2014). This phenomenon can also be described as *college wage premium* and measured by the percentage of extra wage a college graduate earns when compared to a high school graduate (Helpman, 2016).

For assessing wage inequality between skilled and non-skilled workers, the extant empirical literature considers distinct groups or categories for proxying the skilled and non-skilled (WTO, 2008): production versus non-production workers (Girma and Gorg, 2007); manufacturing and non-manufacturing sectors (Anwar and Sun, 2012); unskilled jobs (e.g., farmers, shermans, unskilled manual workers) versus all other jobs (Zulfiu-Alili, 2014); blue-collar versus white-collar workers (Lipsey and Sjoholm, 2004); and top versus low wage earners (Kijima, 2006).

The type of income considered as 'wages' also varies considerably: wage and non-wage compensations (Lipsey and Sjoholm, 2004; Chen et al., 2011); total annual cash employment income (Tomohara and Yokota, 2011; Nakamura, 2013); or annual wage without compensations (Heyman, Sjoholm and Tingvall, 2007).

At the country level, there are very few indicators of inequality using wages as their source data. The broadest indicator purely of wage inequality is the UTIP-UNIDO dataset of industrial pay inequality, hereafter called the Industrial Pay Inequality (IPI) index. This index is a Theil's T-statistic comparison of between countries and years industrial sector wages, which are available in the UNIDO dataset (Galbraith, Halbach, Malinowska, Shams and Zhang, 2015). The Theil's T-statistic method (Conceição and Ferreira, 2000) allow us to compare between and within groups inequality by measuring the discrepancy in the distribution of income and of individuals between groups. If a group has equal share of income as it as share of income, it is not included has it does not contribute to inequality

Other income inequality indicators, such as the Gini index, the S90-S10 Ratio and the S80-S20 Ratio are used as a proxy for wage inequality (e.g. Figini and Gorg, 2011)

because they are based on household income, which includes wages (one of the main sources of income of families) and other forms of income, such as self-employment revenue sources, public cash transfers and capital income, deducted from taxes and social security (OECD, 2011).

The most often used is the Gini index (see Figini and Gorg, 2011; OECD, 2011). The Gini index is a measure of statistical dispersion that "gives more detailed information on the entire income distribution of households in an economy and considers the fact that an individual household may have several sources of income" (WTO, 2008: 127). It ranges between 0 (equal income/wealth distribution) and 1 (extreme unequal distribution). It is also used in a coefficient form, ranging the values from 0% (perfect equality) to 100% (perfect inequality).

Other inequality measures are the S90-S10 ratio and the S80-S20 ratio (or 20/20 ratio). The S90-S10 ratio (OECD, 2011) is the ratio of the average income of the richest 10% individuals to the average income of the poorest 10%: the higher the ratio, the higher the level of income inequality. The S80-S20 ratio (OECD, 2011, 2015) is the ratio of the average income of the richest 20% of the population to the average income of the poorest 20%, following the same logic as the S90-S10 ratio.

The Gini coefficient, the form of the Gini index we are using later in our model, basically gives us the degree of distribution of a country income by its population. The S90-S10 ratio (S80-S20 ratio), gives us a percentage of how much more or less income the top 10%(20%) income earners receive on average when compared to the lower 10%(20%) income earners. Example: a S90-S10 ratio of 10 means that the top 10% income earners receive on average 10 times what the low 10% income earners receive on average.[4]

2.1.2. Foreign direct investment

Foreign Direct Investment (FDI) is defined by UNCTAD has a lasting investment made by one entity in an entity outside the residence of the investor. To be considered a lasting investment, the investor should own at least 10% of ordinary shares or voting power of the entity it is investing in. It relates to all transactions between the two entities and it relates to equity capital, reinvested earnings and intra-company loans.

[4] There are other inequality measures, such as the Atkinson's index, the Hoover index and the Palma ratio (Afonso, LaFleur and Alarcón, 2015), but they will not be used on this study, so we will not get in details.

FDI can be measured as flows (inward or outward) or as stocks. FDI inward flows are the amount invested in a year by foreign entities per year in a country and FDI outward flows, on the contrary, are the amount invested in a year by resident entities of a country in other entities residing in other countries. Both flows of FDI are available in UNCTAD data centre since 1970. FDI stocks are estimated since 1980 by UNCTAD and reflect the current level of direct investment made by non-residents in each country. As Wacker (2016: 5) describes "FDI stocks are the (revalued) accumulation of past flows, while flows are the current transactions taking place in a certain period t, most importantly within a year".

There are two main types of empirical approaches when studying FDI related topic: some studies (e.g. Aitken et al., 1996; Feenstra and Hanson, 1997; Heyman et al., 2007) use micro and meso-level data, focusing on foreign ownership of companies rather than aggregate capital flows; other studies (e.g., Figini and Gorg, 2011; Dreher and Gaston, 2008) use macro-level data by using flows or stocks of Foreign Direct Investment (FDI).

When using the micro and meso-level data approach, FDI is seen as the ownership status of an enterprise, being mainly based on information provided by direct surveys. In this type of studies, the percentage threshold that defines a foreign firm depends from the study and countries in question. For instance, Aitken et al. (1996), which analysed the US, Venezuela and Mexico, use, for each country, a distinct threshold of foreign ownership: for the US, they considered foreign MNEs those firms with 10% or more of foreign capital, whereas for Venezuela and Mexico they consider foreign MNEs those firms that have any share of foreign ownership. Heyman et al. (2007) consider a foreign-owned MNEs those companies that have more than 50% of foreign ownership. In the case of Nakamura (2013), which analysed both inward and outward FDI in Japan, it is considered two thresholds for foreign ownership: 20% and 50%.

2.2. Main theoretical approaches explaining the relation between FDI and wage inequality

In scientific literature, it is of our understanding that there is a blur line when analysing the impact of globalization on inequality. Both international trade (exports and imports) and/or FDI are used to measure this phenomenon, being trade commonly used in

theoretical studies and both indicators of globalization used in empirical studies (separately or combined).

Globalization theory has come a long way from the David Ricardo's theory of comparative advantages, which compares the relative cost of goods between two countries in autarky (WTO, 2008). In 1933, Heckscher and Ohlin developed the relative advantage theory which compared international trade between two countries, two products and two factors (labor and capital). In this theory "a country exports those goods whose production is intensive the country's relatively abundant factor and imports other goods that use intensively the country's relatively scarce factor" (Blaug, 1992:185). Afterwards, Stolper and Samuelson (1941) developed a corollary to this theory, important later on in the study of wage inequality, in which two countries trade and when the price of low-skill-intensive product increases, there is an increase in real wages of low-skill workers in the country that is abundant in low-skilled labour and decreases the real wages of the high-skilled workers, decreasing wage inequality in this country. If the price of the low-skilled intensive product declines, real wages of low-skilled workers decrease and real wages of high-skill workers increase, increasing wage inequality. The changes in prices can depend on trade costs.

Although the Stolper and Samuelson's (1941) HO corollary, was the basis for the study of the impact of international trade (IT)/foreign direct investment (FDI) on wages, many authors, including Pflüger et al. (2013) and Helpman (2016), assert that this theorem is not sufficient in explaining the ever-growing complexity of international trade, as its results were not matching the empirical evidence. According to these authors, the Heckscher–Ohlin theorem is too simple for explaining the relation between trade and factor endowment/prices. To match empirical evidence, these authors argue that it is necessary to put forward other factors and assumptions.

In this vein, many theoretical approaches were developed aiming at studying how other factors could explain the impact of globalization (including international trade (IT) and FDI) on societies' well-being, namely on the wage gap variations.

The main theories are summarized in Table 1 and include: the location theory (Krugman, 1991); the technology approach (e.g., Katz and Murphy, 1992; Feenstra and Hanson, 1996, 1997; Leamer, 2000; Krugman, 2000; Autor et al., 2003, 2006; Grossman and Rossi-Hansberg, 2006, 2008, 2012); assortative matching approach (Becker, 1973);

firms' heterogeneity approach (Melitz, 2003; Bernard, Redding and Schott, 2007); labor market frictions approach (Diamond, 1982a,b; Mortensen and Pissarides, 1994); observable attributes approach (Antràs, Garicano and Rossi-Hansberg, 2006; Costinot and Vogel, 2010; Sampson, 2014; Grossman and Helpman, 2014); observable attributes and technology choice approach (Yeaple, 2005; Bustos, 2011); and the residual inequality approach (Helpman, Itskhoki and Redding, 2010; Amiti and Davis, 2012).

Table 1: Summary of theoretical approaches to the relation between globalization and wage inequality

	Authors (year)	Argument	Expected relation between International Trade (IT)/FDI and Wage Inequality (WI)	Mechanism through which FDI impacts on wage inequality
Traditional Theory	Stolper and Samuelson (1941)	**Heckscher–Ohlin's Stolper Samuelson Theorem** When a country is specialized in low-skill-intensive products, international trade will decrease the price of its products as well as the wages of low-skilled workers.	↑IT →↑ WI [if there is a decrease in the price of low-skill-intensive product] ↑IT → ↓ WI [if there is an increase in the price of low-skill-intensive product]	Product prices
Location	Krugman (1991)	**Core-Periphery Model** Regional model that attempts to understand why firms locate close to each other regarding the following factors: economies of scale (demand and fixed-costs) and transportations costs.	↑IT → ↑WI [Low TC/MS is high ES are strong] ↑IT → ↓WI [High TC; ES are weak or SM is low]	Transport costs (TC), economies of scale (ES), shares of manufacturing (SM)
Technology	Katz and Murphy (1992)	Factor content analysis is used to analyse and compare in different countries the additional factor endowment created by trade thus analysing the changes in labour demand	↑IT → ↑WI	Skill-biased technology shift
	Feenstra and Hanson (1996,1997)	Developed countries, relatively specialized in skilled labour, outsource to the developing countries, relatively specialized in unskilled labour, unskilled labour activities, though they are considered skilled labour activities in the developing perspective.	↑IT → ↑WI	
	Leamer (2000)	Wages of skilled workers will grow at the pace of technology (maintaining wages per effective unit) and wages of low-skilled workers won't be affected.	No effect	
	Krugman (2000)	Direct effect on wages: Leamer's analysis; Indirect effect on wages: changes in prices due to supply shifts.	↑IT → ↑WI	
	Autor, Levy and Murnane (2003); Autor, Katz and Kearney (2006)	**Polarization Hypothesis** It studies the impact of computerization on skills demand. Accessible computerization costs tend to have two effects on labour market: (1) substitute tasks of unskilled labour, reducing their demand and consequently their wages; (2) complement skilled-labour tasks, increase their demand and their wages. There is also an indirect impact of international trade sustained by the development of information technology, increasing international fragmentation of production.	↑IT→ ↑WI	
	Grossman and Rossi-Hansberg (2006, 2008)	Defends that the decision of a MNE to offshore a low-skill or high-skill activity of production is based on the minimization of costs. Workers, which tasks are relocated, managed to see their real wages increase due to productivity gains that result from the relocation of tasks.	↑IT/FDI→ ↓WI	
	Grossman and Rossi-Hansberg (2012)	Studies trade of tasks in developed countries that have similar comparative advantages but differentiate in size: North's bigger country will specialize in tasks that are costlier to offshore and North's smaller country will specialize is tasks that are cheap to offshore.	↑IT/FDI → ↓WI [if countries are very different in size]	

(…)

	Authors (year)	Argument	Expected relation between International Trade (IT)/FDI and Wage Inequality (WI)	Mechanism through which FDI impacts on wage inequality
Assortative Matching	Becker (1973); Helpman (2016	**Positive Assortative Matching (PAM)** Higher (lower) skilled workers are matched with firms with more (less) technology and wage inequality depends on the impact of globalization in assortative matching.	↑IT/FDI → ↑WI [if globalization creates efficiency in labour market] ↑IT/FDI → ↓WI [if globalization creates inefficiency in labour market	Labour market effects
Firms' heterogeneity	Melitz (2003)	Studies the impact in exporters and non-exporters firms. When entering a market, firms differ in productivity and only highly productive firms survive and low-productive firms leave. Workers have same salary independently of firms' productivity.	No effect	Worker's homogeneity [all workers are paid equal]
	Bernard, Jensen, Redding and Scholl (2007)	This model, based on Melitz's model, implies that each country will specialize in industries that have comparative advantages towards the factor that is relatively more abundant. An increase in price of the factor that is abundant will increase productivity and consequently wages of all industries, through efficient allocation of factors.	Reduced positive impact or even no effect	Factor prices
Labour market frictions	Diamond (1982a, b); Mortensen and Pissarides (1994)	Job openings and workers are matched depending on the characteristics of the labour market. IT modifies choices of workers and firms.	Depends on how globalization affects the labour market.	Labour market frictions
Observable attributes	Antràs, Garicano and Rossi-Hansberg (2006)	There is a managerial hierarchy and workers are matched to managers due to complementarity between skills. There is a PAM between them. Open trade will make developing countries' higher-skilled managers and workers to be employed by developed countries' firms.	↑IT/FDI → ↑WI [for workers in high-skill intensive countries] ↑ IT/FDI → ↓WI [for managers in low-skill intensive countries]	Distribution of skills
	Costinot and Vogel (2010)	Sectors produce intermediate inputs that are traded internationally for countries to produce final consumer goods. Workers differ in skill levels and sectors differ in technological sophistication, so high-skill workers are matched with more sophisticated sectors and low-skill workers are matched with less sophisticated sectors across countries.	↑IT → ↑WI [in countries more abundant in high-skill workers] ↑IT →↓WI [in countries more abundant in low-skill workers]	Factor endowment
	Sampson (2014)	Firm's productivity depends on technology, worker's abilities and degree of trade openness. So, exporters tend to be more productive and hire high-skill workers and non-exporters are less productive and hire low-skill workers. The higher the export fixed costs are, the higher is the rightward distribution of technology and consequently wage inequality.	↑IT → ↑WI	Distribution of technology
	Grossman and Helpman (2014)	Low-skill workers are hired by manufacturing firms (produce intermediate inputs) and high-skill workers are hired by innovating firms (research new intermediate inputs to be produced). There is PAM between workers and firms. Links globalization with increasing countries' growth.	↑IT → ↑WI	R&D spillovers
Observable attributes and technology choice	Yeaple (2005)	Higher-skilled workers have advantage in the higher technology firms of the advanced sector, mid-skilled workers have advantage in lower technology firms of the advanced sector and low-skill workers have advantage in the traditional sector. Globalization leads to the extension of the lower technology firms of the advanced sector.	↑IT → ↑WI	Workers' comparative advantages
	Bustos (2011)	There are two types of workers (low-skilled and high-skilled), two types of firms (exporters and non-exporters) and among exporters there two types of technologies (large output technology with high fixed costs and low output technology with low fixed costs). Large scale firms employ higher-skilled workers and low-scale firms and domestic-oriented firms hire lower skilled labour.	↑IT → ↑WI	Technology costs and trade costs
Residual inequality	Helpman, Itshoki, and Redding (2010)	Firms' productivity depends on the productivity of workers hired, although firms only know workers productive after hiring. More productive firms (exporters) have an incentive to keep screening for workers to increase firms' productivity. Bargaining wages will lead to increasing wages in exporters firms.	↑IT → ↑WI	Workers' bargaining power
	Amiti and Davis (2012)	More productive firms have higher profits and pay higher wages. There is a productivity threshold in which firms bellow this leave the market. Productivity increases with increasing involvement in global markets (imports and/or exports).	↑IT → ↑WI	Trade barriers

Source: Own elaboration based on Pflüger et al. (2013) and Helpman (2016).

The core-periphery model, developed by Krugman (1991), seeks to understand firms' location decisions and their impact on labour prices. The author demonstrated that such impact was dependent on transport costs, the share of manufacturing and economies of scale: when transportation costs are high, economies of scale are weak or the share of manufacturing is low (disperse) firms will locate according to workers' location. In this way, wage inequality will be reduced. In contrast, when transportation costs are low, manufacturing share is high and economies of scale are strong, firms tend to concentrate in the region in which they have a head start. Thus, wage inequality will increase. In accordance to this model, when FDI is attracted to the region where transportation costs are high, economies of scale are weak or the share of manufacturing is low, it is expected that FDI will reduce wage inequality. When FDI is attracted to the other region, where transportation costs are low, manufacturing share is high and economies of scale are strong, there will be an increase in wage inequality.

Within the technology approach, several studies (e.g., Katz and Murphy, 1992; Feenstra and Hanson, 1996, 1997; Leamer, 2000; Krugman, 2000; Autor et al., 2003, 2006; Grossman and Rossi-Hansberg, 2006, 2008, 2012) show that the "efficiency of skilled labour increased faster than the efficiency of unskilled labour" (Helpman, 2016: 9). This will, in general, increase polarization between workers thus increasing wage inequality.

Through differences in factors endowment in different countries, Katz and Murphy (1992) found that trade increased the demand for skilled labour, increasing the wage gap between skilled and unskilled. In the North and South model developed by Feenstra and Hanson (1996) a developed country specializes in high skill intensive products and sources the low-skill intensive tasks to a developing country. The sourcing is financially efficient until the point that the developed country stops the production of the low-intensive products and invest in facilities in the developing country. Through an empirical test of this theory, using the US and Mexico as case studies, Feenstra and Hanson (1997) observed that not only wage inequality increased in the developed economy (US) but also increased in the developing economy (Mexico), as North American FDI in Mexico increased the demand for skilled labour.

In contrast with all the remaining studies within the technology approach, Leamer (2000) defended that there will be no effect on wage inequality because the technological skill-biased effect will only increase the overall wages of high-skilled labour maintaining the

ration of wages per effective unit. This is the case because Leamer's approach is assuming that world prices do not change. Krugman (2000) added to this model the indirect effect on wages of changes in prices of the final product which leads to changes in supply of these products and increasing wage inequality.

