ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor Thesis: International Bachelor of Economics and Business Economics

The impact of globalization on income inequality within the developing countries from Latin America

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Date final version: 09/08/2021

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Abstract

Researchers and politicians have mostly contested the effects of economic globalization in many world areas by investigating the causes of recently established significant income gaps. This article employs panel data regression techniques to examine the influence of economic from 1995 to 2006. One of the most important contributions is applying an alternative inequality measure (the Palma Ratio), which overcomes numerous limitations of the Gini Index and provides a different perspective on within-nation disparities. Because of the presence of omitted variable bias in a non-experimental dataset, the empirical results are inconclusive.

1 Introduction

1.1 General Overview

Over the last decades, the effect of globalization on income inequality has become an area of study for many scholars. Since numerous economies experienced tremendous integration into the world market, the process of trade liberalization resulted in an unprecedented increase in the cross-border movement of commodities and capital within nations (Kang-Kook, 2014). The majority of the existing research focused on the consequences of income inequality in advanced economies like the US and Western-European states (Milanovic, 2005). Past contributions to this area have attempted to quantify the presence of economic globalization by employing various measures through the level of trade liberalization (Ezcurra and Rodriguez-Pose, 2013). However, the empirical assessments regarding economic development (e.g., economic reforms and increasing international integration) on the within-country income distribution in the Latin American region is limited (Milanovic, 2005). Unsurprisingly, the entry of many developing countries into the world market conducted significant changes in inequality and distribution. Latin America has pointed out several distinguishing characteristics in this regard, being among the first emerging-world areas to embrace the tendency of globalization (Martin and Ocampo, 2003). Thus, trade reforms (e.g., Tariff reductions in Brazil) in these emerging nations have encouraged substantial research on the distributional implications of economic globalization (Castilho, Menéndez and Sztulman, 2012).

1.2 Central research question and research objectives

"Wherever there is great property there is great inequality. For one very rich man, there must be at least five hundred poor, and the affluence of the few supposes the indigence of the many"

—Adam Smith (Higgs, Smith and Cannan, 1904). This quote comprises Adam Smith's view in his book "Wealth of Nations" about the concept of inequality and its significant effect on the less advantaged individuals. It pinpoints that economic inequality was a field of interest from an early stage of economics. As an analogy frequently used in past studies, the global economy is becoming fundamentally an "uneven playing field" characterized by aggregate economic and technological innovations in industrialized nations (Martin and Ocampo, 2003).

Latin America constitutes a substantial percentage of the globe's complex and heterogeneous developing regions, being a widely discussed topic about social, economic or political transformations over the past decades (De Rosa, Flores and Morgan, 2020). Nowadays, the Latin American area is renowned for vast economic inequality (Murakami, 2016). As Gasparini, Cruces and Tornarolli (2011) state, the recent trends highlight how high-income disparities have taken hold in third-world countries. Moreover, the scarcity of essential services and education deepened income inequality as the distribution of economic gains created by international marketplaces was not equal (Birdsall, 2006). Consequently, the following debate arises: Is globalization augmenting income inequality within nations by widening the gap between rich and poor? Greater trade openness, as stated by Wood (1995) in his article, is connected with an increasing rather than a declining wage gap. By following the standard Heckscher-Ohlin theory, the distributional changes went in the opposite direction: While globalization intended to benefit the less-skilled workers, assumed to be a relatively abundant factor of production in developing countries, the evidence indicates how these workers were worse off than the employees with better abilities or levels of education. Therefore, high-skilled workers benefit from high earnings in contrast to the less-skilled ones who suffer losses (Goldberg and Pavcnik, 2007). This paradox leads to the formulation of the following central research question:

What is the impact of economic globalization on income inequality within countries from Latin America?

The major goal of this paper is to provide an overview regarding the mechanisms and channels through which economic globalization might generate within-country income discrepancies in the Latin American region. One important aspect is to comprehend whether or not economic globalization directly impacts income inequality since various factors might influence it indirectly. For instance, economic globalization might have an impact on inequality through

several channels like trade liberalization, offshoring, skill-biased technological changes, foreign direct investment (Murakami, 2016). To mitigate this issue, the OLS analysis implemented will control for the factors most likely to influence inequality in accordance with previous studies.

Most studies concerning the link between globalization and inequality have focused on the global scale — examining within-country inequality through aggregate economic indicators such as gross domestic product per capita (GDP per capita) or the Gini index (income inequality measurement). According to Milanovic (2005), these measures of global inequality face some limitations since they imply that within-country distributions of income are equal. Furthermore, the purpose of this study is to implement other inequality measures such as the Palma Ratio that will contribute to capturing the direction and magnitude of the effect: an increase in inequality due to globalization, a decrease or no impact[1].

The gist of our research is defined by the following theoretical and empirical sub-questions:

Is the increasing inequality in Latin American countries consistent with the assumptions of the Heckscher-Ohlin-Samuelson model?

Is it possible to predict a causal relationship between economic globalization and income inequality?

1.3 Scientific relevance

The academic relevance of our research is predicated on the scarcity of empirical studies available about the emerging nations in South and Central America. The present evidence sheds light on the influence of globalization on income disparity in the United States, Western Europe, and other advanced states. The latest work has examined how globalization impacts global income distribution by varying average growth rates per capita (Milanovic, 2005).

The impact of economic globalization through trade liberalization differentiates itself across regions, countries. Under these circumstances, well-thought-out national and international policies may attenuate or even eliminate undesirable effects of trade on within-country inequality since variations in results give convincing evidence (UNCTAD, 2019). The causal effect is established by relying on historical evidence of changes in inequality during the pre-

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[1] An alternative measure of income inequality that was introduced by Palma (2011).

globalization period and by utilizing trade reforms implemented by their governments. This thesis may contribute to the existing literature by addressing phenomena like rising income inequality in Latin American nations because of globalization through the channel of international trade. The central objective is to tackle the effect of economic globalization by using the economic globalization index that consists of real international trade flows and capital constraints (tariff rates).

From an academic perspective, this thesis adds to the current literature on income disparity in Latin America in various ways. Many researchers, according to Heimberger (2020), agree on the presence of a relationship between globalization and economic disparity. Despite plenty of other studies, the relationship between globalization and inequality remains unknown. We seek to generate meaningful results using an OLS fixed effects regression analysis to adjust for multiple biases by controlling the country and time-specific effects. Furthermore, compared to alternative inequality measures, using the Palma Ratio as the dependent variable has some advantages (e.g., Gini Index, Theil index, Atkinson measure). The Palma measure prevails as an accurate method based on "the comparative balance of the 'middle' or 'median' categories between the impoverished 40% and the wealthiest 10%".This measure focuses on a characteristic of disparity that prominent scholars have deemed critical, namely the relationship between the tails and capturing the share of the middle 50% (Cobham, Schlögl, and Sumner, 2016).

1.4 Thesis Outline

The thesis structure is organized as follows: firstly, the introduction (section 1) addresses the general background of the topic, the scientific relevance and the main research question and sub-questions. Secondly, the literature review (section 2) presents the terminology and ideas and discusses the primary sources of globalization and inequality. In this part, I will look at some well-recognized findings concerning trends in inequality in the Latin American region. The adjacent theorems, hypotheses and the previous empirical research are discussed in the theoretical framework (section 3). Moreover, earlier empirical literature presents broad conclusions about the effect of trade globalization on income inequality. In the fourth part (section 4), the data sources, the sample selection and variables are specified and explained. Moreover, a Descriptive Statistics (statistical characteristics of variables) table and correlation table are included (see appendix B, C). Next, by laying out an accurate research design, the methodology section (section 5) describes the econometric technique employed (e.g., fixed

effects, pooled OLS). The following part (section 6) presents the study findings (regression analysis) and discusses the accuracy of the results and research limitations. Furthermore, as a robustness check, the variables of interest are transformed into logarithms. Finally, our thesis is completed with the formulation of the main conclusions (section 7) and an answer to the central research question.

2 Literature Review

2.1 Globalization

Globalization has become a broad and generalized notion, commonly used to describe a wide range of phenomena. In the 90s, this term was regularly applied in political and academic public discussions however, the interpretations attached to it emphasizes the complex aspects of the concept (Martin and Ocampo, 2003). According to Goldberg and Pavcnik (2007), the wide-ranging definition of globalization comprises "flows of goods and services across borders, reductions in policy and transport barriers to trade, international capital flows, multinational activity, foreign direct investment, outsourcing, increased exposure to exchange rate volatility, and immigration". It is considered a factor that stimulates international activity between countries (Perraton, Goldblatt, Held and McGrew, 1997) and a principal cause that induces significant inequality and disregard of the poor in emerging countries (Kremer, 2006). Every viewpoint on globalization underlines fundamental aspects of the term, particularly the effect of its economic elements. Instead of trying to define globalization by emphasizing certain elements, Dreher et al. (2008) state that taking a more diversified, pluralistic view would be beneficial for avoiding oversimplification of the actual concept. As stated by the authors, many observers (e.g., economists, policymakers) consider globalization, a process that created considerable advantages at a global scale. The movement between borders of commodities, services, technology, labor and capital have been considerably facilitated. The authors consider that aside from economic improvements, there have been advancements in culture and government.

