Sustainability of the Decline in Inequality in Latin America: The Effects of Changing Trade Patterns

Carmen Rosa Marull Maita
Freie Universität Berlin

Luis D. Rosero
Framingham State University

December 2015

Abstract

After growing for most of the 1980s and 1990s, income inequality in Latin America has reversed course during the last few years. Declining levels of inequality are a welcomed change for a region that has typically topped the charts in this regard. Even more promising is the fact that this recent decline has also been accompanied by significant reductions in poverty rates. The literature has typically explained the decline in inequality as the result of two main factors: a decrease in the skill premium, and the reduced inequality in terms of non-wage income—primarily driven by the successful implementation of conditional income-transfer programs. We propose that these two are mainly channels through which changing terms of trade have affected inequality, particularly in light of the recent "commodities boom" and the favorable conditions that it has provided to the region. This paper reassesses the effects of trade on inequality by evaluating the degree to which these follow traditional comparative advantage theories. Using data for eighteen Latin American countries during the 1995-2012 period, we find overall evidence to support that terms of trade are inversely related to inequality. Moreover, we demonstrate that this effect is only significant for countries with moderate to high export concentration levels, and explore these in more detail through case studies. Finally, we acknowledge that the current trade patterns run the risk of proving ephemeral due to the vagaries of international markets, and discuss policy implications for sustaining this recent decline in inequality in the region.

I.   Introduction

In light of the growing interdependence that characterizes the process of globalization, one of the critical questions faced by the economics profession deals with the effects that trade openness has on domestic income inequality, if any. Traditional arguments—couched in the idea of factor price equalization originating from the Hecksher-Ohlin framework and the Stolper-Samuelson corollary—posit that international trade guided by comparative advantage will have an equalizing effect on the economies involved. Developing countries, such as those in Latin America, are seen as being abundant in unskilled labor and land, and relatively capital-deprived. Consequently, by specializing in the production and export of unskilled labor and land-intensive goods, the income of the owners of these factors of production will increase relative to that of capital owners and skilled workers.

The Latin American experience, following its liberalization process in the 1980s and 1990s, called these theories into question as income inequality, rather than compressing, actually increased. However, since the beginning of the 2000s, most countries in the region, while still mainly exporters of commodities; have experienced an improvement in their terms of trade and significant reductions in income inequality and poverty rates. This suggests that the linkage between comparative advantage-based trade openness and domestic inequality is tenuous at best and only bound to reduce inequality if accompanied by improvements in a country's terms of trade. The favorable trade conditions associated with the recent commodities super-cycle has presented both opportunities and challenges for developing countries, including those in Latin America. Rising food and energy prices have the potential to undermine some of the inroads made in the region in terms of poverty reduction. On the other hand, the unusual improvement in the terms of trade of commodity exporters has made it appear that these countries are moving towards the factor payments convergence implied by traditional trade theory. However, we question whether this is sustainable.

Figure 1.1 shows the evolution of the Gini coefficient of household per capita income for the recent years. As seen on this figure, income inequality declined for all countries in the region with the exception of Costa Rica, Honduras, and Nicaragua. That being said, the level of inequality and the rate at which it declined varied among countries. During this period the biggest reductions in inequality took place in Bolivia, Peru, and Paraguay (19.8%, 19.4% and 17.5%, respectively). Mexico and Uruguay had more modest declines in inequality (1% and 1.9 %, respectively).

Figure 1.1: Gini Index across Time[1]


Income Gini Index
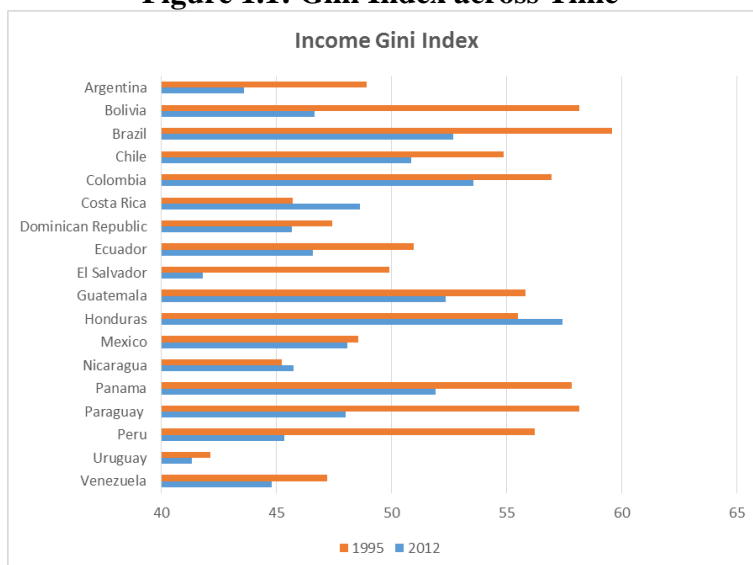
Source: World Bank

Aside from the significant changes in inequality outlined above, the period since the beginning of the century has also been characterized by a dramatic increase in the world prices of commodities (see Figure 1.2 below). Despite a temporary setback in the second half of 2008 due to the global financial crisis, growth in the prices of all major commodity subgroups resumed promptly in 2009. By the end of 2013, the aggregate price of all commodities was nearly 84% higher than eight years earlier. However, this commodities boom came to an end starting roughly around July 2014. By mid-2015 the overall price of commodities was back to 2005 levels. Figure 1.2 also indicates that increases in world commodity prices during recent years have been most pronounced in two critical sectors: metals and fuels. The price growth in agricultural raw materials, while positive, has been relatively modest.

---

[1] Figure 1.1 presents an approximation of the Gini index between these two periods. Given the discontinuity of the data, some countries' numbers are based on different starting and ending years. The first period for Chile, Colombia, Dominican Republic and Mexico was 1996; for Bolivia 1997; and for Guatemala and Peru 1998. The second period for Venezuela was 2006; Nicaragua 2009; and Argentina, Chile, and Honduras 2011.

Figure 1.2 World Commodity Prices
### (2005=100)
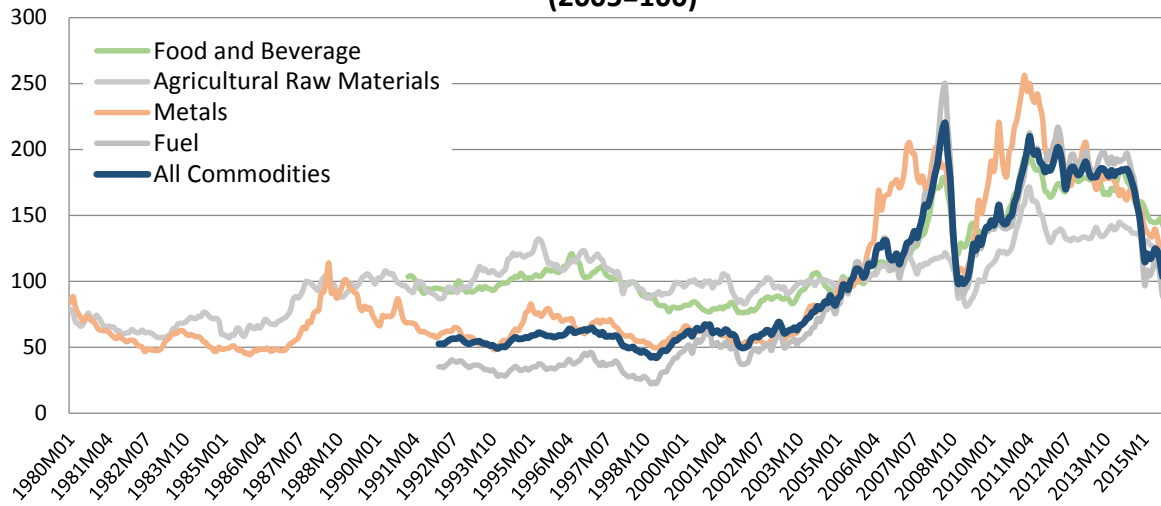
Source: IMF Primary Commodity Prices database.

Rising global commodity prices since the early 2000s were accompanied by a notable reconfiguration of the export profiles of countries in Latin America. In general, Latin America's exports today (relative to the period before the commodities boom) are more concentrated in the fuels and the ores and metals sectors. The growing importance of these two subgroups for exports contrasts with the lower shares of traditional subgroups like agricultural raw materials and food products, but also manufacturing. The reorientation of domestic production to match the changing demand for exports, supported by improving global price conditions, is also evident at the product level. In general terms, countries for which exports have traditionally revolved around one single commodity have further increased their reliance on this commodity. Moreover, some countries with relatively more diversified export structures have recently refocused their exports towards fuels and other metals (e.g. Colombia).

The atypical recent rise in the world prices of commodities appears to have benefited Latin American countries in the form of improved terms of trade. Figure 1.3 below captures this improvement for the countries studied in this paper. Countries where the shift towards the exportation of fuels and metal—particularly petroleum and copper—has been more pronounced, have also experienced the largest gains with regards to the terms of trade that they enjoy. This is especially the case of Venezuela, Chile, and Peru.

Figure 1.3: Changes in the Terms of Trade
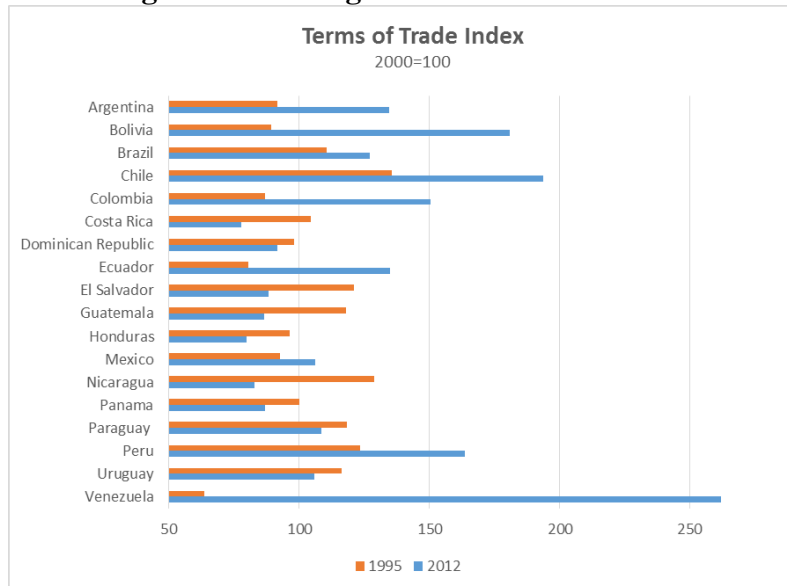
Source: World Bank

In light of these trends, this paper explores the degree to which changes in the terms of trade of eighteen Latin American economies have been associated with reductions in inequality—as captured by the Gini coefficient of household per capita income—in the 1995-2012 period. The literature argues that the contribution of better terms of trade conditions to a declining Gini coefficient can be partially explained through two main channels. First, rising government revenues originating from export-led economic growth make possible greater government spending in social programs targeted towards the poor (e.g. Bolsa Familia in Brazil, Progresa in Mexico, Juntos in Peru, and Familias en Acción in Colombia, among others). Second, as the productive structure of countries changes to accommodate global commodity prices, and its indirect effects, the demand for unskilled labor increases at a faster rate than that of skilled labor, and thus results in the improvement in the relative wages of unskilled workers. This compression in the skill premium contributes to lower income inequality in general. Aside from accounting for the effect of the terms of trade on inequality our econometric model also controls for other non-trade factors which might directly affect the level of inequality (e.g. the dependency rate, and the degree labor informality). Finally, to further delve into the relevance of trade conditions on the level of inequality, we account for changes in a country's homogeneity of exports. Using an index of export concentration, we classify countries in the region into three groups and identify the effect of terms of trade on inequality. These groupings reveal slightly different stories, and provide a starting point for our qualitative analysis of six sample countries. This case study approach makes it possible to more directly trace the stories behind the empirical results associated with our pooled model.

The rest of this paper is organized as follows. Section 2 reviews the existing literature by presenting a general overview of the relationship between international trade and inequality, as well as specifically addressing the much more limited literature on the direct and indirect role of terms of trade on inequality. Section 3 presents our methodology and data, and sums up the

theoretical expectations for our econometric models. Section 4 presents our empirical findings. Based on these findings, and using classifications based on export concentration, Section 5 presents an in-depth descriptive exploration of channels through which patterns of trade might have affected inequality in six country case studies. Section 6 concludes by placing the main findings in the context of what appears to be the beginning of a deterioration of the region's terms of trade.