The impact of computers on skill polarization is studied by Autor et al. (2003) and Autor et al. (2006). Accordingly, computers tend to reduce the demand of unskilled labour and increase the demand for skilled labour due to its increase in productivity. International trade amplifies the productivity effect because it allows the spread of computerization, increasing wage gap between skilled and unskilled workers.

A decrease of wage inequality is expected in the study by Grossman and Rossi-Hansberg (2006, 2008) through which offshoring activities (a form of IT) will create a productivity effect in both countries (the one that is offshoring activities and the one producing these activities) that will compensate the decrease in wages of the workers whose tasks are being relocated. Also in a latter model, Grossman and Rossi-Hansberg (2012: 621) demonstrate that a "reduction in offshoring costs induces more task trade and tends to improve welfare". Specifically, in this model larger countries will specialize in production of tasks that are costlier to offshore and offshore to smaller countries the production of tasks that are cheaper to offshore. Admitting that countries vary in size, there are strong external economies of scale or higher elasticities of substitution, offshoring will generate a reduction in wage gap through the reduction of offshoring costs and increased productivity.

The above referred skill-biased technology change approaches were found to be insufficient to explain the relationship between IT/FDI and wage inequality because they fail to take into consideration observable attributes of workers (such as gender, education, age, etc.) or firms (technology and consequent productivity levels) in the wage policy of firms (Helpman, 2016).

The positive assortative matching model, developed by Becker (1973), constitutes the basis for the observable attributes approach which establishes that higher skilled workers are matched with firms that have higher level of technologies and lower skilled workers with firms that have lower levels of technology. The effect on wage inequality depend on globalization: when globalization is associated with increasing efficiency in the labour market, that is, better matching of workers, this will result in a very distinct polarization

of skills, and thus increase wage inequality; when globalization entails a not so good matching of skills, that is, the possibility that higher skilled workers are matched to lower technology firms and vice-versa, wage inequality will be reduced.

Also, based on Becker's positive assortative matching model, Melitz (2003) developed a model which controlled for observable attributes of firms (namely, productivity). In this model workers are homogeneous and wages are equal for all, thus it is not possible to analyse wage inequality. Melitz's model, together with Becker's positive assortative matching model, was, nevertheless, the basis for the next stream of research into wage inequality, which took into consideration observable attributes of both workers and firms.

Through Bernard et al.'s (2007) approach globalization has a narrow positive impact, or even none, on wage inequality. Accordingly, an increase in the price of the product that is intensive in the factor in which the country is abundant will increase the productivity of the production of said product, thus increasing the price of all factors.

The main labour market frictions and globalization studies were developed by Diamond, (1982a, b) and then Mortensen and Pissarides (1994). In their framework, globalization creates friction by altering employment opportunities available and choices for firms and the impact on wage inequality will depend on how globalization impacts the labour market by creating or reducing additional costs of the matching process between workers and firms.

Although skills are important in defining wages, they depend on various individual characteristics (education, experience, etc.) (Helpman, 2016). Antràs et al. (2006), Costinot and Vogel (2010), Sampson (2014), Grossman and Helpman (2014) developed different approaches that seek to explain the matching between both heterogeneous workers and firms taking in consideration other firms and workers characteristics.

In Antràs et al. (2006) the relevant issue is the matching between managers and workers and the matching of workers to managers (high-skill workers work for high-skill managers and vice-versa). In the presence of globalization, the matching changes the redistribution of income between countries depending on the distribution of skills: higher skilled workers in low-skill intensive countries are matched with low-ability managers in the high skill intensive countries and low-skill workers in low-skill intensive countries are matched with high-skilled managers in the same countries. As a result, when management consumes little time and the gap in skills is high between countries,

globalization increases wage inequality between workers in the high-skill intensive countries. Otherwise, it reduces wage inequality for workers in high-skill intensive countries. It also reduces inequality between managers in low-skill intensive workers and has an ambiguous effect in managers of high-skill intensive workers.

In the approach by Constinot and Vogel (2010) workers differ in skill levels and sectors differ in technology levels. Trade improves the matches of high skilled workers and worsens the matches of lower skilled workers in the country with more labour factor endowment, increasing wage inequality in this country. The opposite is expected in the country with lower factor endowment, in which trade worsens the match of higher skilled labour and improves the match of lower skilled labour, thus reducing wage inequality in this country.

The distribution of technology between countries seems to be the mechanism with which Sampson (2014) justifies the differences in wage inequality. In this approach firms involved in IT (that is, the exporters) tend to have higher levels of technology and productivity and hire more skilled workers and firms not involved in IT (the non-exporters) tend to hire lower skilled workers and wage inequality depends on the distribution of technology between firms in a country.

In Grossman and Helpman (2014), high ability workers are hired by innovative firms and low ability workers are hired by manufacturing firms and there is positive assortative matching between them. When involved in trade, countries improve R&D levels through spillovers from other countries thus reducing the threshold level through which high ability workers are matched with innovation sector, the country experiences more growth and increasing wage inequality.

Yeaple (2005) and Bustos (2011) added to the previous approaches the firm's option for the level of technology, explicating distinct mechanisms through which wage inequality is impacted by globalization: whereas Yeaple (2005) elects' workers' comparative advantages, Bustos (2011) put forward technology costs and trade costs. Yeaple (2005) theory assumes three different sectors: the traditional sector (not involved in IT), the advanced sector with lower technology levels and the advanced sector with higher technology levels (both advanced sectors involved in IT) and inequality depends on the comparative advantage of workers towards these sectors. Trade increases technology levels for all firms in the advanced sector, decreasing the number of firms in the advanced

sector with lower technology, thus increasing relative wages in the latter sector and reducing relative wages of the advanced sector with lower technology levels. Wages of the traditional sector are not affected and this way trade increases wage inequality.

Bustos (2011) assumes two types of workers (high-skill and low-skill) and two types of firm's technologies (high-fixed-cost and low-fixed-cost). Firms with higher costs of technology produce large volumes of output and hire relatively higher skilled workers and when the country is involved in free trade they start being exporters. A reduction in variable trade costs leads to a market selection of firms in which least productive firms have two options: leave the market or employ higher levels of productivity, hiring more skilled workers and increasing wage inequality.

With the development of this theories, some authors saw the necessity of separating wage inequality created by workers' observable attributes (age, education, gender, experience) and wage inequality due to workers unobserved characteristics, named as residual inequality, and comprehend how residual inequality impacts wages.

Katz and Murphy (1992) were the firsts to find the impact of these unobserved attributes on wage inequality. Helpman et al. (2010) and Amiti and Davis (2012) developed theories attempting to explain how unobservable attributes such as labour market efficiency and trade barriers impacted on workers' wages.

Assuming that firms involved in IT have more incentives to screen workers, finding better matches and therefore increasing productivity and wages, Helpman et al. (2010) found that workers employed in firms involved in IT will have more bargaining power and in the overall there is a growth in wages compared to domestic firms. This being, wage inequality increases.

By developing a model of fair wages, Amiti and Davis (2012) establish that wages increase with higher profits, so more productive firms pay higher wages. Firms have the option to import and/or export or none. Firms that import and export are more productive and have better revenues than firms who only import, firms who only import are more productive than firms who only export and firms who only export are more productive than firms who do not trade. A reduction in trade barriers in imports or exports will increase the productivity of firms involved in IT and increase its wages comparing with domestic firms, thus increasing wage inequality.

Summing up, we can expect that, in general, globalization (FDI and/or IT) increases wage inequality by expanding the gap between groups of workers (see Table 2). In the 21 theoretical approaches reviewed, 16 predict that FDI increases wage inequality, 8 predict a decrease, with 6 predicting a bi-causality relation. Only 4 state that no effect exists between these variables.

Table 2: Analysis of the impact of FDI on wage inequality

	Authors (year)	↑IT/FDI → ↑WI	↑IT/FDI → ↓WI	No effect
Traditional Theory	Stolper and Samuelson (1941)	X	X	
Location	Krugman (1991)	X	X	
Technology	Katz and Murphy (1992)	X		
	Feenstra and Hanson (1996,1997)	X		
	Leamer (2000)			X
	Krugman (2000)	X		
	Autor et al. (2003); Autor et al. (2006)	X		
	Grossman and Rossi-Hansberg (2006, 2008)		X	
	Grossman and Rossi-Hansberg (2012)		X	
Assortative matching	Becker (1973); Helpman (2016)	X	X	
Firms' heterogeneity	Melitz (2003)			X
	Bernard, et al. (2007)			X
Labor market frictions	Diamond (1982a, b); Mortensen and Pissarides (1994)	X	X	X
Observable attributes	Antràs et al. (2006)	X	X	
	Costinot and Vogel (2010)	X	X	
	Sampson (2014)	X		
	Grossman and Helpman (2016)	X		
Observable attributes and technology choice	Yeaple (2005)	X		
	Bustos (2011)	X		
Residual inequality	Helpman et al. (2010)	X		
	Amiti and Davis (2012)	X		
		16	**8**	**4**

Note: The X means that the referred study focused on that particular relation.
Source: Own elaboration.

2.3. Empirical evidence on the impact of FDI and wage inequality: a brief bibliometric analysis

To obtain a comprehensive picture on the studies that analysed FDI and wage inequality, we undertook a quantitative approach to the literature, that is, a bibliometric exercise (see Pato and Teixeira, 2016). The main bibliographic databases for such purposes are the

Web of Science (WoS) and Scopus Sci Verse (Scopus). However, these databases present some advantages and disadvantages (see Teixeira, 2014) which advices the combination of both in other to obtain the referred comprehensive picture.[5]

The search into the bibliographic databases was performed on 29th September 2016. As search keywords, we use the terms 'wages' and 'foreign direct investment'. In Scopus, the search was done limited to the field 'Keywords', considering 'All documents' restricted to the field of 'Social Sciences and Humanities'. This resulted in 131 documents. In WoS, we use the same keywords in the search field 'Topic' and obtained 391 documents. Combining the results of both databases, and eliminating the duplicate results, we reached to an amount of 455 documents to be analysed.

We continued the analysis by reading the abstracts of each document, identifying the topic that was tackled, and assessing the effective relevance of each document for further analysis. We found that out of the 455, 89 (that is, 20%) dealt specifically with the issue of FDI and wage inequality. Other topics included the effects of FDI on employment (12 papers), labour market (12 papers), gender (9), productivity (7), R&D (7), spillovers (7), and general effects/issues (35). Papers addressing the issue of FDI determinants represent 14% of the total, whereas does addressing a miscellaneous of subjects included the bulk of the papers (41%).

Regarding the papers that exclusively focus on FDI and wage inequality, we observe (see Figure 1) that the majority (58 papers, 65%) are empirical studies, whereas theoretical studies represent 27%, with only 7 papers being reviews of the literature on the topic. The bulk of the empirical studies (45 papers or 78%) analyse a single country, being China the country with more papers on this matter, due, mainly, to the country competitive advantage in (low-skilled) labour (Liu and Song, 1997).

[5] WoS is older than Scopus and encompasses a longer time span in terms of articles published and corresponding citations. Scopus only emerged in 2004 and thus is not very representative of research published before 1995. Notwithstanding, Scopus encompasses a larger number of journals and other sources.

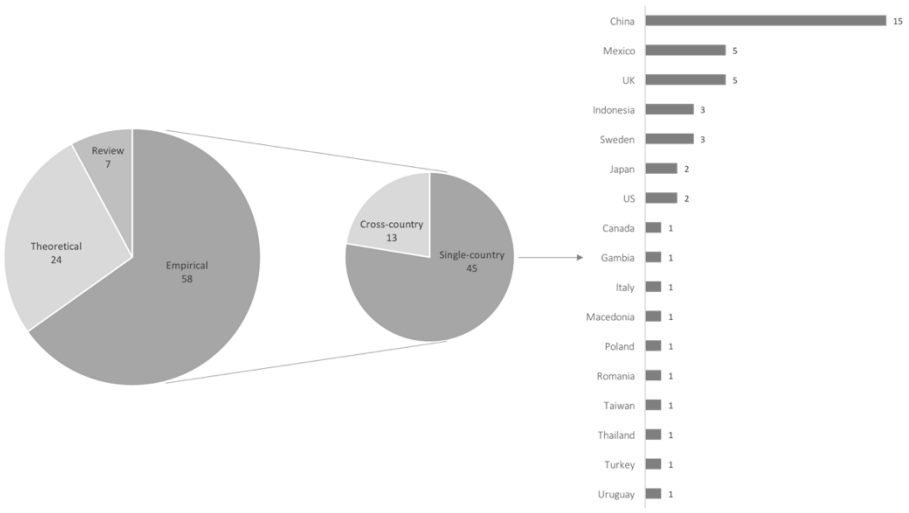

Figure 1: Distribution of the empirical studies on FDI and wage inequality
Source: Own computation based on data gathered from Scopus and WoS

As we can see in Table 3, and in accordance with the theoretical expectations (cf. Table 2), the clear majority of the empirical studies on this subject indicates that FDI tends to increase wage inequality (e.g. Aitken et al., 1996; Robertson, 2000; Onaran, 2009; Chen et al., 2011; Lee and Wie, 2015). A reduced number of studies predict no effect of FDI on wages (e.g. Aitken et al., 1996; Blonigen and Slaughter, 2001). Other studies, such as Heyman et al. (2007) and Pittiglio, Reganati and Sica (2015), predict that FDI diminishes wage inequality. Some cross-country studies, like Aitken et al. (1996), detect two different effects, one that FDI increases wage inequality in the developing countries such as Mexico and Venezuela and that FDI has no effect on wage in the US.

Table 3: Empirical studies on the impact of FDI on wage inequality: a synthesis

Impact	Country	Period	Authors (year)
↑IT/FDI → ↑WI	Mexico, Venezuela and US [in the case of Mexico and Venezuela]	1987-1990	Aitken et al. (1996)
	Mexico	1987-1997	Robertson (2000)
	Mexico, Turkey and Korea	1987-2003	Onaran (2009)
	China	1998-2007	Chen et al. (2011)
	Indonesia	1990-2009	Lee and Wie (2015)
FDI has no effect on WI	Mexico, Venezuela and US [only in the case of the US]	1987-1990	Aitken et al. (1996)
	US	1977-1994	Blonigen and Slaughter (2001)
↑IT/FDI →↓ WI	Sweden	1996-2000	Heyman et al. (2007)
	Italy	2015	Pittiglio et al. (2015)

Source: Own elaboration.

2.4. Other determinants that influence countries' wage inequality

To fully comprehend the relation between FDI and wages, it is needed to control for other variables. In Table 4, we summarize some of the most frequent explanatory variables that the empirical literature uses for explaining wage inequality: countries' degree of trade openness (Te Velde and Morrissey, 2004; Taylor and Driffield, 2005; Onaran, 2009; Figini and Gorg, 2011; Tomohara and Yokota, 2011), the level of economic development of a country (e.g. Gopinath and Chen, 2003; Dreher and Gaston, 2008), human capital (e.g. Lipsey and Sjoholm, 2004; Tansel and Bodur, 2012; Zulfiu-Alili, 2014), and corruption (no empirical study was found).

Table 4: Other determinants of inequality: a brief account

Impact	Country	Period	Sign and significance of the estimated coefficient	Authors (year)
Degree of trade openness	Hong Kong, Korea, Singapore, Thailand, Philippines	1985-1998	++	Te Velde and Morrissey (2004)
	UK	1983-2002	++	Taylor and Driffield (2005)
	Thailand	1999-2003	+++	Tomohara and Yokota (2011)
Level of economic development	26 countries	1970-1995	++	Gopinath and Chen (2003)
	156 countries	1970-2000	++	Dreher and Gaston (2008)
Human capital	Indonesia	1996	+++	Lipsey and Sjoholm (2004)
	Turkey	1994-2002	+++	Tansel and Bodur (2012)
	Macedonia	2008	+++	Zulfiu-Alili (2014)
Corruption	No empirical studies found			

Legend: +++ (++) [+] / --- (--) [-] Positively/negatively and statistically significant at 1% (5%) [10%].
Source: Own elaboration.

Human capital is expected to have a positive impact on wage inequality and a high statistical significance in the explanation of the wage gap between workers, in the case of Indonesia (Lipsey and Sjoholm, 2004), Turkey (Tansel and Bodur, 2012) and Macedonia (Zulfiu-Alili, 2014). In a cross-country analysis, it is relevant to understand the education level of said country to comprehend wage inequality. Also, the level of economic development of a country might influence the wages paid in said country, so by analysing the GDP of every country Gopinath and Chen (2003) and Dreher and Gaston (2008) did a cross-country analysis and controlled for GDP magnitude and found that the impact is positive on wage inequality and it has 5% level of statistical significance.

When looking to the degree of openness/trade authors such as Te Velde and Morrissey (2004), Taylor and Driffield (2005) and Tomohara and Yokota (2011) found that this variable has a positive impact on wage inequality and a statistical relevance of 5 to 10%.

3. Methodological considerations

3.1. Econometric specification

To have a clear idea of our methodological approach, we analysed the methodological approaches used by authors who did a cross-country/panel empirical analysis relating FDI/globalization and wage inequality using macro-level data (see Table 5). We had some difficulty encountering relevant empirical studies since most cross-country empirical studies analyse income rather than wage inequality.

Focusing on this small set of studies, we observe that their methodological approaches involve a variety of estimation methods, from the simple Ordinary Least Square (OLS) method (Lessmann, 2013), to more recent methods, such as the Dynamic Panels data (Gopinath and Chen, 2003; Dreher and Gaston, 2008).

The pooled OLS estimation is the choice of Ezcurra and Rodriguez-Posse (2013). The authors analyse 47 countries over a period of 17 years. Through an analysis of variance (ANOVA) model, the authors detected that the variance between countries are due to endogeneity between variables and time only explains 1% of the variance in the dependent variable (wage inequality, being the Theil index the selected proxy). For this reason, they opted to calculate the mean for all variables throughout the total period and estimate a pooled OLS.