Most economic research about the implications of globalization has concentrated on empirically testable aspects of economic integration, namely the impact of liberalizing international trade (Goldberg and Pavcnik, 2007). Similar to previous studies, we will consider the element of trade openness as the fundamental indication of globalization. According to

Lang and Mendes Tavares (2018), several emerging countries[2] underwent periods of rapid economic development and significant poverty reduction as their economies opened to trade. Economic globalization may provide better market access, fast technology transfer from more affluent countries, and higher production and efficiency (Hartungi, 2006). However, the process of global integration, along with widening income inequality within countries, has fostered uncertainty about the advantages of this phenomenon (Lang and Mendes Tavares, 2018).

It is crucial to distinguish between different types of globalization (e.g., political, social, financial, economic) in order to tackle their influences in explaining specific events and concepts. In this research, we may apply known categories of economic globalization measures. Heimberger (2020) claims that these types consistently identify three elements of global market inclusion such as financial globalization, trade globalization (measured by the trade intensity ratio: sum of imports and exports divided by GDP), and overall economic globalization.

2.2 Inequality trends within countries

The within-country inequality has become one of the most persistent tendencies in many nations in the XXI century as income disparity is widening in advanced and developing countries. Income inequality has grown significantly in the US, Latin America, Asia, and Africa (Harrison, McLaren and McMillan, 2011).However, the measurement of this concept presents several difficulties. The majority of current research on emerging countries has concentrated on the relative interpretation of inequality. It discovered that trade reforms correspond temporally with a rise in inequality, inferring an income disparity (Goldberg and Pavcnik, 2004). About measuring income disparity, an analysis presenting the relevant tools will be illustrated in the Data section.

Income inequality began increasing in Latin American developing countries throughout the second half of the 1970s and the first half of the 1980s, coinciding with a time of greater international trade openness, suppression of civil rights, limits on the labor union movement

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[2] According to reports from WID (World Inequality Database) 2019, emerging countries (e.g., Latin American region and South Asia) experienced accelerated economic growth once opening to international trade which worsened the income inequality within the country, as stated by indicators (e.g., top 1% share, bottom 50 % share); see Deher et al. (2008) for further information.

and macroeconomic instability (Bebczuk and Gasparini, 2001). The degree of disparity has experienced a sharp rise since 1980, according to both distributional and growth metrics. Income inequality continued to increase in most nations in the 1990s, although at a slower rate (Ferreira, Ferranti, Perry and Walton, 2004). The next paragraphs provide a comprehensive overview of income disparity tendencies by nation dividing the Latin American region into two parts: Central America and South America.

South America. According to Ferreira et al. (2004), inequality experienced a dramatic rise in the value of the Gini Index. In Argentina, the coefficient exhibited a significant growth from 34.5 points to 53.8 during 1974-2002. Hence, Argentina has confronted the most profound distributional changes of income among Latin American countries. Although there is no strong indication that income distribution got more uneven in Peru in the 1970s and 1980s, statistics for the 1990s indicate a substantial shift toward increased income intensity. Research studies have produced comparable results. In the neighboring state of Ecuador, the distribution appears to have gotten much more uneven, especially in the second part of the 1990s. Also, inequality rose in Uruguay as well, but at a slower rate. Furthermore, no substantial distributional changes occurred in Uruguay throughout the period 1970-1980.

Distributional data for Bolivia and Paraguay before the mid-1990s is rare since the low quantity and changing the type of household surveys. Inequality appeared to rise marginally in Bolivia throughout the 1990s. In the 1990s, there was no rebound from the income distribution losses of 1980. Inequality in Venezuela steadily increased, and the pattern in Colombia held constant. Finally, Brazil witnessed considerable growth in income inequality, but disparities have been stable and begun to fall (Ferreira et al.,2004).

Central America. As stated by Ferreira et al. (2004), income inequality has shifted in several directions in Mexico. Following an improvement in the 1970s, the distribution got significantly more uneven in 1980, denoting the effect of wage inequality. The inclusion of Mexico in GATT and the North American Free Trade Agreement (NAFTA) enabled its integration in the global economy and industrial expansion in and around economic centers (Ezcurra and Rodriguez-Pose, 2013). After significant economic developments and shocks throughout the 1990s, income distribution remained relatively steady. The disparity has remained steady at lower levels of inequality for years. Considering the increase in inequality throughout the 1990s, Costa Rica continues to be among the countries with the lowest income inequalities in the area. According to empirical studies, inequality seems to be significantly higher in the rest of Central

America. Moreover, the data points show no substantial increases in inequality in Nicaragua, low growth in El Salvador and a decrease in Honduras (Ferreira et al., 2004).

2.3 Historical perspective of globalization and inequality

One of the most striking economic realities in many industrialized nations during the 1980s and early 1990s was the degradation of the relative labor market results for unskilled labor. For instance, events like the disintegration of the Bretton Woods system[3], the expansion of multinational corporations and worldwide production all served as essential foundations for economic globalization (Dreher and Gaston, 2008). As defined before, economic globalization aims to integrate national systems by merging them at the global stage through promoting international movements of commodities, services, labor and capital (Kang-Kook, 2014). Due to the advancement of international free trade (e.g., the formation of the World Trade Organization (WTO)), the proportion of total global exports (% from global GDP) increased steadily. According to Kang-Kook (2014), exports have risen from around 12% in the 1970s up to approximately 20% in the 1980s, and up to about 25% in 2000.

Martin and Ocampo (2003) argue that the Latin American region has demonstrated a variety of distinguishing characteristics in this regard. For starters, it was among the first developing world areas to adopt the globalization movement. After WWII, the comparatively low rise in inequality was associated with the increase of economic expansion in this region. The trend toward increased openness and engagement in international trade, an aspect of economic globalization, originated in the 1960s. However, it did not necessarily start until the 1980s and 1990s. During the postwar phase of globalization, most emerging countries in Latin America pursued several methods of achieving industrialization through import substitution. The key strategy adopted by their governments stated by Dollar (2005) was to maintain greater levels of import protection compared to advanced economies in order to stimulate domestic production. Furthermore, international corporations were prohibited to invest because the development of national firms was highly encouraged.

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[3] A collection of integrated rules and regulations serves as the basis for establishing fixed international currency exchange rates. The importance of this agreement underlines the institution of a fixed exchange rate by the IMF for the currencies. The Bretton Woods regime was abolished by President Richard Nixon on August 15th, 1971 (Bordo and Eichengreen, 2007).

The current wave of globalization in Latin America, beginning from 1980, is characterized by greater trade openness and trade intensity ratios (TIR)[4] as the developing nations, specifically Mexico, Colombia, Brazil, Argentina, become more integrated into the global economy (Thorbecke, Nissanke, Freije, and Porto, 2008). In line with the study conducted by Thorbecke et al. (2008), most countries from South America experienced high-income inequality over the decade ending in 2001. Firstly, Argentina accomplished a significant increase in inequality, the value of the GINI Index[5] reaching 7.7 points. Secondly, Venezuela was next, with a roughly 3.8 Gini Index rise. Furthermore, in the emerging nations from Central America (e.g., Mexico, Honduras, Nicaragua, Panama) the income distribution has been considerably diminished (see Figure 2). Thus, this period of divergent developments has shown an influence on the region's inequality rating. According to Table 2, despite having the highest drop in inequality (-2.3 points), Brazil still ranks first among the most unequal countries in the region (Ferreira, Ferranti, Perry, and Walton, 2004).

As the Latin American countries experience advancements in trade liberalization, Goldberg and Pavcnik, (2007) put an emphasis on the importance of trade reforms and several changes in globalization policies. For instance, states such as Colombia and Argentina started the implementation of short-term trade reforms around the 1970s. Consequently, other Latin American nations began liberalizing their trading policies (e.g., Mexico 1985–1987; Brazil 1988–1994, Chile 1974-1979). The following reforms were notable for substantially lowering tariffs, which before liberalizing trade played an essential protectionist role and were characterized by high values. The great tariff values indicate the lack of involvement in the GATT[6] or WTO tariff negotiations previous to their economic reforms (e.g., Mexico was not a GATT member before openness to trade).

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[4] A popular indicator of quantifying economic globalization is measured by the trade intensity ratio obtained by summing up imports and exports and dividing the sum by GDP. It reflects the influence of economic globalization on trade (Thorbecke, Nissanke, Freije, and Porto, 2008).

[5] The most popular measure of total income inequality, particularly representing the income inequality within a country or other entity. It was created by the Italian statistician Corrado Gini.

