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Inequality in Latin America: the role of the nature of trade and partners

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Abstract

This paper investigates the relationship between trade openness and income inequality in 11 Latin American countries over the period 1989-2015. We use a panel dynamic approach to take into account the high persistence of income inequality. The analysis classifies trade flows, exports and imports according to trading partner's economic development and income level. Then, we split trade flows according to different stages of production. The results show that overall trade flows lessen income inequality in Latin America. However, trade has divergent effects depending on the trade partners: trade with similar-income countries exacerbates inequality, while trade with developing countries and higher-income countries reduces income dispersion. The results also emphasise the role of the export channel (in particular in primary commodities) in explaining income inequality in Latin American countries and imports of consumption goods seem to matter more than imports of intermediate and capital goods.

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Keywords Trade openness; trade direction; income inequality; Latin America

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Introduction

The question of how trade openness affects income inequality is still a matter of controversy. Theoretical predictions from the standard trade theory (Stolper and Samuelson, 1941) emphasise that trade openness would be beneficial to unskilled-labour in developing countries. However, they are not fully backed by empirical evidence (Goldberg and Pavcnik, 2007; Pavcnik, 2017). Accordingly, the literature insights into other mechanisms to resolve the contradictions between the theoretical predictions and the empirical findings, such as skill biased technological change (SBTC) induced by either technology transfer from North to South (Acemoglu, 2003) or by the production shift of unskilled-labour activities to the South (Feenstra and Hanson, 1996), or Southern technological catch-up by the growth in the export of skill-intensive goods (Zhu and Trefler, 2005).

There exists an ongoing debate about whether income inequality is affected by trade flows in general or rather by specific aspects of openness (IMF, 2017). For instance, Jaumotte et al. (2013) find a more robust impact of technological progress than globalization on income inequality in a sample of 51 developed and developing countries. In Latin America, the region with the highest level of inequalities around the world, this debate seems even more relevant. The role played by trade partly depends on the extent to which trade reforms have affected the economy's productivity-enhancing structural change in the region. Wood (1997) argues that trade openness has shifted the production toward more skill-intensive goods in Latin America due to the integration of low-income exporters into the global economy, i.e. China and India. This argument is in line with the 'defensive innovation' term introduced by (Wood, 1995), which states that the increased foreign competition provides incentives for firms to invest in new technologies. However, Mcmillan et al. (2014) argue that an "economy's overall productivity depends not only on what is happening within industries, but also on the reallocation of resources across sectors". They show that opening up to global economy impedes the movement toward more productive industries and strengthens traditional patterns of production in natural resource-based commodities countries. Thus, in this paper, we attempt to identify the possible channels through which trade openness would have affected income inequality in Latin America.

The empirical literature has reached inconclusive findings on the relationship between trade and inequality in Latin America. Some authors confirm a positive association (Attanasio et al., 2004

for Colombia; Hanson and Harrison, 1999 for Mexico), while others report a negative association (Ferreira et al., 2007 for Brazil), or others point out no effect of trade on inequality (Pavcnik et al., 2004 for Brazil). A common shortcoming in these studies is the focus on trade reforms, embodied in tariff changes, to explain inequality. These studies, hence, adopted *de jure* indicators of openness and ignored *de facto* flows. Moreover, studies on Latin America have neglected the role played by the aforementioned mechanisms (Acemoglu, 2003; Feenstra and Hanson, 1996; Zhu and Trefler, 2005) in the relationship between trade openness and income inequality (see Székely and Mendoza, 2015; 2016 for Latin America). This paper, therefore, aims to fill these gaps. More specifically, we go deep into the relationship between trade openness and income inequality by adopting a more disaggregated analysis of trade, exports and imports. Building on the idea that trade in manufactured products and, in particular, imports of intermediate and capital products from developed countries may induce technology transfers, we disaggregate trade flows by type of trading partners and type of products to isolate their potential impacts on income inequality. The analysis covers a sample of 11 Latin American countries over the 1989-2015 period. We also account for the fact that inequality is a heavily persistent phenomenon, which is not accurately tackled in the literature except by Meschi and Vivarelli (2009). For this purpose, we use a dynamic panel approach that ensures robust and efficient estimators of the effect of trade openness on income inequality. Since the inclusion of the lagged dependent variable as an independent variable violates strict exogeneity assumption, we use least-squares dummy variable corrected (LSDVC) estimator to overcome these drawbacks.

The results suggest that overall trade has contributed to reduce the dispersion of income in Latin American countries. However, the nature of trading partners matters more for inequalities. When we disaggregate trade according to partners' economic development stage and relative income level, we find a weakly increasing-inequality effect of trade with developed countries and a decreasing-inequality effect of trade with developing countries. In contrast, if trading partner is a higher-income country, inequality tends to lessen, while if trading partner is similar-income countries, inequality tends to worsen. Once trade flows are disaggregated by stage of production, it appears that trade in agriculture goods, oil and mining goods and consumption goods play an important role in explaining the relationship between trade openness and income inequality, while trade in equipment and intermediate goods do not play any role for the countries of our

sample. We also observe that income inequality is more affected through the export channel than the import channel, mainly through the exports of primary commodities, which lessen inequality.

The study proceeds as follows: section 2 describes the literature, which is followed by the data and empirical strategy in section 3. Section 4 presents the results, after which the discussion of the results and concluding remarks are given in section 5.

Literature Review

According to standard trade theory (Stolper and Samuelson, 1941), trade openness would reduce the wage gap among skilled and unskilled workers in developing countries, since trade opening would lead to a rise in the relative price of unskilled-labour intensive goods in a low-skilled developing country and to an increase in the demand of unskilled-labours. This effect could be delayed according to Atolia (2007), who suggests that inequality could decline only in the long-run due to asymmetries in the speed of contraction in the import sector relative to the expansion in the export sector and the capital-skill complementary in production. This argument is empirically validated by cross-studies on Latin America, which indicate an initial disequalizing effect of trade openness on income inequality, but this effect considerably appears to fade away over time (Behrman et al., 2007; Székely and Mendoza, 2015). On the other hand, Davis (1996) puts forwards the hypothesis that the effect of trade openness on inequality depends on the reference sets, factor abundance of a country is compared to. He shows that a developing country, which is unskilled-labour abundant by global standards, might experience an increase in wage inequality if it is abundant in skilled-labour within its own reference set. Hence, the distributional consequences of trade may not reconcile with the Stolper-Samuelson's prediction for developing countries. Wood (1997) echoes this argument and attributes the rising income inequality in Latin America in the 80s and 90s to the emergence of large low-income exporters, such as China and India, which shifted their comparative advantage toward intermediate skill-intensive goods.

The literature on the topic has underlined several mechanisms through which trade openness may affect inequality in developing countries in an intent to reconcile theoretical predictions and empirical findings. The first mechanism introduced by Feenstra and Hanson (1996) links the rising wage inequality in the South to the reallocation of the production of intermediate goods

from the North to the South. By increasing the production of these goods, which are unskilled labour-intensive relative to Northern standards and skill-labour intensive relative to Southern standards, the relative wages of skilled-labour increases and consequently wage inequalities worsens in both regions. The role played by imported intermediate inputs is backed up by empirical evidence, which shows that intermediate goods can indeed foster quality upgrading and shift the production towards more skill-intensive goods, which would increase the demand of skilled workers (Crinò, 2012; Fernandes and Paunov, 2013; Kasahara et al., 2016). Based on the perspective of Feenstra and Hanson (1996), Zhu and Trefler (2005) argue that trade shifts can be also induced through Southern technological catch-up, which moves the production of unskilled-intensive goods from the North to the South. These products would correspond to the most skill-intensive according to Southern standards and this, in turn, would foster wage inequality in both regions.