In the presence of cross-section and time variant data, there is an endogeneity bias associated with the OLS estimation. Thus, Lessman (2013) uses two estimation methods separately, the pooled OLS and the Limited Information Maximum Likelihood (LIML) to compare the validity of the OLS estimation method in the presence of endogeneity between the dependent variable (inequality) and independent variables (FDI). This happens because foreign investors might have two opposite behaviours in the presence of high inequality: they might not invest because of the risks associated with these countries; or they might want to invest because they want to be part of the future economic prosperity of this country. The LIML method is an instrumental variable method that permits to overcome the bias introduced by endogeneity.

Due to the unobserved heterogeneity between countries, a fixed-effect panel is the method preferred by Figini and Gorg (2011) to allow to remove the country-specific effect. The fixed-effect panel is also used by Yay, Taştan and Oktayer (2016) with the addition of using the dynamic panel, as a robustness check for the fixed-effect panel. For these latter

authors, there is one main different reason favouring the use of the dynamic panel: the fact that inequality of today is arguably dependent on the past inequality.

Similarly, Gopinath and Chen (2003) and Dreher and Gaston (2008) resorted to the most recent econometric estimation model, the dynamic panel data model. For Dreher and Gaston (2008: 524), the "OLS estimator is biased and inconsistent in the presence of fixed country effects" and it is added the lagged dependent variable because "inequality tends to change slowly over time". Gopinath and Chen (2003) also recognized that changes in labour compensations shares are not instantaneous, taking time to adjust (2 years in their case).

Based on the set of studies summarized in Table 5, and guided by the literature review performed in Section 2, we estimate our model using a panel of 39 (emerging) countries over a 45-year period, from 1970 to 2015. The chosen econometric specification is as follows:

$$WI_{it} = \propto_i + b_1 FDI_{it} + b_{2\ to\ 5}\mathbf{X} + u_i + \varepsilon_{it},$$

where

WI is a measure of wage inequality in the country *i* at year *t*, proxied separately by the Gini coefficient, the S90-S10 ratio, the S80-S20 Ratio, and the Industrial Pay Inequality index,

FDI represents two separate measures of FDI: FDI inward flows as a percentage of the GDP as well as FDI stocks as a percentage of the GDP, and

X is a vector of control variables which are usually considered to explain wage inequality, such as (see Section 2.4): GDP per capita to control for the countries' level of economic development; openness (countries' degree of trade openness) to control for international trade; average years of schooling, to control for the countries' level of human capital and corruption, to control for irregularities in the countries' institutions.

u is a country specific effect, and

ε_{it} the remaining white noise error term.

Coefficient b_1 gives the impact of FDI on wage inequality and coefficient $b_{2\ to\ 5}$ gives us the impact of the control variables. All variables, their definition and data source, are explained in Table 7.

Table 5: Methodological approaches to estimate the relationship between FDI and wage inequality

Author (year)	Nº countries	Period	Methodology	Dependent variables (proxy)	Independent variables	Control variables
Ezcurra and Rodríguez-Pose (2013)	47	1990-2007	Pooled ordinary least squares (OLS)	Theil index (log variation between GDP per capita and population share)	KOF index[(a)]	Number and size of the regions used in each country Level of economic development of the country Country size dummy distinguishing between federal and unitary states Proxy for the redistributive capacity of public sector Degree of ethnolinguistic fractionalization.
Lessmann (2013)	55	1980-2009	Standard OLS and limited information maximum likelihood (LIML) estimator	Coefficient of variation of GDP per capita (CV) Gini coefficient of regional GDP pc Weighted CV	FDI inflows GDP per capita FDI (% GDP pc)	Unemployment ratio Level of trade openness Share of urban living population Total population Share of employment in agriculture
Figini and Gorg (2011)	103	1980-2002	Fixed-effect panel	Gini index Industrial Pay Inequality Index (UTIP-UNIDO)	FDI inward stocks/GDP FDI inward stocks/GDP^2	Openness - (EXP+IMP)/GDP GDP per capita Number of students enrolled in secondary education
Yay, Taştan and Oktayer (2016)	90	1970-2005	Fixed-effect panel and Dynamic panel	Industrial Pay Inequality Index (UTIP-UNIDO)	KOF Index and Economic Freedom of the World index (EFI)	GDP per capita GDP per capita^2 Share of population with higher education Share of inactive population Democracy Index Level of industrialization Share of industry value added
Gopinath and Chen (2003)	26	1970-1995	Dynamic panel	Share of labour compensation in GNP	**Vector of prices:** Price indexes for agricultural, manufacturing and services sector **Vector of factor endowment:** Inward FDI stocks (developing economies) and Outward FDI stocks (developed economies) Land area Labour force Capital GNP share of labour GNP share of FDI	-
Dreher and Gaston (2008)	156	1970-2000	Dynamic panel	Industrial Pay Inequality Index (UTIP-UNIDO) Index of income inequality (EHII-UTIP)	KOF index	GDP per capita GDP per capita^2 Democracy index

Notes: [(a)] The KOF Index, is the acronym for the German word Konjunkturforschungsstelle, which means Business Cycle Research Institute, and it measures economic, political and social globalization by a panel of 23 variables. It has a scale from 1 to 100, being 1 de minimum level of globalization and the higher the values, the higher the degree of globalization. More information: http://globalization.kof.ethz.ch.
Source: Own elaboration

3.2. Description of the variables

3.2.1. Wage inequality variables

In this section, we attempt to comprehend the main characteristics as well as the evolution of the four different wage inequality measures used in this study: the Gini coefficient, provided by SWIID database, the Industrial Pay Inequality Index, provided by UTIP database, the S90-S10 ratio and the S80-S20 ratio, both provided by the World Bank database (see Table 7 for more information about each measure).

Table 6: Summary statistics of inequality measures, 1970-2015

Variable	Period	Obs.	Mean	Std. Dev.	Min.	Max.
Gini coefficient	1970-2015	1006	37.3	8.68	15.65	58.42
Industrial Pay Inequality index	1970-2008	747	0.057	0.051	0.001	0.432
S90-S10 ratio	1980-2015	396	16.53	24.4	2.82	361.6
S80-S20 ratio	1980-2015	396	8.30	5.52	2.23	65.83

Source: Own elaboration based on data extracted from the sources in Table 7.

When analysing Table 6, we observe that the Gini coefficient is the measure that has more data available for the period of our study, followed by the Industrial Pay Inequality index. The Gini coefficient values can vary from 0 to 100, being 0 perfect equality and 100 perfect inequality. The mean for this coefficient is 37.3, hence in average all countries of our study show a medium-low degree of inequality. The minimum value observed is 15.7, that is, the lowest inequality observed, was in 1974, in Bulgaria, and the maximum value is 58.4 and it was observed in 2000, in Angola. The Industrial Pay Inequality index has values varying from 0 to 1, being 0 perfect equality and 1 perfect inequality. A mean of 0.057 reflects that average inequality in the EEs in terms of manufacturing wages is relatively low. The EE with the lowest inequality moment is China, in 1977, with a value of 0.001, and the EE with the highest inequality was Peru, in 2003, with a value of 0.432.

The mean of the S90-S10 ratio is 16.5, superior when compared to the mean of the S80-S20 ratio, which is 8.3, meaning that the 10% higher income earners received on average 16.5 times more income than the 10% lower income earners. Thus, there is a higher level of inequality between the 10% top/lower income earners compared to the 20% top/lower income earners.

Table 7: Description of variables used in the estimation model

	Name	Description	Nº of countries with available data	Period with available data	Database	Source
Dependent Variables	**Gini coefficient**	The Gini coefficient is a percentile representation of the Gini index. Both are a measure of the income distribution by each country's population. It ranges from 0 to 100, being 0 representative of perfect equality and 100 of perfect inequality.	39	1950-2012	SWIID	The Standardized World Income Inequality Database
	Industrial Pay Inequality (IPI) index	Commonly known as the UTIP-UNIDO index, it was developed by the University of Texas Inequality Project and it is an index calculated through the Theil's T-statistics method to measure industrial pay inequality, using data from the UNIDO Industrial Statistics database.	34	1963-2008	UNIDO Industrial Statistics	University of Texas – Inequality Project
	S90/S10 Ratio	Income share held by the top 10% income earners divided by the income share held by the low 10% income earners.	38	1980-2015	Computed based on data provided by the World Bank national accounts data and OECD National Accounts data files.	World Bank
	S80/S20 Ratio	Income share held by the top 20% income earners divided by the income share held by the low 20% income earners.	38	1980-2015	Computed based on data provided by the World Bank national accounts data and OECD National Accounts data files.	World Bank
Independent Variables	**FDI inflows (as percentage of GDP)**	Foreign Direct Investment is defined, by UNCTAD, has a lasting investment made by a non-resident entity in an entity of another economy. To be considered FDI, the investor should own at least 10% of the voting power of the entity it is investing in. It relates to all transactions between the two entities and it relates to equity capital, reinvested earnings and intra-company loans (see section 2.1.2).	39	1970-2015	World Investment Report 2016	UNCTAD
	FDI stocks (as percentage of GDP)		39	1980-2015	World Investment Report 2016	UNCTAD
Control Variables	**Openness (Percentage of Trade on GDP)**	Openness measures the level of trade openness of a country. It is calculated through the sum of exports and imports of goods and services divided by the gross domestic product.	39	1960-2015	World Bank national accounts data, and OECD National Accounts data files.	World Development Indicators - World Bank
	GDP pc (constant 2010 US Dollar)	Gross Domestic Product (GDP) per capita at constant 2010 prices in US dollars is the total GDP of a country in a year divided by its population.	39	1960-2014	World Bank national accounts data, and OECD National Accounts data files.	World Development Indicators - World Bank
	Human Capital	It is formally known as the *Barro-Lee: Average years of total schooling, age 15+, total*. Represents the average years of total completed education of the population over 15 years old. Data is only available every five years; for the remaining years, we estimated based on the growth rate during that period.	31	1970-2015	Robert J. Barro and Jong-Wha Lee: http://www.barrolee.com/	Education Statistics - World Bank
	Corruption	We used the indicator Control of Corruption: Percentile Rank. It captures the perception of the influence of private individuals on public power for private gain. It captures various levels of corruption. The percentile rank can vary from 0%, corresponding to lowest rank, meaning total influence of private individuals of government power for private gain, and 100%, corresponding to the highest rank, meaning no influence of private individuals on public power for private gain. Hereafter named as the "Corruption" variable.	39	1996-2015	Detailed documentation of the WGI, interactive tools for exploring the data, and full access to the underlying source data available at www.govindicators.org.	World Bank

Note: [1] Developed by Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi (2010). "The Worldwide Governance Indicators: Methodology and Analytical Issues". World Bank Policy Research Working Paper No. 5430 (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1682)
Source: Own elaboration

The S90-S10 ratio is also a more disperse ratio of inequality when compared to the S80-S20 ratio, meaning that the values of this ratio vary more significantly from countries and years. The minimum value both for the S90-S10 and the S80-S20 ratios, occurred in 2004 for Azerbaijan, with, correspondingly, 2.82 and 2.23. The maximum value for the S90-S10 ratio was 361.6, and it was registered in Colombia, in 2000, and the maximum for the S80-S20 ratio was 65.8, and it was registered in Zambia, in 1991.

Peru and Angola are frequent attenders of the top five for all the inequality measures (see Table 8). Armenia, Cambodia and Azerbaijan stand as high inequality countries for Industrial Pay Inequality Index, whereas Colombia, Chile and Zambia rank high in the remaining measures.

Table 8: **The five countries with the highest inequality, according to the four inequality measures**

Gini coefficient			Industrial Pay Inequality index			S90S10 ratio			S80S20 ratio		
1st	Angola	51.98	1st	Peru	0.187	1st	Colombia	67.77	1st	Zambia	20.8
2nd	Peru	51.39	2nd	Angola	0.162	2nd	Zambia	53.72	2nd	Colombia	20.26
3rd	Colombia	50.47	3rd	Armenia	0.162	3rd	Chile	32.39	3rd	Chile	15.7
4th	Zambia	49.97	4th	Cambodia	0.149	4th	Peru	31.36	4th	Peru	15.13
5th	Chile	49.79	5th	Azerbaijan	0.123	5th	Angola	28.34	5th	Angola	13.29

Source: Own elaboration based on data extracted from the sources in Table 7.

Grouping EEs by world region (see Table 9) we observe higher levels of inequality between 1970 and 2015 in Latin America and Caribbean (see Figure 2).

Table 9: Countries divided by world regions

World Region	Nº Countries	Country
Europe & Central Asia	15	Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Kazakhstan, Latvia, Lithuania, Montenegro, Poland, Romania, Serbia, Turkey, Turkmenistan, Uzbekistan
Sub-Saharan Africa	8	Angola, Ethiopia, Ghana, Mozambique, Nigeria, Tanzania, Uganda, Zambia
East Asia & Pacific	7	Cambodia, China, Indonesia, Myanmar, Philippines, Thailand, Vietnam
Latin America & Caribbean	5	Chile, Colombia, Dominican Republic, Peru, Uruguay
South Asia	3	Bangladesh, India, Sri Lanka
Middle East & North Africa	1	Morocco

Source: Own elaboration based on World Bank. - http://www.worldbank.org/en/country Accessed on 29th of March 2017.

In contrast, the world region with lower level of inequality is Europe and Central Asia. Between 1970 and 1989 there was a high decrease in the inequality for the African

continent (Sub Saharan Africa and Middle East and North Africa), as well as in European and Central Asian EEs. Afterwards, there were no major increases or decreases.

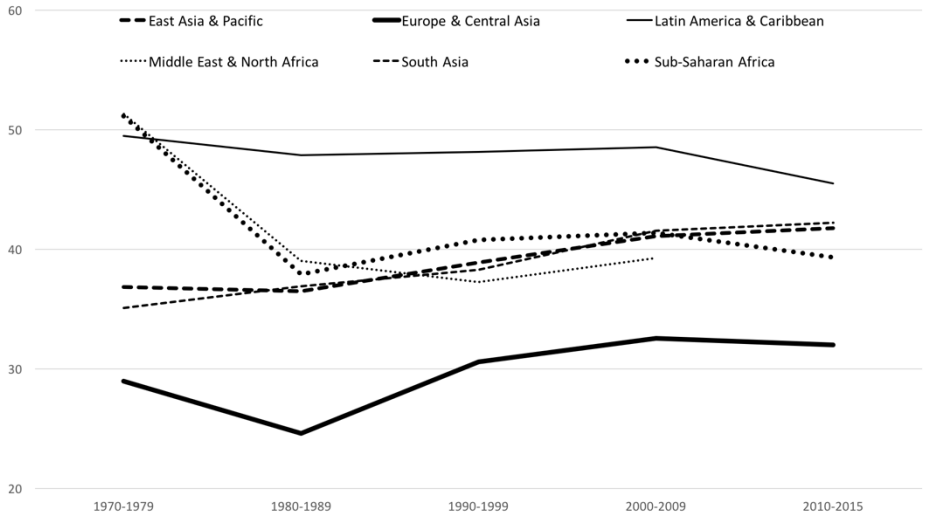

Figure 2: Gini coefficient by world regions, 1970-2015
Source: Own computation based on data gathered from SWIID

Dividing the Gini by countries' income group (see Table 10), the high-income countries show low levels of inequality and the lower-middle-income EEs show the highest level of inequality, except between 1980 and 1989 (see Figure 3).

Table 10: Countries divided by World Bank's income level distribution

Income Level	Nº Countries	Country
Low	4	Ethiopia, Mozambique, Tanzania, Uganda
Lower-middle	14	Armenia, Bangladesh, Cambodia, Ghana, India, Indonesia, Morocco, Myanmar, Nigeria, Philippines, Sri Lanka, Uzbekistan, Vietnam, Zambia
Upper-middle	16	Albania, Angola, Azerbaijan, Belarus, Bulgaria, China, Colombia, Dominican Republic, Kazakhstan, Montenegro, Peru, Romania, Serbia, Thailand, Turkey, Turkmenistan
High	5	Chile, Latvia, Lithuania, Poland, Uruguay

Note: Classification based on Gross National Income per capita (GNI pc), estimated using World Bank Atlas method and data from 2015. Low income – $1,025 or less. Lower middle income - between $1,026 and $4,035; Upper middle income - between $4,036 and $12,475; High income - $12,476 or more.
Source: Own elaboration based on information provided by World Bank - https://datahelpdesk.worldbank.org/knowledgebase/articles/906519 Accessed on 29th of March 2017.

Between 1980 and 1989 the low income became the group of countries with higher inequality levels and the high-income countries continue to be the group of countries with lower inequality levels. Recently, between 2010 and 2015, the low-income countries became the group of countries with lower inequality and the lower-middle-income countries the group of countries with higher inequality.

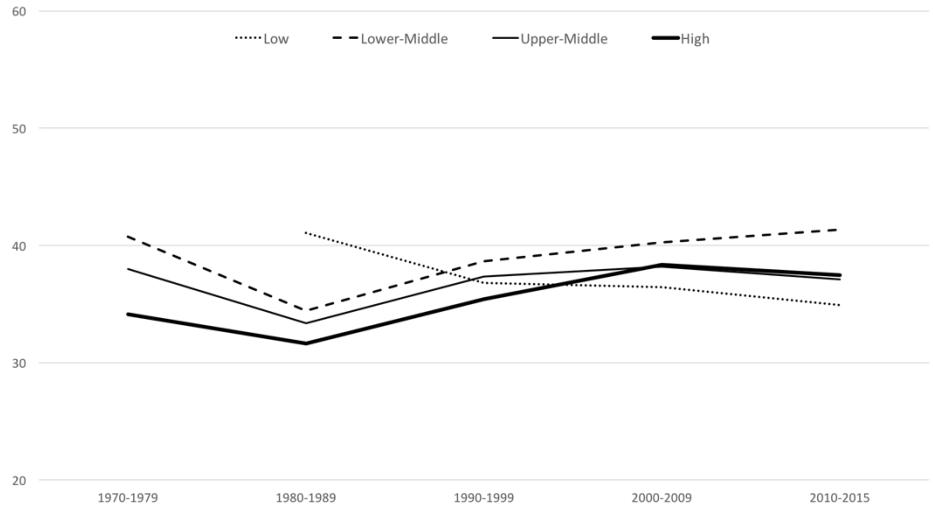

Figure 3: Gini coefficient by countries' income level, 1970-2015
Source: Own computation based on data gathered from SWIID

The Industrial Pay Inequality index (see Figure 4) was, in the 1970s, low for all countries (with an average value bellow 0.08) and very small variances until 1999. The countries in Europe and Central Asia were the countries with lowest inequality until in this period.