II.   Literature Review

2.1 International Trade and Inequality

The literature on the relationship between globalization, including trade liberalization, and inequality is extensive. It also remains mostly inconclusive as to the direction and size of the relationship, if any. Rather than attempting to capture all the intricacies of this literature, this section briefly sketches out some of the most salient approaches to the question of how international trade affects within-country inequality.[2]

For most of the twentieth century, discussions of international trade centered on the orthodox, general equilibrium model developed by Swedish economists Eli Heckscher and Bertil Ohlin. The Heckscher-Ohlin model (HO model), proposed as an improvement on the classical Ricardian model, advanced the idea that comparative advantage, and thus trade flows, are determined by factor endowments of countries and factor intensities in the production of goods. Countries should produce and export those goods which more intensively use the factor of production in which they are relatively more endowed: labor-abundant countries will specialize in and export labor-intensive products, while capital-abundant countries will do the same in terms of capital-intensive products. Two extensions of the HO model are particularly relevant to the question of inequality in relation to international trade. First, the Factor Price Equalization theorem predicts that as countries specialize according to the HO model, the price of the factors of production will equalize along with that of the products being traded. One direct implication of this is that trade will promote cross-country inequality, for example in the form of equal wages for workers regardless of the country where they are employed. Along the same lines, the Stolper-Samuelson theorem argues that trade based on comparative advantage will raise the payments to the relatively abundant factor which is used intensively in the production of exports, and reduce the payments to the relatively scarce factor (Stolper and Samuelson 1941). Thus, for labor-abundant countries wages are expected to rise, while interest payments decrease, and in so doing trade reduces within country inequality.

The Stolper-Samuelson theorem opens the door to the acknowledgment that while trade liberalization based on comparative advantage leads to mutual gains from trade for countries involved and to improvements in society's overall welfare, there will be some that will lose domestically as a result of trade specialization (namely the owners of the relatively scarce resource). In this case, it is argued, all of society could be made better off if transfers were to take place from those who see their income increase to those whose income is negatively affected, for

---

[2] For more comprehensive reviews of this literature, please refer to Goldberg and Pavcnik (2004), Pavcnik (2011) or Van den Berg (2012).

example through the use of trade adjustment assistance schemes (see Feenstra and Lewis 1994; Magee 2001). Of course the problem with this line of argument is that, even if one accepts the concept of mutual gains and ignores the political economy of how these gains are distributed among countries, this type of domestic arrangements to compensate the losers from trade are mostly non-existent in practice. Thus, redistribution never materializes.

Moreover and despite its seemingly sound logic, the experiences of the late 1980s and 1990s, when trade liberalization accelerated and inequality increased in both developing and developed countries, proved the inadequacy of the HO model and its extensions in capturing the realities of the relationship between trade and inequality. This was certainly the case for Latin American countries, which despite being assumed to be relatively abundant in unskilled labor, saw the wage gap between skilled and unskilled workers increase following the liberalization process of the late 1980s.

Attempts to reconcile the theoretical expectations of trade liberalization with the actual changes in inequality have focused primarily on revisiting some of the unrealistic assumptions on which the HO model is based. For instance, the assumption that production technologies are equally available to all countries is difficult to support. However, even if liberalization does facilitate technological transfer among countries, it is important to consider where technology originates and the degree to which it embodies the productive conditions of its country of origin. By importing technology from developed countries that have relative skilled-labor and capital abundance, developing countries transform their own production process to favor skilled-labor and capital to operate this newly adopted technology; at the expense of low-skilled labor. Skill-biased technological change is thus seen by some as a key driver in growing inequality in developing countries (see for example Bekman et al., 1998; Samuelson, 2004; Zhu 2005). Moreover, Acemoglu (2002) finds evidence to support the idea that the skill-biased technological change effect is greater in countries that are more dependent on foreign technology for their production. Gasparini and Cruces (2010) found evidence of this effect during the 1990s in the case of Argentina. Moreover, Esquivel and Rodríguez-López (2003) find that the increase in wage inequality in Mexico both before and after the implementation of NAFTA was to a large degree driven by this technological effect of trade.

Another implicit assumption of the traditional trade models is that trade among countries takes primarily the form of final goods. Feenstra and Hanson (1995, 1996) challenged this assumption by emphasizing the importance that trade in intermediate goods and outsourcing play in determining the changes in relative payments to the factors of production as a result of trade integration. The concept of 'global production sharing' reflects the fact that production of a capital and/or skill-intensive good is no longer done by a single country, but rather by an amalgamation of sub-components produced in different countries. Consequently, the production of these sub-components, even in relatively unskilled labor-abundant countries, will increase the relative demand of capital and skilled-labor which ultimately increases inequality. Feenstra and Hanson (1997) find support for this idea in the case of Mexico, where US firms actively used maquiladora firms for the production of their intermediate goods.

A more recent strand in the literature on the effects of trade and inequality focuses on the existence of heterogeneous firms within the same industries, which are affected differently by trade integration. As a result, workers and capital owners within the same industry of a country may face different payoffs. Verhoogen (2008) claims that product quality upgrading can help explain

differences in wages among workers within the same industry. Firms that succeed in accessing the export sector are seen as those that are most efficient and able to provide higher quality goods than those provided for the domestic market. As a result, workers of firms that produce for export benefit disproportionately from payments to greater productivity and the increased profitability associated with the gains from trade. Frias et al. (2009) and Krishna et al. (2011) find empirical support for this theory in the case of Mexico and Brazil, respectively.

2.2 Connecting Terms of Trade to Inequality

Most of the recent literature on the decline of income inequality in Latin America has explored the immediate determinants of this reduction, but few of these studies have focused on the impact of broader, more cyclical factors. The aim of this paper is to contribute to the literature by exploring the relationship between changes in country export conditions and the changes in their domestic inequality. It also attempts to bring to the forefront a discussion of its implications for the sustainability of inequality reduction efforts.

The existing literature has little to say when it comes to direct connections between inequality and the terms of trade in general. One of the few existing works is a 2010 report by the United Nations Research Institute for Social Development (UNRISD). In this report, UNRISD argues that in general the degree of the integration into global financial and commodity markets plays a more important role than national policies or structural changes in a country's level of inequality. This is especially true for developing countries for whom the export of commodities accounts for a large component of economic activity. Consequently, terms of trade are seen as a key determinant of within-country inequality.

In the Latin American context, recent reductions in inequality have been primarily attributed to two main aspects: the implementation of social transfer programs to supplement the income of the poor, and the reduction of the skill premium. While these factors are undoubtedly important, we believe that they are mostly channels through which favorable terms of trade conditions have contributed to inequality reduction in Latin America. Without considering the favorable conditions provided by improving terms of trade, one cannot fully understand the progress made, as well as its long-term vulnerabilities. We therefore focus our discussion here on the indirect connections made in the literature.

2.2.1. Terms of Trade Channels

One of the main channels through which terms of trade have affected inequality is the prevalence of a more progressive approach to government spending in large part due to an increase in commodity related governmental revenues. This is not to say that the regressive character of Latin America's tax collection systems has been reversed over time. Rather, as argued by some in the literature (see Jiménez and López Azcúnaga, 2015; Valdés 2015), increases in government social spending during the last decade have been the result of windfalls in government commodity-related revenues and not structural changes in tax policy to favor the poor.

Along with growing revenues due to higher commodity prices, some countries in the region have implemented new tax instruments that have amplified the positive effect of rising commodity prices on revenues. Argentina, Bolivia, Chile, and Venezuela all introduced measures like export duties, and other commodity-specific taxes on profits (ECLAC/OECD 2012). Thus, the increasing

terms of trade together with the implementation of new tax instruments allowed several countries to allocate greater resources for debt reduction, productive investments and for anti-poverty programs. The latest is the most relevant type of government expenditure for the reduction in inequality.

Well-designed anti-poverty programs (non-contributory and conditional cash transfers programs) have been created and expanded throughout most of the region in recent years. The increasing progressivity of government expenditures can be seen in terms of changes in size, coverage and distribution of monetary, as well as non-monetary transfers. Many in the literature assign an important role to the expansion of these programs in reducing income inequality in the region (e.g. Lustig et al. 2011; 2013; Gasparini and Lustig, 2011; Cornia, 2012; Esquivel et al., 2010; Alejo et al., 2009, among others). For instance, Azevedo et al. (2012) found that this sort of state action accounts on average for 14% of the decline in inequality in the region between 2000 and 2010.[3] Unlike previous anti-poverty programs, the recent wave of government transfers schemes are seen as being more successful due to their emphasis on the development of human capital among the poorest of the poor, and its conditional nature (de Brauw and Hoddinott, 2011).

Others in the literature have emphasized the compression of the skill premium in reducing overall income inequality. This development, we argue, is a second channel through which the terms of trade affect income inequality. The skill premium is often defined as the wage differential between skilled and unskilled workers. Given that wages make up a large portion of total income, it is not surprising that changes in overall inequality in Latin America have usually moved in the same direction as changes in the skill premium: during the 1990s both increased, while in the 2000s both decreased (Lustig et al., 2013; Lustig et al 2011, Cornia, 2012; Gasparini and Lustig, 2011, Esquivel et al 2010, Jaramillo and Saavedra 2009). For instance, Azevedo et al. (2012), find that lower wage inequality contributed to 45% of the decline in overall income inequality for the region.[4] Thus, the skill premium is in a sense a less comprehensive measure of inequality when compared to more traditional measures like the Income Gini Coefficient used in this paper.

Different measures of the skill premium point to the conclusion that after increasing during the 1980s and 1990s, the gap between the earnings of the skilled and unskilled in Latin America has declined since the early 2000s. Cornia (2012), by looking at the ratio of hourly wages of highly educated workers with those of low-education workers, shows that in 12 of the 18 Latin American countries under consideration, the wage gap had declined by 2009 relative to 2000. Similarly, Gasparini et al. (2011) concludes that during the decade of the 1990s the wage differential increased by 1.8% between skilled and unskilled workers[5], while during the first decade of the century it decreased by 2.8%. Given the importance of the changes in the skill premium to overall income inequality, it is important to review the causes that have been identified in the literature as contributing to the recent decline in the skill premium. In this respect, these causes, which are non-exclusive, can be broadly categorized as the result of policy changes, and supply-side and demand-side factors. We argue that the demand-side factors in particular are also directly associated with

---

[3] However, the contribution of government transfer programs to the reduction of inequality variables considerably from country to country; ranging from 0% in the case of Peru to 110% in the case of Uruguay.

[4] However, the explanatory power of changes in labor income inequality varies significantly among countries.

[5] Gasparini et al. (2011) define skilled workers as those with some tertiary education. Unskilled workers are defined as those with a high school degree or less.

terms of trade conditions, while the supply-side factors originate primarily from demographic changes.

Policy Changes

The liberalization of the labor markets that characterized the 1990s proved un-equalizing as the wages of low-skilled workers dropped and the precariousness of employment increased (see Fraile, 2009; Novick et al., 2009). As the political pendulum swung in the other direction throughout most of Latin America in the 2000s, some of the liberalization policies of the 1990s, including flexible labor markets, were partially reversed. The increase in minimum wages in countries like Argentina, Brazil, Chile, and Uruguay contributed to a rise in household income for those sectors of the population, which rely more extensively on low-skilled employment wages for their income, and thus reduced inequality (Lustig et al. 2011; Gasparini and Lustig, 2011). Moreover, Gasparini and Cruces (2010) suggest that the resurgence of labor unions in countries like Argentina overlap with the recent period of decreasing inequality.

Supply Side Factors

Reductions in the relative wages of skilled workers in the region are seen by some as the outcome of an increase in the supply of this type of worker. In the context of a region that has traditionally been assumed to be relatively deprived in terms of skilled labor, the apparent success in promoting human capital has had an equalizing effect in terms of the skill premium and of inequality in general. The relative reduction of low skilled workers has been associated with the expansion of basic education, which in turn, has been linked to the shift of public expenditure from the tertiary to primary education experienced in the 1990s (Lustig et al., 2011; Esquivel et al. 2010). Others suggest that the increase in the supply of experienced and educated workers was the main determinant in the fall of the skill premium (Azevedo et al., 2012). Moreover, some authors indicate that the adoption of cash transfers conditioned to school attainment might have also supported this trend by lowering the opportunity cost of sending children to school; this might be especially relevant in the case of Brazil and Mexico (Lustig et al. (2013), Esquivel et al. (2010)).

In a context of limited resources, expansion of higher education can come at the expense of the quality of this education. Frankema (2009) finds that in the Latin American case this is indeed what has occurred. Moreover, this conclusion is further supported by the recent PISA examinations, which highlight the relative poor performance of Latin American students with respect to the world average. This leads Hanushek and Woessmann (2009) to conclude that policies to increase government investments (between 1960 and 2000) in human capital in Latin America have failed to improve outcomes in terms of quality. This argument is in line with those who argue that the decline in the skill premium in recent years is due to the decline in the *quality* of education, which in turn lowers the relative contribution of skilled labor to the production process, and thus its wages (see Castro and Yamada (2012) and Lustig et al. (2013)).

An alternative supply-side explanation for the reduction in the relative wages of skilled workers is proposed by Ocampo and Vallejo (2012). As birth rates have declined in the region— along with the rate of demographic dependence— smaller households are able to better direct resources towards the educational training of their youth. Similarly, smaller cohorts entering primary education, has freed up resources to be invested in secondary education by Latin American

governments. These two effects have consequently increased the relative supply of skilled workers.

Demand-Side Factors

Recent reductions in the skill premium must also be understood from the context of the changing export structure of the countries in the region since the early 2000s. As the products that are exported change, so does the relative skill profile of those employed domestically. Moreover, favorable trade conditions tend to have positive effects on the economy that go beyond direct employment creation.