[6] The General Agreement on Tariffs and Commerce (GATT) represents a legally binding agreement between several nations that aims to encourage international trade by lowering or removing trade obstacles (e.g., quotas, tariffs).

3 Theoretical Framework

3.1 Channels of globalization and inequality

The channels through which the impact of globalization on income inequality can be assessed are diverse and highly debatable. The argument over globalization's distributional consequences is frequently divided between two perspectives. According to International Monetary Fund's (2007) research, there is an optimistic view regarding an absolute augmentation of income, even low-income people benefit from globalization. This is equivalent to Kuznets' (1955) inverted U-shaped hypothesis denoting the relationship between economic growth and income inequality. The hypothesis postulates how income disparity rises at an initial stage of growth and subsequently falls during the development process of economic growth (Campano and Salvatore, 1988). Thus, while income inequality may grow during the early stages of industrial expansion, it inevitably declines as the economy accomplishes its shift to industrialization.

In contrast, an opposing perspective contends that, while globalization may increase total earnings, the gains are not distributed evenly across a country's inhabitants, eventually creating relative losers and winners. As a consequence, broad income disparities might affect economic growth as the benefits offered by the globalization process may not even be entirely explored (International Monetary Fund, 2007). Furthermore, economic globalization can cause income inequality distortions via a variety of processes, as described in several theoretical and empirical research articles (e.g., Wood (1997), Goldberg and Pavcnik (2007), Goldberg and Pavcnik (2004), International Monetary Fund (2007), and so on).

Heckscher-Ohlin (H-O) model and the Stolper–Samuelson theorem effects

This passage will explore the main mechanisms via which economic globalization is likely to impact income inequality within countries. These factors may be primarily crucial to determining why many poor societal groups have not profited significantly from current globalization (Thorbecke et al., 2008). The traditional comparative advantage theory served as the foundation for observational studies regarding trade and income distribution in the 1990s. The main contrast concerning the distributive implications between Heckscher-Ohlin and the Specific Factors (SF) model was indeed an important priority.

The Heckscher-Ohlin (H-O) model has remained a relevant method for evaluating the effects of globalization through trade liberalization on inequality as most of the South American

nations have primarily engaged in conventional inter-industry trade (e.g., import of manufactured commodities) (Murakami, 2016). Although the limitations of the H-O framework are widely acknowledged, its basic insight is empirically helpful since it underlines the importance of trade liberalization (Leamer, 1995). According to Wood (1997), the model's predictions highlight that the home country will export products that make intensive use of relatively abundant production resources, however, will import goods that make extensive use of relatively scarce factors of production. Thus, trade specialization generally favors industries that are intense in the abundant factor. The model's associated theorem, Stolper–Samuelson, presents the association to income inequality by linking the differences in the prices of goods to the fluctuations in factor returns (Goldberg and Pavcnik, 2007).

As stated by the theorem, greater trade liberalization (by implementing tariff-cutting policies) could lead to a rise in the wage of low-skilled employees and a decrease in the remuneration of high-skilled workers. Therefore, it will follow a reduction in income inequality. This is the case of emerging countries that are usually abundant in unskilled labor (IMF, 2007). The majority of theoretical and empirical research does not support the Heckscher-Samuelson model. According to Franco and Gerussi (2013), trade globalization usually widens income inequality in impoverished countries. Similarly, Spilimbergo, Londoño and Székely (1999) find a negative impact of trade openness on income distribution in economies with a significantly higher supply of high-skilled workers and a favorable effect in states with a considerably large capital endowment.

Skill-biased technical change. Through skill-biased technological progress, globalization may have a negative impact on income disparity (Thorbecke, Nissanke, Freije, and Porto, 2008). Murakami (2016) argues that the H-O framework's structure cannot address an increase in prices for qualified employees inside industries. Furthermore, technological progress (e.g., advanced computers and automated production lines) has introduced the replacement of low-skilled employees for qualified employees Thus, the demand for high-skilled workers has experienced an increase in all industries, leading to the reduction in employment of unskilled workers. During 1980, the wage shares for qualified workers in the manufacturing sectors of Latin America increased considerably denoting the foundation of technological advancement of supporting high-skilled and educated workers (Murakami, 2016). Although the assumption that free trade is linked with skill-biased technological change to enhance demand for a high-skilled labor force appears theoretically supported, actual research on the matter is incomplete and highly debatable (Goldberg and Pavcnik, 2007).

Foreign Direct Investments (FDI). Foreign direct investment (FDI) is often considered among the most important aspects of globalization, as it has gained widespread interest ever since around the 1990s (Hemmer, Krüger and Seith, 2005). Before the 1980s, the government from Latin American maintained severe prohibitions on FDI and considerable trade barriers as part of a deliberate mission to encourage the development of the local manufacturing industry. FDI became a massive stream of resources after more nations followed the trade openness trend (Feenstra and Hansson, 1997). Bornschier, Chase-Dunn and Rubinson (1978) suggest that direct foreign investment has led to increased economic disparity within countries. This view is also supported by Evans and Timberlake (1980) who explain how FDI in emerging countries influences the domestic workforce via the rise of the service sector.

Analog to the Heckscher-Ohlin framework, FDI inflows would benefit the abundant factor of production. According to Herzer, Hühne and Nunnenkamp (2014), inward FDI can influence inequality through a fluctuating non-linear relationship once the transition to contemporary technological effect skill development of the labor forces. FDI generally concentrates in the economic regions of the host nations, where highly skilled and mobile employees are engaged in export-oriented and developed industries from a technological perspective. As a consequence, the introduction of modern technologies may enhance income disparity as FDI spillover effects may benefit firms situated in urban regions. With regards to Latin America, the developing countries are generally considered to be unskilled labor abundant. In their research Herzer, Hühne and Nunnenkamp (2014) state that within-country inequality caused by FDI may widen until impoverished societal groups develop the necessary human resources to utilize contemporary technology. Namely, empirical studies show that FDI from the United States has a detrimental impact on Mexican income distribution when the requirement for a qualified workforce rises in comparison to other emerging nations (Feenstra and Hanson, 1997). Furthermore, the empirical research focused on poor income host nations is limited and the relationship between inequality and FDI remains unclear. The effect of FDI on income inequality is isolated in the empirical section of our research since it is included as a control variable in the OLS regression analysis.

Off-shoring. Different theoretical models have been created to investigate the effects of intra-industry outsourcing on wage disparity in emerging nations. Murakami (2016) suggests that within-industry offshoring is an essential factor in assessing whether globalization might

promote skill-biased technical change in emerging economies. In his research, the author pinpoints that several parts of production operation are progressively being split across nations depending on the expertise levels needed for the process. Therefore, cheap labor was advantageous as low-skilled and intensive jobs (e.g., assembling) were offshored from advanced states to the emerging ones. Despite the crucial influence of offshoring, limited empirical studies investigated the impact of this channel on inequality in Latin America. One reason is provided by the reduced availability of data. Namely, offshoring has previously been measured only through FDI statistics. Moreover, the extent of integration across developing countries has been generally low, particularly demonstrated by the limited participation of intermediary products in intra-regional commerce.

It is crucial to highlight that the notion of "outsourcing" previously referred to by Goldberg and Pavcnik (2007) is unsuitable in the context of the Latin American region. The distinction between the two terms is in the following: outsourcing implies the transfer of a company's manufacturing processes to a third party outside the corporation, contrarily, offshoring is delegating some responsibilities to other nations rather than separate companies. Thus, the channel of offshoring as an aspect of economic globalization requires more empirical research (Murakami, 2016).

3.2 Empirical evidence of income inequality and trade globalization

The empirical work regarding the influence of globalization (through trade openness) on wage inequality in Mexico has highlighted an increase in income disparity according to the demand augmentation and increased relative return of high-skilled employment (Thorbecke et al., 2008). The trade liberalization measures implemented over the previous decades had a significant distributional effect within the country (Popli, 2010). According to the IMF (2007), between 1985 and 1994, Mexico implemented several reforms that contributed to the initiation of trade and capital flows. In the empirical study by Hanson and Harrison (1999), the results show that protectionism was originally higher in less-skilled industries but decreased considerably the implementation of trade reforms. As a consequence, the overall rise in wage inequality was compatible with the Stolper–Samuelson theorem.

Other papers emphasize that economic globalization affected the growing income disparity in Mexico, however, policy improvements have favored unskilled employees overall. For

instance, in the 1990s, societal groups in urban regions more affected by globalization experienced a rise of approximately 10 % compared to people in rural areas (IMF, 2007).