Another mechanism suggests that trade openness can indirectly worsen wage inequality through technology transfer from the North to the South, which, in turn, fosters SBTC in developing countries because these technologies are more skill-biased than pre-trade local technologies. (Acemoglu, 2003). Robbins (2003) introduces the ‘skill-enhancing trade hypothesis’ to explain the nexus between trade openness and wage inequality in developing countries, which predicts that trade openness accelerates the imports of capital goods and of new technologies in the South. This would, in turn, increase the demand for more skilled labours in the South and widen the unskilled-skilled wage gap. More recently, Wang and Yin (2016) find that technology transfer from the developed countries propels wage inequality in the host country. The empirical studies by Conte and Vivarelli (2011), and Sánchez-Páramo and Schady (2003) offer evidence supporting this argument for low- and middle-income countries, and Latin America, respectively, whereby the imported technologies from developed countries increase the demand for skilled-labour in these countries. In contrast, Gourdon (2011) finds that South-South trade leads to technical change that is more biased toward more skill-intensive sectors and this, in turn, would fuel wage inequality in lower-middle and low-income countries more than North-South trade does. In contrast, Meschi and Vivarelli (2009) conclude that only trade with developed countries leads to technological change in developing countries, hence boosting income inequality.

Other studies have underlined that technological change in developing countries is not only driven by imports but also by exports. This stems from the fact that access to export markets generates an increase in revenues for exporting-firms, making it profitable for them to invest in technology (Bustos, 2011a) and thereby increasing the demand for skilled-labour (Bustos, 2011b). Matsuyama (2007) provides another explanation of why the act of exporting *per se* favours skilled labours. He argues that exporting requires activities that are biased in favour of skilled-labours, such as language knowledge and marketing. However, Brambilla et al. (2012) lend partial support for this argument in Argentina. Alternatively, other authors have suggested that exporting *per se* does not necessarily stimulate the demand of skilled labours and the use of new technologies. Rather, the destination of exports would matter more. Verhoogen (2008) emphasises a mechanism where exporting to high-income countries allows for quality upgrading in Mexico. According to this author, the production of goods to serve high-income markets requires more skilled labours than producing for home or low- and middle-income countries because individuals in high-income countries have a higher income level and value high-quality products. Brambilla and Porto (2016) and Brambilla et al. (2012) lend support for the ‘quality upgrading’ mechanism in a panel of developing countries and Argentina, respectively. A different argument is provided by Brambilla et al. (2018), which points out that exporters do not equally expand their demand for all type of skilled labours because exporting requires tasks that demand a specific type of skills. They empirically find that exporting-firms in Chile have shifted the labour demand in favour of engineers over skilled administrative workers and managers.

In view of the foregoing, the relationship between trade openness and income inequality in Latin America may indeed be influenced in different ways by the nature of its exports and of its import structures. As intermediate countries (in terms of development level), the relative abundance in production factors may vary depending on the trading partners considered and trade flows could also have a different impact depending on the destination and origin of these flows.

On the exporting-side, Rodríguez-Pose and Gill (2006) suggest that trade composition may influence regional inequality. According to these authors, when manufacturing exports gain in importance over primary exports, regional inequality tends to ascend. However, in a region where the relative size of primary sector exports is still considerable in the exports basket, the distributional consequences of exports on income inequality may follow a different trajectory,

which depends on the relative skill composition used in the production of primary goods. Székely and Mendoza (2016) argue that, in this vein, the world demand for primary goods may either improve or worsen the distribution of income, depending on whether their production is relatively intensive in skill and capital (e.g. oil extraction and mining) or relatively intensive in unskilled-labour (e.g. foodstuffs). On the importing-side, the literature widely confirms that imports from North deteriorate both wage and income inequality in the South due to technological differences between the two regions (Acemoglu, 2003; Meschi and Vivarelli, 2009). Imports from middle-income countries may also cause inequality to grow. As noted by Gourdon (2011), trade within developing countries leads to technological skill-biased toward more skill-intensive sectors and hence widening inequality. Imports from low-income countries may include standard technology and, in turn, would not induce any effect on inequality (Gourdon, 2011; Meschi and Vivarelli, 2009).

Based on the previous literature, changes in the distribution of wages and income in developing countries can be driven by standard explanations as well as by new trade theories. Traditional explanations suggest that trade openness would decrease inequality in country unskilled-labour abundant. However, Davis (1996) nuances this conclusion by underlining that factors abundance of one country varies according to the reference set. Thus, inequality could grow in a Southern country unskilled-labour abundant by global standards but skilled-labour abundant relative to other Southern countries. On the other hand, more recent theories suggest that trade openness allows for technology upgrading in developing countries either through the import channel (capital goods and outsourcing of “intermediate goods”) or through the export channel (quality-upgrading mechanism), which is conditional upon partners’ income levels. Thus, the effect of trade on income inequality may vary depending on the nature of the product traded and the nature of the trading partners.

Methodology

To assess the nexus between trade openness and income inequality, we consider a dynamic panel approach, which enables us to capture the high persistence of income inequality, to control for the unobserved heterogeneities within countries and to take into account the quasi-fixed country structural factors that affect inequality, such as institutional context and factor endowments.

Generalized least squares, Within Groups (WG) and Ordinary Least Squares (OLS) estimators are biased and inconsistent when lagged dependent variable is included as explanatory variable. A suitable dynamic panel data technique to overcome this problem is the difference Generalized Method of Moments (GMM) estimation (Arellano and Bond, 1991). Moreover, bias-corrected least-squares dummy variable estimators are used to correct small-sample bias (Bruno, 2005).

As Bond (2000) pointed out, a good estimator of the coefficient of the lagged dependent variable should lie between the OLS and WG estimators. We have checked that this holds true in all our models (available upon request). In addition, given the highly persistent behaviour of Gini coefficients, system GMM estimator (Blundell and Bond, 1998) have been used as a robustness test. The results are very similar except for model 3 in Table 4 (available upon request).

To examine the effect of trade openness on income inequality in Latin America, our empirical baseline model takes the following form:

$$INEQ_{it} = \alpha_{it} + \beta INEQ_{i,t-1} + CTRADE_{it} + \sum \delta X_{it} + \varepsilon_{it} \quad (1)$$

Where $INEQ_{it}$ denotes the distribution of income measured by Gini coefficient in country i where i is one of the 11 LA and year t , while $INEQ_{i,t-1}$ is the lagged Gini coefficient in country i and year t ; $TRADE_{it}$ represents trade (% of GDP) of country i in year t ; X_{it} is a vector of control variables in country i and year t , including GDP per capita and its square, GDP growth, and FDI net inflow (% of GDP).

Our baseline model studies the effect of overall trade on inequality, once we control for the persistence of income inequalities.

To obtain a deeper insight into the relationship between trade openness and income inequality in Latin America, we adopt a more disaggregated analysis of trade using several classifications of trade partners and nature of products. To this end, we distinguish among partners inside and outside Latin America to check the role of regional integration in this process. To account for different capital intensities, we also disaggregate flows according to partners' economic development stages (developed, developing and emerging following the classification of the CHELEM database) Then, we turn to a more relative classification to take into account more precisely the relative abundance in factors (as suggested by Davis (1996)). Partners are classified

as higher, similar and lower-income countries according to the relative levels of income of the trading partners compared with the reporting income levels of Latin American countries¹.

In a second step, we disaggregate trade flows by stage of production, namely agriculture goods, oil and mining goods, consumption goods, intermediate goods and equipment goods in order to test if the SBTC hypothesis holds for Latin America and to which extent its comparative advantage in the production of primary commodities contributes to a reduction in income inequality. SBTC indeed arises from the increase in trade in final goods and technology transfer (in the form of capital and intermediate goods) (see Acemoglu, 2003; Feenstra and Hanson, 1996; Murakami, 2014). Hence, we conjecture a negative impact of trade in consumption, intermediate, and equipment goods on inequality, conditional upon the technological differentials between trading partners. Regarding the region's comparative advantage in primary commodities, we predict two conflicting effects on inequality. Trade in agriculture goods reduces inequality as they are unskilled-labour intensive, while trade in oil and mining goods may worsen inequality as these goods are complementary to capital and skills (Székely and Mendoza, 2016).