There are competing views on the effect of the expansion of natural resources industries on the economy. Some argue that the exploitation of natural resources follows an "enclave" model which is skilled and capital intensive and have few links to the domestic economy (Baran 1957, and more recently Rodrik 2013). Following this argument, an increase in natural resources exploitation would not have any long-term effect on economic growth, and instead negatively affect equality. This is in line with the 'resource curse' hypothesis advanced by some in the literature (e.g. Sachs and Warner 1995; Auty 2002).

However, and as argued in the World Bank's 2014 World Trade Report, it is not clear that the curse of commodities can be generalized for all countries in all periods. For instance, Aragon and Rud (2013) using a general equilibrium model for Peru show that gold mining has resulted in, at least short-term, improvements in living standards, primarily as a result of backward linkages— including to non-mining sectors of the economy. Similarly, a 2012 report by the Instituto Peruano de Economía (IPE 2012) found that for each job created in the mining sector in Peru, nine jobs were created elsewhere in the economy. Along the same lines, Costa et al. (2014) assesses the effects on different Brazilian regions of trade with China. They find that as trade relations with China intensify, Brazilian regions that produce exports destined to China (mainly basic commodities) experienced favorable conditions in terms of higher wages, lower reliance on social safety nets, and improved working conditions. This is not to say that the resource curse has been entirely overcome. In fact, it is important to keep in mind the failures of the past to ensure that the gains made in reducing inequality can be sustained in the long-run.

Other demand-side explanations have been offered in the cases of Argentina and Mexico. Gasparini and Cruces (2010) suggest that the fall in labor income inequality experienced after the Argentinian crisis in 2002 was influenced by the increasing demand of low-skilled labor due to an expansion of labor-intensive production sectors, which was in turn influenced by the devaluation of the Argentinian peso. Esquivel et al. (2010) cites the expansion of low skilled labor-intensive *maquiladoras* in the context of NAFTA as a factor accounting for the decrease in the skill premium in Mexico. In a later work, Gasparini et al. (2011) found that for most countries in the region reduced demand is particularly important for explaining the decrease in skill premium for high skilled workers (tertiary education complete/incomplete).

2.2.2 The Skill Premium in the Context of the latest Commodities Super Cycle

Given the improving trade conditions for commodity exporters, and the consequences that they have for the relative demand of unskilled labor and the skill premium, as seen above, it is important to explore what the literature has to say with relation to the origins of the improved terms of trade.

The identification of these origins is imperative for understanding how sustainable favorable trade conditions are, and how likely are the recent gains in inequality reduction in Latin America to prevail in the future.

Some in the literature have classified the recent spike in most global commodity prices as the rise of a "super-cycle" (see for example Erten and Ocampo, 2013; Heap, 2005). Unlike the traditional conceptualization of commodity price booms and busts, super-cycles are defined as unusual long term deviations from the mean in the price of commodities. The upward portion of a super-cycle is thought to last a decade or more, and is mostly associated with a spur in industrialization in a large economy. Growing demand for commodities by such an economy results in higher world prices as the supply side is unable to readily adjust to the higher demand.

There are different hypotheses to explain the origin of this latest super-cycle. The most widely accepted argument claims that the recent long-term growth in the global price of commodities can be mainly traced back to astounding economic growth in large developing nations like China, India, and Russia (Helbling 2012, Heap 2005, among others). These economies, which in the process of building their infrastructure and urbanizing, are seen as driving the increases in global demand for commodities associated with capital formation like metals and energy. Moreover, as argued by Radetzki (2006) and others, the recent economic growth of some of these major economies goes beyond regular cyclical fluctuations, and thus continues to drive an extended expansion in global commodity prices. An alternative argument advanced in the literature with regards to increases in global demand for commodities deals with the role of speculative activities made possible by financial innovations in the commodities future markets. For instance, Hamilton (2009) and Pollin and Heintz (2011) find speculation to have played a significant role in the increase of oil prices during the 2007-2008, and the 2010-2011 surges, respectively.

Aside from demand-side considerations, supply shocks are seen by some as contributors to growing commodity prices. Dobbs et al. (2013) propose that the recent rise in commodity prices is partly the result of the higher costs associated with tapping into new commodity sources, as is the case with offshore oil. Growing production costs and increasingly inelastic supply of commodities are argued to be contributing not just to higher prices, but also to growing volatility of these prices. Stockholding behavior by producers in the face of growing prices, weather-related disruptions, and distorting protectionist policies are also argued to have led to commodity shortages and higher prices (Carter et al., 2011).

The origins of the last commodity super-cycle also hint at the ephemeral nature of the recent favorable trade conditions. Aside from the unsustainability of relying on non-renewable natural resources, our data from Figure 2 suggest that the expansionary portion of the latest super-cycle already came to an end in mid-2014. This is of further concern in light of the findings by Erten and Ocampo (2013), which suggest that despite these occasional favorable developments in the terms of trade for developing countries, the Prebisch-Singer Hypothesis still applies in the long run (Prebisch 1949, Singer 1950).

III. Methodology

In order to test the direct and indirect contributions that variations in the terms of trade have on inequality, data was collected for eighteen economies in the region for the 1995-2012 period. Least square regressions with sectional and time fixed effects were carried out for our unbalanced panel. The introduction of fixed effects allows us to account for unobservable differences among the sample countries, and across time.

Our dependent variable, the Gini Index, captures inequality in terms of household or individual income, and is based on estimates from the World Bank, which in turn rely mostly on primary household survey data. These surveys are not conducted on an annual basis, and thus limit the availability of consistent observations across time.

In line with our hypothesis, the basic model, Model 1, includes measures of the terms of trade, the dependency rate, the real interest rate, the minimum wage, the informal sector, and the real economic growth rate as explanatory variables. Additionally, and in order to test the robustness of our model, we rely on the labor Gini, as an alternative specification of our dependent variable. The labor Gini is a measure of inequality in terms of wages and earnings alone, and data for it was obtained from SEDLAC.

The terms of trade variable accounts for a country's net barter terms of trade, expressed as the ratio between export unit value and import unit value indices. The terms of trade index uses the year 2000 as its base year, and is obtained from the World Bank. As argued throughout this paper, it is expected that improvements in a country's terms of trade are associated with reductions in the Gini index. Improving trade conditions, especially higher global prices for the commodities exported by countries in our sample, should result in expanded domestic production of these commodities. Therefore, an improved outlook in terms of production of labor-intensive commodities should also lead to higher labor-income for previously unemployed or underemployed sectors of the population. Moreover, larger government revenues associated with improved terms of trade can result in greater resources being directed towards social spending, including social welfare programs aimed at supplementing the income of individuals in the bottom of the distribution scale. For these reasons, it is expected that the relationship between terms of trade and income inequality be negative.

Aside from accounting for the effects of terms of trade on within country income inequality (*TOT*), our base model also controls for five other variables, which are expected to have significant effects on income distribution. The control variables included are the dependency rate (*Dependency*), the real interest rate (*RIR*), an index of the prevailing domestic minimum wage (*Minwage*), the share of workers in the informal sector of the economy (*informal*), and the per capital real GDP growth rate (*GDPgrowth*). Thus, our basic econometric model specification (Model 1) is such that:

Income Gini$_{i,t}$ = β_0 + β_1TOT$_{i,t}$ + β_2Dependency$_{i,t}$ + β_3RIR$_{i,t}$ + β_4Minwage$_{i,t}$ + β_5Informality$_{i,t}$ + β_6GDPgrowth$_{i,t}$ + μ_t

In order to account for demographic factors that might contribute to inequality, we consider the dependency ratio, which is measured as household size over the number of income earners in the household. Given that households in the bottom of the income distribution tend to have a larger number of dependents, it is expected that the greater the level of dependency that prevails, the less

unequal the distribution of income in a country will be. This in line, as explained above, with the existing literature that suggests that smaller households are better positioned to direct limited resources towards investments in the human capital of its members, and thus reduce disparities in education and health access.

In addition to the significant changes in trade-related patterns in the region and beyond, Latin American countries have also experienced important changes in their financial sectors. Some in the literature have argued that greater access to credit is likely to reduce inequality (e.g. Beck et al. 2007). To control for the importance of this financial channel, we use the real interest rate, which consists of the lending rate adjusted for inflation using the GDP deflator. Real interest rate data was collected from the World Bank. The assumption here is that lower real interest rates are bound to 'democratize' access to credit, and in turn allow households with limited levels of wealth accumulation to invest in productive projects and/or their members' own human capital. Based on this, our expectation for the relationship between the real interest rate and the level of within country inequality is a direct one, such that higher interest rates should be associated with higher values of the Gini index.

In light of the prevalent labor market segmentation in the region, we consider the role that labor informality plays in relation to inequality. Labor informality is measured as the sum of all salaried workers in small enterprises, non-professional self-employed, and zero-income workers, as the share of all those employed. Higher levels of labor informality are expected to be associated with higher Gini index values, given the relatively low wages and poor-working conditions associated with this sector of the labor market. Along the same lines, and given that the poor tend to benefit disproportionately from higher minimum wages, we expect that higher minimum wages should contribute to a better distribution of national income. The minimum wage measured in our models consists of an annual index (using the year 2000 as the base) of nominal wages deflated using each country's Consumer Price Index. Both our data for informality and the minimum wage are based on data provided by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC).

Finally, our basic model controls for a country's overall economic performance by tracking the annual growth rate of real gross domestic product per capita, using constant 2005 US dollars. This data comes from the World Bank's National Accounts dataset. As illustrated by the existing literature, the relationship between economic growth and inequality is not a straightforward one. The type of growth that takes place is critical for determining the direction of the effect of growth on inequality. Economic growth that is biased towards capital and skill-intensive activities is likely to prove un-equalizing. On the other hand, pro-poor economic growth could lead to a compression of the income scale. For this reason, our expectation in terms of the sign of the economic growth-inequality relationship is indeterminate.

The history of most modern Latin American economies has been largely influenced by the remnants of enclave systems, which emphasized an extractive mode of production. One of the results of this economic structure is the over-reliance by countries in the region on a few primary commodities. This exposes them to what has been usually referred in the literature as the 'resource curse' in which countries perform remarkably well when the global prices of their commodities increase, but face deep economic contractions when these prices drop. In order to account for the potential effect of over-reliance on a particular set of exports, we use data for the export concentration index developed by the United Nations Conference on Trade and Development

(UNCTAD). This index is based on a traditional Herfindahl-Hirschman methodology to measure the level of homogeneity in the export structure of each country relative to that of the world economy. We use this index (Exports HHI) in Model 2 to expand our original model and account for the effects of export concentration. As with the relationship between economic growth and inequality, the relationship between export concentration and inequality is complex. If a country's exports become more homogeneous due to rising prices for a particular commodity and this commodity extensively uses unskilled labor, we argue that one should expect the relationship to be negative. However, if instead, the commodity in which a country concentrates tends to favor the use of capital and high-skill labor, we could expect this relationship to be positive. Thus, our sign expectation for the export concentration index is also indeterminate.

Moreover, and to account for the intricacies of the relationship between export concentration and income inequality, we divide the countries used in our sample into three categories: Low, Medium, and High export concentration. This categorization was done based on each country's average export concentration index for the 1995-2014-period.[6] Using data for each of these three country groupings, we replicated our original basic model to identify how a country's terms of trade, along with our other control variables affect the level of income inequality of a country with different export structures.

IV. Results

Table 4.1 below presents our regression results. As seen in this table, our theoretical expectations in terms of the sign for our main variable of interest and all control variables are supported by our empirical analysis. However, two of our variables do not appear to significantly affect a country's level of inequality, as measured by the Income Gini Index: the real interest rate, and per capita real GDP growth rate. Of all the variables considered in our model only the export concentration index (Export HHI) required corrections for non-stationarity, which were addressed by taking first differences.[7]

These annual data from the eighteen largest Latin American economies encompasses the 1995-2012 period, and thus captures most of the recent boom in commodity prices[8]. As argued by others in the literature (for example Pavcnik 2011), data on inequality is notoriously inconsistent for developing countries, as it mostly originates from national surveys which are not conducted every year, and which vary their area of coverage over time. The lack of consistent data for our dependent variable causes our panel to be unbalanced.

With that in mind, our empirical results do consistently suggest that improvements in the terms of trade of a country appear to be associated with a decline in the levels of inequality of that country. Using the labor Gini as an alternative dependent variable retains the statistical

---

[6] Low concentration countries are those with an index of less than 0.2. Medium concentration countries had indices ranging between 0.2 and 0.3. High concentration countries were those with an index of 0.3 or higher. For specific country listings, please refer to Table 5 below.

[7] See Appendix 1 for Fisher Test Results.

[8] The countries considered in our analysis include Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

significance, sign, and general size of the estimate for terms of trade. In models 1 through 3, a one unit increase in the terms of trade index appears to be associated with approximately a 0.04 *decrease* in the Gini index. It is also important to note the consistent statistical significance of the coefficients for two key labor market variables: the minimum wage index and the prevalence of the informal sector. Our empirical results suggest that one unit increase in the minimum wage index is associated with a 0.01 point decrease in the Gini index. In the case of the share of workers employed in the informal sector, it appears that other things held constant, a one percentage point increase in this ratio is related to approximately a 0.24 point increase in our measure of income inequality.