Similarly, Brazil appears to be a particular example among Latin American nations, especially concerning the research investigating the impact of globalization on income and employment results. In their study, Castilho et al. (2012) demonstrate that household poverty and inequality were reduced less in Brazil as it was more vulnerable to tariff decreases. By performing an analysis of the Brazilian economy by using a regional approach, the empirical results depict contrasting outcomes when the impact of trade liberalization is tackled in rural and urban areas. Firstly, opening up to trade leads to expanded poverty and inequality in urban areas associated with decreases in rural disparity. Secondly, concerning global markets integration, statistical evidence is found showing that inequality in Brazil is significantly reduced as export exposure increases. However, the income disparity advances as import penetration rises. This article demonstrates that trade openness increased within-country inequality, even though Brazil encountered an improvement in the indices of welfare over the study period.

Likewise, Goldberg and Pavcnik (2005) describe a novel methodology employed by Attanasio, Goldberg, and Pavcnik (2004) to research the income inequality outcomes of trade liberalization, an essential globalization shock. The regressions denoting the variation of high-skilled employees in the Colombian economy due to the modification in tariff protection policies from 1984 to 1998 demonstrate that the rise in demand for high-qualified people was significant in the industries that received the greatest tariff reduction. This indicates that the channel of skilled-biased technical progress represented an endogenous reaction to trade liberalization in Colombia.

Another piece of evidence suggests that greater economic integration was most probably a key cause of the 1990s income inequality increase in Argentina. The paper by Bebczuk and Gasparini (2001) highlights two main channels that could have led to income inequality augmentation. Firstly, since Argentina disposes of a relatively abundant supply of natural resources and high-skilled labor, trade globalization caused a change in employment in industries that take advantage of those resources. As a result, the relative return on natural resources rises, and the wage gap between high-skilled and low-skilled employees widens. Secondly, the reduction in capital prices and the technological advancements demanding qualified labor caused a higher integration in the world economy. It led to a skill premium

increase in more efficient industries. This impact appears to be a more substantial contributor to rising income inequalities in Argentina.

3.3 Hypotheses

As it has been stated in empirical studies before (e.g., Hanson (2004), Goldberg and Pavcnik, (2004), Harrison and Hanson, (1999)), the expansion in economic globalization through the channel of trade liberalization is one probable explanation for the growing disparity of income in Latin America. Usually, this process was connected by trade reforms that denoted changes in income distribution within countries. According to Harrison, McLaren and McMillan (2011), the amount of evidence expressing a clear connection between trade reforms and increasing inequality accounts only for a few countries (e.g., Feliciano (2001) for Mexico; Castilho, Menendez and Sztulman (2005) for Brazil). The fact that various results are obtained in different nations motivates us to investigate the issue once more, by considering more countries and different measurements of globalization and inequality. Thus, the following hypothesis is formulated:

H1: Increased economic globalization captured by the economic globalization index has augmented the within- income disparity in Latin America.

According to the empirical study performed by Ezcurra and Rodrigues-Pose (2013) in a panel considering 47 nations over the time period 1990–2007, it was concluded that emerging countries by incurring higher degrees of trade openness also register greater levels of regional income disparities. This result holds whether we consider the geographical effect of real flows or current trade and capital limitations. Based on this research, we formulate the second hypothesis, consistent with our sample and region of study.

H2: The degree of economic globalization and income inequality within nations have a positive relationship.

4 Data

As reported by Ravallion (2003) inequality refers to differences in living standards. The connection of inequality consequences to globalization is especially difficult to predict since it highly depends on measurement techniques. In the following two subsections an overview will be provided regarding the inequality and globalization measurements employed.

4.1. Inequality measurements

An increasing number of empirical studies has concentrated on changes in intra-country income disparity. The Gini index, which describes the income distribution within the country, represents a widely employed metric in this context. It depicts the range of inequality from an equal distribution (as the Gini Index equals 0) to the most extreme state of disparity where one individual possesses all of the income (Gini coefficient equals 1) (Mills, 2008). An aspect addressed by Palma and Stiglitz (2016) is that the Gini coefficient is misleading concerning several processes that occur within each nation's distribution. The Gini coefficient's regional distributional layout indicates high-income inequalities among 50% of the global population, especially those at the very upper part and bottom of each nation's distribution. It provides little information regarding the other half's impressive distributional uniformity. It generates serious concerns about the Gini index's use as an indication of general income inequality, especially since the Gini coefficient is statistically more susceptible to differences in the center of the distribution. At increasing levels of inequality, the index becomes insensitive.

Therefore, in our study, we employ the Palma Ratio based on the work of the Chilean economist Gabriel Palma. This measure is defined as the ratio of the richest 10% of the population's share of GNI divided by the poorest 40% 's share (Palma and Stiglitz, 2016). The advantage of the Palma Ratio is that it tackles the Gini index's excessive sensitivity to variations in the center of the distribution and lack of sensitivity to fluctuations at the upper part of the lower part of the range. Unlike the Gini Index, the Palma aggregates the earnings of 50 % of the population in the "center" of the distribution. Moreover, it depicts the consequences of income inequality on society overall (Cobham and Sumner, 2014). A comparison between the Gini and Palma is provided by Figure 1 in Appendix C for each country individually.

4.2 Globalization measurements

The analysis of globalization is becoming a major concern for academics, industry, the public and specialized media, and policymakers. According to (Dreher, 2006), economic globalization, in general, has two aspects. First, real economic flows are commonly used as indicators of globalization. Second, the prior literature utilizes proxies for trade and capital constraints. As a result, two indexes are created that comprise specific components that have previously been proposed as indicators for globalization. The index of the Economic globalization used in our research represents a measurement between 0 and 100, where greater values indicate a higher degree of globalization. This is described in this context as long-distance movements of commodities, services, and capital, also the knowledge and views that precede market transactions. It is determined by real trade, investment flows, as well as trade and capital limitations (e.g., tariff rates). The quality of the economic globalization indicator has a substantial relevance in our study since it will represent the independent variable of the OLS regression in the methodology part.

4.3 Description of data sources

The Palma Ratio coefficient is retrieved from UNU-WIDER World Income Inequality Database (WIID), version from May 2021. So far, it includes around 20,000 data points and 3,700 distinct country observations. This database has been actively utilized in research studies (such as Carter (2006); Zhou, Biswas, Bowles, Saunders, (2011)) to explain inequality patterns at the international and national levels, as well as to examine the link between disparity and other relevant economic issues (e.g., economic growth). WIID offers a comprehensive and standardized dataset, especially net income distributions per capita for every nation over the greatest period available. It includes data for 196 nations with a minimum 1-year observation from the period 1940- 2019 (Gardin, 2021).

Other data sources used include the IDLA database, which has been recognized for providing statistical information crucial for the evaluation of income distribution in the Latin American region over the last twenty years, a period defined by significant developments in the sector of income disparity. The IDLA dataset is ideal for macro panel studies of Latin America and comprises information on around 18 states. In our study, the EGI (Economic globalization index) and the other control variables are retrieved from this source. The period covered in

IDLA is 1990-2008, with annual information except for a few variables (e.g., illiteracy rate and urban population are determined for a five-year time frame) (Martorano and Cornia, 2011).

4.4 Sample description

The sample of the empirical analysis is based on a panel dataset with a balanced structure, consisting of 120 observations and 12 time periods. The following observations are applied to 10 Latin American emerging countries: Argentina, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Peru and Venezuela. The period chosen is between 1995-2006 since the EGI variable did not register missing values, generating a complete balanced panel dataset. According to the IDLA data set created by Martorano and Cornia (2011), in our sample, we operate with 11 variables: GDP per capita, terms of trade, economic globalization index (EGI), country, country id, year, FDI, labor force participation rate, informal sector, Palma Ratio and urban population rate. Table 4.1 annexed in the appendix displays the definition of variables and their data sources according to Martorano and Cornia (2011).

Regarding the statistical characteristics of the variables employed in our analysis, Table 4.2 (appendix B) provides a summary of the data sample by illustrating the number of observations, mean, standard deviation, minimum and maximum values in a panel data framework. The statistical features of variables like country, country ID and year are not included since they are not relevant. Furthermore, Table 4.3 represents the Pearson correlation table illustrating the main variables. The Pearson correlation r is a measurement tool used to evaluate the association between two numerical variables, also the extent to which there is a linear relationship between them (denoting the direction and magnitude). From Table 4.3 it can be deduced a significant positive correlation between the Palma Ratio and the labor force participation ratio. Even though the correlation coefficient of EGI and Palma Ratio is not significant, correlation does not particularly imply causation and a proper investigation of the causal effect will be performed.