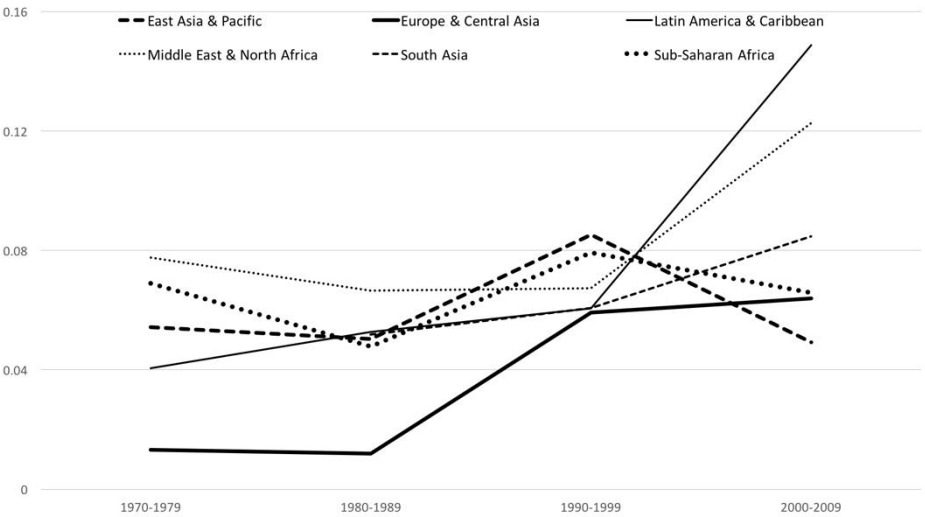

Figure 4: Industrial Pay Inequality index by world regions, 1970-2008
Source: Own computation based on data gathered from UTIP

Between 2000 and 2009, inequality increased (almost doubled) for Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay), thus being the group of EEs with higher inequality in that period. The inequality in Middle East and North Africa (Morocco), South Asia (Bangladesh, India and Sri Lanka), and Europe and

Central Asia also increased, whereas in Sub-Saharan Africa and East Asia and Pacific there was a decrease in inequality, being the group of countries with the lowest inequality in that period, together with Europe and Central Asia.

When analysing the Industrial Pay Inequality index by EEs income level (see Figure 5) we observe that the high-income EEs show lower inequality throughout the whole period (1970-2008). In the seventies (1970s), the low-income EEs showed higher levels of inequality. Afterwards, this tendency changed. From 1990s onwards the lower-middle and upper-middle-income EEs became the group of countries with higher inequality.

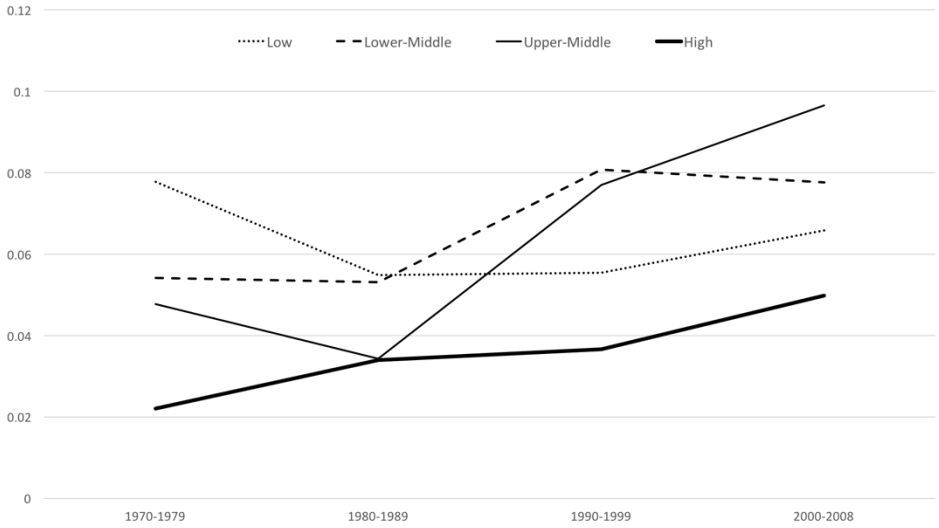

Figure 5: Industrial Pay Inequality Index by countries' income level, 1970-2008
Source: Own computation based on data gathered from UTIP

The percentage of income detained by the top 10% income earners when compared to the lower 10% income earners is much higher in Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay) (see Figure 6) than in South Asia (Bangladesh, India and Sri Lanka) and Middle East and North Africa (Morocco). In Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay), inequality increased significantly between 1990 and 2009, although in more recent years (2010-2015), it was reduced to slightly lower levels than those from the 1980s.

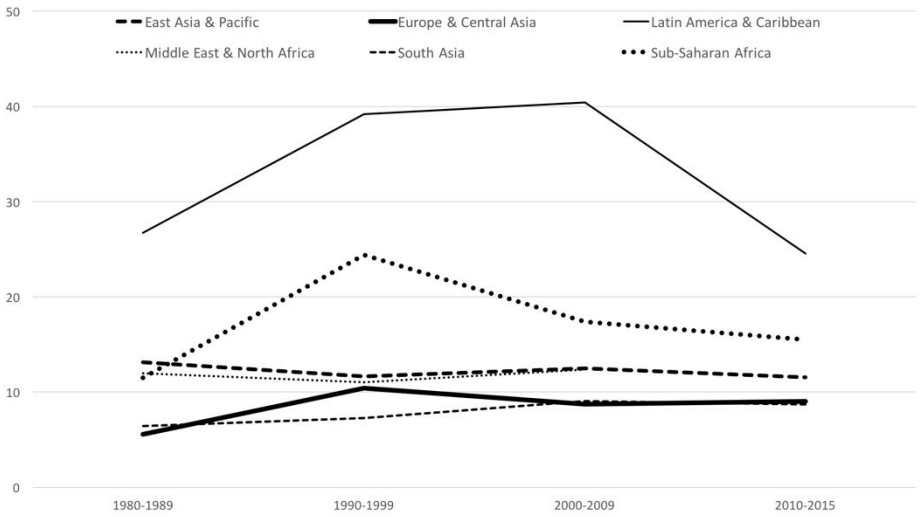

Figure 6: S90-S10 Ratio by world regions, 1980-2015
Source: Own computation based on data gathered from World Bank

When analysing the countries by groups of income level (see Figure 7), the low-income EEs are almost always the group evidencing the lowest levels of inequality, whereas in the other extreme stands the upper-middle-income EEs.

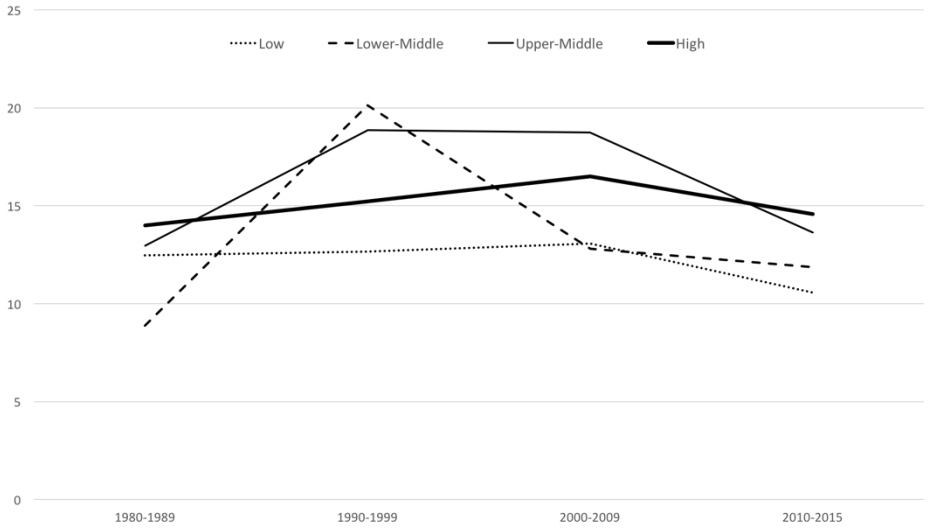

Figure 7: S90-S10 Ratio by countries' income level, 1980-2015
Source: Own computation based on data gathered from World Bank

The S80-S20 ratio (see Figure 8) shows almost the same pattern as the S90-S10 ratio, albeit with much lower averages per region/year. Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay) is the region of the world with higher inequality and South Asia (Bangladesh, India and Sri Lanka) and Europe and Central Asia are the regions with lower inequality.

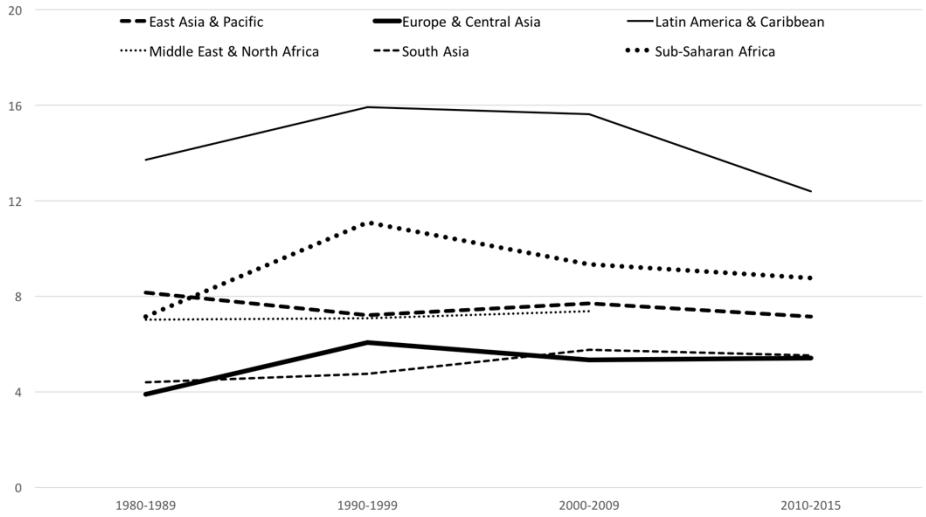

Figure 8: S80-S20 Ratio by world regions, 1980-2015
Source: Own computation based on data gathered from World Bank

In Figure 9, lower-middle-income EEs display higher levels of inequality between the top 20% income group and the 20% lower income group. Low income EEs have displayed usually (except between 1990 and 1999) the lowest levels of inequality.

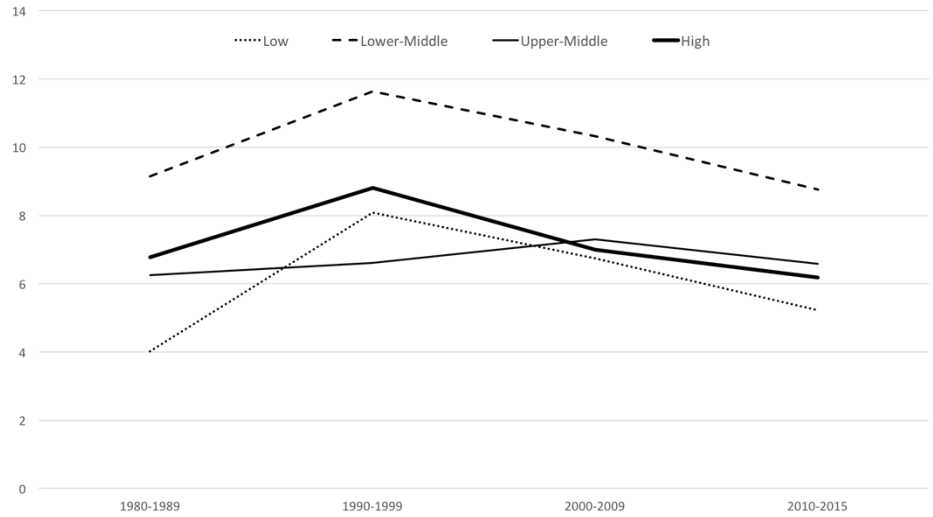

Figure 9: S80-S20 Ratio by countries' income level, 1980-2015
Source: Own computation based on data gathered from World Bank

3.2.2. Foreign direct investment variables

To understand how FDI evolves within the EEs, we gathered and compared data on both inward flows and stocks. Table 11 presents the number of observations available, standard deviation, minimum, and maximum values for both measures of FDI. The number of observations vary from the fact that FDI inward flows data is available since 1970 and FDI stocks data is available since 1980, both from UNCTAD statistics database.

Table 11: **Summary statistics of the foreign direct investment variables, 1970-2015**

Variable	Period	Obs.	Mean	Std. Dev.	Min.	Max.
FDI inward flows	1970-2015	1431	2.69	4.21	-14.37	45.15
FDI stocks	1980-2015	1168	22.97	23.25	$3.79E^{-7}$	195.49

Source: Own elaboration based on data extracted from the sources in Table 7.

When looking closely to the available data, the overall standard deviation for FDI inward flows is of 4.21 and for FDI stocks of 23.25, although FDI inward flows tend to vary more between years (standard deviation - 3.63) than between countries (standard deviation - 3.14). FDI stocks on the other way, tend to vary more between countries (standard deviation – 20.20) than throughout the years (16.92). According to Wacker (2016), this is one of the main differences between both variables: FDI flows tend to vary significantly between years, in reaction to policies and economy fluctuations, FDI stocks are less prone to these changes. When analysing both Figures 12-15, it is possible to observe the variable FDI stock is not as irregular as FDI inward flows, going in line with the previous statement. FDI inward flows reach the maximum of 45.2% of the GDP, in 2003, for Azerbaijan, and a minimum of -14.4% of the GDP, for that same country, in 2007. As for the FDI stocks the minimum value $3.79E^{-7}$% of the GDP occurred in Turkmenistan, in 1992, and the maximum 195.5%, in Mozambique, in 2015.

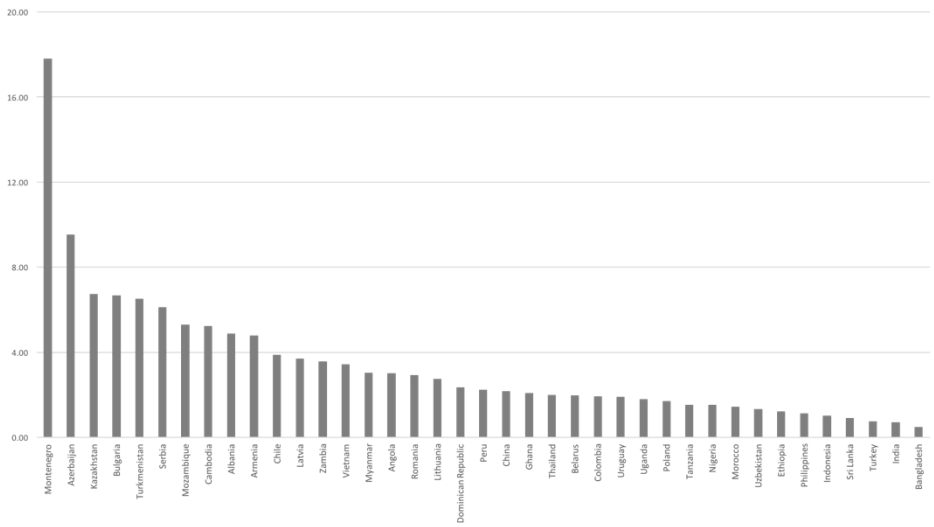

Figure 10: Average FDI inward flows, all EEs, 1970-2015
Source: Own computation based on data gathered from UNCTAD

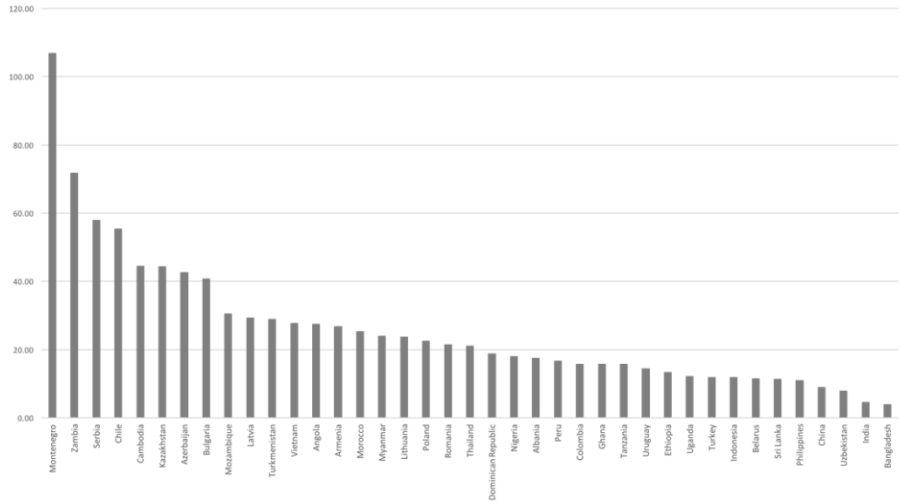

Figure 11: Average FDI stocks, all EEs, 1980-2015
Source: Own computation based on data gathered from UNCTAD

Within the sample of EEs, the five countries that received more FDI inflows over the period in analysis (1970-2015) were Montenegro,[6] Azerbaijan, Kazakhstan, Bulgaria and Turkmenistan (see Figure 10). Montenegro, Zambia, Serbia, Chile and Cambodia present the highest levels of FDI stocks (see Figure 11).