Then we disaggregate all trade flows into export and import to check if they have an asymmetric influence on inequalities as suggested by the literature review. In particular, the hypothesis of SBTC is mainly induced by the import channel. We predict overall exports to have an equalizing effect on inequality due to the region's concentration in the export of unskilled-labour intensive activities, or an increasing effect if technology catch-up hypothesis holds for Latin America through the exports of more skill-intensive goods (see Zhu and Trefler, 2005). Hence, we predict a deteriorating-inequality effect of the exports of intermediate and equipment goods, while the effect of the exports of consumption goods on inequality is not clear, depending on the skill intensity used in their production. We also conjecture that the exports of oil and mining goods worsen inequality due to complementary to capital and skills, while the exports of agriculture

¹ Our income level classifications are based on the difference between the GDP per capita (GDP_{pc}) of country i and the GDP per capita (GDP_{pc}) of country j in year t , where i is a Latin American country and j is a trading partner. Considering the percentiles 33 (p33) and 66 (p66) of the difference $GDP_{pcit} - GDP_{pcjt}$, we define j as a higher-income partner if $GDP_{pcit} - GDP_{pcjt} < p33$, we define j as a lower-income partner if $GDP_{pcit} - GDP_{pcjt} > p66$ and we consider j as a similar-income partner if $p33 \leq GDP_{pcit} - GDP_{pcjt} \leq p66$.

goods reduce it because they are unskilled-intensive. On the importing-side, we expect the effect of overall imports on inequality to depend on the technological level of trading partners, as discussed in the literature review section. We also predict that the imports of consumption (see French-Davis, 2010), intermediate and equipment goods raise inequality, depending on the technological level of trading partners. The imports of agriculture goods may boost inequality, as it would decline the demand for domestic unskilled labours, whereas the imports of oil and mining goods induce the opposite effect.

Data

Our sample accounts for 11 Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela) and covers the 1989-2015 period.

Data on income inequality are imported from the Standardized World Income Inequality Database (SWIID). The control variables, including FDI inflow, GDP per capita, and GDP growth, are mainly retrieved from the World Development Indicators, the World Bank. Trade/export/import variables and GDP are taken from Comptes Harmonisés sur les Échanges et l'Économie Mondiale (CHELEM) of the Centre d'Études Prospectives et d'Informations Internationales (CEPII).

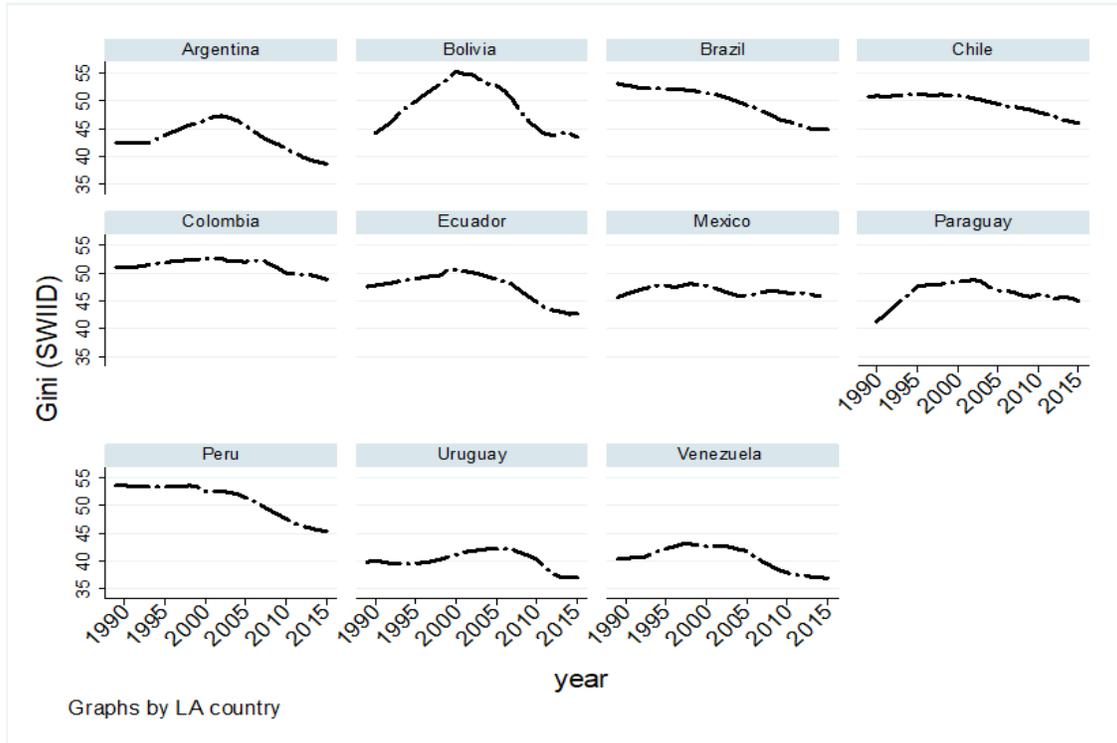
Table 1: summary statistics

Variables	Mean	Std. Dev.	Min	Max
Control variables				
GDP growth	3.446	3.995	-12.31	18.28
GDP per capita	1.953	3.993	-14.19	16.22
FDI inflow (% of GDP)	2.860	2.426	-2.498	12.19
Trade (% of GDP) with:				
All partners	40.68	17.25	9.266	92.76
Higher-income countries	28.14	15.70	5.842	73.36
Similar-income countries	7.912	5.864	0.200	28.01
Lower-income countries	2.252	3.842	0	22.46
Developed countries	19.31	9.606	5.573	52.04
Developing countries	3.182	2.108	0.263	11.03
Emerging countries	15.81	13.74	0.813	67.33
Within Latin America	14.01	12.76	0.705	57.96
Outside Latin America	24.29	10.86	6.857	61.73

Source: CHELEM of the CEPII for trade variables and World Bank for control variables.

Income inequality has experienced significant changes in Latin America during the last three decades as shown in figure 1, which displays its evolution measured by Gini coefficient from 1990 to 2015. As can be observed, although there are considerable differences across countries, all Latin American countries have witnessed apparent declines in their inequality levels, starting from 2000 onwards. The countries with the highest income inequalities at the end of the period are Colombia (48.91), Chile (45.91), Mexico (45.87) and Peru (45.44). However, although the considerable reductions in income inequality, the average of Gini index in Latin America (46.8) is still higher than the average of Gini index in high-income countries (45.3) and low- and middle-income countries (41.5) during the late 2000s (UNDP, 2013).

Figure 1: The evolution of Gini coefficient

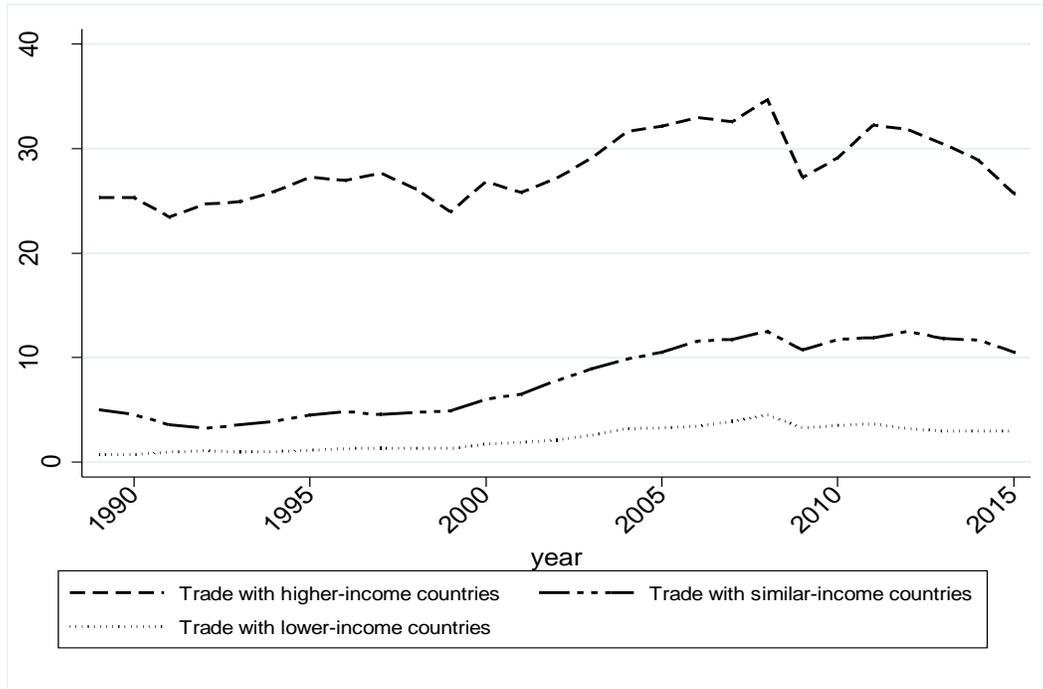


Source: the Standardized World Income Inequality Database (SWIID).