Table 4.3. Correlation table for the developing countries in Latin America

	Variable	1	2	3	4	5	6	7	8
1	EGI	1.00							
2	Palma Ratio	0.03	1.00						
3	GDP per capita	0.20*	-0.48*	1.00					
4	Terms of Trade	0.02	0.19*	-0.21*	1.00				
5	Informal Sector	0.10	0.39*	-0.54*	0.23*	1.00			
6	FDI	0.47*	0.32	-0.31	0.17	0.42	1.00		
7	Labor Force Rate	0.25*	0.57*	-0.33*	0.44*	0.41*	0.32*	1.00	
8	Urban population	0.01	-0.14	0.66*	-0.06	-0.37*	-0.17	0.14	1.00

*Note. * $p < 0.05$.*

5 Methodology

Carter's (2006) research inspired the empirical approach utilized in this paper, which is a valuable contribution to the field that demands further analysis. The author offers an empirical study in which estimates of a fixed-effects regression model of the country-level Gini Index as a function of economic globalization and control variables are reported. The Gini index numbers are derived from the same source as our inequality measure Palma Ratio, the UNU/WIDER World Income Inequality Database. The study's main conclusion is that increased economic globalization can improve income inequality by extending income-earning opportunities, but it can also reduce inequality by reducing income transfers to the most disadvantaged. In addition, Sala-i-Martin (2006) reached the same conclusion stating that a higher level of economic integration in the global economy has greater concentrations of

regional disparities. According to both the Theil entropy index[7] and MLD index[8], within-country income inequality has grown considerably. In contrast to these studies, Dreher and Gaston (2008) determined that globalization worsened economic inequality among OECD nations from 1970 to 2000. By the use of the KOF Index and income disparity statistics, the results indicate there is no significant influence in emerging countries. Our methodology will operate with an alternative measure of inequality, particularly the Palma Ratio. The rest of this section details our estimation techniques, discusses the regression characteristics and motivates their application in our study.

5.1 Empirical Strategy

Entity fixed-effects regression model

Consistent with Torres-Reyna (2007) findings, panel data accounts for characteristics that are impossible to see or quantify, such as cultural differences, as well as factors that are time-variant but not across nations (e.g., national policies, international trade agreements like NAFTA for Mexico). Hence, one can account for unknown heterogeneity across nations and time. The method of our analysis makes use of within-country variation across time, by estimating ordinary least squares (OLS) regression in a fixed-effects (FE) model and eliminating any observed and unobserved country-specific time-invariant effects. Country-specific unobserved effects can be incorporated in country-specific variables, thus preventing the omitted variable bias. To analyze the effects of economic globalization on income inequality, a fixed-effects statistical model is implemented by the following equation:

$$PALMA_{it} = \beta_0 + \beta_1 EGI_{it} + \beta_2 GDP_{it} + \beta_3 LAB_{it} + \beta_4 TRADE_{it} + \beta_5 FDI_{it} + \beta_6 URBAN_{it} + \beta_7 INFORMAL_{it} + \alpha_i + u_{it}$$

Here, $i = 1, \dots, 10$ and $t = 1995, \dots, 2006$. $PALMA_{it}$ is the dependent variable, EGI_{it} represents independent variable (the value of the first regressor) for country i in the period t, $\beta_1, \beta_2, \dots \beta_7$ is the coefficient for respective independent variable and control variables. The other time-variant variables included (e.g., $GDP_{it}, TRADE_{it}$, etc.) are controlled for since they could influence the outcomes and are not captured by the economic globalization index. The

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[7] A statistical measurement that is used to quantify economic and regional disparities and other economic phenomena (OECD,2016).
[8] The mean logarithmic deviation is an inequality measure, representing the mean of the log ratios of each individual's income divided by the average income (Burniaux, Dang, Fore, Forster, Mira D'Ercole and Oxley, 2000).

fixed effect is denoted by α_i, the unobservable time-invariant intercept capturing the individual heterogeneity specific for every country. Thus, we consider α_i being the total effect on the dependent variable of all unseen factors which are constant across time. The error term (idiosyncratic error) is denoted by u_{it}.

The mechanism regarding the computation of the OLS fixed effects can be illustrated through the "entity-demeaned" OLS algorithm (Stock and Watson, 2012). The intercept α_i cannot be completely controlled because it is unobservable. It comprises all the country characteristics that do not change over time (e.g., geography, formal institutions, currency etc.). The FE method excludes the time-invariant factor by demeaning the variables within each country:

$$PALMA_{it} - \overline{PALMA_i} = \beta_1(EGI_{it} - \overline{EGI_i}) + \beta_2(GDP_{it} - \overline{GDP_i}) + \beta_3(LAB_{it} - \overline{LAB_i}) +$$
$$\beta_4(TRADE_{it} - \overline{TRADE_i}) + \beta_5(FDI_{it} - \overline{FDI_i}) + \beta_6(URBAN_{it} - \overline{URBAN_i}) +$$
$$\beta_7(INFORMAL_{it} - \overline{INFORMAL_i}) + (u_{it} - \overline{u_i})$$

The fixed-effects model is deemed appropriate when the unobserved effects may be connected with the explanatory components. Country-specific unknown effects can be incorporated in country-specific variables in fixed-effects, preventing the connection between the error term and explanatory variables that would lead to the omitted variable bias. Because of the prevalence of common disruptions and unexpected factors which account as a part of the error term, panel-data models are prone to developing significant cross-sectional dependency in the errors. Thus, we utilize fixed effects methods with clustered standard errors since it might account for the autocorrelation in residuals. Moreover, another justification is that clustered standard errors can correct for within-cluster correlation or heteroscedasticity (Colin Cameron and Miller, 2015). The standard errors will be clustered at the country level.

Time and entity fixed-effects regression model
It is crucial to include the time and entity fixed-effects OLS model in our analysis to determine how the economic globalization index affects within-country income inequality operationalized by the Palma Ratio. When omitted elements are relatively unchanged over time but differ across countries (e.g., cultural norms), though some differ substantially yet are consistent amongst countries (for example, state safety regulations), it is indeed reasonable to incorporate both entity (state) and temporal effects. A central assumption is accounting for

time effects anytime an unforeseen fluctuation or a special event may have an impact on the dependent variables. Therefore, the subsequent regression equation is formulated:

$$PALMA_{it} = \beta_0 + \beta_1 EGI_{it} + \beta_2 GDP_{it} + \beta_3 LAB_{it} + \beta_4 TRADE_{it} + \beta_5 FDI_{it} + \beta_6 URBAN_{it}$$
$$+ \beta_7 INFORMAL_{it} + \alpha_i + \delta_t + u_{it}$$

Here, $i = 1, \ldots, 10$ and $t = 1995, \ldots, 2006$. As in the previous equation, $PALMA_{it}$ is the dependent variable, EGI_{it} represents the independent variable for country i in the period t, $\beta_1, \beta_2, \ldots \beta_7$ —of explanatory variables. The only distinction compared to the previous fixed-effects model is the inclusion of time fixed-effects intercept. The period-specific intercept δ_t is generally used to account for macroeconomic shocks (e.g., national economic business cycles, price shocks) when investigating longitudinal data. Furthermore, the country fixed intercept α_i controls for variables that do not vary over time for individual countries (location and natural features). The error term is expressed by u_{it}.

Pooled OLS

To investigate the reasons for changing patterns of income inequality within Latin American states, as well as the possible links between economic globalization and income disparity, an equivalent pooled ordinary least squares (OLS) regression using a linear panel data model is used. The model is estimated by the equation:

$$PALMA_{it} = \beta_0 + \beta_1 EGI_{it} + \beta_2 GDP_{it} + \beta_3 LAB_{it} + \beta_4 TRADE_{it}$$
$$+ \beta_5 FDI_{it} + \beta_6 URBAN_{it} + \beta_7 INFORMAL_{it} + u_{it}$$

Here, $i = 1, \ldots, 10$ and $t = 1995, \ldots, 2006$. As in the previous equation, $PALMA_{it}$ is the dependent variable, EGI_{it} represents one independent variable for country i in the period t, $\beta_1, \beta_2, \ldots \beta_7$ -are the coefficients of explanatory variables. The error term is expressed by u_{it}. In this framework, pooled OLS method simply aggregates observations for each country across time, failing to make distinctions between entities or overtime periods. According to Gil-García and Puron-Cid (2014), the major drawback of this model is failing to analyze the impact of variables across countries and over time, consequently distorting the realistic scenario of the variable association. Given this scenario, there is a significant likelihood of heteroskedasticity or auto-correlation in the estimates. Even though our estimates will suffer from omitted variables bias by performing a pooled OLS regression, the fixed effects strategy can help us remove the bias caused by the missing variables even though they are not included in the model.

By comparing the two techniques, we will illustrate the superiority of the fixed effects model in a panel data approach.

5.2 Control variables

In a non-experimental setting, randomized studies are attempted to be simulated by controlling for explanatory factors associated with the main regressor and regressand. Beyond the response (Palma) and explanatory variable (EGI), a set of control variables are included in the OLS regression analysis in order to account for OVB. We conform to previous economic studies while selecting our collection of control variables. Therefore, GDP per capita is added to account for the possibility of income effect stated by Kuznets (1955). Two other dimensions of globalization such as FDI and the terms of trade are controlled since the main purpose is to capture the real impact of EGI on the Palma. The rest of the factors included: labor force participation rate, informal sector and urban population might be correlated with both Palma and EGI, thus it is essential to account for them. The correlation matrix of the coefficients of the panel data model from Table 5.1 (Appendix B) presents the association between all the variables included in the regression analysis.