Table 4.1 Panel Least Squares with Fixed Effects

(Dependent Variable)	Expected Sign	Model 1 (Income Gini)	Model 2 (Income Gini)	Model 3 (Labor Gini)
Terms of Trade	-	-0.039***	-0.043***	-0.045***
		(0.01)	(0.01)	(0.008)
Dependency Rate	+	2.738**	3.462***	-0.479
		(1.254)	(1.315)	(0.995)
Real Interest Rate	+	0.003	0.003	0.014
		(0.02)	(0.02)	(0.016)
Minimum Wage	-	-0.011*	-0.012**	-0.012**
		(0.006)	(0.006)	(0.005)
Informality	+	0.24***	0.218***	0.271***
		(0.077)	(0.083)	(0.065)
GDP Growth Rate	+/-	0.019	0.009	0.028
		(0.059)	(0.059)	(0.047)
D(Exports HHI)	+/-	—	7.873*	11.318***
			(4.668)	(3.641)
C		37.466***	37.593***	42.387***
		(5.76)	(6.07)	(4.565)
Adjusted R^2		0.772	0.777	0.863
N		192	185	183
Periods		1995-2012	1996-2012	1996-2012
Cross Sections		18	18	17[a]

Note: *** ∝ = 1% , ** ∝ = 5% , * ∝ = 10%
Standard error expressed in parentheses.
a. Sufficient Labor Gini data for El Salvador is not available, and thus excluded from the analysis associated with this version of the model.

Finally, it is important to note that in both models 2 and 3, the coefficient of the change in the export concentration index (*d(exhhi)*) is statistically significant and positive. At first sight, this appears to suggest that for the countries and years included in our sample, increases in a country's export concentration are associated with important increases in its level of inequality. However, and in light of the nuances described in the previous section of this paper, it is useful to delve deeper into this relationship. Table 4.2 presents our econometric results for the three country

groups outlined in our Methodology section, and which are based on the degree of export reliance of these countries. By separating our panel in this manner, some important differences emerge.

Terms of trade seems to only play a role in the reduction of inequality in medium and highly export concentrated countries. The terms of trade coefficient is not significant for countries with relatively low concentration of their exports. For these countries, however, it is other factors such as increases in the minimum wage, and reductions in the informality and dependency rates, which are seen as contributing to lower levels of the income Gini index. This finding is not surprising, given the realities of the last few years, as with less concentration in commodities with rising prices, the terms of trade effect is not as acute.

Table 4.2 Panel Least Squares with Fixed Effects
(Exports HHI Subgroups)

Dependent Variable: Income Gini	Low HHI	Medium HHI	High HHI
Terms of Trade	-0.01	-0.062**	-0.043**
	(0.033)	(0.026)	(0.017)
Dependency Rate	3.836*	4.223*	0.45
	(2.198)	(2.273)	(5.342)
Real Interest Rate	-0.019	0.086	0.024
	(0.023)	(0.086)	(0.042)
Minimum Wage	-0.026***	0.023	-0.063
	(0.007)	(0.022)	(0.049)
Informality	0.292**	-0.146	0.301*
	(0.126)	(0.203)	(0.163)
GDP Growth Rate	0.003	-0.202	0.114
	(0.093)	(0.187)	(0.096)
C	33.314***	54.017***	44.687**
	(7.7)	(13.307)	(20.456)
Adjusted R^2	0.922	0.718	0.694
N	53	73	66
Periods	1995-2012	1995-2012	1995-2012
Cross Sections	5	7	6

Note: *** $\propto = 1\%$, ** $\propto = 5\%$, * $\propto = 10\%$
Low HHI: Brazil, Mexico, Argentina, Guatemala, and Uruguay.
Medium HHI: Dominican Republic, Panama, Nicaragua, El Salvador, Peru, Honduras, and Colombia.
High HHI: Costa Rica, Chile, Bolivia, Paraguay, Ecuador, and Venezuela.

If improving terms of trade have played a role in the recent reduction of inequality in the region, the next logical question to ask is "How long can this decline in inequality last?" A reversal in the gains in the regional terms of trade could thus threaten the progress that has been made over the last decade in relation to inequality. Table 4.3 presents data on price instability and the price trends of selected commodities that tend to be among the main exports of the countries in the region. This data suggests two similar patterns for most of the commodities considered. First, price instability for commodities has declined in recent years (relative the 1983-1992 period), but the

downward trend was reversed during the last 5-year period considered. Similarly, the price trends for commodities reversed course in the 2000s, when the price trend became positive. However, if we once again we consider only the last five years, the trend is still positive but becoming smaller. Both of these trends point towards what appears to be the end of the latest commodities "super cycle", and raises concerns about its implications for the sustainability of the decline in inequality in Latin America.

Table 4.3. Global Price Instability and Trends for selected commodities

Item	1983-1992		1993-2002		2003-2012		2008-2012	
	Price Instability	Price Trend (Constant Dollars)	Price Instability	Price Trend (Constant Dollars)	Price Instability	Price Trend (Constant Dollars)	Price Instability	Price Trend (Constant Dollars)
ALL COMMODITIES	9.63	-3.02	8.58	-3.09	10.86	8.31	10.87	3.83
Food	11.11	-2.32	8.79	-3.07	7.46	8.15	6.90	3.16
Maize	14.35	-6.35	13.46	-2.76	15.78	9.41	16.89	9.23
Tropical beverages	10.99	-14.00	21.09	-4.61	8.45	7.73	10.54	5.54
Vegetable oilseeds and oils	17.49	-8.08	16.07	-3.98	15.53	7.17	17.18	3.33
Soybean oil	17.95	-7.63	15.75	-4.61	15.41	7.09	17.28	2.22
Agricultural raw materials	6.17	-1.95	8.64	-3.81	9.90	6.17	15.34	6.05
Minerals, ores and metals	14.99	-0.07	10.11	-1.99	21.65	9.98	16.85	4.13
Iron ore	7.50	-2.77	3.38	0.87	19.28	16.71	19.37	7.71
Copper	17.30	2.95	14.10	-4.72	25.94	11.51	18.39	7.18
Gold	9.36	-5.17	7.53	-3.63	6.08	15.04	6.60	15.98
Crude petroleum	20.07	-9.32	15.26	5.63	18.48	9.56	19.08	5.96

Source: UNCTADStat

V. Case Studies

The results of the econometric analysis show that the level of export concentration determines the impact of the terms of trade on income inequality. In the model we have used fixed effects in order to control for cross-country heterogeneity. The purpose of this section is to deepen our understanding between the trade patterns and the decline in income inequality within the Latin American region. Therefore, we have selected representative case studies for different degrees of export concentrations and carried out in-depth analysis.

As previously noted, the case study selection is based on the level of export concentration of each country. According to the average concentration index between 1995 and 2014 we have grouped the countries of our sample into three clusters: low, medium and high export concentration. Table 6 shows the different export concentration index averages and the decline in income inequality as measured by the income Gini index (2000=100). We choose two representative countries for each of these groups to provide a more extensive qualitative analysis of the determinants of income inequality suggested by our empirical models. Our case study countries are Argentina and Brazil for the low export concentration group, Colombia and Peru for the medium export concentration group, and Bolivia and Ecuador for the high concentration export group.

Table 5.1 Country Groupings by Export Concentration Index

		Average Concentration Index (1995-2014)		% Change in Gini Index (1995-2012)*	
Low Concentration Index		Brazil	0.11	Brazil	-11.6%
		Mexico	0.14	Argentina	-10.9%
		Argentina	0.15	Guatemala	-6.2%
		Guatemala	0.17	Uruguay	-1.9%
		Uruguay	0.19	Mexico	-1.0%
Medium Concentration Index		Dominican Republic	0.20	Peru	-19.4%
		Panama	0.20	El Salvador	-16.2%
		Nicaragua	0.21	Panama	-10.2%
		El Salvador	0.22	Colombia	-6.0%
		Peru	0.24	Dominican Republic	-3.7%
		Honduras	0.26	Nicaragua	1.1%
		Colombia	0.28	Honduras	3.4%
High Concentration Index		Costa Rica	0.31	Bolivia	-19.8%
		Chile	0.32	Paraguay	-17.5%
		Bolivia	0.33	Ecuador	-8.6%
		Paraguay	0.35	Chile	-7.3%
		Ecuador	0.45	Venezuela	-5.2%
		Venezuela	0.63	Costa Rica	6.3%

* ARG, CHI, GUA, HON changes from 1995 to 2011, for NIC from 1995 to 2009 and for VEN from 1995 to 2006.
Source: Own calculations based on data from UNCTAD and World Bank.

5.1 Low Concentration Index Countries (Argentina and Brazil)

The results of the econometric model suggest that while the terms of trade is not a significant determinant for inequality in countries with a low export concentration index, changes in the dependency, and informality rates, as well as the minimum wage might be the main contributors to the recent decline in inequality for this type of countries, including Argentina and Brazil.

Our econometric model for this sub-group of countries suggests that the relationship between the dependency rate and inequality is positive. Thus, we interpret the reduction of income inequality in Argentina and Brazil during the 2000s as partially a consequence of a declining dependency rate. We argue that lower dependency rates allow for the reallocation of limited resources in the households towards fewer members to increase investment in human capital, and thus higher incomes for the household. Moreover, we hypothesize that decreases in the dependency rate also affect inequality through the freeing up of adult members of the household, who are now able to move from household work to paid work. This is likely to have a disproportionate effect on low income households, which typically do not have the luxury of home assistance. Thus, larger

total household income from work is bound to reduce inequality. If this is the case, we should expect dropping dependency rates in these countries to be associated with greater labor force participation rates. In the following graph we show the evolution of the dependency rate measured as the household size over the number of income earners and the share of adults in the labor force over the last three decades for Argentina and Brazil. As expected, we can observe that these two variables are indeed trending in opposite directions over time, especially during the 2000s. However, as pointed out by Cornea (2014) a declining dependency rate is not a new phenomenon, as this rate also decreased in the1980s and 1990s—a period of increasing income inequality in the region.

Figure 5.1: Labor Force Participation and Dependency Rate
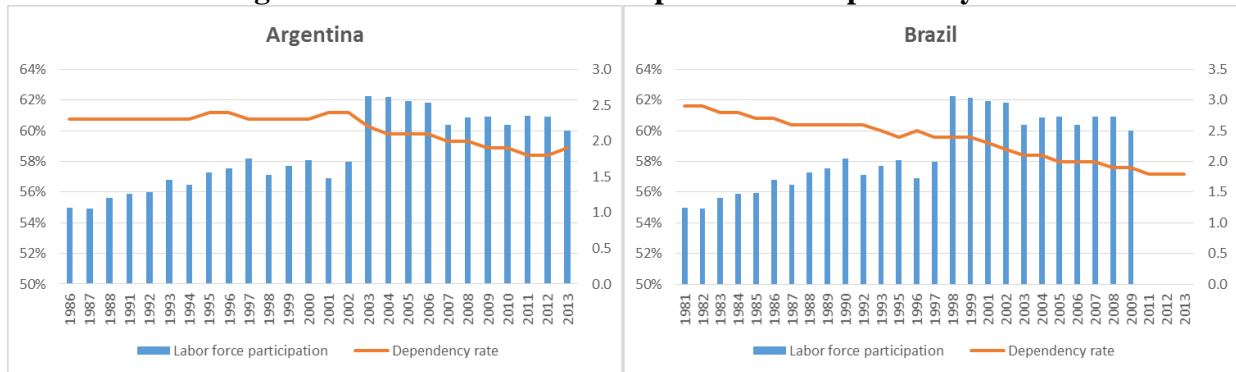
Source: SEDLAC

To better assess the potential linkage between the dependency rate and income inequality, it is important to distinguish how each sector of the income scale has been affected by these changes. Figures 5.2 show the evolution of the dependency rate for each of the five income quintiles in Argentina and Brazil. As shown on the graph for Argentina, when one decomposes the dependency rate by quintile, it is clear that the recent reduction in this rate has been particularly important for the bottom 40% of the population. While all households appear to be getting smaller, it is those households with relative lower incomes which have faced the greatest reductions. In the Brazilian case, all quintiles have been similarly affected by reductions in the dependency rate.