As can be gathered from figure 2, Latin America trades mainly with countries with higher-income, which is confirmed by the prevalence of trade with developed countries and emerging countries, respectively, and, to a lesser extent with similar-income countries. More specifically, as shown in figure 3, trade with developed countries accounts for the largest share of Latin America’s trade in equipment goods, consumption goods, intermediate goods, oil and mining goods and agriculture goods, followed by emerging countries and developing countries.

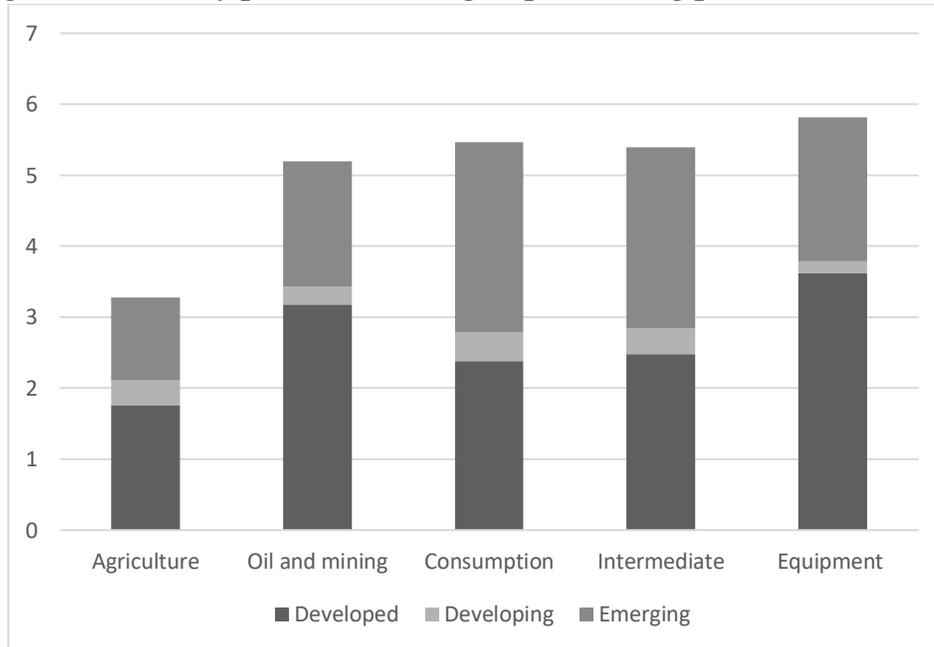
According to figure 4, the exports of oil and mining goods and agriculture goods account for the largest share of the exports of Latin American countries and are mainly directed to developed countries and to a lesser extent to emerging countries. On the other hand, their import basket includes equipment goods (mainly from developed countries and emerging countries) and consumption and intermediate goods (mainly from emerging countries and developed countries).

Figure 2: Trade with higher, similar or lower income trade partners (% of GDP)



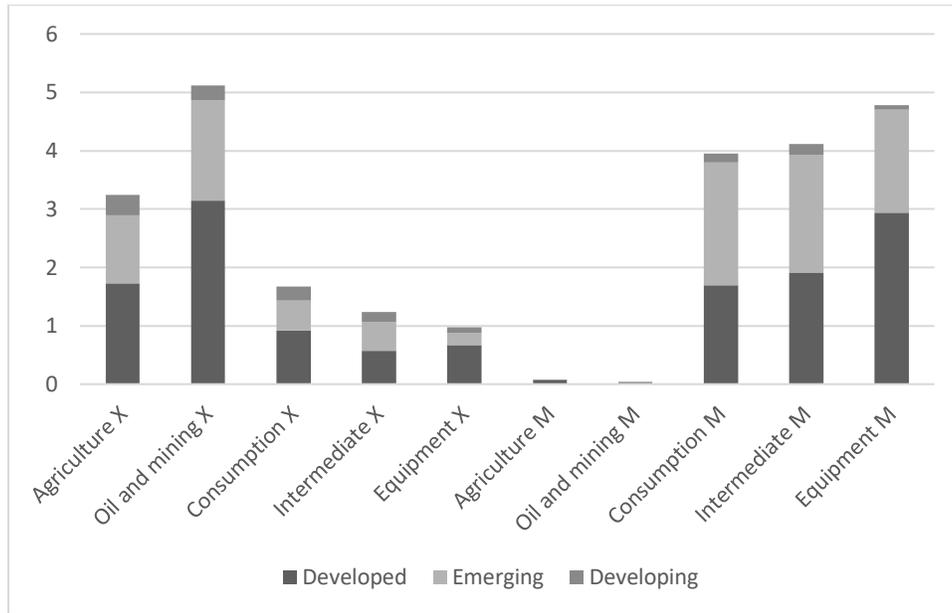
Source: CHELEM of the CEPII

Figure 3: Trade by products with a group of trading partners (% of GDP)



Source: CHELEM of the CEPII.

Figure 4: Exports and imports by product and partner (% of GDP)



Source: CHELEM of the CEPII.

Results Analysis

The results of our baseline model (the effect of overall trade and trade by partners) are presented in Table 1. Results for control variables are standard and similar in all the estimations. The lagged Gini index is highly significant, which mirrors the fact that inequality is a highly persistent phenomenon. Income inequality decreases with GDP per capita decreases (statistically significant in models 1 and 3) while the effect is lower for higher income (the squared value of GDP per capita displayed a negative coefficient). According to the Kuznets curve hypothesis (1955), this would situate these countries in a second phase of development where the increase in income per capita translates into a decrease in the income dispersion. As expected, GDP growth contributes to a reduction in income inequality (statistically significant in models 3 and 4). FDI is statistically significant in all models and points out a positive association of openness to capital flows with income inequality, corroborating the empirical studies on Latin America (Herzer et al., 2014; Suanes, 2016). Since these control variables have almost the same effects in all estimations, we only comment on the impact of trade variables in the following.

When the origin and destination of trade flows is not taken into account, we find that trade significantly reduces income inequality in the region. This would, at first sight, corroborate what

the standard trade theory properly stresses for developing countries: trade openness shifts the production toward their comparative advantage, which would benefit unskilled labours relative to skilled labours. However, when we split overall trade into trade within and outside Latin America, we find that all the benefits in terms of reduction of inequality come from regional trade. In the opposite, trade with countries that do not belong to Latin America would worsen income inequality. In fact, Latin American countries trade more with partners located outside the region than within due to the relative similarities in the production structure and hence relative similarities in their comparative advantages (IMF, 2017). Due to the heterogeneity between partners located outside LA in skill abundance, the explanation of this effect on income inequality is not clear.

To fix this issue, we turn to a disaggregation of trade partners according to their income per capita level, used as a proxy of their capital intensity and relative abundance in human capital. The results for trade variables according to development stage reveal that trade with developed countries raises income inequality, while trade with developing countries would lessen it². This evidence would contradict the Stolper-Samuelson prediction but would fit with the SBTC hypothesis introduced by Acemoglu (2003) and empirically confirmed by Meschi and Vivarelli (2009) that the distributional effects of trade openness on income inequality depend on the development stage of trading partners. In contrast, when we take into account the relative position of each Latin American country compared with each of their partners, we find that trade with higher-income countries attenuates inequality, whereas trade with similar-income countries accentuates income differences. This evidence corroborates the predictions of Davis (1996) concerning trade and inequality for developing countries: middle-income countries can see a rise in inequality, if they are unskilled-labour abundant by global standards and skilled-intensive abundant by Southern standards. That would be the case of the richest LA of the sample.