6 Empirical Results and Discussion

In this section, we provide an overview regarding the methods utilized and explained in the methodology section. The hypotheses formulated in the theoretical framework are tested and discussed following the results presented in Table 5.1. Furthermore, an additional robustness test of the fixed-effects approach is performed by running our model with the logarithmic version of the regressor (EGI) and the regressand (Palma Ratio).

6.1 Hypothesis testing

Table 6.1 exhibits the OLS regression results regarding the impact of the economic globalization index on income inequality captured by the Palma Ratio. In each case, the Palma is regressed on EGI and relevant control variables. Model 1 illustrates the pooled OLS regression results without year and country fixed effects depicting a negative relationship between EGI and Palma Ratio. The results are contradictory with respect to our hypotheses. The coefficient of EGI (β_1) is not statistically significant at the 10% level ($p > 0.1$) and has a value of -0.0237, implying that an increase of the economic globalization index by 1 unit will diminish the Palma Ratio by 0.0237 units on average. This method is unsuitable for our study

since there is a high chance of omitted variable bias (OVB) and a high likelihood the conditional independence assumption[9] (CIA) is violated. Furthermore, the violation of this assumption induces an inconsistent and downward biased estimator. The pooled OLS approach fails to tackle the true effect of EGI on inequality in the ten Latin American states as this method disregards the general effects across time and countries. Model 2 reports the results of the OLS regression with country fixed-effects included. In contrast with the pooled OLS method from column 1, this technique has the advantage of avoiding OVB arising from missing factors that vary across countries but remain constant across time (e.g., cultural norms). The results suggest that a one-point surge in EGI increases the within-country inequality by 0.0232 points on average. The coefficient of EGI is significant at a 5% significance level ($p < 0.05$) and implies a positive relationship between the explanatory and response variable. Therefore, we cannot reject the second hypothesis stating that economic globalization and income inequality within nations have a positive relationship. The control variables included as FDI and labor force participation rate present significant coefficients for FDI at 1% level ($p<0.01$) and for labor at 10% ($p<0.1$). Although other control factors show insignificant results, their aim is to account for OVB. By omitting them, the effect of EGI on the Palma Ratio becomes insignificant. The inclusion of the intercept (β_0) in the fixed effects regression equation accounts for the possibility that the average variation in inequality is different from 0 in the absence of a change in the economic globalization index. The constant term has a value of 8.4127 and is significant at a 5% significance level. Given the results presented, one cannot reject the first hypothesis that increased economic globalization captured by the EGI has augmented the within-income disparity in Latin America. The entity fixed effect regression model explains around 13% of the within-country fluctuations for income discrepancies.

When including the time-fixed effects and country-fixed effects in Model 3 from Table 6.1, the coefficient (β_1) can be interpreted as an increase of the economic globalization index by 1 unit will augment the Palma Ratio by 0.0135 units on average. The effect displays insignificant ($p > 0.1$) results regarding the relationship of the regressand and regressor. Even though the advantage of this technique induces the relationship between EGI and Palma Ratio to be immune to OVB from time-invariant factors, there is still a suspicion of endogeneity problems

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[9] If the error term is correlated with previous, current, or future values of the independent variable, this assumption is violated. See and Stock and Watson (2012) for further explanations.

and OVB. Both hypotheses are rejected when employing time and entity fixed-effects regression model. It explains around 18% of the within-country fluctuations for income inequality. Therefore, the R-squared augments from 0.13 to 0.18 when adding the year fixed-effect, denoting how much the variation of income inequality within Latin American countries is captured by the model.

Table 6.1: Panel regression results − Pooled OLS, Fixed Effects.

Dependent variable: Palma Ratio	Model 1	Model 2	Model 3
EGI	-0.0237	0.0232**	0.0135
	(0.0160)	(0.0091)	(0.0074)
GDP	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0002)
Trade	-0.0075	0.0008	0.0024
	(0.0045)	(0.0025)	(0.0028)
Informal sector	0.0010	-0.0126	-0.0140
	(0.0069)	(0.0274)	(0.0312)
FDI	0.0118	0.0187***	0.0194**
	(0.0075)	(0.0056)	(0.0062)
Labor force rate	0.1343***	-0.0596*	-0.0479
	(0.0274)	(0.0284)	(0.0434)
Urban population	-0.0053	-0.0108	0.0571
	(0.0099)	(0.0448)	(0.0714)
Constant	-2.3579*	8.4127**	2.9908
	(1.2434)	(2.6544)	(4.2151)
Model specification	Pooled OLS	FE with country fixed-effects	FE with country and time fixed-effects
Observations	120	120	120
R²	0.44		
R² within		0.13	0.18
Countries	10	10	10

*Note. Standard errors are in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.*

6.2 Robustness Checks

To examine the robustness of the OLS models, Table 6.2 describes four alternative variants of the fixed-effects regression models from the previous section. Models 3 and 4 are regressed using the logarithm version of both dependent variable – Palma Ratio and independent variable – EGI. However, in Model 1 and 2 only the response variables are transformed into a logarithm. These methods are implemented in order to mitigate the effect of outliers in both variables since one of the FE regression assumptions asserts that large outliers are unlikely. Furthermore, another objective of this adjustment is to account for any income-level-driven distributional impacts.

In the first estimated OLS variant (Model 1) incorporating country fixed-effects, there is a positive and significant association between the logarithmic Palma Ratio and EGI as the value of $\beta = 0.0069$ (p< 0.05). In comparison with Model 2 from Table 6.1, the effect size differs as the impact of EGI on the Palma Ratio has decreased from 0.0232 points to 0.0069. Despite the fact the significance level of the coefficient of EGI has not changed, its interpretation is different. A change in EGI by one unit (Δ EGI = 1) is associated with a 0.69% increase in the response variable, Palma Ratio_ log. The effect of economic globalization incorporating real international trade flows and capital limitations such as tariff rates (see Table 4.1 in Appendix B) on within-income inequality in Latin American countries has a small and positive (< 1%) magnitude. Furthermore, considering the time fixed intercept in the FE model, the size effect is still significant, but smaller, from 0.69% to 0.55%.

Similarly, Model 3 (country FE) and Model 4 (country and time FE) show a significant and positive relationship between EGI_ log and Palma_ log. According to Model 3, a 1% change in the log version of EGI is associated with an increase of 35,92% in income inequality on average. By considering country and time fixed-effects, an equivalent interpretation of the coefficient is deduced from Model 4. When transforming the independent variable EGI into a logarithm we account for outliers and the interpretation of the effect on inequality radically changes. Regarding the hypothesis formulated, one cannot reject the hypothesis that higher economic globalization captured by EGI has augmented the within-income disparity in Latin America. Moreover, on the basis of these results, we can infer that economic globalization and income inequality within nations have a positive relationship. However, it is critical to note that the measurement of inequality in our study is a ratio, thus it is not feasible to convert it

into a logarithm. This specification is used as an alternative analysis to correct for the Palma ratio's skewed distribution and transform the variable as a better fit of a standard normal distribution.

Table 6.2: Panel regression results with log variables − Fixed Effects.

Dependent variable: Palma Ratio_ log	Model 1	Model 2	Model 3	Model 4
EGI_ log			0.3592***	0.2681**
			(0.1017)	(0.1076)
EGI	0.0069**	0.0055**		
	(0.0022)	(0.0022)		
GDP	-0.00004	-0.00003	-0.00003	-0.00003
	(0.00002)	(0.00004)	(0.00003)	(0.00004)
Trade	-0.00017	0.0003	-0.0001	0.0003
	(0.0005)	(0.0006)	(0.0005)	(0.0006)
Informal sector	-0.0037	-0.0037	-0.0038	-0.0038
	(0.0005)	(0.0077)	(0.0063)	(0.0078)
FDI	0.0040**	0.0030*	0.0041**	0.0032*
	(0.0015)	(0.0016)	(0.0016)	(0.0015)
Labor force rate	-0.0161*	-0.0209	-0.0164*	-0.0208
	(0.0079)	(0.0126)	(0.0084)	(0.0136)
Urban population	0.0044	0.0212	0.0040	0.0211
	(0.1180)	(0.0178)	(0.0119)	(0.0191)
Constant	2.0824**	1.2172	1.0679	0.4534
	(0.6663)	(1.0837)	(0.7124)	(1.1609)
Country fixed-effect	Yes	Yes	Yes	Yes
Time fixed-effect	No	Yes	No	Yes
Observations	120	120	120	120
R^2 within	0.15	0.20	0.14	0.20
Countries	10	10	10	10

*Note. Standard errors are in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.*

6.3 Discussion

As previously mentioned, Table 6.1 presents the central results of the study concerning the relationship between globalization and inequality. Various empirical techniques are employed such as pooled OLS, OLS with country fixed-effects, OLS with time and country fixed-effects. The statistically significant p-value ($p<0.05$) indicates that a FE regression with a country-invariant intercept is a superior match for the research in issue. Both hypotheses are satisfied and cannot be rejected when implementing Model 2 from Table 6.1. Latin American states with higher EGI have a higher likelihood of income inequality and a positive relationship between these variables is found. Due to the statistically insignificant coefficients, alternative techniques implemented do not represent accurate methods in the area of interest. This is consistent with the previous literature estimations (e.g., Heimberger (2020); Dreher and Gaston (2008)), however, the empirical realities continue to be unknown. The statistical inferences obtained are most likely to suffer from OVB, thus a valid causal effect cannot be drawn for the setting of interest[10]. The omitted variable bias arises as the error term is correlated with independent variables. The impediments of capturing the causal effect are presented in the limitations of the methodology performed.