Figure 5.2: Dependency Rate by Income Quintile

Source: SEDLAC

20
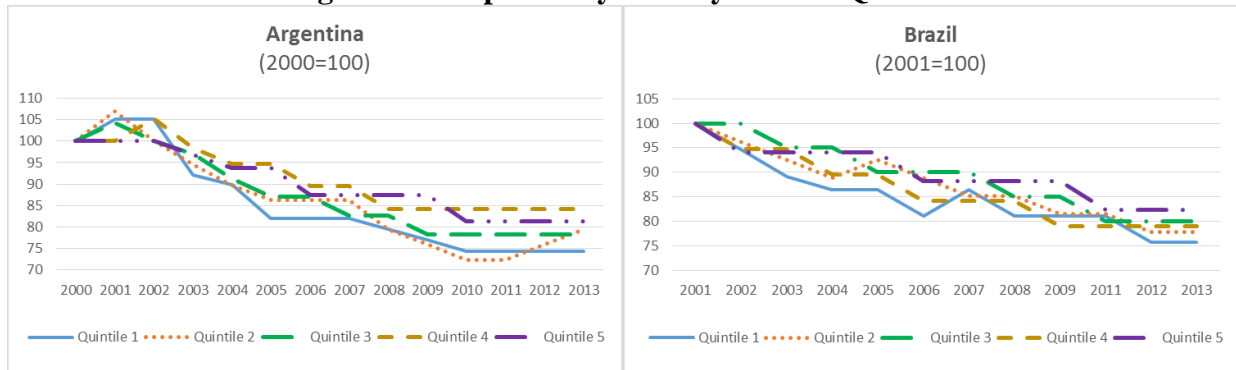
Another significant determinant of inequality found in our model for countries with low export concentration index is the share of the labor force that is employed in the informal sector. Once again, we define informal workers as those who are employed in a small firm (less than 5 workers), non-professional self-employed workers, or zero-income workers. These individuals who engage in precarious work tend to participate in sectors with low levels of productivity and low unionization rates, and consequently earn low incomes and are disproportionately vulnerable to unemployment and poverty associated with the business cycle. Our results show a positive relationship between the level of informality and inequality. For both Argentina and Brazil we observe an overall decline in the share of the informal sector over the last couple of decades, which were briefly interrupted by their respective periods of financial crisis (i.e. 1997-1998 in Brazil and 2001-2002 in Argentina.) In the Brazilian case, for example, the government has actively promoted labor formalization by implementing tax reduction schemes like the Simples Law (introduced in 1996) and more recently the Bem Mais Simples program. Aside from providing more progressive tax terms to small and medium enterprises, the Simples Law also aims to reduce the bureaucratic burden associated with the formalization process, while also educating workers in these enterprises about their legal rights.

**Figure 5.3: Informality as a Share of Total Employment**
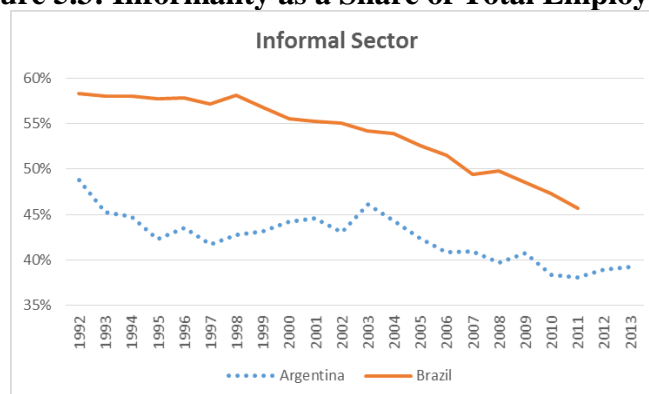
Note: Data for years 1994, 1999, 2009 for Brazil was imputed due to missing values.
Source: SEDLAC

As mentioned in the literature review, several authors point to the significant pro-worker labor policies implemented in recent decades by left of center governments in the region. One of these changes involves the increase in the prevailing minimum wage. Our empirical analysis also identifies a role for the level of minimum wage in the determination of the inequality level in our subset of low export concentration countries. The graph below presents the evolution of the real minimum wage over the last two decades. Argentina has moved away from the labor market flexibility policies that characterized the neoliberal agenda of the 1990s. As a result, it has also experienced a large increase in the real minimum wage during the 2000s, which is bound to predominantly benefit low-skill workers. In fact, starting in 2003 the Argentinean government began unilaterally, and without direct consent from the business sector, implementing minimum wage increases. To a lesser degree, the governments of Luiz Inázio Lula da Silva and Dilma Rousseff managed to raise the minimum wage in Brazil. In 2006, the country implemented a formula for annual adjustments in the minimum wage according to the inflation level and the GDP per capita growth rates of the previous two years. This ensures that workers through their real

wages (and recipients social benefits tied to the minimum wage), share in the prosperity of the country. Along with the aforementioned decrease in informality of labor markets in these countries, rising minimum wages imply that more workers are covered by these regulations. The outcome is even greater if one considers, as some in the literature do, the "lighthouse" and the "ripple" effects of the minimum wage on the wages of the informal sector and near-minimum wage workers.

Figure 5.4: Real Minimum Wage Index (2000=100)
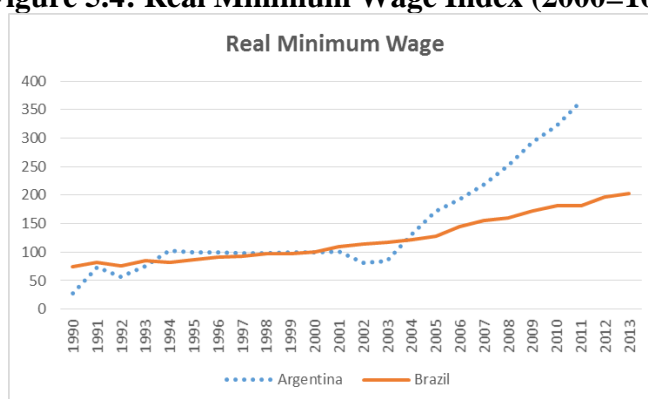
Source: CEPALSTAT

5.2 Medium Export Concentration Countries (Colombia and Peru)

Our econometric results in Table 6 suggest that for the medium export concentration countries, changes in the terms of trade are negatively associated with changes in income inequality. Therefore, and as argued in this paper, it is important to probe the channels through which this relationship might work. The first channel through which terms of trade are conducive to lower inequality has to do with changes in the productive structure and relative labor demand within each country. Second, we suggest that improvements in the terms of trade tend to reduce inequality through expansions in a country's government revenue, and thus makes it possible (although not certain) to increase government social spending. If this social spending tends to target primarily those at the bottom and middle of the income scale, it can prove to be equalizing.

Rising global commodity prices since the early 2000s were accompanied by a notable reconfiguration of the export profiles of countries in the region. Table 5.2 captures the change in export composition by major subgroups for Colombia and Peru. It shows how changes in the terms of trade have transformed the export structure of both countries. Colombia and Peru experienced a significant increase in the share of total exports made up by fuels relative to 1995. A similar trend is observed in the case of the ores and metals subgroup in the Peruvian case. The growing importance of these two subgroups for exports contrasts with the lower shares of traditional subgroups like agricultural raw materials and food products. Moreover, the dramatic increase in the share of fuel exports in Colombia (from 27.2% of total exports in 1995 to 65.6% in 2014) meant a much less central role for manufactured goods, which saw its share of the total decreased from 29.8% in 1995 to 16.9% in 2014. Peru also experienced, albeit a milder, process of relative 'de-manufacturing' of exports during this period. The reorientation of domestic production to match the changing demand for exports, supported by improving global price conditions, is also evident at the product level (See Appendix 2).

Table 5.2: Export Composition by Major Categories (as % of Total Exports)

Country	Year	Food Products	Agricultural Raw Materials	Fuels	Ores, Metals, Precious Stones	Manufactured Goods
Colombia	1995	30.80%	5.40%	27.20%	6.80%	29.80%
	2012	8.70%	2.30%	65.70%	6.90%	16.30%
	2014	10.60%	2.80%	65.60%	4.10%	16.90%
Peru	1995	28.80%	2.50%	4.90%	50.20%	13.60%
	2012	18.60%	1.10%	12.90%	55.10%	12.30%
	2014	20.20%	1.20%	12.40%	53.70%	12.50%

Source: Authors' calculations based on UNCTADStat

The changes in the export structure of these economies have also become evident in the domestic labor market conditions. In 2013, the manufacturing sector employed 11.1% and 10.1% of all employees, respectively. These figures represent a slight decrease from 1999 when 12.5% of Colombian workers were employed in manufacturing. In the case of Peru, the share of employment remained unchanged relative to 1997. Moreover, the mining sector in both countries has grown over this period. Mining accounted for 0.6% of all employees in 1999 in Colombia and 0.7% in 1997 in Peru, and increased to 1.1% and 1.2%, respectively, by 2013 (CEPALSTAT 2015) This is suggestive of a mild process of de-manufacturing in the labor markets as well, and thus an apparent reversal of skill-biased production that prevailed in the 1990s. This is especially true, if as some literature have found, the mining sector's effect on domestic labor markets is mostly through *indirect* employment generation in sectors like Services and Transportation, which have gained a large share of the total in recent years. Table 5.3 illustrates the changes in the wage differentials of male workers aged 25-65 with different levels of education from 2002 to 2012. Low-skilled workers are those with less than 9 years of formal education, medium-skilled workers are those with 9 to 13 years of education, and high-skilled workers are those with more than 13 years of educational attainment. We can see that the greatest relative reversal in terms of wage premium has been for the low-skill section of the labor force, which again is suggestive of increasing relative demand for this type of workers.

Table 5.3: Change (in percentage) of hourly wages ratios of workers with different education levels from 2000 to 2012

Country	High/Low		High/Medium		Medium/Low	
	2000	2012	2000	2012	2000	2012
Colombia	4.8	4.11	2.9	2.73	1.7	1.51
% Change	*-14%*		*-5%*		*-10%*	
Peru	3.26	2.13	2.0	1.75	1.6	1.22
% Change	*-35%*		*-12%*		*-26%*	

Source: Authors' calculations based on SEDLAC database.

Figure 5.5 shows the evolution of the terms of trade and government tax revenue as a share of GDP for Colombia and Peru. As seen on this graph, both countries have experienced similar trends in these two indicators. Terms of trade have improved significantly in recent years. For the case of Peru this come as a partial recovery from a large drop in the early 1980s and stagnating levels in the 1990s. Moreover, we can see that government tax revenues in both countries have increased significantly as well. While greater government tax collections cannot be entirely attributed to changes in the terms of trade—especially in light of active attempts to broaden the tax base since the 1990s—it can be argued that favorable trade conditions have coincided with rapidly growing levels of revenues in Colombia and Peru.

Figure 5.5: Evolution of the Terms of Trade and Tax Revenue
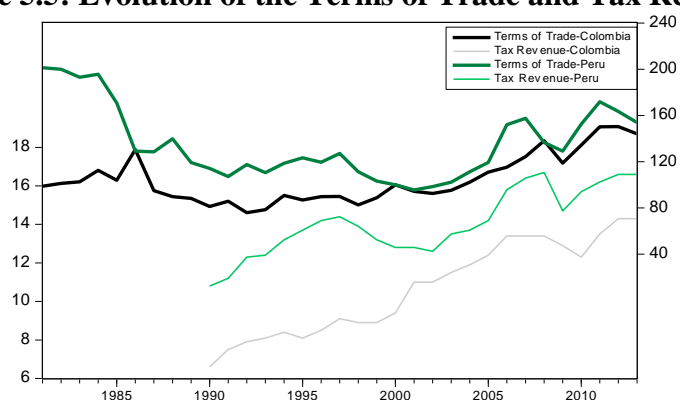
Note: The terms of trade values, measured on the right-axis, are based on an index where 2000=100.
The left-axis captures government revenue as a share of GDP.
Source: Authors' calculations based on World Bank and ECLAC.

As previously argued, greater government revenues are a necessary, but not sufficient, condition for using public policy to address poverty and inequality. Figure 5.6 below captures the degree to which these greater revenues have translated into greater government social spending. Here the picture is less clear. In the Colombian case, we do see a significant increase in the role played by the government in social programs, where it increased from 10.2% of GDP in 2000 to 13.1% in 2012. Peru has experienced a mild, and less constant, increase in its social expenditures by government. However, it is important to note that while social spending as a share of GDP in Peru has not increased as much, the level of social spending has gone up along with GDP. This suggests that in the Colombian case there has been an actual reallocation of government spending towards social goals, while in Peru resources have increased, but not proportionately. Moreover, in both countries social programs seem to target the poor more intensively. For example, According to the World Bank, in the year 2012, 34% and 29% of people in the bottom quintile for Colombia and Peru, respectively, were covered by conditional cash transfers from the government. In contrast, the coverage ratio for the overall population is only 18% in Colombia and 8% in Peru, which again highlights the emphasis of existing social programs on the poor.[9] These includes

---

[9] See World Bank's 'Atlas of Social Protection: Indicators of Resilience and Equity' database.

innovative conditional cash transfer schemes like Juntos in Peru, and Familias en Acción in Colombia.

Figure 5.6: Social Expenditure as a Percentage of GDP
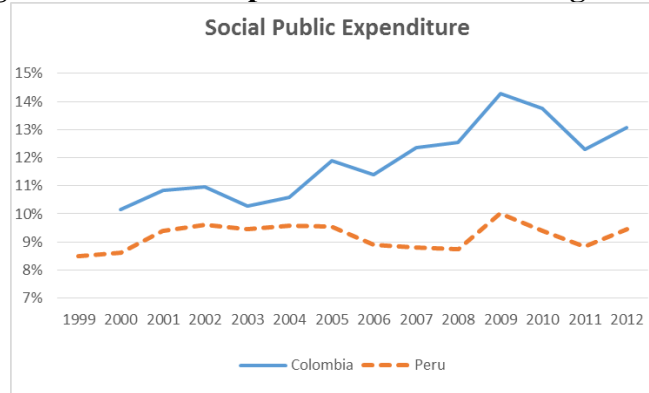
Source: CEPALSTAT

Beyond the factors that stem from terms of trade changes, our model for medium export concentration countries suggests the dependency rate as another factor associated with income inequality. Figure 5.7 shows the dependency and labor force participation rates for Colombia and Peru. As in the case of Argentina and Brazil discussed previously, there has been a decreasing trend of the dependency rate for both countries—with a more pronounced decline in Colombia. Concurrently, the labor force participation rate has generally increased relative to the beginning of the century in both countries.