Figures 12 shows the behaviour, over time, of FDI inward flows, separated by world regions (cf. Table 9). Accordingly, FDI inflows for all countries were relatively low between 1970 and 1979, being the main receiver countries based in Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay), and East Asian EEs, whereas Europe and Central Asia stood at the bottom.

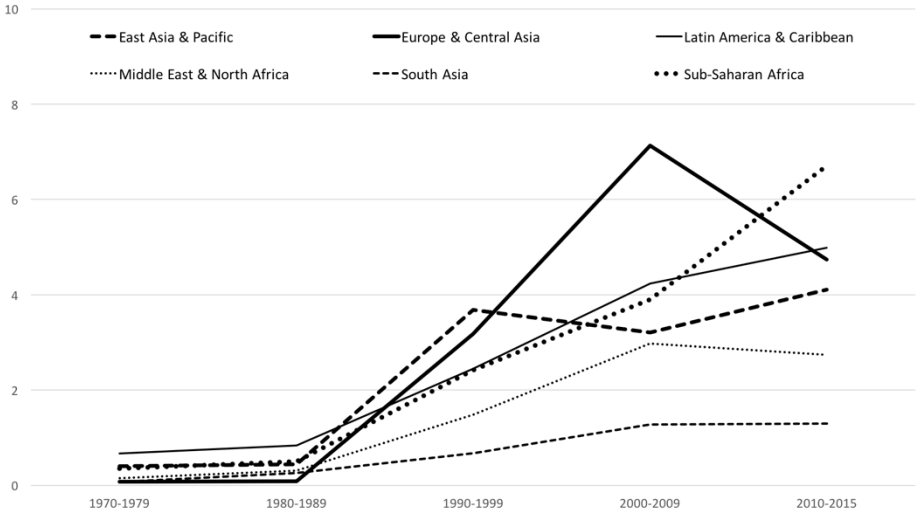

Figure 12: FDI inward flows by world regions, 1970-2015
Source: Own computation based on data gathered from UNCTAD

[6] For Montenegro and Serbia data is only available from 2008 onwards, due to the separation of Serbia and Montenegro in 2006. Due to the small set of data restricted to the most recent years, the average of FDI stocks and inflows for both countries are higher than for the remaining countries.

FDI inflows (as percentage of the GDP) grew markedly for all regions, with an annual average growth rate, for the 45 years in study, of 11.8%. The annual average rate of growth for the Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay) and Middle East and North Africa (Morocco) regions was the lowest (5.3% and 4.5%, respectively) and the highest occurred in European and Central Asian EEs (annual average growth rate of 15.9%).

Between 1990 and 1999, the main receivers within EEs were the countries from East Asia and Pacific and Europe and Central Asia, whereas between 2000 and 2009 FDI inflows targeted mainly the EEs located in Europe and Central Asia. In 2000-2009 there was a decrease of the average FDI inflows for the Middle East and North Africa (Morocco). More recently (2010-2015), there was a considerable decrease of FDI inflows for Europe and Central Asia.

When analysing the evolution of FDI inflows by groups of income (cf. Table 9) we observe a general positive trend over the whole period (see Figure 13). From 1970 until 1999 the low-income countries presented a lower inflow of FDI as compared with the other economies, but in the most recent years (2010 and 2015), the level of FDI inward flows for low-income countries grew significantly with an annual average growth rate of 11,9% in this period. The upper-middle EE's where, between 1970 and 2015, the group of EE's with highest levels of inflows of FDI as well as the highest growth rate of inward flows of FDI (14.9%), but they were surpassed by the low-income economies in the most recent years (2010 and 2015).

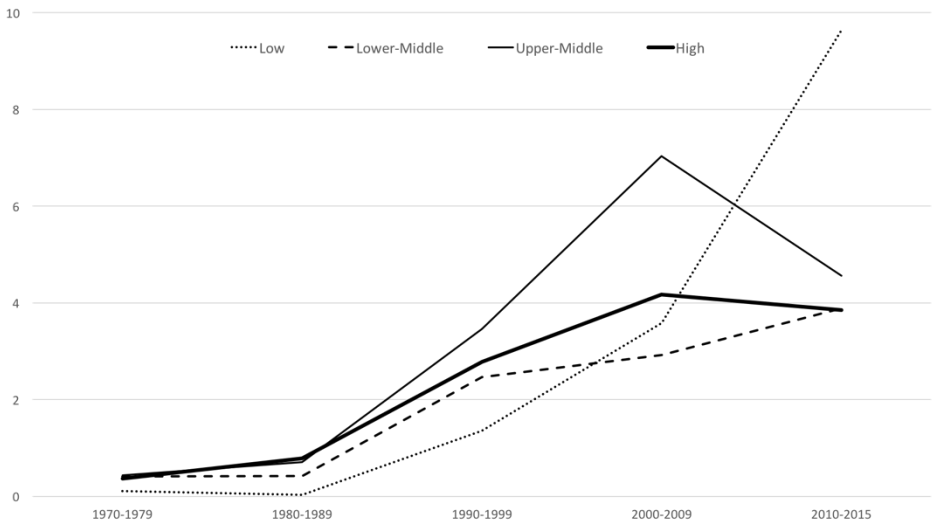

Figure 13: FDI inward flows by countries' income level, 1970-2015
Source: Own computation based on data gathered from UNCTAD

FDI stocks (see Figure 14 and Figure 15) have a general tendency to increase as they are the accumulation of revaluated inward flows. Nonetheless, FDI stocks grew for all available years and countries at an annual average growth rate of 9.7%.

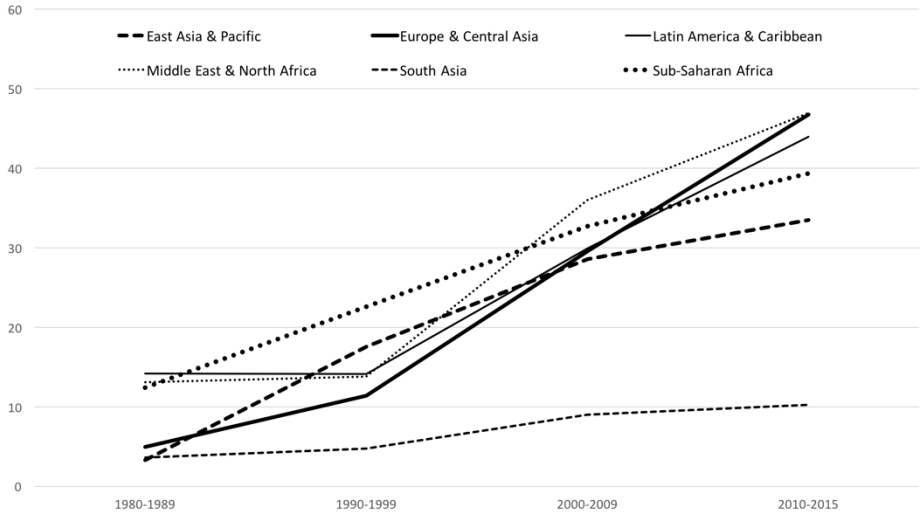

Figure 14: FDI stocks by world regions, 1980-2015
Source: Own computation based on data gathered from UNCTAD

South Asian EEs (Bangladesh, India and Sri Lanka) FDI stocks (see Figure 14) experienced a low average growth rate (when compared with the remaining EEs) of 5.7%, being the world region with lower levels of FDI stocks for the total period in study. All the remaining EEs experienced a high increase of FDI stocks between 1980 and 2015, expect for Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay) and Middle East and North Africa (Morocco), in which the average stocks started growing only after the period of 1990 to 1999.

In terms of income level groups (see Figure 15), FDI stocks in the 1980 decade were higher for high-income EEs and lower for low-income EEs. Between 1990 and 1999 the stock of FDI decreased for the high-income EEs, with lower levels than the lower-middle-income EEs. In the recent years (2010-2015) the countries with higher levels of FDI stock are the low-income economies and the EEs with lower levels of FDI stocks are the lower-middle-income EEs.

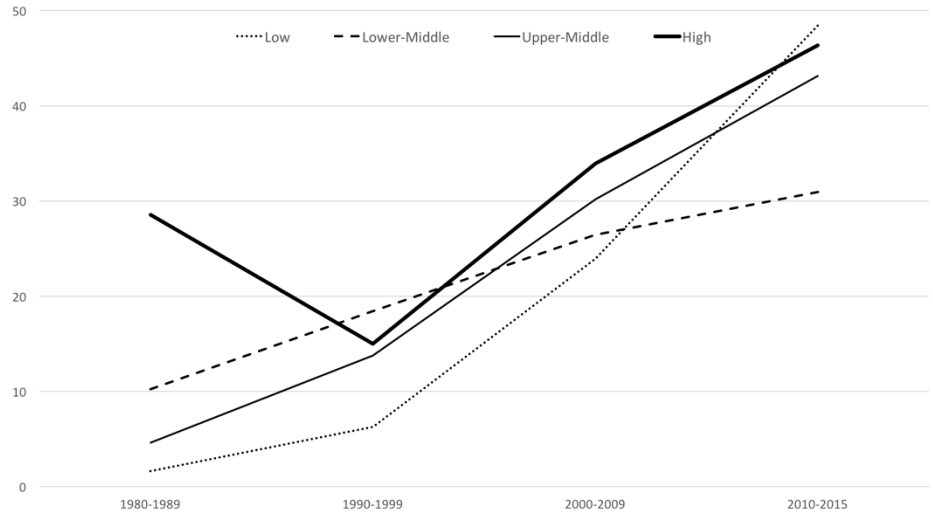

Figure 15: FDI stocks by countries' income level, 1980-2015
Source: Own computation based on data gathered from UNCTAD

3.2.3. Control variables

In Table 12 we take a closer look at the control variables of our model: openness, GDP per capita, human capital and corruption, with data for all variables provided by the World Bank.

Table 12: Summary statistics of the control variables, 1970-2015

Variable	Period	Obs.	Mean	Std. Dev.	Min.	Max.
Openness	1970-2015	1324	62.34	33.43	0.17	178.99
GDP per capita	1970-2015	1415	3151.7	3072.6	130.4	15346.8
Human Capital	1985-2010	806	6.82	2.54	0.93	11.6
Corruption	1996-2015	659	36.87	21.5	0.47	92.2

Source: Own elaboration based on data extracted from the sources in Table 7.

The openness variable evaluates a country's openness to trade, by dividing the total trade of a country (imports and exports) by its GDP. The higher the value, the more open to trade is the economy. The average value of this variable for the past 45 years was of 62.3% (as shown in Table 12), meaning that taking the countries as whole, the degree of openness is reasonably high. The minimum value of a country trade openness was of 0.17% in 2009, in Myanmar, and the maximum value is 178.99% in Angola, in 1999. The top five countries in terms of average openness, between 1970 and 2015, are Turkmenistan (126%), Belarus (125%), Lithuania (116%), Angola (115%) and Vietnam

(107%). The EEs with the lowest levels of openness are Colombia (33%), China (31%), Bangladesh (27%), India (25%) and Myanmar (10%).

The GDP per capita is the variable with more data available of all the control variables. Its mean is of 3151.7 constant US dollars (2010) per capita. The minimum value of 130.4 is observed in Azerbaijan in 1995 and the maximum value in Lithuania, in 2015, of 15346.8 constant US dollars per capita. The five countries with the highest average GDP per capita between 1970 and 2015 are: Lithuania, Latvia, Poland, Uruguay and Chile. The countries with the lowest average GDP per capita are Bangladesh, Uganda, Myanmar, Mozambique and Ethiopia.

The human capital variable describes the average years of schooling. So, the adult population of the EEs possesses, on average, 6.8 years of formal education, varying significantly between countries and years. The minimum value for this variable is 0.93 years for Mozambique, in 1995. The maximum value for this variable is 11,6 years of schooling for Kazakhstan, in 2005. The countries that evidence higher levels of schooling are basically the transition countries, namely Armenia (10.4), Poland (10.0), Romania (9.8), Kazakhstan (9.8) and Lithuania (9.5). The countries with lowest years of schooling are Bangladesh (4.2), Morocco (3.6), Myanmar (3.6), Cambodia (3.6) and Mozambique (1.2).

The corruption index indicates the level of influence of private individuals on public power of each country. As a percentage, 0% means total influence of private individuals on the government power and 100% means no corruption perceived. The highest level of corruption occurred in Myanmar, in 2011, with 0.47%. The value of 92.2% was the lowest level of corruption observed in Chile, in 2000. The five countries with the lowest level of corruption are Chile (90.1%), Uruguay (83.3%), Poland (68.3%), Lithuania (63.2%) and Latvia (59.5%). The countries with the highest levels of corruption are Uzbekistan (11.7%), Nigeria (10.4%), Turkmenistan (7.6%), Angola (5.1%) and Myanmar (5.0%).

4. Empirical results

In the previous section, Section 3, by analysing the behaviour of the different variables, it is possible to conclude that not only "the emerging economies represent a highly heterogeneous group, in terms of economic size, population, levels of per capita income and growth performance over the past decade" (OECD, 2011), but also a very heterogeneous group in terms of FDI inward flows and levels of FDI stocks, as well as inequality levels. They are characterized as the economies "arising from the necessity of differentiating developing countries that entered the take-off phase from those still entrapped in their early stages of development" (Saccone, 2017: 800). This author attempts to close on a concept of EEs that in the last 15 years showed a GDP pc as well as its growth rate above world average (including other variables to measure this growth). We can also see the heterogeneity by observing Table 10 in which, according to their Gross National Income per capita, EEs can fit into the four different income levels distinguished by the World Bank. Taking this heterogeneity into consideration, we decided on using the fixed-effect panel, on opposition to other estimation methods. This model, estimated through the software Stata, version 14, allows us to control for country specific effects, thus giving us a more reliable outcome.

We performed some diagnosis tests, namely that of homoscedasticity by running OLS estimations and obtaining the Breusch-Pagan/Cook-Weisberg test, the White's test, and the Cameron & Trivedi's decomposition of IM-test. For the three tests, we rejected the null hypothesis (of homoscedasticity), which meant that we have heteroscedastic residuals. These advices to estimate robust fixed-effect panel coefficients. We also test for the presence of multicollinearity by using the Variance Inflation Factors (VIF). For all estimations, the level of the VIFs were bellow 5, indicating that the phenomenon of multicollinearity is not present in our estimations (O'Brien, 2007).[7] In all regressions, the Hausman test indicates that the fixed-effect panel is preferable to random-effect in estimating our models.

In Tables 13-16 we present the results of the estimations of the robust fixed-effect panels separated by each of the four-wage inequality measures we gathered (Gini coefficient, S90-S10 Ratio, S80-S20 Ratio, and the Industrial Pay Inequality index), and for each of the FDI measures we use (FDI inflows and FDI stocks). Estimated models present distinct adjustment qualities: some (e.g., A1, B1, C1) have poor fit, with low R^2 and most of the

[7] In Appendix we present, for illustrative purposes, the correlation matrix, the VIF and the heteroscedasticity tests for the baseline model.

individual coefficients being statistically non-significant, whereas other models present reasonable fit, with several individual coefficients being statistically significant and/or R^2 above 20% (e.g., A2, A2', B3', D1, D2, D1'). All estimations include logarithmized variables, meaning that estimated coefficients can be interpreted as elasticities. For each inequality measure, first we estimated our base model (Models 1), controlling only for Openness and GDP pc, due to the fact that these are the control variables with more data available. Then, we added Human Capital has control variable (Models 2), and, finally, we added the variable Corruption (Models 3) obtaining a more complete set of specifications but with less observations, because the corruption variable is only available for the period between 1996 and 2015.There are similarities in the results for all EEs (see Table 13) when using the Gini coefficient and the Industrial Pay Inequality index as the dependent variables, with the results being in general significant and positive for all estimations either for FDI inward flows (A2, D1 and D2) or for FDI stocks (A1', A2', D1' and D2'), with the exception of the models that include corruption as control variable (A3, A3', C3', D3 and D3') and in the base model of the Gini coefficient and FDI inward flows (A1).

With our general estimates for this two inequality measures, we can conclude that FDI (inward flows or stocks) increases wage inequality in the EEs, going in line with the general studies of globalization and inequality (Dreher and Gaston, 2008; Ezcurra and Rodríguez-Pose, 2013; Faustino and Vali, 2013; Yay et al., 2016). Moreover, there is evidence that FDI has a greater impact in increasing inequality in terms of wages than in terms of income, being the elasticities about 10% greater when we use the Industrial Pay Inequality index (0.13 to 0.21 percentage points) than when we use the Gini coefficient (0.01 and 0.02 percentage points). As Dreher and Gaston (2008), globalization (measured through the KOF index) also has a greater impact on inequality measured by the Industrial Pay Inequality index than household income (EHII - UTIP). Regarding the ratios S90-S10 and S80-S20, the first two specifications (Models 1 and 2), that corresponds to the periods 1970-2015 and 1985-2015, the estimates associated with FDI (inflows and stocks) are not statistically significant, for the Models 3, that is, the most recent period, 1996-2015, estimates for either measures of FDI are statistically significant and negative. (B3, B3' and C3), meaning that, on average, in the last twenty years, EEs that received higher inflows (or possess higher stocks) of FDI tend to, all the remaining factor remaining constant, lessen the gap between highest and lowest income earners. In other words, FDI contributed in the last two decades to a decrease in inequality (as proxied by the ratios of top versus low income earners) of EEs.