The econometric analysis has various constraints that must be addressed. Firstly, the OLS regression findings are influenced by the sample coverage of specific Latin American nations. The selection criteria of the sample disregard certain states from the region like Panama, Nicaragua, Chile, Uruguay, Paraguay and so on due to limited available data. There is a high chance to obtain different coefficients and significance levels if we re-estimate the regression. A larger sample and higher quality of data might reduce the bias and consistency of the effect. In addition, the data generation process of panel data comprises limitations just as incomplete sampling, survey design errors, misinterpretation of the results etc. which manipulate the research outcomes.

Secondly, although highlighting the benefits of employing Palma as an inequality indicator, it does have certain drawbacks. It has the main disadvantage of not measuring the whole distribution since it ignores deciles 5-9 in the center and changes within the lowest 40% or top 10%. The Palma violates the standard theorems for inequality measures specifically: Pigou-Dalton transfer sensitivity is disregarded since a movement from the 89th to the 41st centile

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[10] To capture the real population causal effect of a change in the Palma Ratio, the causal effect estimator (OLS estimator) must be consistent and unbiased; see Stock and Watson (2012).

keeps failing to lead to a lower ratio (Cobham, Schlögl and Sumner, 2016). Another drawback is that the indicator of economic globalization (EGI) may fail to reflect the true impact of globalization due to the broad scope of the concept. Dreher and Gaston (2008) prove that the aspects of globalization (e.g., economic, social and political) are strongly correlated. The expected effect of economic globalization would be the aggregate of all aspects. In consequence, to get accurate insights into the impact of globalization on income inequality, it is crucial that social and political openness, also the components that are generally considered to be prominent globalizing forces, must be included in the analysis. Regarding the control variables employed, we failed to account for all the channels of globalization that could have had an impact on inequality (e.g., skilled biased technological change, offshoring) because of data limitations. A further recommendation also mentioned by Heimberger (2020) is to include variables that reflect technological development and education.

Fixed-effects models possess the inability to investigate time-invariant sources of the response variable. Unexplained heterogeneity is a constraint caused by unmeasured variables that change over time. For example, Hill, Davis, Roos and French (2019) note that fixed-effects models must be carefully applied when the main variables vary slightly. In contrast to other approaches, the standard errors of the calculated coefficients are higher, especially when the regressor exhibits little change over time. A recommendation would be to focus more on concerns such as the quality of data, selection of variables, potential origins of unknown heterogeneity and measurement inaccuracy when applying fixed-effects models.

7 Conclusion

The Latin American countries are characterized by significant imbalances generated by economic globalization, which are also linked to advances in income inequality across the region. Globalization's features, such as trade liberalization and FDI, are potential channels via which the income gap between rich and poor has increased significantly. This paper investigated the nature of income inequality using panel fixed effects techniques precisely meant to address the central issue from earlier research of the globalization-inequality relationship, such as examining the presence of a causal effect congruent with Stolper-Samuelson theorem. According to the findings of this paper for a sample of ten Latin American countries throughout 1995-2006, the impact of economic globalization on income disparity remains inconclusive. A positive and significant relationship was found by applying the OLS

regression with country-fixed effects. Furthermore, the results of the OLS technique are subject to various limitations that lead to distorting the internal and external validity of the study. To answer the core research question, it cannot be asserted that an emerging nation in Latin America has shown a clear impact of economic globalization on income inequality due to the incapacity of drawing a causal effect. The results contradict the Heckscher-Ohlin framework and Stolper-Samuelson theoretical expectations that increased trade (channel of globalization) would precede lower income disparities within emerging economies. Our conclusions are analogous with previous research (Goldberg and Pavcnik, 2007; Milanovic, 2005). It suggests that there is reasoning to consider that distinct dimensions of globalization could have unequal implications at various stages of disparity. Nevertheless, our conclusions are intriguing and potentially controversial, they should serve as a foundation for future theoretically and empirically investigation.

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Appendices

Appendix A

Table 2: The distribution of the equalized income of households: GINI INDEX

Countries	Early 90s (i)	Mid-90s (ii)	Early 00s (iii)	Change (iv)
Argentina	42.6	45.8	50.4	7.7
Bolivia	54.3	55.8	55.9	1.6
Brazil	59.5	58.3	57.2	-2.3
Chile	54.7	54.9	56.1	1.4
Colombia	55.9	54.3	55.8	-0.1
Costa Rica	43.9	44.0	44.6	0.8
El Salvador	50.5	49.4	51.8	1.3
Honduras	55.6	54.1	53.0	-2.6
Jamaica	49.6	51.5	49.0	-0.6
Mexico	53.9	52.5	52.7	-1.2
Nicaragua	54.2		54.1	-0.1
Panama	54.7	54.0	54.4	-0.3
Peru	45.7	46.4	47.7	2.0
Uruguay	40.8	40.9	42.5	1.7
RB de Venezuela	41.7	44.5	45.5	3.8
Average (non-weighted)	50.5	50.7	51.4	0.9
Average (weighted)	51.9	51.2	51.5	-0.4
Dominican Rep.		50.2	48.1	
Ecuador		53.0	54.3	
Guatemala			56.0	
Paraguay		57.8	54.9	
Trinidad & Tobago	47.2			

Source: Ferreira, Ferranti, Perry, and Walton (2004)

Appendix B

Table 4.1   Variable description and data sources.

Variable	Definition	Data source
Year (YEAR)	Year	IDLA
Country ID (ID)	Identifier number of the country	IDLA
Country (COUNTRY)	Name of country	IDLA
Economic Globalization Index (EGI)	EGI is described as long-distance movements of commodities, capital, and services, data and views that accompany market transactions. It is assessed by real international trade flows, also capital limitations including tariff rates.	Dreher(2006) Dreher et al. (2008)
International terms of trade (TRADE)	International commerce, products, and services terms (2000 = 100).	CEPALSTAT
Informal sector (%) (INFORMAL)	The urban population employed in activities that are unstable in terms of pay, duration, and social protection. The indicator is calculated as a percentage of the number of working-population in urban areas. Interpolation technique is used to fill in gaps of missing data.	SEDLAC National Data CEPALSTAT ILO
FDI (FDI)	Net FDI stocks assessed as a proportion of GDP are referred to net foreign direct investment. In our research we label it as FDI.	UNCTAD
Labor Force Participation Rate (LAB)	The coefficient indicates the proportion of the entire population aged 15 and older.	CEPALSTAT
Urban Population (URBAN)	The term "urban population" references individuals who live in cities as stated in the national statistics bureaus. This is derived using World Bank forecasts and United Nations World Urbanization Prospects urban ratios.	WDI

GDP per capita (GDP)	It represents the gross domestic product adjusted to foreign currencies using purchasing power parity rates. It is computed without concern for depreciation of manufactured assets or depletion and deterioration of natural resources. The figures are in constant international currency from 2005.				WDI
Palma ratio (PALMA)	Top 10% / Bottom 40%				WIID

Source: Martorano and Cornia, (2011)

Table 4.2 Descriptive statistics for the developing countries in Latin America in a panel data framework.

Variable		Obs.	Mean	Std. Dev.	Min.	Max.
EGI	Overall	N=120	59.31	5.98	34.21	71.20
	Between	n=10		4.22	49.98	65.57
	Within	T=12		4.43	43.54	71.62
Palma Ratio	Overall	N=120	3.79	1.04	2.19	7.40
	Between	n=10		0.96	2.66	5.51
	Within	T=12		0.50	2.58	5.68
GDP per capita	Overall	N=120	7513.35	2448.04	3190.14	13070.10
	Between	n=10		2492.82	3445.68	11651.30
	Within	T=12		594.28	5747.42	9036.36
Terms of Trade	Overall	N=120	100.89	16.92	53.52	179.12
	Between	n=10		7.80	92.18	118.26
	Within	T=12		15.20	59.67	185.26

|						
Informal Sector	Overall	N=120	53.14	12.30	34.00	75.33
	Between	n=10		12.41	40.74	71.18
	Within	T=12		3.42	42.74	63.00
FDI	Overall	N=120	20.20	13.85	0	82.67
	Between	n=10		11.61	8.52	49.12
	Within	T=12		8.34	-5.87	53.76
Labor Force Rate	Overall	N=120	67.43	4.21	57.99	75.28
	Between	n=10		3.78	62.99	72.02
	Within	T=12		2.19	61.61	71.10
Urban population	Overall	N=120	71.60	11.39	55.80	92.30
	Between	n=10		11.79	58.12	89.73
	Within	T=12		1.89	68.18	77.18

Note. N represents the total number of observations; n- number of countries, T - time periods.