**Figure 5.7: Labor Force Participation and Dependency Rate**
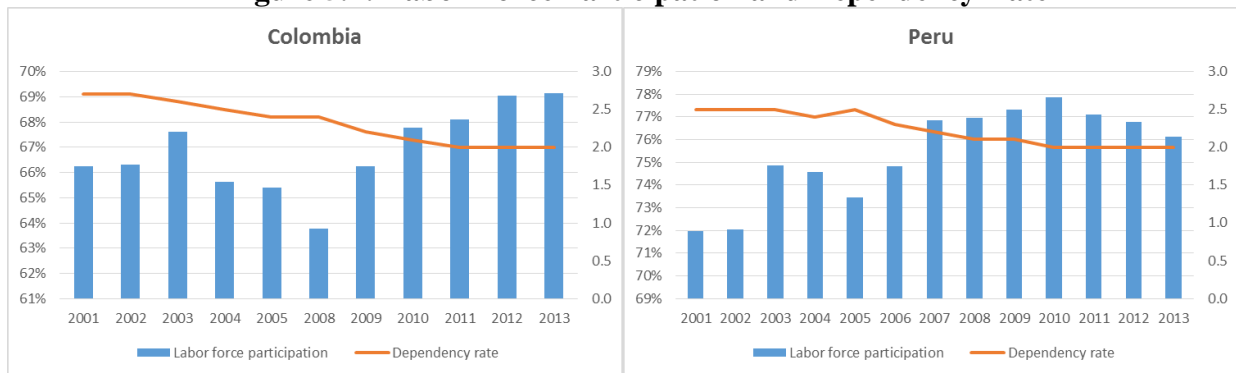
Source: SEDLAC

Looking at the changes in dependency rate by quintiles of the income distribution, Figure 5.8 reveals two different stories. On the one hand, we observe that Colombian households belonging to the three middle quintiles (i.e. 20-80%) have faced the largest reduction in the dependency rate. This suggests that demographic changes might have contributed to the expansion of the middle class in Colombia during the last decade. On the other hand, we observe that Peruvian households in the bottom 20% of the income distribution experienced the largest and fastest drop in the dependency rate since 2006. This indicates that the poorest households from the income

distribution might have been able to increase their budget due to the smaller number of dependents, and thus improved their chances of overcoming poverty—similarly to what was seen in Argentina.

Figure 5.8: Dependency Rate by Income Quintile
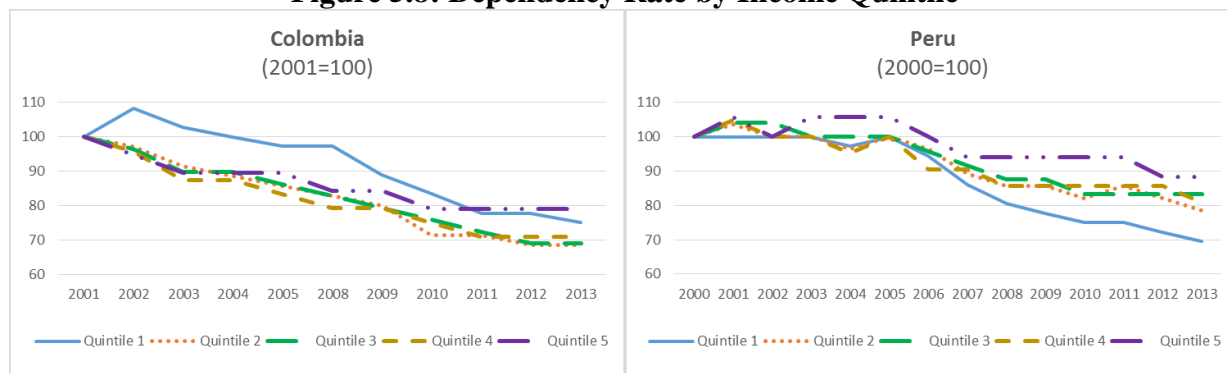
Source: SEDLAC

*5.3 High Concentration Index Countries (Bolivia and Ecuador)*

Finally, we consider the case of high export concentration countries by focusing on the experiences of Bolivia and Ecuador. Our econometric results for this sub-group of countries suggest that inequality in these countries is primarily associated with changes in the terms of trade, and the degree of labor informality. An exploration of country-level trends supports these relationships.

As with most countries in the region, the terms of trade for Bolivia and Ecuador have experienced three distinct phases since the 1980s. The 1980s in both countries were characterized by a significant deterioration in the terms of trade that coincided with the Lost Decade. The 1990s was a period of mostly stable terms of trade. Finally, starting in the first years of the century, Bolivia and Ecuador saw their terms of trade increase and partially recover in relation to the 1980s. This can largely be attributed to greater concentration in exports towards natural gas in Bolivia and oil in Ecuador, respectively. For instance, the world price of oil—a commodity that accounted for 53.3% of Ecuadorean exports in 2012—doubled from 2005 to 2012. The average world price of natural gas, a commodity which made up nearly half of all Bolivian exports in 2012, increased by 50.8% during the same period.[10]

Growing prices for the main export commodities in these highly concentrated countries contributed to rising government revenues. As seen on Figure 5.9, revenue collections as a percentage of GDP for Bolivia and Ecuador have been on an upward trend since 1990, and further solidified over the past decade. In light of healthy growth rates of GDP over the last decade, this implies significantly greater resources at the disposal of government in these countries. Compared to Ecuador, Bolivia has had and continues to have greater tax revenues.

---

[10] These figures are based on the authors' calculations using the International Monetary Fund's "Primary Commodity Prices" database. The world average price for natural gas is based on the average of the Russian Natural Gas border price in Germany, Indonesian Liquified Natural Gas in Japan, and the spot price at the Henry Hub terminal in Louisiana.

Figure 5.9: Evolution of the Terms of Trade and Tax Revenue
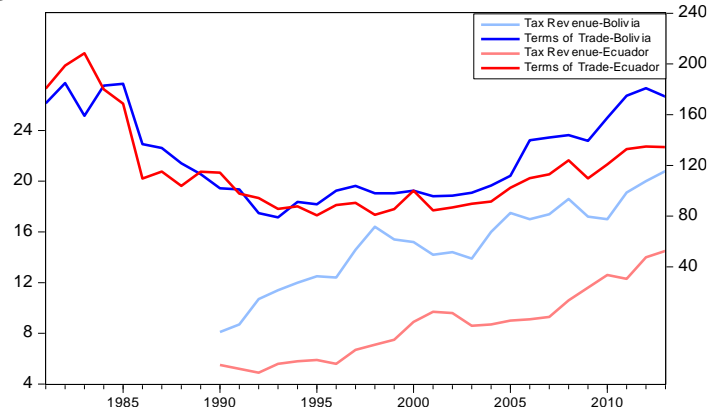
Note: The terms of trade values, measured on the right-axis, are based on an index where 2000=100.
The left-axis captures government revenue as a share of GDP.
Source: Authors' calculations based on World Bank and ECLAC.

Have these larger resources been used to target poverty and inequality in Bolivia and Ecuador? Here the experience of these countries is slightly different. Ecuador's social expenditure as a percentage of GDP increased considerably in recent years, going from 2.9% in 2000 to 8.3% in 2012—with roughly more than half of it going to educational spending. On the other hand, Bolivia's social expenditure as a share of GDP has remained mostly unchanged throughout this period. In both the years 2000 and 2012, the country spent 11.5% of its GDP in social programs. That being said, it is important to note that while social spending as a *share* of GDP has not changed by much, there have been significant gains in the *levels* of real social spending per capita. In the year 2000, the Bolivian government spent $111 per person in social spending. By 2012, the real social spending per capita was $149—a 34% increase, but still the lowest in the region.[11] We can then say that favorable trade and economic conditions have made it possible for the Bolivian government to increase social spending, but that this spending has not grown at the same rate as the rest of the economy.

**Figure 5.10: Social Expenditure as a Percentage of GDP**
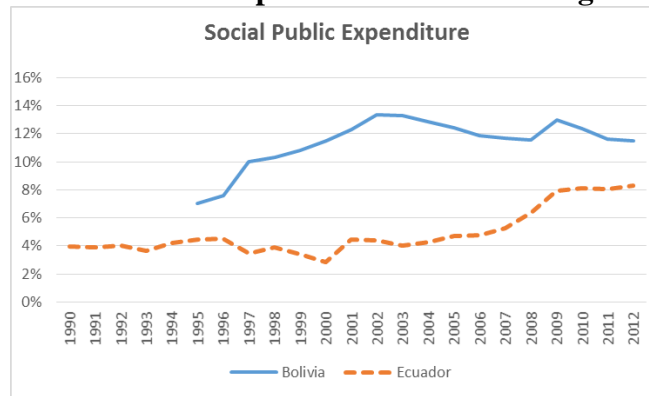
Source: CEPALSTAT

Some of this social spending has been directed toward education, which as the graph below shows has contributed to education inequality declining during the 2000s. However, we can observe different patterns within this decreasing trend. Within the period from 2000 to 2011,

---

[11] Based on data from CEPALSTAT

Ecuador experienced a steady improvement of the distribution of education, while Bolivia saw its Gini coefficient for education drop the fastest in the second half of the decade. This suggests that the improvement in education equality is a rather recent phenomenon. Democratization in access to education creates the potential for income equalization.

Figure 5.11: Gini Coefficient for Education
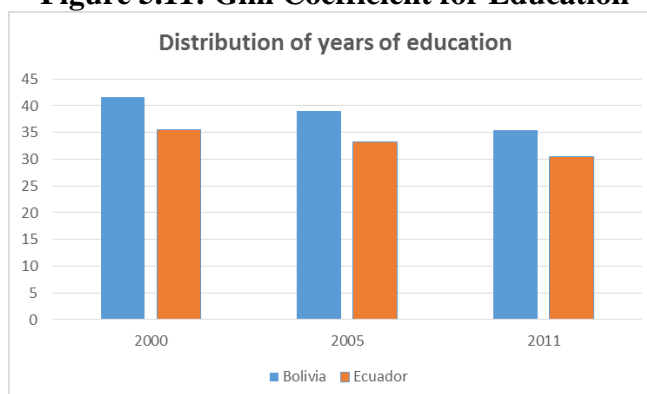
Source: SEDLAC

Countries with high exports concentration, like Bolivia and Ecuador, have also transformed their export structure as a result of the favorable trade conditions associated with the latest commodity boom. Table 5.4 illustrates these relative changes. Both Bolivia and Ecuador have shifted their exports dramatically towards fuels, and away from sectors like manufacturing. As of 2014, fuels account for more than half of all exports in both countries. However, it is important to note that the changes in Bolivia are particularly dramatic, and highlight the process of export concentration in fuels at the expense of sectors like agricultural raw materials (which has mostly disappeared), metals, and manufactured goods. Needless to say, this exposes Bolivia to the wild fluctuations in global oil prices that have prevailed in the last couple of years, and which are not yet reflected in the data currently available.

Table 5.4: Export Composition by Major Categories (as % of Total Exports)

Country	Year	Food Products	Agricultural Raw Materials	Fuels	Ores, Metals, Precious Stones	Manufactured Goods
Bolivia	1995	20%	13.40%	10.90%	40.10%	15.40%
	2011	13.8%	0.90%	46.90%	34.00%	4.30%
	2014	15%	0.40%	53.60%	27.20%	3.20%
Ecuador	1995	51.8%	3.00%	35.10%	2.50%	7.60%
	2011	29.80%	3.70%	57.80%	1.20%	7.50%
	2014	34.10%	3.80%	51.70%	4.70%	5.60%

Source: Authors' calculations based on UNCTADStat

The transformation in the export structure of these countries has arguably also resulted in important changes in local labor markets through both direct and indirect effects. In the case of Bolivia, employment in agriculture has declined, while the service sector has thrived. The agriculturasector, as the largest sector of the economy, accounted for 40.4% of total employment in 1997. However,

by 2011 the share of workers employed in the agriculture sector was only 29.6%. In Ecuador, employment in the manufacturing sector has slightly shifted towards the services and (to a lesser degree) the mining sector (CEPALSTAT).

Table 5.5: Change (in percentage) of hourly wages ratios of workers with different education levels from 2000 to 2012

Country	High/Low		High/Medium		Medium/Low	
	2000	2012	2000	2012	2000	2012
Bolivia	5.6	1.8	3.2	1.5	1.7	1.2
% Change	*-69%*		*-54%*		*-32%*	
Ecuador	3.3	2.2	2.2	1.6	1.5	1.4
% Change	*-33%*		*-29%*		*-6%*	

Source: Authors' calculations based on SEDLAC database.