Table 13: Determinants of wage inequality, all EEs (panel fixed effects, robust estimations, marginal effects)

		Gini Coefficient						S90-S10 Ratio					
	Model	**A1 1970-2015**	**A2 1985-2015**	**A3 1996-2015**	**A1' 1970-2015**	**A2' 1985-2015**	**A3' 1996-2015**	**B1 1970-2015**	**B2 1985-2015**	**B3 1996-2015**	**B1' 1970-2015**	**B2' 1985-2015**	**B3' 1996-2015**
FDI	**FDI inward flows (% GDP)**	0.0063	0.0115*	-0.0048				0.0167	0.0214	-0.0681***			
		(0.0610)	(0.0068)	(0.0054)				(0.0221)	(0.0138)	(0.0255)			
	FDI stocks (% GDP)				0.0213***	0.0207**	-0.0030				0.0650	0.0544	-0.1622*
					(0.0316)	(0.0091)	(0.0140)				(0.0450)	(0.0442)	(0.1000)
Control variables	**Openness**	0.0503*	0.0614**	0.0789**	0.0437	0.0472	0.0680*	0.1736	0.1972	0.3310*	0.1365	0.1755	0.3440*
		(0.0271)	(0.0289)	(0.0345)	(0.0321)	(0.0350)	(0.0363)	(0.1184)	(0.1317)	(0.1734)	(0.1301)	(0.1440)	(0.2008)
	GDP per capita	0.0586	0.1270**	0.0632	0.0422	0.1095*	0.0587	-0.1331	-0.0470	0.0064	-0.2092*	-0.1034	0.1233
		(0.0475)	(0.0577)	(0.0594)	(0.0537)	(0.0649)	(0.0618)	(0.1130)	(0.2229)	(0.2514)	(0.1267)	(0.2144)	(0.2931)
	Human capital		-0.1229	-0.0377		-0.1072	-0.0060		0.2325	-0.1652		0.2517	0.0264
			(0.1052)	(0.0947)		(0.1109)	(0.1002)		(0.4246)	(0.6002)		(0.3919)	(0.5322)
	Control of Corruption			-0.0006			0.0033			-0.0204			-0.0108
				(0.0159)			(0.0172)			(0.1271)			(0.1331)
Number of observations		863	619	339	821	619	340	364	259	187	362	259	187
Number of countries		38	30	30	38	30	30	37	28	28	37	28	28
R2		0.1456	0.3536	0.176	0.2031	0.3603	0.1632	0.0238	0.0586	0.0480	0.0402	0.0713	0.0670

		S80-S20 Ratio						Industrial Pay Inequality Index (UTIP-UNIDO)					
	Model	**C1 1970-2015**	**C2 1985-2015**	**C3 1996-2015**	**C1' 1970-2015**	**C2' 1985-2015**	**C3' 1996-2015**	**D1 1970-2015**	**D2 1985-2015**	**D3 1996-2015**	**D1' 1970-2015**	**D2' 1985-2015**	**D3' 1996-2015**
FDI	**FDI inward flows (% GDP)**	0.0128	0.0154	-0.0466***				0.1295***	0.1280***	-0.0185			
		(0.0176)	(0.0112)	(0.0172)				(0.0254)	(0.0392)	(0.0698)			
	FDI stocks (% GDP)				0.0463	0.0374	-0.0787				0.2115***	0.1976***	0.1645
					(0.0325)	(0.0316)	(0.0536)				(0.1433)	(0.0412)	(0.1073)
Control variables	**Openness**	0.1262	0.1549*	0.2151*	0.1019	0.1431	0.2101*	0.1879*	0.1618	0.5500**	0.1647	0.0001	0.4578
		(0.0893)	(0.0925)	(0.1126)	(0.0986)	(0.1022)	(0.1277)	(0.1129)	(0.2291)	(0.2574)	(0.1433)	(0.2160)	(0.2891)
	GDP per capita	-0.1155	-0.0716	-0.0872	-0.1726*	-0.1125	-0.0480	0.1535	0.2352	0.0019	0.1723	0.0824	-0.4106
		(0.0848)	(0.1667)	(0.1730)	(0.0968)	(0.1601)	(0.1815)	(0.2405)	(0.3321)	(0.0018)	(0.2380)	(0.3600)	(0.3579)
	Human capital		0.2123	0.1734		0.2154	0.2825		0.0286	1.0039		0.3916	0.3318
			(0.3259)	(0.3368)		(0.2998)	(0.3335)		(0.7238)	(1.1369)		(0.7216)	(0.9478)
	Control of Corruption			0.0315			0.0491			0.1138			0.0118
				(0.0728)			(0.0747)			(0.1975)			(0.1979)
Number of observations		364	259	187	362	259	187	582	386	168	492	396	170
Number of countries		37	28	28	37	28	28	32	29	26	32	29	26
R2		0.0346	0.0861	0.0884	0.0531	0.0972	0.4135	0.2552	0.2204	0.1048	0.2625	0.2373	0.1383

Legend: *** (**) [*] Statistically significant at 1% (5%) [10%].
Note: Robust standard errors in brackets. Grey cells identify the statistically significant coefficients. All variables were logarithmized.
Source: Own elaboration

Estimation results by decades using the baseline model (see Table 14), evidence that, in general, the 1970s, 1980s and 1990s were periods of time where FDI impacted positively inequality indicators. That is, FDI contributed to an increase in EEs' income and wage inequality. Specifically, and for the 1980s and 1990s decades, a 1 percentage point increase in the inflows (stocks) of FDI, lead, on average, to a 0.01 (0.02-0.07) percentage points in the Gini coefficient (see Models E2, E3, E2', E3'), 0.03 (0.11-0.14) percentage points in S90-S10 ratio (see Models F2, F2', F3'), 0.03 (0.08-0.16) percentage points in S80-S20 ratio (see Models G2, G2', G3'), and 0.12 (0.21) percentage points in Industrial Pay Inequality (see Models H3, H3').

For the initial decade (1970s), we only have enough data to estimate the models for the Gini coefficient and Industrial Pay Inequality index using FDI inflows (Models E1 and H1). The evidence indicates that FDI contributes significantly for increasing wage inequality (IPI index) of EEs in the 1970s, but nothing can be concluded regarding income inequality (as reflected by the Gini coefficient). The last fifteen years (2000-2015) reveal a different picture. In concrete, when using the Gini coefficient as the proxy for income/wage inequality, there is not enough evidence to claim that FDI (inflows and stocks) impacts on EEs' inequality.

In contrast, when we use the S90-S10 or S80-S20 ratios, we find that FDI inflows contribute to a decrease in income inequality in the period before the world financial crisis (2000-2007) (see Models F4 and G4), but no evidence exists that FDI (inflows/stocks) impact on income inequality in the period after (2008-2015) (Models F5, F5', G5, G5').

FDI (inflows and stocks) impact significantly and positively in Industrial Pay Inequality index in the period 2000-2007 (no data is available for estimating the following period). Thus, in contrast to what we observe for top-low earners income indicator, FDI continues to contribute to a wage inequality increase in EEs in the 2000s.

Table 14: Determinants of wage inequality, all EEs (panel fixed effects, robust estimations), by decades, 1970-2015

Gini Coefficient

	Model	E1 1970s	E2 1980s	E3 1990s	E4 2000-2008	E5 2009-2015	E1' 1970s	E2' 1980s	E3' 1990s	E4' 2000-2008	E5' 2009-2015
FDI	FDI inward flows	0.0195	0.0129*	0.0147**	-0.0139	-0.0012					
		(0.0133)	(0.0070)	(0.0062)	(0.01607)	(0.0076)					
	FDI stocks							0.0781***	0.0201***	0.0057	0.0311
								(0.0205)	(0.0044)	(0.0413)	(0.0197)
Control variables	Openness	0.0505	0.0659*	0.0021	0.0620	0.0664*		0.0061	-0.0035	0.0464	0.0592*
		(0.0908)	(0.0384)	(0.0356)	(0.04011)	(0.0361)		(0.0565)	(0.0374)	(0.0319)	(0.0350)
	GDP per capita	0.1011	-0.0419	0.0385	0.0493	-0.1489**		-0.0708	0.0485	0.0402	-0.1669***
		(0.1662)	(0.1300)	(0.0435)	(0.0390)	(0.0639)		(0.0727)	(0.0425)	(0.0363)	(0.0563)
Nº of observations		25	96	291	302	129	No obs.	98	286	308	129
Nº of countries		10	16	35	37	32		18	35	36	32
R2		0.3234	0.1078	0.1484	0.0770	0.2062		0.2971	0.2464	0.0473	0.2208

S90-S10 Ratio

	Model	F1 1970s	F2 1980s	F3 1990s	F4 2000-2008	F5 2009-2015	F1' 1970s	F2' 1980s	F3' 1990s	F4' 2000-2008	F5' 2009-2015
FDI	FDI inward flows (% GDP)		0.0372*	0.0382	-0.0758*	0.0246					
			(0.0207)	(0.0492)	(0.0410)	(0.0338)					
	FDI stocks (% GDP)							0.1364***	0.1059***	-0.2037	-0.0060
								(0.0532)	(0.0343)	(0.1548)	(0.0512)
Control variables	Openness		-0.3673***	0.1831	0.1296	0.1697		-0.1073	0.2538	0.2117	0.0641
			(0.0709)	(0.2396)	(0.1903)	(0.1578)		(0.0961)	(0.2103)	(0.1931)	(0.1918)
	GDP per capita		-0.2728***	0.0349	-0.0636	-0.6738***		-0.1750**	-0.1663	-0.0422	-0.6969***
			(0.0712)	(0.2439)	(0.1563)	(0.1748)		(0.0764)	(0.1846)	(0.1766)	(0.1954)
Nº of observations		No obs.	20	83	157	104	No obs.	23	79	156	104
Nº of countries			13	31	34	30		15	29	33	30
R2			0.8239	0.0358	0.0414	0.1413		0.7738	0.1240	0.0523	0.1360

S80-S20 Ratio

	Model	G1 1970s	G2 1980s	G3 1990s	G4 2000-2008	G5 2009-2015	G1' 1970s	G2' 1980s	G3' 1990s	G4' 2000-2008	G5' 2009-2015
FDI	FDI inward flows (% GDP)		0.0267*	0.0290	-0.0613**	0.0101					
			(0.0164)	(0.0369)	(0.0314)	(0.0248)					
	FDI stocks (% GDP)							0.1637***	0.0767***	-0.1124	-0.0069
								(0.0339)	(0.0261)	(0.0997)	(0.0395)
Control variables	Openness		-0.2836*	0.1541	0.1025	0.0989		-0.0153	0.2021	0.1064	0.0335
			(0.1573)	(0.1818)	(0.1236)	(0.1135)		(0.0556)	(0.1598)	(0.1236)	(0.1171)
	GDP per capita		-0.1640	-0.0363	-0.0536	-0.5235***		-0.0801*	-0.1709	-0.0381	-0.5340***
			(0.1239)	(0.1776)	(0.1085)	(0.1446)		(0.0441)	(0.1504)	(0.1263)	(0.1560)
Nº of observations		No obs.	20	83	157	104	No obs.	23	79	156	104
Nº of countries			13	31	34	30		15	29	33	30
R2			0.6331	0.0421	0.0795	0.1635		0.8656	0.1485	0.0488	0.1707

Industrial Pay Inequality Index (UTIP-UNIDO)

	Model	H1 1970s	H2 1980s	H3 1990s	H4 2000-2008	H5 2009-2015	H1' 1970s	H2' 1980s	H3' 1990s	H4' 2000-2008	H5' 2009-2015
FDI	FDI inward flows (% GDP)	0.0769***	0.0283	0.1206***	0.0373*						
		(0.0257)	(0.0516)	(0.0391)	(0.0215)						
	FDI stocks (% GDP)							0.2101	0.2090***	0.1616**	
								(0.1314)	(0.0435)	(0.0783)	
Control variables	Openness	0.0185	0.0786	-0.1199	0.3982*			0.0516	-0.1692	0.2557	
		(0.2311)	(0.1493)	(0.3727)	(0.2336)			(0.1434)	(0.3529)	(0.1937)	
	GDP per capita	0.7377*	-0.0996	0.2837	-0.5375**			-0.1327	0.2540	-0.5954***	
		(0.4413)	(0.5301)	(0.4249)	(0.2735)			(0.3471)	(0.3803)	(0.2164)	
Nº of observations		105	133	193	151	No obs.	No obs.	144	194	154	No obs.
Nº of countries		14	16	29	25			18	29	25	
R2		0.1485	0.0136	0.1803	0.1544			0.0554	0.2268	0.2026	

Legend: *** (**) [*] Statistically significant at 1% (5%) [10%].
Note: Robust standard errors in brackets. Grey cells identify the statistically significant coefficients. All variables were logarithmized.
Source: Own elaboration.

In general, the impact of FDI on inequality tends to decrease with time with elasticities decreasing for all periods of time, except when estimating the model using FDI inward flows for the Gini coefficient - between 1980s (E2) and 1990s (E3) - and Industrial Pay Inequality index – between 1970s (H1) and 1990s (H3). This fact is supported in Dabla-Norris, Kochhar, Suphaphiphat, Ricka and Tsounta (2015: 4) "Inequality trends have been more mixed in emerging markets and developing countries (EMDCs), with some countries experiencing declining inequality, but pervasive inequities in access to education, health care, and finance remain."

Separating EEs by groups of income, using the baseline model (see Table 15), we observe that, even when we use the same proxy for income/wage inequality, FDI (inflows and stocks) impact distinctively on inequality depending on the income group we are analysing. In concrete, FDI inflows (see Model I1) and stocks (Models I1' and J1') contribute to attenuating income inequality, as proxied by the Gini index and S90-S10/S80-S20 ratios, in lower income EEs. In sharp contrast, the stocks of FDI lead, on average, to an increase in income inequality (proxied by the Gini index) for richer EEs, most notably lower-middle-income (Model I2'), upper-middle-income (Model I3'), and high-income (Model I4') countries. When using S90-S10 or S80-S20 ratios as inequality proxies, we observed that only for the group of upper-middle-income EEs (Models J3' and L3'), the stocks of FDI produce a statistically significant impact on inequality, increasing it. There is not enough evidence to support the content that, for any group of EEs, FDI inflows impact significantly on EEs' ratios of top versus low income earners.

Again, the picture change completely when we refer to wage inequality (that is, the IPI index). Regardless the country's income group, those EEs that received higher inflows or present higher stocks of FDI tend to observe higher wage inequality.

Moreover, that impact is larger for upper-middle-income EEs (in the case of FDI inflows – see Models M1-M4) and high-income EEs (for FDI stocks – see Models M2'-M4'). Taking these results into consideration, there is a contradiction with Lessman (2013) results, who claims the higher the level of economic development the lower the effect of FDI on (regional) inequality.

Table 15: Determinants of wage inequality (panel fixed effects, robust estimations), by income groups, 1970-2015

Gini Coefficient

	Model	I1 Low	I2 Lower Middle	I3 Upper Middle	I4 High	I1' Low	I2' Lower Middle	I3' Upper Middle	I4' High
FDI	FDI inward flows	-0.0107***	0.0183**	0.0052	-0.0046				
		(0.0023)	(0.0078)	(0.0100)	(0.0105)				
	FDI stocks					-0.0056**	0.0357**	0.0213***	0.0288*
						(0.0027)	(0.0170)	(0.0082)	(0.0169)
Control variables	Openness	0.0208*	0.0517**	0.0173	0.0862*	0.0279	0.0318	0.0523	0.0180
		(0.0124)	(0.0233)	(0.0728)	(0.0457)	(0.0175)	(0.0267)	(0.0902)	(0.0648)
	GDP per capita	0.0814	0.0194	0.0938	0.0177	0.0462	0.0244	0.0566	-0.0014
		(0.0542)	(0.0315)	(0.0728)	(0.0660)	(0.0624)	(0.0440)	(0.0792)	(0.0602)
Nº of observations		56	323	337	127	58	311	324	128
Nº of countries		4	13	16	5	4	13	16	5
R2		0.2342	0.2730	0.1333	0.1839	0.0562	0.3177	0.1969	0.2880

S90-S10 Ratio

	Model	J1 Low	J2 Lower Middle	J3 Upper Middle	J4 High	J1' Low	J2' Lower Middle	J3' Upper Middle	J4' High
FDI	FDI inward flows (% GDP)	0.0048	0.0437	0.0165	-0.0088				
		(0.0050)	(0.0306)	(0.0472)	(0.0163)				
	FDI stocks (% GDP)					-0.0292*	-0.1452	0.1197**	0.0558
						(0.0162)	(0.1200)	(0.0586)	(0.1067)
Control variables	Openness	-0.1356	0.2988*	-0.0882	0.2833**	-0.3619	0.5636***	-0.1200	0.1456
		(0.2333)	(0.1665)	(0.2149)	(0.1178)	(0.4426)	(0.1455)	(0.2574)	(0.1272)
	GDP per capita	0.2037	-0.1854	-0.1682	0.0378	0.4164	0.0007	-0.3855*	0.0279
		(0.1470)	(0.1887)	(0.1825)	(0.2223)	(0.03640)	(0.1889)	(0.2130)	(0.2827)
Nº of observations		14	84	183	83	15	84	179	84
Nº of countries		3	13	16	5	3	13	16	5
R2		0.1490	0.1632	0.0277	0.1458	0.1439	0.2113	0.0897	0.1429

S80-S20 Ratio

	Model	L1 Low	L2 Lower Middle	L3 Upper Middle	L4 High	L1' Low	L2' Lower Middle	L3' Upper Middle	L4' High
FDI	FDI inward flows (% GDP)	0.0060	0.0306	0.0089	0.0007				
		(0.0037)	(0.0230)	(0.0361)	(0.0168)				
	FDI stocks (% GDP)					-0.0266	-0.1340	0.0867**	0.0709
						(0.0167)	(0.0931)	(0.0425)	(0.0677)
Control variables	Openness	-0.1090	0.2369*	-0.0853	0.2254**	-0.3410	0.4565***	-0.1057	0.0917
		(0.1988)	(0.1280)	(0.1597)	(0.1024)	(0.4196)	(0.1186)	(0.1948)	(0.1121)
	GDP per capita	0.1462	-0.1395	-0.1346	-0.0151	0.3566	0.0157	-0.2990*	-0.0510
		(0.1294)	(0.1503)	(0.1336)	(0.1821)	(0.3562)	(0.1462)	(0.1634)	(0.2092)
Nº of observations		14	84	183	83	15	84	179	84
Nº of countries		3	13	16	5	3	13	16	5
R2		0.1756	0.1582	0.0517	0.1292	0.1753	0.2305	0.1383	0.1530

Industrial Pay Inequality Index

	Model	M1 Low	M2 Lower Middle	M3 Upper Middle	M4 High	M1' Low	M2' Lower Middle	M3' Upper Middle	M4' High
FDI	FDI inward flows (% GDP)	0.0260***	0.0753**	0.1861***	0.1269***				
		(0.0102)	(0.0303)	(0.0259)	(0.0464)				
	FDI stocks (% GDP)					-0.1977	0.2522*	0.2312***	0.2957***
						(0.1260)	(0.1384)	(0.0613)	(0.0231)
Control variables	Openness	0.5302	0.1406**	0.2878	0.5241**	0.2024	0.0047	0.4209	-0.0093
		(0.5524)	(0.0609)	(0.2177)	(0.2184)	(0.3408)	(0.1180)	(0.4205)	(0.3050)
	GDP per capita	1.554	-0.1246	0.1212	0.1991	2.172	-0.3117	0.2052	0.1061
		(1.124)	(0.2034)	(0.4231)	(0.2811)	(1.385)	(0.3664)	(0.3263)	(0.2737)
Nº of observations		29	229	217	107	32	178	184	98
Nº of countries		3	12	12	5	3	12	12	5
R2		0.3848	0.1016	0.3598	0.4377	0.1679	0.1489	0.3520	0.4898

Legend: *** (**) [*] Statistically significant at 1% (5%) [10%].
Note: Robust standard errors in brackets. Grey cells identify the statistically significant coefficients. All variables were logarithmized.
Source: Own elaboration.