In Table 2, trade variables are divided into exports and imports regardless partners and by destination/origin. Our results tend to show that the mechanism through which trade decreases inequality transits through exports more than through the import channel and indicate that the

² Note that none of Latin American countries is considered as developed countries. Most of them are classified as Emerging countries (Argentina, Chile, Colombia, Ecuador, Mexico) while Bolivia, Brazil, Paraguay, Peru, Uruguay and Venezuela are included in developing countries.

destinations of exports matter for inequalities. This is an important result because the literature has focused more on the latter to the extent that foreign competition could boost productivity through a more efficient assignment of resources among sectors, but also because access to a wide variety of capital and intermediate products boost technology transfers. We find that exports to other LA countries, developing countries or to partners with higher income per capita would contribute to a reduction of income inequality. In contrast, the exports to other destination have no significant effect. More interestingly, none of these flows exacerbates inequalities neither. Imports have usually not a significant effect except when we consider LA partners versus third partners. In this case, imports from LA countries are found to tighten inequality, while imports from non-LA would contribute to a more polarized distribution of income.

A possible explanation is that Latin America's regional trade is shaped by trade agreements between countries rather than comparative advantages (Acosta and Montes-Rojas, 2008). Apart from Mercosur between Argentina, Brazil and Uruguay, there are other trade agreements, such as Andean, which includes Bolivia, Colombia, Ecuador and Peru. While the positive association between imports from non-LA and inequality stems from the fact that the region's imports basket from outside is mainly concentrated in relatively skill-intensive goods (ECLAC, 2015). This, in turn, favours skilled labours over unskilled labours and thus rises inequality (Ing, 2009).

Tables 3 contains the results for trade by type of products. Firstly, trade in oil and mining goods is the only type of trade that really impacts income inequality in LA countries and this is driven by exports of these products, and in particular by exports to other Latin American countries³. In the same line, importing these products from countries of the region propel income inequality. In this case, and since these products are mainly traded on an inter-industry basis, the effect may not transit through a decrease in the skill premium but mainly represents the important increase in revenue obtained from exports of these primary products even if the pure price effect is controlled for by time fixed effects. This can be attributed to the acceleration in the importance of primary goods in global markets, which led to an increase in their relative prices, employment expansion and as a result reducing income inequality (IMF, 2018). There is also another possible channel transiting through FDI. Indeed, oil and mining sector in Latin America has attracted foreign capital following trade reforms (Suanes, 2016). According to Jensen and Rosas (2007),

³ All the 11 countries considered export oil or mining products except Paraguay and Uruguay.

foreign capital may have two conflicting influence on income inequality in the host country. First, the competition between foreign capital and local capital increases the wages of local labours and hence reducing inequality. Second, foreign capital may decrease inequality, if foreign firms hire unskilled labours and pay wage premiums for them. Unfortunately, it is beyond the scope of this study to test this indirect effect.

As regards consumption goods, trade of these products within Latin America would be inequality-reducing while and trade with third countries would have the opposite effect. In fact, the region implemented significant tariff cuts on consumption goods following trade reforms. The net effect of trade in these goods on the skill premium therefore depends on their skill level or industry affiliation (Porto, 2006 and Marchand, 2017). A conjecture for that finding is that tariff changes induced by Mercosur on consumption goods have contributed to an increase in the relative price of unskilled-intensive goods (mainly the price of “food and beverage” consumption goods). This, in turn, has led to increase the wages of unskilled labours over skilled labours (Porto, 2006). On the other hand, a possible explanation for why trade in consumption goods with non-Latin American countries increases income inequality is that the decreases in the region’s protection level had a significant impact on the composition of its imports from non-Latin American countries with a shift in the imports of non-traditional products. For example, French-Davis (2010) observes that trade openness has led to a rapid rise in the imports of “non-food” consumption goods in Chile and Reinert (2007) reports an increase in the import of high-tech durable consumer goods in Peru. The results also show that trade in these flows with emerging countries decreases income inequality.

Another important feature of the intra-regional trade is that exports of agricultural products to the region and imports of consumption goods from the region decrease inequalities. We conjecture that the first result is explained by the fact that the production of these goods intensively depends on unskilled-labour (Székely and Mendoza, 2016). In the second case, imports of consumption products from other LA contribute to reduce disparities in income, which may be explained by the fact that cheaper products alleviate the budget of poor households. In this vein, Marchand (2017) suggests that the distributional effects of the imports of consumption goods depend on the extent to which these goods are important in the budget of poor households and on their prices in global markets. The results also show that the export of consumption goods to lower-income

countries (table 4, column 4) aggravates income inequality, while the exports to other partners have no significant effect. Indeed, the distributional effect here on income inequality depends on the type of labour intensively used in the production (low, medium or high-skilled labour). Hence, an increase in the demand for consumption goods by lower-income countries would lead to increase the returns to this factor over others. We hypothesize that exports to these lower-income countries exert a high pressure on unskilled-labour wages, if they compete with local demand, or an upward pressure on the wages of skilled-labour. If in the opposite, LA export goods relatively skill-intensive in line with their intermediate position in terms of endowments.

Notice that trade with developed countries leads to an increase in Gini (almost significant at the 5% level), while trade with a relatively higher-income partner decrease it. Tables 3 and 4 shed some new lights on this puzzling result. Neither exports to high-income countries nor imports from these partners for any products have a significant impact on inequalities. In turn, the second effect is exclusively explained by trade in oil and mining products. Then, trade of manufactured goods with developed countries or countries with higher income would have no effect on inequalities. In particular, imports of equipment goods or intermediate goods that should bring some important technology transfers have no direct effect on this outcome.

In the manufacture sector, we have already underlined that imports of consumption goods from other LA decrease inequalities and export to lower income countries would exacerbate this dispersion. Regarding equipment goods, the effects are almost not significant.⁴ Apart from this, the only flows that drive some effect on the dispersion of income are the exports of intermediate goods to similar countries that boost inequalities, while imports from similar countries reduce the dispersion. The effect on inequality indeed depends on the skill composition used in the production of these goods. In developing countries, for instance, Chang (2017) argues that the production of intermediate goods is described as less sophisticated and cheap, and hence imply a lower use of skilled labours, while emerging countries have pushed their production toward more sophisticated products, especially China, since the early 1990s and deepened their productive capacity of intermediate goods (Hanson, 2012), and thus a higher use of skilled labours.

⁴ Trade in equipment goods with emerging countries raises inequality but exports and imports treated separately have no significant effect. Exports of equipment goods to similar- and higher-income countries induce a reduction in income inequality but is fairly significant.

Conclusion

To assess the effects of trade openness on income inequality, we use a dynamic panel approach to take into account the high persistent behaviour of income inequality for 11 Latin American countries, during the period 1989-2015. Then, unlike most previous studies, we fully account for all the effects that may have influenced income inequality in the past. Our estimates of the effect of trade on income inequality represent only the direct effect of current trade and would, if anything, underrate this effect. We go deep into the nature of trade and partners by considering trade inside and outside Latin America and partners' economic development stages to take differences in capital intensities into account. Finally, we adopt a more disaggregated analysis of trade, exports and import of production by stages, including agriculture goods, oil and mining goods, consumption goods, intermediate goods and equipment goods, which enables us to identify the different potential channels through which trade may affect income inequality.

We find that overall trade flows tend to reduce income inequality in Latin America. As announced by the Stolper-Samuelson effect, trade openness would contribute to lessen income inequality in developing countries. When we account for the direction of trade taking into account the economic development of trading partners, we find that trade with developing countries lessens inequalities. On the other hand, trade with partners that enjoy a higher income per capita also improves the dispersion of income, whereas trade with similar-income countries leads to a rise in inequality. As regard trade by stage of production, we find that trade in primary goods and trade in consumption have a more obvious effect than trade in intermediate and equipment goods. Trade in primary commodities moderates inequality in Latin American countries in the period analysed. Regional trade in consumption goods decreases inequality, while trade in consumption goods with non-Latin American countries harms inequality.

As shown by the results, the export channel has a more significant effect on income inequality than the import channel. In general, the exports of agriculture and oil and mining contribute to decline income inequality, while imports of these goods enhance the opposite effect. As predicted by the Stolper-Samuelson effect, trade opening would shift the production towards countries' comparative advantages and, in turn, would raise the return of the factor intensively used. What is more surprising is that our empirical findings emphasise a more significant role of the export channel while the import channel has received more attention in the literature and

raises more expectations in terms of benefits to be obtained from trade. Our results hence confirm that the consequences of trade openness depend on how countries are integrated into the international economic system (McMillan et al., 2014). Given the fact that Latin America is abundant in natural resource-based commodities, McMillan et al. (2014) suggest that the abundance in natural resources and primary products lowers the motivation for transition toward modern industries and enhances traditional production patterns. This argument is linked to the extensive strand of the literature studying the negative effects of substantial natural resources endowment on countries' performance, which may turn the “blessing” of natural resources into a “curse” since productive activities that boost growth decline in favour of natural resources sector for rent-seeking purposes (Sachs & Warner, 2001). This argument mirror the position of IMF (2017) according to which the commodity price boom would have prevented Latin American countries to shift the production of more skill-intensive goods.