Table 5.5 shows that both countries have experienced a recent decline in wage differentials, which also suggests a decrease in labor income inequality. The first column indicates that the wage gap between the two extremes of the educational distribution has declined, giving space for the expansion of a middle class. A closer look at the disaggregation by educational levels reveals that the decrease in the wage differential of high-skilled relative to medium-skilled workers has been greater than the one for medium-skilled versus low-skilled workers. This suggests greater labor income equalization for those with some level of education relative to those with little to no education—although both groups have made significant gains during this time in the case of Bolivia. This underlines the role played by the democratization of access to education discussed above, including in terms of secondary and tertiary education. We can also observe that the reduction in the skill premium has been larger for Bolivia than for Ecuador, which in is line with Bolivia's larger reduction in income inequality as measured by the Gini coefficient.

The degree of labor informality also proved to be significant in our model for high export concentration countries. As previously mentioned, the relationship between the level of informality and inequality is positive. In the graphs below we observe different trends for Bolivia and Ecuador. In general, the level of informality is larger for Bolivia than for Ecuador. Moreover, the Bolivian case shows a dramatic decrease in the degree of informality, while Ecuador presents a more modest decline. It is important to note that the share of workers in the informal sector of these non-diversified exporting countries is about 30 percentage points higher than that of diversified exporters like Argentina and Brazil.

Figure 5.12: Informality as a Share of Total Employment
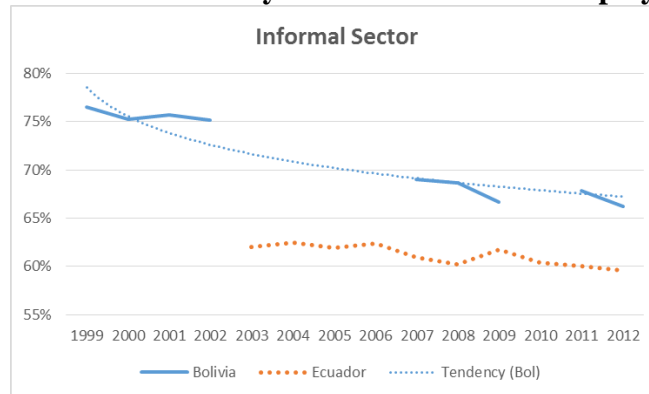
Note: The tendency was calculated using the logarithmic approximation: y=-0.43ln(x) +0.7855
Source: SEDLAC

VI.   Conclusion

In this paper we explore the degree to which changes in the terms of trade have been associated with reductions in inequality in Latin America in the 1995-2012 period. In line with our expectations, our empirical results using panel data for eighteen Latin American countries suggest that there is a negative relationship between a country's terms of trade and its degree of domestic inequality. Our results indicate that one unit of increase in the terms of trade index is associated with approximately a 0.04 decrease in the Gini index. Regarding our control variables, only the real interest rate and per capital real GDP growth rate do not appear to be significant in all of our model specifications. On the other hand, the minimum wage index as well as the size of the informal sector seem to always be significant and in accordance with our expectations. Another interesting result of our econometric analysis is that the change in export concentration index is statistically significant and positive. When we look deeper into the relationship between the degree of export concentration and inequality, by running the model separately for countries categorized as high, medium and low export concentrated countries, we found that terms of trade is only significant for inequality for the high and medium groups. For low export concentrated countries, the increases in minimum wage, the reductions in informality and in dependency rate are significant determinants for decreases in inequality.

For the low export concentration countries (Argentina and Brazil) we found that the downward trend of the dependency rate seems to be an equalizing force through the increase of labor participation which allows households to increase their incomes. While in Brazil all sectors of the society seem to be equally benefited by the demographic trend, in Argentina the bottom 40% appear to be the most favored. We also found that policy changes in the labor market have had an equalizing effect. Policies towards formalization and increases of the minimum wage might reinforce each other making their impact on the reduction in inequality stronger.

For the medium concentration countries (Colombia and Peru) we looked into the channels through which the improvement of terms of trade have impacted inequality levels: export reorientation, tax revenues and social expenditure. The descriptive analysis shows that both countries have re-oriented their export structure towards commodities as a reaction to the increase in international prices. The analysis also shows a strong correlation between the positive trend of

30

the international commodity prices and the increases in the tax revenues for both countries. Yet larger increases in government social expenditure seems to be true only for Colombia while staying roughly constant for Peru. Despite the fact that a re-allocation of public funds towards social policies can only be proven for Colombia, both countries evidence a great effectiveness in their social programs for targeting the poor. The effect of the declining dependency rate together with an increase of the labor force seem to stimulate the building of the middle class in Colombia, while in Peru it seems to help overcome poverty for households from the bottom 20% of the income distribution.

For the high export concentration countries we found that increases in the terms of trade move together with increases in tax revenue collection, which suggest that the public budget is increased due to the favorable external conditions. While in Ecuador even more resources were re-allocated towards social spending, in the case of Bolivia, this type of public expenditure has not grown at the same rate as the rest of the economy. However, the level of social spending has increased considerably in both countries leading to a democratization of education. This phenomenon shows high equalizing potential, since the wage gap has reduced in favor of those with some degree of educational attainment. Both countries have increased their dependency towards commodities in their export sector. As a consequence, the structure of the labor market has changed. During the last few years we observed that the agricultural sector, formerly the biggest sector in the Bolivian economy, has reduced drastically. In contrast, Ecuador seems to be experiencing a de-manufacturing process. The informal sector, although still 30% larger than those corresponding to diversified export economies, has reduced in both countries. However, the reduction in Bolivia was outstanding.

Overall, these results confirm our hypothesis that terms of trade has been a significant factor in recent reductions in inequality in Latin America – at least for medium and high export concentration countries. The descriptive case studies help to further confirm the channels in which this effect operates. However, it also leaves us with a concern. If favorable terms of trade have been associated with lower levels of inequality through reductions in the skill premium and have facilitated greater government expenditures on human capital development, then the prospect of a deterioration of trading conditions has the potential to undo some of the gains made in recent years. It is critical to acknowledge that since the factors that led to the improvement in the terms of trade are not sustainable and constitute a relatively rare episode (i.e. a super-cycle), the decrease in inequality is itself not sustainable. The precipitous change of fortunes that may result from changing trade conditions of Latin American countries adds to the urgency of discussing strategies to protect some of the gains that have been made in the last decade in terms of inequality reduction. The question then becomes one of how policy can be guided to make the most out of these temporary favorable conditions to consolidate institutional safety nets that stay in place even during the downswing of the cycle. Here lessons may perhaps be drawn from the low export concentration countries – where terms of trade were not a significant factor, but where social policies had a significant impact.

VII. References

Acemoglu, D. (2002) "Technical Change, Inequality, and the Labor Market", Journal of Economic Literature, Vol. 40, No. 1, pp. 7-72

Alejo, J., M. Bergolo, F. Carbajal, and G. Cruces (2009) "Cambios en la Desigualdad del Ingreso en América Latina. Contribución de sus principales determinantes (1995-2006)". CEDLAS, Universidad Nacional de la Plata, prepared for the project Markets, the State and the Dynamics of Inequality, UNDP.

Aragón, F. M., and J. P. Rud (2013) "Natural resources and local communities: evidence from a Peruvian gold mine." American Economic Journal: Economic Policy 5.2 (2013): 1-25.

Auty, Richard (2002) Sustaining development in mineral economies: the resource curse thesis. Routledge.

Azevedo, J.P., G. Inchauste, and V. Sanfelice (2012) "Decomposing the Recent Inequality Decline in Latin America", Mimeo, The World Bank

Baran, Paul. The Political Economy of Growth. Harmondsworth: Penguin, 1957.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. Journal of economic growth, 12(1), 27-49.

Bekman, E., J. Bound, and S. Machin (1998) "Implications of Skill-Biased Technological Change: International Evidence." The Quarterly Journal of Economics 113, no. 4 (1998): 1245-1279.

Carter, C.; G. Rausser; A. Smith (2011) "Commodity Booms and Busts", Annual Review of Resource Economics, Vol. 3: 87-118

Castro, J.; G. Yamada (2012) ""Convexification" and "Deconvexification" of the Peruvian Wage Profile: A Tale of Declining Education Quality". Centro de Investigación de la Universidad Pacífico, DD/12/02.

Cornia, G.A. (2012) "Inequality Trends and their Determinants: Latin America over 1990-2010", Working Paper 2012/09, UNU-WIDER.

Cornia, G. A. (Ed.). (2014). Falling inequality in Latin America: policy changes and lessons. Oxford University Press.

Costa, F., Garred, J. and J. P. Pessoa (2014) "Winners and Losers from a Commodities-for-Manufactures Trade Boom". No. dp1269. Centre for Economic Performance, LSE.

de Brauw, A., and Hoddinott, J. (2011) "Must conditional cash transfer programs be conditioned to be effective? The impact of conditioning transfers on school enrollment in Mexico", Journal of Development Economics, Vol. 96, No. 2: 359-370.

Dobbs, R; J. Oppenheim; F. Thompson; S. Marlees; S. Nyquist; S. Sanghvi (2013) "Resource Revolution: Tracking global commodity markets". Trends survey 2013, McKinsey Global Institute, McKinsey Sustainability & Resource Productivity Practice.

ECLAC/OECD (2012) Latin American Economic Outlook 2012: Transforming the State for Development, OECD Publishing, Paris.

Erten, B., & Ocampo, J. A. (2013). Super cycles of commodity prices since the mid-nineteenth century. World Development, 44, 14-30.

Esquivel, G. and J.A. Rodríguez-López (2003) "Technology, Trade and Wage Inequality in Mexico before and after NAFTA". Journal of Development Economics, Vol. 72, No. 2:543-65.

Esquivel, G., N. Lustig, and J. Scott. (2010) "A decade of falling inequality in Mexico: market forces or state action?", In Luis. F. López-Calva and Nora Lustig (eds.), Declining Inequality in Latin America: A Decade of Progress? Chapter 7. Whashington DC: Brookings Institution and UNDP.

Feenstra, R. and T. Lewis (1994) "Trade adjustment assistance and Pareto gains from trade." Journal of International Economics, May 1994, 36(3), pp. 201-222.

Feenstra, R. C., and G. H. Hanson. (1995) "Foreign investment, outsourcing and relative wages". No. w5121, National Bureau of Economic Research.

Feenstra, R. C., and Hanson, G. H. (1996). "Globalization, outsourcing, and wage inequality" (No. w5424). National Bureau of Economic Research.

Feenstra, R. C., and Hanson, G. H. (1997) "Foreign direct investment and relative wages: Evidence from Mexico's maquiladoras". Journal of international economics, 42(3), 371-393.

Frankema, E. (2009) Has Latin America Always Been Unequal?, Brill, Leiden-Boston.

Freile, L. (2009) "Lessons from Latin America's neo-liberal experiment: An overview of labour ans social policies since the 1980s". International Labour Review, Vol 148 (2009), No. 3

Frıas, J, A., D, S. Kaplan, and E. A. Verhoogen. "Exports and wage premia: Evidence from Mexican employer-employee data." Unpub. paper, Columbia University (2009).

Gasparini, L., and G. Cruces (2010) "A Distribution in Motion: The Case of Argentina", In Luis. F. López-Calva and Nora Lustig (eds.), Declining Inequality in Latin America: A Decade of Progress? Chapter 5. Whashington DC: Brookings Institution and UNDP.

Gasparini, L., S. Galiani, G.Cruces, and P. Acosta (2011) "Educational Upgrading and Returns to Skills in Latin. Evidence from a Spply-Demand Framework, 1990-2010", Policy Research Working Paper 5921, World Bank.

Gasparini, L., and N. Lustig (2011) "The Rise and Fall of Income Inequality in Latin America", Working Paper 1110, Tulane University.

Goldberg, P., N. Pavcnik (2004) "Trade, Inequality, and Poverty: What Do We Know? Evidence from Recent Trade Liberalization Episodes in Developing Countries." Brookings Trade Forum 2004, 223-269.

Hanushek, E.; L. Woessmann (2009) "Do Better Schools Lead to More Growth? Cognitive Skills, Economic Outcomes, and Causation", NBER Working Paper No. 14633

Heap, A. (2005) "China: The Engine of a Commodities Super Cycle". Sector Mapping. Citigroup.

Helbling, T. (2012) "Commodities in Boom", International Monetary Fund's Finance and Development, Vol 49, No. 2

Instituto Peruano de Economía (2012): "Efecto de la minería sobre el empleo, el producto y recaudación en el Perú". Sociedad Nacional de Minería, Petróleo y Energía: Lima.

Jaramillo, M.; J. Saavedra (2009) "Inequality in Post-Structural Reform Peru: The Role of Market and Policy Forces", Research for Public Policy, Inclusive Development, ID-12-2009, RBLAC-UNDP, New York.