Finally, estimates by world region (Table 16) suggest that FDI increases inequality in European and Asian EEs, proxied by the Gini coefficient, with FDI inflows influencing positively inequality in East Asian and Pacific EEs as well as for South Asian EEs (Bangladesh, India and Sri Lanka), and FDI stocks increasing inequality in European and Central Asia EEs.

As for income earners gap, FDI inflows increase inequality (proxied by the S90-S10 and S80-S20 ratios) in Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay), and FDI stocks have the same impact in Europe and Central Asia for the S90-S10 ratio and in Latin America and Caribbean for the S80-S20 ratio. In Figure 6 and 8, in Section 3.2.1., both ratios (S90-S10 and S80-S20) showed higher levels of inequality for Latin America and Caribbean EEs. The opposite effect is observed in East Asia, Pacific and South Asia, with FDI stocks decreasing inequality.

When using the wage inequality proxy (IPI index), FDI (inflows and stocks) have a significant and positive impact in all regions with available data (Q1, Q2, Q3, Q2' and Q3'), except for East Asia, Pacific and South Asia (Bangladesh, India and Sri Lanka - Q1'). Latin America and Caribbean (Chile, Colombia, Dominican Republic, Peru and Uruguay) show the highest elasticity of all our estimations, with 1% increase of FDI stocks leading to, all else constant, a 0.54% increase inequality.

African EEs, have not enough data for their models to be estimated (S90-S10 ratio, S80-S20 ratio and IPI index) and not to be significant when estimating the model using the Gini proxy for inequality.

Table 16: Determinants of wage inequality (panel fixed effects, robust estimations), by world region, 1970-2015

Gini Coefficient

	Model	N1 East Asia & Pacific +South Asia	N2 Europe & Central Asia	N3 Latin America & Caribbean	N4 Middle East & North Africa + Sub-Saharan Africa	N1' East Asia & Pacific + South Asia	N2' Europe & Central Asia	N3' Latin America & Caribbean	N4' Middle East & North Africa + Sub-Saharan Africa
FDI	FDI inward flows	0.0164**	0.0105	0.0047	0.0064				
		(0.0074)	(0.0119)	(0.0076)	(0.0091)				
	FDI stocks					-0.0111	0.0288***	0-.0012	0.0286
						(0.0173)	(0.0070)	(0.0083)	(0.0205)
Control variables	Openness	-0.0165	0.0021	-0.0386	0.1160***	0.0246	00008	-0.0106	0.0660***
		(0.0483)	(0.0697)	(0.0359)	(0.0222)	(0.0443)	(0.0684)	(0.0431)	(0.0190)
	GDP per capita	0.1561***	0.0224	-0.0451	-0.0964	0.1892***	-0.0301	-0.0472*	-0.0828**
		(0.0543)	(0.0437)	(0.0266)	(0.0614)	(0.0358)	(0.0478)	(0.0273)	(0.0423)
Nº of observations		252	268	156	167	239	268	144	170
Nº of countries		9	15	5	9	9	15	5	9
R2		0.6011	0.0302	0.1385	0.1500	0.6374	0.1867	0.1536	0.2308

S90-S10 Ratio

	Model	O1 East Asia & Pacific +South Asia	O2 Europe & Central Asia	O3 Latin America & Caribbean	O4 Middle East & North Africa + Sub-Saharan Africa	O1' East Asia & Pacific + South Asia	O2' Europe & Central Asia	O3' Latin America & Caribbean	O4' Middle East & North Africa + Sub-Saharan Africa
FDI	FDI inward flows (% GDP)	-0.0218	-0.0302	0.1168***					
		(0.0234)	(0.0393)	(0.0352)					
	FDI stocks (% GDP)					-0.2235***	0.0845*	0.1406	
						(0.0574)	(0.0521)	(0.0882)	
Control variables	Openness	0.2661**	0.1838	-0.0386		0.4421***	0.1052	0.0570	
		(0.1246)	(0.2432)	(0.0775)		(0.0609)	(0.2706)	(0.1689)	
	GDP per capita	-0.2710*	0.0089	-0.7173***		-0.0282	-0.1300	-0.7728***	
		(0.1415)	(0.1722)	(0.1151)		(0.1442)	(0.2008)	(0.2382)	
Nº of observations		49	171	92	No obs.	48	171	89	No obs.
Nº of countries		6	15	5		6	15	5	
R2		0.1468	0.0230	0.1866		0.3162	0.0659	0.1294	

S80-S20 Ratio

	Model	P1 East Asia & Pacific +South Asia	P2 Europe & Central Asia	P3 Latin America & Caribbean	P4 Middle East & North Africa + Sub-Saharan Africa	P1' East Asia & Pacific + South Asia	P2' Europe & Central Asia	P3' Latin America & Caribbean	P4' Middle East & North Africa + Sub-Saharan Africa
FDI	FDI inward flows (% GDP)	-0.0140	-0.0290	0.0884***					
		(0.0222)	(0.0310)	(0.0174)					
	FDI stocks (% GDP)					-0.1752***	0.0582	0.1438**	
						(0.0457)	(0.0381)	(0.0705)	
Control variables	Openness	0.2212**	0.1219	-0.0046		0.3593***	0.0638	0.0595	
		(0.1000)	(0.1831)	(0.0332)		(0.0475)	(0.2052)	(0.1329)	
	GDP per capita	-0.2424**	-0.0215	-0.5215***		-0.0558	-0.1214	-0.6426***	
		(0.1172)	(0.1283)	(0.0380)		(0.1196)	(0.1523)	(0.1829)	
Nº of observations		49	171	92	No obs.	48	171	89	No obs.
Nº of countries		6	15	5		6	15	5	
R2		0.1706	0.0279	0.3592		0.3265	0.0566	0.2936	

Industrial Pay Inequality Index

	Model	Q1 East Asia & Pacific +South Asia	Q2 Europe & Central Asia	Q3 Latin America & Caribbean	Q4 Middle East & North Africa + Sub-Saharan Africa	Q1' East Asia & Pacific + South Asia	Q2' Europe & Central Asia	Q3' Latin America & Caribbean	Q4' Middle East & North Africa + Sub-Saharan Africa
FDI	FDI inward flows (% GDP)	0.1272***	0.1971***	0.1527**					
		(0.0343)	(0.0150)	(0.0655)					
	FDI stocks (% GDP)					-0.0951	0.2191***	0.5470*	
						(0.2636)	(0.0545)	(0.3370)	
Control variables	Openness	-0.0617	0.3726*	0.5671***		0.2067	0.5988	-0.1620	
		(0.4235)	(0.1965)	(0.2084)		(0.2538)	(0.3997)	(0.4027)	
	GDP per capita	0.2367	0.1862	0.1259		0.7270	-0.1539	0.3071	
		(0.5314)	(0.3263)	(0.3154)		(0.4690)	(0.3009)	(0.2822)	
Nº of observations		106	160	132	No obs.	81	151	107	No obs.
Nº of countries		6	10	5		6	10	5	
R2		0.1841	0.4078	0.3828		0.3041	0.3473	0.4605	

Legend: *** (**) [*] Statistically significant at 1% (5%) [10%].
Note: Robust standard errors in brackets. Grey cells identify the statistically significant coefficients. All variables were logarithmized.
Source: Own elaboration.

5. Conclusions

Main contributions

Through fixed-effect panel estimations based on 39 Emerging Economies (EEs) over a period of 45 years (1970-2015), the present dissertation intended to comprehend the impact of FDI on wage inequality.

In a global overview, the present study is novel for three main reasons. First, for the best of our knowledge, it is the first empirical study on the impact of FDI on wage inequality of a wide set (39) of EEs. Second, it compares four different macro-level measures of wage inequality (Gini coefficient, S90-S10 ratio, S80-S20 ratio and Industrial Pay Inequality index) combined with two measures of FDI (inward flows and stocks), controlling for GDP pc, openness, human capital and corruption and such approach has not been encountered by us in literature. Finally, estimating separately by time, income and location groups was, to what we could observe from literature, the first attempt of this kind to analyse the heterogeneity of EEs in what regards the impact of FDI on wage inequality.

Looking closely to the results of this study, they suggest that FDI, in general, increases wage inequality in EEs, which can also be evident in a major set of studies such as Aitken et al. (1996) for the case of Mexico and Venezuela, Feenstra and Hanson (1997) for Mexico only, Gopinath and Chen (2003) for developing economies, Dreher and Gaston (2008) for OECD countries, Figini and Gorg (2011) for developing economies, and Bigsten and Munshi (2014) for lower income OECD countries. On the other side, it is also evident in our study that, in general, FDI reduces the gap between highest and lowest income earners in the last two decades.

In a longitudinal overview, it was possible to conclude that the 1970s, 1980s and 1990s decades were periods where FDI led to increasing wage inequality in all EEs (proxied by the Gini and IPI measures). Notwithstanding, in the pre-world crisis period, 2000-2007, FDI decreased the gap between top and bottom income earners.

It is also a relevant outcome of this study the evidence that FDI increases inequality in a decreasing rate over time, as in Figini and Gorg (2011), leading us to conclude that the markets are adjusting to *foreign wage premium* as well as governments are acting on it, by increasing expenditure in education, distributive taxing system, etc. These results go

in line with Author's (2014) theory, there are main forces of supply and demand in play in reducing *college skill premium* that combined with increasing education incentives lead to decreasing inequality.

Our results further evidence that, in lower income EEs, FDI decreases wage inequality (as proxied by the Gini) and reduces the gap between the income earners. On the other side, FDI stocks increase wage inequality (proxied by the Gini) in all other groups of income and increases the gap between income earners in higher-medium-income EEs. When observing wages (proxied by the IPI index), FDI increases inequality for all EEs, being the effect larger in higher income EEs (i.e., upper-middle and higher-income EEs).

Finally, FDI shows a greater impact on inequality measured through wages based indicators (IPI index) than on income based indicators (Gini, S90-S10 and S80-S20), with elasticities being greater (around 10% superior) for wage inequality, as shown in Dreher and Gaston (2008) and commented in Dabla-Norris et al. (2015).

Policy implications

Equality is a major value for most societies (Dabla-Norris et al., 2015) and nowadays creating awareness for the lack of equality in its various forms (opportunity, gender, race, income, wages, etc.) has been a priority for many world organizations, such has the OECD, IMF, World Bank and UN. "Reduce inequality within and among countries" is even one of the 17 goals of the 2030 Sustainable Development Agenda for the United Nations. Inequality is proven to affect lower income shares of societies and, in general, leads to lower economic growth (OECD, 2015) in the medium-term (5 years) (Dabla-Norris et al., 2015)

Globalization and its instruments, foreign direct investment, trade and others, used to have a negative view in society, but from 1970s onwards, this perspective has changed. Nowadays, it is seen as positive in almost all countries, as, in general, FDI is related to increasing economic growth (Te Velde, 2006; Dabla-Norris et al., 2015).

The relation between FDI and equality (or the lack of it) is not, though, a clear one. When many authors tried to understand it, at a first glance the answer was in general that FDI leads to increasing inequality. However, the relation between the globalization and inequality is not a direct one: FDI brings technology shifts between countries, changes in labour market institutions, increasing market competitiveness, and shifts in market

dynamics Helpman (2016). Also, foreign-owned firms are proven to hire more skilled labour, increasing wages for skilled workers, widening the gap in society, but not necessary harming the economy. In fact, "some degree of inequality may not be a problem insofar as it provides the incentives for people to excel, compete, save, and invest to move ahead in life" (Dabla-Norris et al., 2015:6).

With our empirical study, this relation showed that FDI has a positive impact not only in reducing inequality (proxied by the Gini) in the low-income EEs but also decreasing the gap between top and low-income earners in all EEs. On the opposite side, FDI increases inequality (proxied by Gini coefficient and IPI index) in higher-income EEs. This leads us to conclude that, by reducing the gap between top and low-income earners, FDI has a redistributive role in society, being this positive for the economies, but there should be different approaches on establishing policies that control the relation between FDI and wage inequality, depending on each country's development level.

Governments of lower-income EEs should have, as their main priority, to implement policies to attract FDI to their countries, and governments of higher-income EEs should take measures to monitor and control FDI activities in their countries. This is because our evidence shows that FDI increases wage inequality in the higher-income EEs, and this result combined with the fact that this effect is decreasing over time leads us to assume the possibility that the emerging markets are adjusting to the changes in wages brought by globalization (Autor, 2014). There might be a positive side of FDI in higher-income EEs associated with increasing competitiveness: FDI brings higher-skilled jobs to these economies, which pay higher wages. Then, economies converge and adjust to these changes, increasing overall wages, skilled and unskilled, which enable a decrease in wage inequality overtime, creating an overall positive effect in society.

We believe that this market adjustment towards more equal economies might be accelerated using government policies to help creating some form of guided path regarding the type of FDI entering in each country. EEs' governments, especially higher-income EEs, should be concerned with attracting FDI that goes in line with the technology goals of the country, so that, by aligning all the forces in play it will help decrease inequality. So, by developing local institutions to monitor the technology brought by foreign firms (Atkinson, 2015) and their wage levels, will certainly be a powerful tool to create more efficient policies in terms of FDI attraction and overall wages (e.g. tax incentives, minimum wage, etc.), specifically designed for each country's reality in terms

of inequality. Monitoring technology will also help establish a more concrete education plan, designed to meet the country the needs, reducing the gap in skills between workers.

Another important policy in our perspective, now in a worldwide view, is to join the forces of the inequality projects created worldwide (University of Texas Inequality Project, The London School of Economics International Inequalities Institute, etc.), and create a sort of global inequality observatory that will help every government, and its local institutions, to measure more efficiently the impact of inequality in societies and its various causes (including FDI), advising all governments in measures to implement to reduce inequality. This measure will benefit especially governments of developing economies, including EEs that have lower resources than developed economies governments.

Summing up, it is important to use FDI strategically for each country reality. Whether in lower-income EEs, the main policy should be attracting FDI, in all EEs, and especially higher-income EEs, it is relevant to create instruments to use FDI as a tool to reduce wage inequality in the long run, and this way improve the economic growth of EEs, helping them achieve more developed levels, reduce wage inequality and creating an overall advancement in quality of life in every country.

Limitations and paths for future research

In this type of studies, especially when using macro-level approaches, various limitations in terms of data collection are preeminent, with special focus on solely wages indicators. Although the development of the Industrial Pay Inequality index, as we call it, but also known as UTIP-UNIDO index, by the University of Texas Inequality Project, was a major breakthrough for future empirical study on this subject, this data is limited to industrial inequality and available until 2008. It would be important to unite all major efforts in the study of inequality and extend the width of this measures, allowing to have a more precise understand of wage inequality.

Also, controlling for other market-specific variables has proven to be complicated due to the fact of reduced and doubly reliable macro-level indicators. For example, controlling for human capital, the "Barro-Lee: Average years of schooling" was the broadest indicator we have found for our sample, but still data is only available every 5-years, being the remaining years estimated based on growth rates. Improving data availability

will surely help in understanding how other factors may imply in the inequality phenomenon, namely technology, labour market frictions as observable and unobservable firms' and workers' characteristics, etc., (Helpman, 2016), as well as help developing more precise tools for governments to realize the magnitude wage inequality and develop policies more direct to this problem.

As this study is restricted to EEs, we also find relevant to enlarge the present analysis to a full panel of countries, analysing the impact by groups of income/development, time series, regions, adding trade agreements and other group of countries' specific characteristics (e.g. population levels, economic stability, etc.).

References

Afonso, H.; LaFleur, M.; Alarcón, D. (2015). *Inequality measurement* (Development Strategy and Policy Analysis Unit in the Development Policy and Analysis Division of UN/DESA Working Paper). United Nations - Department of Economic and Social Affairs. Retrieved on the 7th of May of 2017 from http://www.un.org/en/development/desa/policy/wess/wess_dev_issues/dsp_policy_02.pdf.