From a more general perspective, our results confirm that income inequality which is a highly persistence phenomenon. This calls for other policies more directed through a restructuration of the production but also the need for social and education policies that directly influence income inequality. As far as trade policies are concerned, our study finds no evidence of a detrimental effect of trade on income inequalities. More interestingly, this paper stresses the role of exports to contribute to a reduction of income inequalities, a question that has been largely overlooked by the literature. Then, our findings provide some evidence for the policy debate and promising avenue for future research.

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Appendix

Table 1: Summary statistic. Trade, Exports (X) and Imports (M) are expressed as % of GDP

Variable	Mean	Std. Dev.	Min	Max	Variable	Mean	Std. Dev.	Min	Max
GiniSWIID	46.88	4.441	36.92	55.22	Agriculture goods M (DEVELOPING)	0.001	0.005	0	0.043
GDPgrowth	3.446	3.995	-12.31	18.28	Agriculture goods M (EMERGING)	0.006	0.022	0	0.115
GDPpercap	1.95	3.993	-14.19	16.22	Agriculture goods M (non-LA)	0.068	0.220	0	1.046
FDI inflow (% of GDP)	2.860	2.426	-2.498	12.19	Agriculture goods M (LA)	0.005	0.016	0	0.099
Trade	40.68	17.25	9.266	92.76	Oil and mining goods X	5.858	7.143	0.007	32.90
Trade higher-income countries (HIC)	28.14	15.70	5.842	73.36	Oil and mining goods X (HIC)	4.188	5.302	0.007	27.74
Trade similar-income countries (SIC)	7.912	5.864	0.200	28.01	Oil and mining goods X (SIC)	0.650	0.877	0	3.997
Trade lower-income countries (LIC)	2.252	3.842	0	22.46	Oil and mining goods X (LIC)	0.276	0.746	0	3.939
Trade developed countries (DEVELOPED)	19.31	9.606	5.573	52.04	Oil and mining goods X (DEVELOPED)	3.141	3.811	0	20.34
Trade developing countries (DEVELOPING)	3.182	2.108	0.263	11.03	Oil and mining goods X (DEVELOPING)	0.249	0.438	0	2.924
Trade emerging countries (EMERGING)	15.81	13.74	0.813	67.33	Oil and mining goods X (EMERGING)	1.725	3.525	0.002	22.98
Trade Latin America (LA)	14.01	12.76	0.705	57.96	Oil and mining goods X (non-LA)	3.772	4.269	0	20.93
Trade non-Latin America (non-LA)	24.29	10.86	6.857	61.73	Oil and mining goods X (LA)	1.343	3.437	0.003	22.82
Exports	20.73	9.522	5.359	47.49	Oil and mining goods M	1.032	1.206	0.021	6.611
Imports	19.94	9.922	3.520	57.08	Oil and mining goods M (HIC)	0.024	0.089	0	0.644
Exports (non-LA)	12.61	7.020	2.541	32.14	Oil and mining goods M (SIC)	0.004	0.016	0	0.134
Imports (non-LA)	11.68	5.454	2.437	31.91	Oil and mining goods M (LIC)	0.002	0.010	0	0.071
Exports (LA)	6.351	6.724	0.241	37.21	Oil and mining goods M (DEVELOPED)	0.023	0.088	0	0.639
Imports (LA)	7.666	6.646	0.365	27.39	Oil and mining goods M (DEVELOPING)	0.004	0.015	0	0.109
Exports (HIC)	14.40	8.449	1.996	41.70	Oil and mining goods M (EMERGING)	0.003	0.013	0	0.112
Imports (HIC)	13.73	8.756	2.322	45.22	Oil and mining goods M (non-LA)	0.027	0.099	0	0.690
Exports (SIC)	3.354	2.491	0.017	11.69	Oil and mining goods M (LA)	0.004	0.015	0	0.090
Imports (SIC)	4.558	3.781	0.182	18.70	Consumption goods X	1.755	1.456	0.017	7.199
Exports (LIC)	1.200	2.189	0	11.66	Consumption goods X (HIC)	1.135	1.333	0.013	6.320
Imports (LIC)	1.052	1.769	0	10.79	Consumption goods X (SIC)	0.427	0.473	0.000	2.429
Exports (DEVELOPING)	1.799	1.357	0.063	8.851	Consumption goods X (LIC)	0.106	0.204	0	1.019
Imports (DEVELOPING)	1.383	0.984	0.128	6.015	Consumption goods X (DEVELOPING)	0.238	0.220	0.000	1.157
Exports (DEVELOPED)	10.38	6.632	1.955	30.51	Consumption goods X (DEVELOPED)	0.915	1.337	0.012	6.153
Imports (DEVELOPED)	8.926	3.939	2.327	21.52	Consumption goods X (EMRGING)	0.514	0.486	0.002	3.414
Exports (EMERGING)	6.777	6.328	0.315	32.75	Consumption goods X (LA)	0.703	0.561	0.002	3.561
Imports (EMERGING)	9.039	7.947	0.414	42.07	Consumption goods X (non-LA)	0.965	1.357	0.013	6.383
Trade in agriculture goods	4.241	3.385	0.487	17.99	Consumption goods M	4.047	3.165	0.349	18.97
Trade in oil and mining goods	6.890	7.036	0.362	33.30	Consumption goods M (HIC)	2.737	2.679	0.257	17.33
Trade in agriculture goods (HIC)	2.626	2.763	0.007	14.66	Consumption goods M (SIC)	0.972	0.993	0.016	7.010
Trade in oil and mining goods (HIC)	4.212	5.297	0.007	27.74	Consumption goods M (LIC)	0.245	0.457	0	2.502
Trade in agriculture goods (SIC)	0.502	0.616	0.001	4.122	Consumption goods M (DEVELOPING)	0.155	0.170	0.007	0.834
Trade in oil and mining goods (SIC)	0.655	0.874	0	3.997	Consumption goods M (DEVELOPED)	1.691	1.202	0.254	9.413
Trade in agriculture goods (LIC)	0.183	0.378	0	2.207	Consumption goods M (EMERGING)	2.108	2.188	0.042	12.39
Trade in oil and mining goods (LIC)	0.279	0.745	0	3.939	Consumption goods M (LA)	1.581	1.682	0.028	8.273
Trade in agriculture goods (DEVELOPED)	1.792	1.528	0.006	8.262	Consumption goods M (non-LA)	2.374	1.809	0.272	11.25
Trade in oil and mining goods (DEVELOPED)	3.165	3.811	0	20.34	Intermediate goods X	1.303	1.034	0.042	6.571
Trade in agriculture goods (DEVELOPING)	0.351	0.482	0.000	3.989	Intermediate goods X (HIC)	0.724	0.892	0.015	5.806
Trade in oil and mining goods (DEVELOPING)	0.253	0.436	0	2.924	Intermediate goods X (SIC)	0.391	0.369	0.000	1.807
Trade in agriculture goods (EMERGING)	1.167	1.615	0.004	9.907	Intermediate goods X (LIC)	0.123	0.230	0	1.140
Trade in oil and mining goods (EMERGING)	1.728	3.524	0.002	22.98	Intermediate goods X (DEVELOPING)	0.178	0.134	0.001	0.719
Trade in agriculture goods (LA)	0.934	1.591	0.001	9.965	Intermediate goods X (DEVELOPED)	0.567	0.922	0.014	5.710
Trade in oil and mining goods (LA)	1.347	3.435	0.003	22.82	Intermediate goods X (EMERGING)	0.494	0.395	0.024	1.838
Trade in agriculture goods (non-LA)	2.378	1.999	0.009	9.394	Intermediate goods X (LA)	0.577	0.381	0.025	1.886
Trade in oil and mining goods (non-LA)	3.799	4.266	0	20.93	Intermediate goods X (non-LA)	0.661	0.978	0.014	6.132
Trade in consumption goods	5.802	3.311	0.911	19.49	Intermediate goods M	4.183	1.962	0.573	10.46
Trade in consumption goods (HIC)	3.873	2.898	0.418	17.77	Intermediate goods M (HIC)	3.063	1.961	0.465	10.40
Trade in consumption goods (SIC)	1.399	1.231	0.051	7.158	Intermediate goods M (SIC)	0.891	0.668	0.028	3.972
Trade in consumption goods (LIC)	0.351	0.641	0	3.379	Intermediate goods M (LIC)	0.156	0.262	0	1.785
Trade in consumption goods (DEVELOPED)	2.607	1.829	0.377	9.518	Intermediate goods M (DEVELOPING)	0.180	0.148	0.006	0.742
Trade in consumption goods (DEVELOPING)	0.394	0.283	0.024	1.278	Intermediate goods M (DEVELOPED)	1.917	1.078	0.454	6.122
Trade in consumption goods (EMERGING)	2.623	2.299	0.109	12.942	Intermediate goods M (EMERGING)	2.013	1.857	0.074	8.423
Trade in consumption goods (LA)	2.284	1.798	0.085	8.752	Intermediate goods M (LA)	1.663	1.744	0.078	7.891
Trade in consumption goods (non-LA)	3.340	2.243	0.647	11.35	Intermediate goods M (non-LA)	2.447	1.180	0.481	8.310
Trade in intermediate goods	5.487	2.267	1.466	15.11	Equipment goods X	1.007	2.064	0.017	12.40
Trade in intermediate goods (HIC)	3.787	2.346	0.551	12.48	Equipment goods X (HIC)	0.753	1.970	0.010	11.66
Trade in intermediate goods (SIC)	1.283	0.932	0.038	5.558	Equipment goods X (SIC)	0.174	0.201	0	0.918
Trade in intermediate goods (LIC)	0.279	0.468	0	2.896	Equipment goods X (LIC)	0.041	0.070	0	0.382
Trade in intermediate goods (DEVELOPED)	2.484	1.890	0.469	11.83	Equipment goods X (DEVELOPING)	0.090	0.086	0.000	0.451
Trade in intermediate goods (DEVELOPING)	0.358	0.213	0.034	1.214	Equipment goods X (DEVELOPED)	0.665	1.968	0.003	11.44
Trade in intermediate goods (EMERGING)	2.507	1.884	0.205	8.811	Equipment goods X (EMERGING)	0.212	0.205	0.003	1.144
Trade in intermediate goods (LA)	2.241	1.753	0.161	8.096	Equipment goods X (LA)	0.267	0.227	0.002	1.226
Trade in intermediate goods (non-LA)	3.109	2.021	0.884	14.44	Equipment goods X (non-LA)	0.702	2.024	0.004	11.91
Trade in equipment goods	5.850	3.576	1.206	21.12	Equipment goods M	4.843	2.762	0.868	17.98
Trade in equipment goods (HIC)	4.391	3.037	0.521	16.79	Equipment goods M (HIC)	3.637	2.146	0.511	10.92
Trade in equipment goods (SIC)	1.147	1.249	0.009	8.067	Equipment goods M (SIC)	0.973	1.208	0.008	8.060
Trade in equipment goods (LIC)	0.208	0.406	0	2.627	Equipment goods M (LIC)	0.167	0.351	0	2.329
Trade in equipment goods (DEVELOPED)	3.599	2.702	0.474	16.24	Equipment goods M (DEVELOPING)	0.071	0.058	0.004	0.472
Trade in equipment goods (DEVELOPING)	0.162	0.108	0.018	0.535	Equipment goods M (DEVELOPED)	2.934	1.428	0.466	7.778
Trade in equipment goods (EMERGING)	1.984	1.875	0.107	12.14	Equipment goods M (EMERGING)	1.771	1.863	0.028	12.10
Trade in equipment goods (LA)	1.301	0.992	0.094	4.554	Equipment goods M (LA)	1.034	0.965	0.027	4.429
Trade in equipment goods (non-LA)	4.445	3.350	0.920	20.44	Equipment goods M (non-LA)	3.743	2.184	0.792	14.18
Agriculture goods X	3.473	3.298	0.011	17.89					
Agriculture goods X (HIC)	2.561	2.797	0.007	14.66					
Agriculture goods X (SIC)	0.497	0.619	0.001	4.122					
Agriculture goods X (LIC)	0.180	0.379	0	2.207					
Agriculture goods X (DEVELOPED)	1.728	1.553	0.006	8.262					
Agriculture goods X (DEVELOPING)	0.350	0.483	0.000	3.989					
Agriculture goods X (EMERGING)	1.160	1.620	0.002	9.907					
Agriculture goods X (non-LA)	2.310	2.037	0.009	9.394					
Agriculture goods X (LA)	0.929	1.594	0.000	9.965					
Agriculture goods M	0.767	0.372	0.105	2.713					
Agriculture goods M (HIC)	0.065	0.210	0	1.010					
Agriculture goods M (SIC)	0.005	0.017	0	0.101					
Agriculture goods X (LIC)	0.002	0.009	0	0.044					
Agriculture goods M (DEVELOPED)	0.064	0.208	0	1.009					