Jiménez, P.; López Azcúnaga, I. (2015) "Volatility, Inequality, and the Quality of Public Finances" in Latin America in A Moment of Equality for Latin America?: Challenges for Redistribution. Ashgate Publishing, Ltd., 2015. Eds Fritz, Barbara, and Lena Lavinas. Ashgate Publishing, Ltd., 2015

Krishna, P., J. P. Poole, and M. Z. Senses (2011) "Trade liberalization, firm heterogeneity, and wages: New evidence from matched employer-employee data." World Bank Policy Research Working Paper Series, Vol (2011).

Lustig, N., L.F. Lopez-Calva, E. Ortiz-Juarez (2011) "The Decline in Inequality in Latin America: How much, since when and why", Working Paper 2011-211, ECINEQ.

Lustig, N., L.F. Lopez-Calva, E. Ortiz-Juarez (2013) "Deconstructing the Decline in Inequality in Latin America", Working Paper 1314, Tulane University.

Magee, Christopher (2001) "Administered Protection for Workers: An Analysis of the Trade Adjustment Assistance Program." Journal of International Economics, February 2001, 53(1), pp. 105-125.

Novick, M.; M. Lengyel; M. Sarabia (2009) "From social protection to vulnerability: Argentina's neo-liberal reforms of the 1990s". International Labour Review, Vol 148 (2009), No. 3

Pavcnik, N. (2011) "Globalization and Within-country Inequality," in M. Bacchetta and M. Jansen eds. Making globalization socially sustainable, pp. 233-259, WTO/ILO: Geneva 2011.

Prebisch, R., 1949. El desarrollo económico de la América Latina y algunos de sus principales problemas. Santiago de Chile, ECLAC, E/CN.12/89. Published in English in 1950 with the title: "The Economic Development of Latin America and Its Principal Problems", New York, UNCLA.

Pollin, R.; J. Heintz (2011) "How Wall Street Speculation is Driving Up Gas Prices Today", Research Brief June, Political Economy Research Institute University of Massachusetts, Amherst

Radetzki, M. (2006) "The anatomy of the three commodity booms". Resources Policy, Vol. 31: 56–64

Rodrik, D. (2013), "The Past, Present, and Future of Economic Growth", Geneva: Global Citizen Foundation Working Paper No 1.

Ocampo, J.A., and J. Vallejo (2012) Economic Growth and Human Development in Latin America, Journal of Human Development and Capabilities: A Multi-Disciplinary Journal for People-Centered Development, 13:1, 107:13

Sachs, J. D., and A. M. Warner (1995) Natural resource abundance and economic growth. No. w5398, National Bureau of Economic Research.

Samuelson, P. A. 2004. "Where Ricardo and Mill Rebut and Confirm Arguments of Mainstream Economists Supporting Globalization." Journal of Economic Perspectives, 18(3): 135-146.

Singer, H. W. (1950). "The distribution of gains between investing and borrowing countries". The American Economic Review, 473-485.

Stolper, Wolfgang F., and Paul A. Samuelson. "Protection and real wages." The Review of Economic Studies 9, no. 1 (1941): 58-73.

UNRISD (2010) Combating Poverty and Inequality: Structural Change, Social Policy and Politics, UNRISD publications, Geneva.

Valdés, M.F. (2015) "Is Tax Policy becoming more pro-equity in the Region? Five Case Studies of Commodity-dependent Economies" in A Moment of Equality for Latin America?: Challenges for Redistribution. Ashgate Publishing, Ltd., 2015. Eds Fritz, Barbara, and Lena Lavinas. Ashgate Publishing, Ltd., 2015

Van den Berg, Hendrik. International economics: A Heterodox Approach. Routledge, 2014.

Verhoogen, Eric A. "Trade, Quality Upgrading, and Wage Inequality in the Mexican Manufacturing Sector". The Quarterly journal of economics 123, no. 2 (2008): 489-530.

Zhu, Susan Chun. "Can product cycles explain skill upgrading?" Journal of International Economics 66, no. 1 (2005): 131-155.

VIII. Appendix

Appendix 1: Panel Unit Root Test (Fisher)

Ho: Unit Root

Variable	At Levels		First-Difference	
	Chi-square	P-value	Chi-square	P-value
Gini	57.17	0.00	-	-
Terms of Trade	115.38	0.00	-	-
Dependency Rate	61.42	0.00	-	-
Real Interest Rate	419.24	0.00	-	-
Minimum Wage	62.21	0.00	-	-
Informality	85.64	0.00	-	-
GDP Growth Rate	263.85	0.00	-	-
Exports HHI	40.49	0.28	213.39	0.00

Appendix 2A: Top 10 Exports for Colombia

1995	2012	2014
(071) Coffee and coffee substitutes: 19.2%	(333) Petroleum oils, oils from bitumin. materials, crude: 44.1%	(333) Petroleum oils, oils from bitumin. materials, crude: 47%
(333) Petroleum oils, oils from bitumin. materials, crude: 18.6%	(321) Coal, whether or not pulverized, not agglomerated: 12.1%	(321) Coal, whether or not pulverized, not agglomerated: 11.7%
(321) Coal, whether or not pulverized, not agglomerated: 5.7%	(334) Petroleum oils or bituminous minerals > 70 % oil: 7.7%	(334) Petroleum oils or bituminous minerals > 70 % oil: 5.2%
(292) Crude vegetable materials, n.e.s.: 4.7%	(971) Gold, non-monetary (excluding gold ores and concentrates): 5.6%	(071) Coffee and coffee substitutes: 5%
(667) Pearls, precious & semi-precious stones: 4.5%	(071) Coffee and coffee substitutes: 3.7%	(971) Gold, non-monetary (excluding gold ores and concentrates): 2.9%
(057) Fruits and nuts (excluding oil nuts), fresh or dried: 4.4%	(292) Crude vegetable materials, n.e.s.: 2.2%	(292) Crude vegetable materials, n.e.s.: 2.6%
(334) Petroleum oils or bituminous minerals > 70 % oil: 2.8%	(671) Pig iron & spiegeleisen, sponge iron, powder & granu: 1.5%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 1.7%
(061) Sugar, molasses and honey: 2.4%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 1.5%	(671) Pig iron & spiegeleisen, sponge iron, powder & granu: 1.2%
(671) Pig iron & spiegeleisen, sponge iron, powder & granu: 1.8%	(325) Coke & semi-cokes of coal, lign., peat; retort carbon: 0.8%	(575) Other plastics, in primary forms: 1%
(971) Gold, non-monetary (excluding gold ores and concentrates): 1.7%	(575) Other plastics, in primary forms: 0.8%	(542) Medicaments (incl. veterinary medicaments): 0.9%

Source: Author's calculations based on UNCTADStat

Note: Numbers in parenthesis represent the corresponding commodity subgroup based on SITC Rev. 3

Appendix 2B: Top 10 Exports for Peru

1995	2012	2014
(682) Copper: 19.8%	(971) Gold, non-monetary (excluding gold ores and concentrates): 21.1%	(283) Copper ores and concentrates; copper mattes, cemen: 18.1%
(081) Feeding stuff for animals (no unmilled cereals): 13.6%	(283) Copper ores and concentrates; copper mattes, cemen: 18.3%	(971) Gold, non-monetary (excluding gold ores and concentrates): 14.6%
(287) Ores and concentrates of base metals, n.e.s.: 10.3%	(287) Ores and concentrates of base metals, n.e.s.: 7.6%	(334) Petroleum oils or bituminous minerals > 70 % oil: 8.6%
(971) Gold, non-monetary (excluding gold ores and concentrates): 8.5%	(334) Petroleum oils or bituminous minerals > 70 % oil: 7.2%	(287) Ores and concentrates of base metals, n.e.s.: 6.6%
(071) Coffee and coffee substitutes: 5.3%	(682) Copper: 5.9%	(682) Copper: 6.1%
(283) Copper ores and concentrates; copper mattes, cemen: 3.2%	(081) Feeding stuff for animals (no unmilled cereals): 4.2%	(081) Feeding stuff for animals (no unmilled cereals): 3.9%
(333) Petroleum oils, oils from bitumin. materials, crude: 2.6%	(343) Natural gas, whether or not liquefied: 2.9%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 3.7%
(686) Zinc: 2.6%	(071) Coffee and coffee substitutes: 2.2%	(343) Natural gas, whether or not liquefied: 2%
(334) Petroleum oils or bituminous minerals > 70 % oil: 2.3%	(281) Iron ore and concentrates: 1.9%	(071) Coffee and coffee substitutes: 1.9%
(845) Articles of apparel, of textile fabrics, n.e.s.: 2.2%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 1.8%	(845) Articles of apparel, of textile fabrics, n.e.s.: 1.7%

Source: Author's calculations based on UNCTADStat
Note: Numbers in parenthesis represent the corresponding commodity subgroup based on SITC Rev. 3

Table 2C: Top 10 Exports for Bolivia

1995	2012	2014
(687) Tin: 11.8%	(343) Natural gas, whether or not liquefied: 46.3%	(343) Natural gas, whether or not liquefied: 48.3%
(287) Ores and concentrates of base metals, n.e.s.: 11.6%	(971) Gold, non-monetary (excluding gold ores and concentrates): 9.8%	(971) Gold, non-monetary (excluding gold ores and concentrates): 10.8%
(971) Gold, non-monetary (excluding gold ores and concentrates): 10.6%	(287) Ores and concentrates of base metals, n.e.s.: 8.6%	(287) Ores and concentrates of base metals, n.e.s.: 8.2%
(897) Jewellery & articles of precious materia., n.e.s.: 7.8%	(289) Ores & concentrates of precious metals; waste, scrap: 6%	(081) Feeding stuff for animals (no unmilled cereals): 5.7%
(343) Natural gas, whether or not liquefied: 7%	(081) Feeding stuff for animals (no unmilled cereals): 5.5%	(333) Petroleum oils, oils from bitumin. materials, crude: 4.9%
(248) Wood simply worked, and railway sleepers of wood: 6%	(333) Petroleum oils, oils from bitumin. materials, crude: 3.9%	(289) Ores & concentrates of precious metals; waste, scrap: 3.7%
(081) Feeding stuff for animals (no unmilled cereals): 4.6%	(421) Fixed vegetable fats & oils, crude, refined, fractio.: 2.9%	(421) Fixed vegetable fats & oils, crude, refined, fractio.: 2.9%
(289) Ores & concentrates of precious metals; waste, scrap: 4.5%	(687) Tin: 2.5%	(687) Tin: 2.6%
(222) Oil seeds and oleaginous fruits (excluding flour): 4.4%	(222) Oil seeds and oleaginous fruits (excluding flour): 1.5%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 1.6%
(211) Hides and skins (except furskins), raw: 4.4%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 1.5%	(045) Cereals, unmilled (excluding wheat, rice, barley, maize): 1.4%

Source: Author's calculations based on UNCTADStat
Note: Numbers in parenthesis represent the corresponding commodity subgroup based on SITC Rev. 3

Table 2D: Top 10 Exports for Ecuador

1995	2012	2014
(333) Petroleum oils, oils from bitumin. materials, crude: 32%	(333) Petroleum oils, oils from bitumin. materials, crude: 53.3%	(333) Petroleum oils, oils from bitumin. materials, crude: 50.6%
(057) Fruits and nuts (excluding oil nuts), fresh or dried: 19.5%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 9.1%	(057) Fruits and nuts (excluding oil nuts), fresh or dried: 10.5%
(036) Crustaceans, mollusks and aquatic invertebrates: 15.6%	(036) Crustaceans, mollusks and aquatic invertebrates: 5.4%	(036) Crustaceans, mollusks and aquatic invertebrates: 10%
(071) Coffee and coffee substitutes: 5.6%	(037) Fish, aqua. invertebrates, prepared, preserved, n.e.s.: 4.7%	(037) Fish, aqua. invertebrates, prepared, preserved, n.e.s.: 4.9%
(334) Petroleum oils or bituminous minerals > 70 % oil: 3.1%	(334) Petroleum oils or bituminous minerals > 70 % oil: 3.6%	(971) Gold, non-monetary (excluding gold ores and concentrates): 3.3%
(072) Cocoa: 3%	(292) Crude vegetable materials, n.e.s.: 3.3%	(292) Crude vegetable materials, n.e.s.: 3.1%
(037) Fish, aqua. invertebrates, prepared, preserved, n.e.s.: 2.7%	(072) Cocoa: 1.8%	(072) Cocoa: 2.7%
(971) Gold, non-monetary (excluding gold ores and concentrates): 2.2%	(971) Gold, non-monetary (excluding gold ores and concentrates): 1.6%	(034) Fish, fresh (live or dead), chilled or frozen: 1.1%
(034) Fish, fresh (live or dead), chilled or frozen: 2.1%	(034) Fish, fresh (live or dead), chilled or frozen: 1.4%	(422) Fixed vegetable fats & oils, crude, refined, fract.: 0.9%
(292) Crude vegetable materials, n.e.s.: 1.8%	(422) Fixed vegetable fats & oils, crude, refined, fract.: 1.3%	(289) Ores & concentrates of precious metals; waste, scrap: 0.8%

Source: Author's calculations based on UNCTADStat

Note: Numbers in parenthesis represent the corresponding commodity subgroup based on SITC Rev. 3