Aitken, A.; Harrison, A.; Lipsey, R.E. (1996). "Wages and foreign ownership. A comparative study of Mexico, Venezuela and the United States". *Journal of International Economics,* 40(3-4): 345-371.

Amiti, M.; Davis, D.R. (2012). "Trade, firms, and wages: theory and evidence". *Review of Economic Studies,* 79(1): 1–36.

Antràs, P.; Garicano, L.; Rossi-Hansberg, E. (2006). "Offshoring in a knowledge economy". *The Quarterly Journal of Economics,* 121 (1): 31–77.

Anwar, S. (2010). "Wage Inequality, increased competition, and trade liberalization: short run vs long run". *Review of International Economics,* 18(3): 574–581.

Anwar, S.; Sun, S. (2012). "Trade liberalisation, market competition and wage inequality in China's manufacturing sector". *Economic Modelling,* 29(4): 1268–1277.

Atkinson, A. B. (2015). *Inequality – what can be done?* (International Inequalities Institute Working Paper). London School of Economics and Political Science. Retrieved on 20th of May of 2017 from http://www.lse.ac.uk/International-Inequalities/Assets/Documents/Working-Papers/Working-Paper-2-Tony-Atkinson.pdf.

Autor, D. H. (2014). "Skills, Education, and the Rise of Earnings Inequality Among the 'Other 99 Percent'". *Science,* 344(6186): 843–851.

Autor, D. H.; Katz, L. F.; Kearney, M. S. (2006). "The polarization of the U. S. labor market". *American Economic Review,* 96(2): 189-194.

Autor, D.; Levy, F.; Murnane, R. J. (2003). "The skill content of recent technological change: an empirical investigation". *The Quarterly Journal of Economics,* 118(4): 1279-1333.

Becker, G. (1973). “A theory of marriage I”. *Journal of Political Economy*, 81(4): 813–846.

Bernard, A. B.; Redding, S. J.; Schott, P. K. (2007). “Comparative advantage and heterogeneous firms”. *Review of Economic Studies,* 74(1): 31-66.

Bigsten, A.; Munshi, F. (2014). “Globalisation and inter-occupational inequality: empirical evidence from OECD countries”. *The World Economy,* 37(3): 501–510.

Blaug, M. (1992). *The Methodology of Economics: Or, How Economists Explain.* Cambridge: UK. Cambridge University Press.

Blonigen, B. A.; Slaughter, M. J. (2001). “Foreign affiliate activity and U.S. skill upgrading”. *The Review of Economics and Statistics*, 83(2): 362–376.

Bustos, P. (2011). “Trade liberalization, exports, and technology upgrading: evidence on the impact of MERCOSUR on Argentinean firms”. *American Economic Review,* 101(1): 304–340.

Chen, Z.; Ge, Y.; Lai, H. (2011). “Foreign direct investment and wage inequality: Evidence from China”. *World Development,* 39(8): 1322–1332.

Conceição, P.; Ferreira, P. (2000). *The Young Person’s Guide to the Theil Index: Suggesting Intuitive Interpretations and Exploring Analytical Application* (University of Texas Inequality Project Working Paper 14). University of Texas. Retrieved on 15th of May of 2017, from http://utip.lbj.utexas.edu/papers/utip_14.pdf.

Costinot, A.; Vogel, J. (2010). “Matching and inequality in the world economy”. *Journal of Political Economy,* 118(4): 747–786.

Dabla-Norris, E., Kochhar, K.; Suphaphiphat, N.; Ricka, F.; Tsounta, E. (2015). “Causes and consequences on income inequality – a global perspective”. International Monetary Fund Discussion Note, SDN/15/13.

Diamond, P.A. (1982a). “Aggregate demand management in search equilibrium”. *Journal of Political Economy,* 90(5): 881–894.

Diamond, P.A. (1982b). “Wage determination and efficiency in search equilibrium”. *Review of Economic Studies*, 49(2): 217–227.

Dreher, A.; Gaston, N. (2008). "Has globalisation increased inequality?". *Review of International Economics,* 16(3): 516-536.

Dunning, J. H.; Lundan, S. M. (Eds.). (2008). *Multinational Enterprises and the Global Economy, Second Edition.* Cheltenham, UK: Edward Elgar.

Ezcurra, R.; Rodriguez-Posse, A. (2013). "Does economic globalization affect regional inequality? A cross-country analysis". *World Development*, 52: 92–103.

Faustino, H.C.; Vali, C. (2013). "The effects of globalization and economic growth on income inequality: Evidence for 24 OECD countries." *Argumenta Oeconomica,* 1(30): 13-31.

Feenstra, R.C.; Hanson, G.H. (1996). "Foreign investment, outsourcing and relative wages". In Feenstra, R.C., Grossman, G.M. and Irwin, D.A. (Eds.), *The Political Economy of Trade Policy: Papers in Honor of Jagdish Bhagwati* (pp. 89-127). Cambridge, England: The MIT Press.

Feenstra, R.C.; Hanson, G.H. (1997). "Foreign direct investment and relative wages: evidence from Mexico's maquiladoras". *Journal of International Economics*, 42(3): 371-393.

Figini, P.; Gorg H. (2011). "Does foreign direct investment affect wage inequality? An empirical investigation". *The World Economy*, 34(9): 1455–1475.

Galbraith, J.K.; Halbach, B.; Malinowska, A.; Shams, A.; Zhang, W. (2015). *The UTIP Global Inequality Datasets 1963-2008* (World Institute for Development Economics Research Working Paper 2015/019). Retrieved on 5th of May of 2017 from https://www.wider.unu.edu/sites/default/files/wp2015-019.pdf.

Girma, S.; Gorg, H. (2007). "Evaluating the foreign ownership wage premium using a difference-in-differences matching approach". *Journal of International Economics,* 72(1): 97–112.

Gopinath, M.; Chen, W. (2003). "Foreign direct investment and wages: a cross-country analysis". *The Journal of International Trade & Economic Development,* 12(3): 285-309.

Groh, A.P.; Wich, M. (2012). "Emerging economies' attraction of foreign direct investment". *Emerging Markets Review,* 13(2): 210–229.

Grossman, G.M.; Helpman, E. (2014). *Growth, trade, and inequality* (National Bureau of Economic Research Working Paper 20502). Retrieved on 23rd of October of 2016 from http://www.nber.org/papers/w20502.

Grossman, G.M.; Rossi-Hansberg, E. (2006). "The Rise of offshoring: it's not wine for cloth anymore". In Federal Reserve Bank of Kansas City (ed.), *The New Economic Geography: Effects and Policy Implications* (pp. 59-102), Jackson Hole, US.

Grossman, G.M.; Rossi-Hansberg, E. (2008). "Trading tasks: a simple theory of offshoring". *The American Economic Review*, 98(5): 1978-1997.

Grossman, G.M.; Rossi-Hansberg, E. (2012). "Task trade between similar countries". *Econometrica*, 80(2): 593-629.

Helpman, E. (2016). *Globalization and wage inequality* (National Bureau of Economic Research Working Paper 22944). Retrieved on 15th of December of 2016 from http://www.nber.org/papers/w22944.

Helpman, E.; Itskhoki, O.; Redding, S.J. (2010). "Inequality and unemployment in a global economy". *Econometrica*, 78(4): 1239–1283.

Heyman, F.; Sjoholm, F.; Tingvall, P.G. (2007). "Is there really a foreign ownership wage premium? Evidence from matched employer–employee data". *Journal of International Economics*, 73(2): 355-376.

Hijzen, A.; Martins, P.S.; Schank, T.; Upward, R (2013). "Foreign-owned firms around the world: A comparative analysis of wages and employment at the micro-level". *European Economic Review*, 60: 170-188.

Katz, L.F.; Murphy K.M. (1992). "Changes in relative wages, 1963–1987: supply and demand factors". *The Quarterly Journal of Economics*, 107(1): 35–78.

Kijima, Y. (2006). "Why did wage inequality increase? Evidence from urban India 1983–99". *Journal of Development Economics*, 81(1): 97-117.

Krugman, P. R. (1991). "Increasing returns and economic geography". *Journal of Political Economy*, 99(3): 483-499.

Krugman, P.R. (2000). "Technology, trade and factor prices". *Journal of International Economics*, 50(1): 51–72.

Leamer, E.E. (2000). “What’s the use of factor contents?”. *Journal of International Economics,* 50(1): 17–49.

Lee, J.W.; Wie, D. (2015). “Technological change, skill demand, and wage inequality: Evidence from Indonesia”. *World Development,* 67: 238-250.

Lessmann, C. (2013). “Foreign direct investment and regional inequality: A panel data analysis”. *China Economic Review,* 24: 129-149.

Lipsey R.E.; Sjöholm F. (2004). “Foreign direct investment, education and wages in Indonesian manufacturing”. *Journal of Development Economics,* 73(1): 415-422.

Liu, X.; Song, H. (1997). “China and the multinationals - a winning combination”. *Long Range Planning*, 30(1): 74-83.

Melitz, M.J. (2003). “The impact of trade on intra-industry reallocations and aggregate industry productivity”. *Econometrica,* 71(6): 1695–1725.

Mortensen, D.T.; Pissarides, C.A. (1994). “Job creation and job destruction in the theory of unemployment”. *The Review of Economic Studies,* 61(3): 397–415.

Nakamura, M. (2013). “Globalization and sustainability of Japan’s internal labor markets: foreign direct investment (FDI) and wages at Japanese manufacturing firms”. *Journal of Asian and African Studies*, 48(4) 396–412.

O’Brien, R.M. (2007). “A caution regarding rules of thumb for variance inflation factors”. *Quality & Quantity*, 41(5): 673-690.

OECD (2011). *Special Focus: Inequality in Emerging Economies (EEs).* Paris: OECD Publishing: 48.

OECD (2015). *In It Together: Why Less Inequality Benefits All*. Paris: OECD.

Oladi, R.; Gilbert, J.; Beladi, H. (2011). “Foreign direct investment, non-traded goods and real wages”. *Pacific Economic Review,* 16(1): 36-41.

Onaran, O. (2009). “Wage share, globalization and crisis: the case of the manufacturing industry in Korea, Mexico and Turkey”. *International Review of Applied Economics,* 23(2): 113–134.

Pato, M.L.; Teixeira, A.A.C. (2016). "Twenty years of rural entrepreneurship: a bibliometric survey". *Sociologia Ruralis,* 56(1): 3-28.

Pflüger, M.; Blien, U; Möller, J.; Moritz, M. (2013). "Labor market effects of trade and FDI – Recent Advances and Research Gaps". *Jahrbücher für Nationalökonomie und Statistik,* 233(1): 86-116.

Pi, J.; Zhou, Y. (2014). "Foreign capital, public infrastructure, and wage inequality in developing countries". *International Review of Economics and Finance,* 29: 195-207.

Pittiglio, R.; Reganati, F.; Sica, E. (2015). "Do multinational enterprises push up the wages of domestic firms in the Italian manufacturing sector?". *The Manchester School,* 83(3): 346-378.

Robertson, R. (2000). "Wage shocks and North American labor-market integration". *American Economic Review,* 90(4): 742-764.

Saccone, D. (2017). "Economic growth in emerging economies: what, who and why". *Applied Economics Letters,* 24(11): 800-803.

Sampson, T. (2014). "Selection into trade and wage inequality". *American Economic Journal: Microeconomics,* 6(3): 157–202.

Stolper, W.F.; Samuelson, P.A (1941). "Protection and real wages". *The Review of Economic Studies,* 9(1): 58-73.

Tansel, A.; Bodur, F.B. (2012). "Wage inequality and returns to education in Turkey: A quantile regression analysis". *Review of Development Economics,* 16(1): 107-121.

Taylor, K.; Driffield, N. (2005). "Wage inequality and the role of multinationals: evidence from UK panel data". *Labour Economics,* 12(2): 223-249.

Te Velde, D. W. (2006). *Foreign Direct Investment and Development, an Historical Perspective*. Overseas Development Institute. Commissioned by UNCTAD for 'World Economic and Social Survey 2006'. Retrieved on 9th of October of 2016 from https://www.odi.org/publications/594-foreign-direct-investment-development-historical-perspective.

Te Velde, D.W.; Morrissey, O. (2004). "Foreign direct investment, skills, and wage inequality in East Asia". *Journal of the Asia Pacific Economy,* 9(3): 348-369.

Teixeira, A.A.C. (2014). "The internationalization of U.Porto's scientific production", ch. 6 (pp. 235-308), in Pedro Teixeira (Ed.), *Percursos da internacionalização na Universidade do Porto - Uma visão centenária*, U.Porto 100, U. Porto Editorial, ISBN: 978-989-746-038-8, pp: 430.

Tomohara, A.; Yokota, K. (2011). "Foreign direct investment and wage inequality: is skill upgrading the culprit?". *Applied Economics Letters* 18(8): 773–781.

Wacker, K. M. (2016). *On the measurement of foreign Direct investment and its relationship to activities of multinational corporations* (European Central Bank Working Paper 1614). Retrieved on the 1st of May of 2017 from https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1614.pdf?53ce65f8e8d83467da09c56469b8d927.

World Trade Organization (WTO) (2008). *World Trade Report 2008: Trade in a globalizing world.* Geneva: WTO.

Yay, G.; Taştan, H.; Oktayer, A. (2016). "Globalization, economic freedom, and wage inequality: a panel data analysis". *Panoeconomicus,* 63 (5): 581-601.

Yeaple, S.R. (2005). "A simple model of firm heterogeneity, international trade, and wages". *Journal of International Economics,* 65(1): 1–20.

Zulfiu-Alili, M (2014). "Inward foreign direct investment and wage inequality in Macedonia". *Eastern European Economics,* 52(5): 56–86.

Appendix

Table 17: Variance Inflation Factors (VIF) for the baseline model

A1			A1'		
Variable	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**
Openness	1.39	0.719614	Openness	1.26	0.790667
FDI inflows	1.36	0.736904	FDI stocks	1.25	0.799833
GDP pc	1.14	0.879450	GDP pc	1.13	0.882861
Mean VIF	**1.29**		**Mean VIF**	**1.22**	

B1			B1'		
Variable	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**
Openness	1.25	0.802683	Openness	1.29	0.775470
FDI inflows	1.17	0.854103	FDI stocks	1.17	0.852435
GDP pc	1.09	0.917617	GDP pc	1.14	0.877945
Mean VIF	**1.17**		**Mean VIF**	**1.20**	

C1			C1'		
Variable	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**
Openness	1.25	0.802683	Openness	1.29	0.775470
FDI inflows	1.17	0.854103	FDI stocks	1.17	0.852435
GDP pc	1.09	0.917617	GDP pc	1.14	0.877945
Mean VIF	**1.17**		**Mean VIF**	**1.20**	

D1			D1'		
Variable	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**
Openness	1.55	0.643859	Openness	1.37	0.727498
FDI inflows	1.50	0.667202	FDI stocks	1.35	0.738130
GDP pc	1.29	0.776474	GDP pc	1.34	0.745287
Mean VIF	**1.45**		**Mean VIF**	**1.36**	

Source: Own elaboration.

Table 18: Correlation matrix of the variables in the baseline model

A1					A1'				
	Gini Coef.	FDI inflows	Openness	GDP pc		Gini Coef.	FDI inflows	Openness	GDP pc
Gini Coef.	1				Gini Coef.	1			
FDI inflows	0.0852	1			FDI stocks	0.2537	1		
Openness	-0.2422	0.4962	1		Openness	-0.2466	0.4170	1	
GDP pc	-0.0142	0.2806	0.3168	1	GDP pc	-0.0256	0.2758	0.2969	1

B1					B1'				
	Gini Coef.	FDI inflows	Openness	GDP pc		Gini Coef.	FDI inflows	Openness	GDP pc
Gini Coef.	1				Gini Coef.	1			
FDI inflows	-0.0086	1			FDI stocks	0.0566	1		
Openness	-0.4561	0.3797	1		Openness	-0.4397	0.3808	1	
GDP pc	0.0795	0.2838	0.1472	1	GDP pc	0.0863	0.3456	0.1790	1

C1					C1'				
	Gini Coef.	FDI inflows	Openness	GDP pc		Gini Coef.	FDI inflows	Openness	GDP pc
Gini Coef.	1				Gini Coef.	1			
FDI inflows	-0.0181	1			FDI stocks	0.0488	1		
Openness	-0.4662	0.3797	1		Openness	-0.4507	0.3808	1	
GDP pc	0.0626	0.2838	0.1472	1	GDP pc	0.0681	0.3456	0.1790	1

D1					D1'				
	Gini Coef.	FDI inflows	Openness	GDP pc		Gini Coef.	FDI inflows	Openness	GDP pc
Gini Coef.	1				Gini Coef.	1			
FDI inflows	0.2650	1			FDI stocks	0.3478	1		
Openness	0.1191	0.5491	1		Openness	0.0772	0.4445	1	
GDP pc	-0.093	0.3970	0.4325	1	GDP pc	-0.0873	0.4219	0.4357	1

Source: Own elaboration.

Table 19: Other diagnosis tests of our baseline model

		A1	A1'	B1	B1'	C1	C1'	D1	D1'
Homoscedasticity	**Breusch-Pagan/Cook-Weisberg Test**	0.0085	0.0000	0.0000	0.0000	0.0013	0.0001	0.6151	0.0000
	Breusch-Pagan/Cook-Weisberg (iid) Test	0.0097	0.0000	0.0001	0.0001	0.0004	0.0000	0.7770	0.0073
	White's Test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
	Cameron & Trivedi's decomposition of IM-test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Endogeneity	**Hausman**	0.0000	0.0000	0.0612	0.0625	0.0122	0.0040	0.0043	0.0074

Source: Own elaboration.