Table 1: Effects of overall trade and trade by partners (% of GDP) on income inequality

<i>Dependant variable: Gini_{it}</i>	Model (1)	Model (2)	Model (3)	Model (4)
Gini (t-1)	0.920***	0.902***	0.933***	0.935***
Overall trade	-0.006*			
<i>Trade with (% of GDP):</i>				
Latin America (LA)		-0.031***		
Others than Latin America (non-LA)		0.016***		
Developed countries			0.015**	
Developing countries			-0.087***	
Emerging countries			-0.006	
Higher income countries (HIC)				-0.011***
Similar income countries(SIC)				0.018**
Lower income countries(LIC)				0.022
Ln (GDP per capita)	-5.415**	-2.580	-5.449**	-3.359
Ln (GDP per capita) ²	0.273**	0.089	0.264**	0.156
GDP growth	-0.012	-0.011	-0.014*	-0.015**
FDI inflow (% of GDP)	0.061***	0.053***	0.058***	0.041***
N	281	281	281	281

Significant at * p<0.1; ** p<0.05; *** p<0.01.

Table 2: Effects of overall exports and imports (% of GDP) on income inequality

<i>Dependant variable: Gini_{it}</i>	Model (1)	Model (2)	Model (3)	Model (4)
Gini (-1)	0.918***	0.903***	0.932***	0.935***
Exports	-0.015***			
Imports	0.010			
Exports (LA)		-0.030***		
Exports (non-LA)		0.004		
Imports (LA)		-0.039***		
Imports (non-LA)		0.033***		
Export (DEVELOPED)			0.007	
Exports (DEVELOPING)			-0.118**	
Exports (EMERGING)			-0.010	
Imports (DEVELOPED)			0.024	
Imports (DEVELOPING)			-0.050	
Imports (EMERGING)			0.009	
Exports (HIC)				-0.017**
Exports (SIC)				-0.001
Exports (LIC)				0.004
Imports (HIC)				0.002
Imports (SIC)				0.030**
Imports (LIC)				0.044
Ln (GDP per capita)	-5.353**	-2.504	-5.748**	-3.051
Ln (GDP per capita) ²	0.266**	0.087	0.282**	0.140
GDP growth	-0.014*	-0.013*	-0.016**	-0.016**
FDI inflow (% of GDP)	0.054***	0.048***	0.053***	0.039***
N	281	281	281	281

Significant at * p<0.1; ** p<0.05; *** p<0.01.