Table 5.1 Correlation matrix of coefficients of panel data model

Variable	1	2	3	4	5	6	7
1 EGI	1.00						
2 GDP per capita	0.25	1.00					
3 Terms of Trade	-0.19	-0.40	1.00				
4 Informal Sector	0.23	0.24	0.33	1.00			
5 FDI	-0.14	0.47	0.66	0.69	1.00		
6 Labor Force Rate	-0.27	0.11	0.15	-0.33	0.15	1.00	
7 Urban population	0.02	-0.09	-0.37	-0.64	-0.82	-0.11	1.00

Appendix C

Figure 1:The inequality trends in Latin America: Gini Index and Palma Ratio.
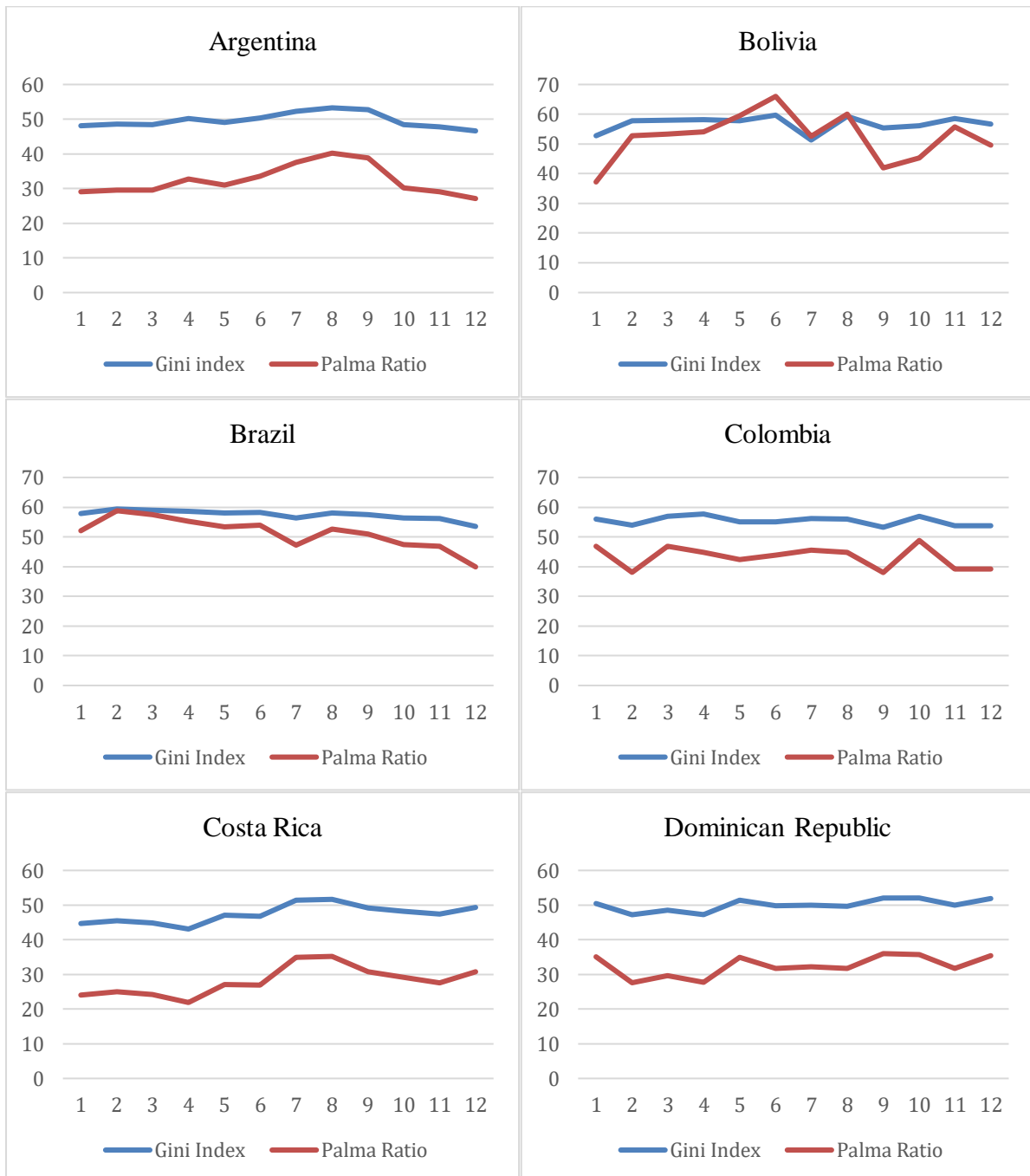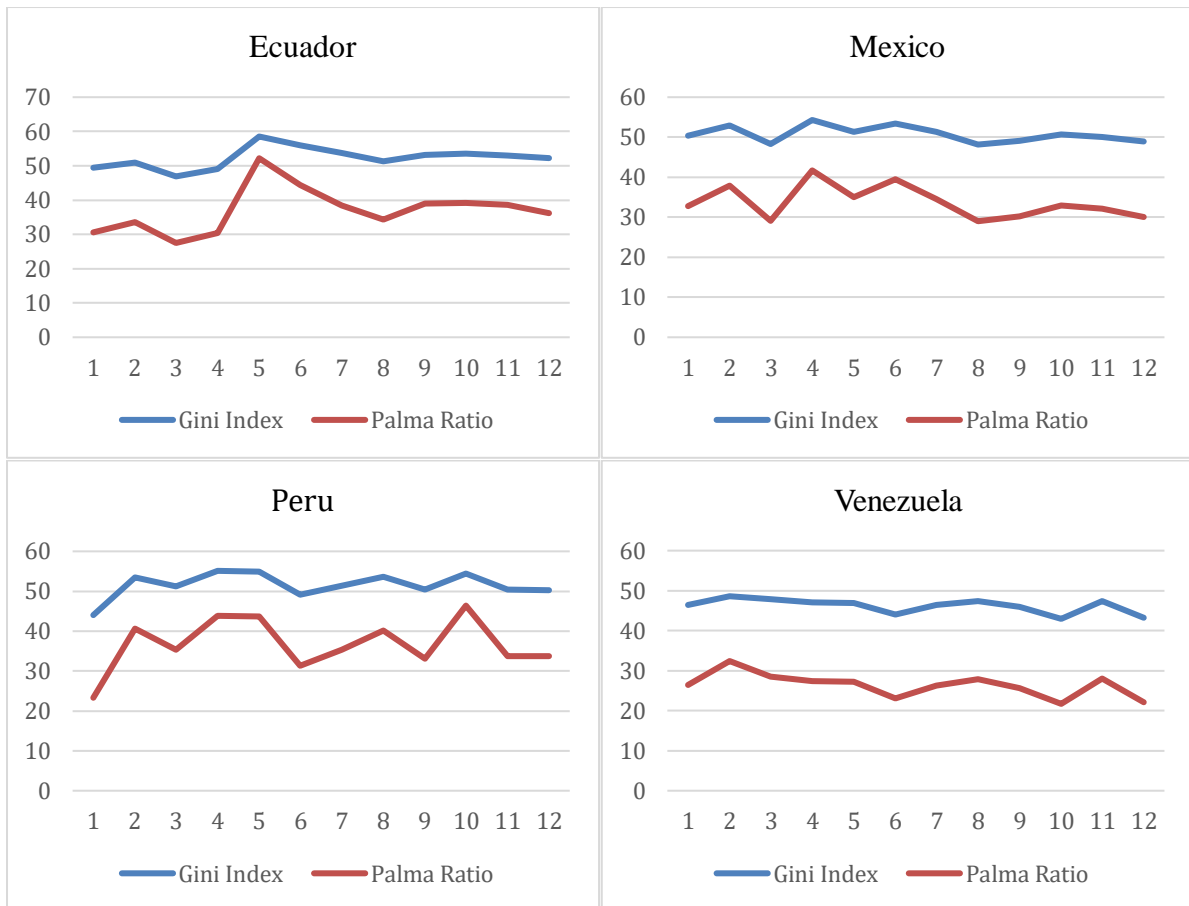
Note. Both measures are scaled from 1 to 100.