Table 3: Effects of trade (% of GDP) by stage of production on income inequality

<i>Dependant variable: Gini_{it}</i>	Model (1)		Model (2)		Model (3)		Model (4)
Gini (-1)	0.911***	Gini (-1)	0.923***	Gini (-1)	0.925***	Gini (-1)	0.929***
Trade in agriculture goods	-0.032	Trade in agriculture goods (LA)	-0.080**	Trade in agriculture goods (DEVELOPED)	0.062	Trade in agriculture goods (HIC)	0.040
Trade in oil and mining goods	-0.025***	Trade in oil and mining goods (LA)	-0.053***	Trade in oil and mining goods (DEVELOPED)	0.010	Trade in oil and mining goods (HIC)	-0.027**
Trade in consumption goods	-0.002	Trade in consumption goods (LA)	-0.091*	Trade in consumption goods (DEVELOPED)	0.065	Trade in consumption goods (HIC)	0.006
Trade in intermediate goods	0.008	Trade in intermediate goods (LA)	0.079	Trade in intermediate goods (DEVELOPED)	0.002	Trade in intermediate goods (HIC)	0.015
Trade in equipment goods	0.006	Trade in equipment goods (LA)	-0.115	Trade in equipment goods (DEVELOPED)	-0.050	Trade in equipment goods (HIC)	-0.033
		Trade in agriculture goods (non-LA)	-0.018	Trade in agriculture goods (DEVELOPING)	-0.140*	Trade in agriculture goods (SIC)	-0.322**
		Trade in oil and mining good (non-LA)	0.010	Trade in oil and mining goods (DEVELOPING)	-0.145	Trade in oil and mining goods (SIC)	-0.002
		Trade in consumption goods (non-LA)	0.083**	Trade in consumption goods (DEVELOPING)	0.214	Trade in consumption goods (SIC)	-0.046
		Trade in intermediate goods (non-LA)	-0.003	Trade in intermediate goods (DEVELOPING)	-0.992***	Trade in intermediate goods (SIC)	0.154*
		Trade in equipment goods (non-LA)	-0.017	Trade in equipment goods (DEVELOPING)	0.390	Trade in equipment goods (SIC)	0.040
				Trade in agriculture goods (EMERGING)	-0.069	Trade in agriculture goods (LIC)	-0.315**
				Trade in oil and mining goods (EMERGING)	-0.024*	Trade in oil and mining goods (LIC)	-0.040
				Trade in consumption goods (EMERGING)	-0.139***	Trade in consumption goods (LIC)	-0.062
				Trade in intermediate goods (EMERGING)	0.136**	Trade in intermediate goods (LIC)	0.078
				Trade in equipment goods (EMERGING)	0.093**	Trade in equipment goods (LIC)	0.143
Ln (GDP per capita)	-4.192*	Ln (GDP per capita)	-6.202*	Ln (GDP per capita)	-3.443	Ln (GDP per capita)	0.380
Ln (GDP per capita) ²	0.206	Ln (GDP per capita) ²	0.336*	Ln (GDP per capita) ²	0.172	Ln (GDP per capita) ²	-0.046
GDP growth	-0.013*	GDP growth	-0.012	GDP growth	-0.016**	GDP growth	-0.014*
FDI inflow (% of GDP)	0.054***	FDI inflow (% of GDP)	0.050***	FDI inflow (% of GDP)	0.034**	FDI inflow (% of GDP)	0.034**
N	281	N	281	N	281	N	281

Significant at * p<0.1; ** p<0.05; *** p<0.01.

Table 4: Effect of exports (X) and imports (M) (% of GDP) by stage of production on income inequality

<i>Dependant variable: Gini_{it}</i>	Model (1)		Model (2)		Model (3)		Model (4)
Gini (-1)	0.892***	Gini (-1)	0.939***	Gini (-1)	0.924***	Gini (-1)	0.925***
Agriculture goods X	-0.040*	Agriculture goods X (LA)	-0.104***	Agriculture goods X (DEVELOPED)	0.101	Agriculture goods X (HIC)	0.027
Oil and mining goods X	-0.027***	Oil and mining goods X (LA)	-0.040***	Oil and mining goods X (DEVELOPED)	-0.005	Oil and mining goods X (HIC)	-0.039***
Consumption goods X	-0.077	Consumption goods X (LA)	0.062	Consumption goods X (DEVELOPED)	0.015	Consumption goods X (HIC)	0.024
Intermediate goods X	0.076	Intermediate goods X (LA)	0.226	Intermediate goods X (DEVELOPED)	-0.092	Intermediate goods X (HIC)	-0.114
Equipment goods X	0.018	Equipment goods X (LA)	-0.190	Equipment goods X (DEVELOPED)	-0.239	Equipment goods X (HIC)	-0.146*
Agriculture goods M	0.346***	Agriculture goods M (LA)	-2.467	Agriculture goods M (DEVELOPED)	-0.135	Agriculture goods M (HIC)	0.617
Oil and mining goods M	0.069	Oil and mining goods M (LA)	9.993***	Oil and mining goods M (DEVELOPED)	3.102	Oil and mining goods M (HIC)	0.850
Consumption goods M	-0.001	Consumption goods M (LA)	-0.159***	Consumption goods M (DEVELOPED)	0.061	Consumption goods M (HIC)	0.029
Intermediate goods M	-0.068	Intermediate goods M (LA)	0.078	Intermediate goods M (DEVELOPED)	-0.017	Intermediate goods M (HIC)	-0.037
Equipment goods M	0.033	Equipment goods M (LA)	-0.103	Equipment goods M (DEVELOPED)	0.066	Equipment goods M (HIC)	-0.015
		Agriculture goods X (non-LA)	-0.017	Agriculture goods X (DEVELOPING)	-0.165	Agriculture goods X (SIC)	-0.339**
		Oil and mining goods X (non-LA)	0.011	Oil and mining goods X (DEVELOPING)	-0.015	Oil and mining goods X (SIC)	0.039
		Consumption goods X (non-LA)	-0.095	Consumption goods X (DEVELOPING)	0.693	Consumption goods X (SIC)	0.256
		Intermediate goods X (non-LA)	-0.075	Intermediate goods X (DEVELOPING)	-1.103	Intermediate goods X (SIC)	0.687***
		Equipment goods X (non-LA)	-0.128	Equipment goods X (DEVELOPING)	0.389	Equipment goods X (SIC)	-0.469*
		Agriculture goods M (non-LA)	1.035	Agriculture goods M (DEVELOPING)	-12.538	Agriculture goods M (SIC)	4.094
		Oil and mining goods M (non-LA)	1.876**	Oil and mining goods M (DEVELOPING)	-4.560	Oil and mining goods M (SIC)	6.958*
		Consumption goods M (non-LA)	0.150***	Consumption goods M (DEVELOPING)	-0.565	Consumption goods M (SIC)	-0.034
		Intermediate goods M (non-LA)	-0.018	Intermediate goods M (DEVELOPING)	-0.092	Intermediate goods M (SIC)	-0.207**
		Equipment goods M (non-LA)	-0.019	Equipment goods M (DEVELOPING)	-0.239	Equipment goods M (SIC)	0.090
				Agriculture goods X (EMERGING)	-0.090	Agriculture goods X (LIC)	-0.348***
				Oil and mining goods X (EMERGING)	-0.003	Oil and mining goods X (LIC)	-0.051
				Consumption goods X (EMERGING)	-0.128	Consumption goods X (LIC)	0.848**
				Intermediate goods X (EMERGING)	0.285	Intermediate goods X (LIC)	0.046
				Equipment goods X (EMERGING)	0.005	Equipment goods X (LIC)	-0.799
				Agriculture goods M (EMERGING)	4.826	Agriculture goods M (LIC)	-8.774
				Oil and mining goods M (EMERGING)	10.743	Oil and mining goods M (LIC)	9.082
				Consumption goods M (EMERGING)	-0.159	Consumption goods M (LIC)	-0.373
				Intermediate goods M (EMERGING)	0.060	Intermediate goods M (LIC)	-0.086
				Equipment goods M (EMERGING)	0.107	Equipment goods M (LIC)	0.282
Ln (GDP per capita)	-3.193	Ln (GDP per capita)	-4.991	Ln (GDP per capita)	-6.927	Ln (GDP per capita)	-1.893
Ln (GDP per capita) ²	0.149	Ln (GDP per capita) ²	0.273	Ln (GDP per capita) ²	0.345	Ln (GDP per capita) ²	0.095
GDP growth	-0.009	GDP growth	0.001	GDP growth	-0.010	GDP growth	-0.012
FDI inflow (% of GDP)	0.039***	FDI inflow (% of GDP)	0.032**	FDI inflow (% of GDP)	0.023	FDI inflow (% of GDP)	0.028**
N	281	N	281	N	281	N	281

Significant at * p<0.1; ** p<0.05; *** p<0.01