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Inequality in Latin America:

Determinants and Consequences

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Abstract

Latin America is together with Sub-Saharan Africa the most unequal region of the world. This paper documents recent inequality trends in the Latin American region, going beyond traditional measures of income inequality. The paper also reviews some of the explanations that have been put forward to understand the current situation, and discusses why reducing income inequality should be an important policy priority. In particular, the authors discuss channels through which inequality can affect growth and output volatility. On the whole, the analysis suggests a two-pronged approach to reduce inequality in the region that combines policies aimed at improving the distribution of assets (especially education) with elements aimed at improving the capacity of the state to redistribute income through taxes and transfers.

This paper—a product of the Office of the Regional Chief Economist, Latin America and the Caribbean Region—is part of a larger effort in the department to understand the determinants of income inequality in Latin America. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at hlopez@worldbank.org.

Inequality in Latin America: Determinants and Consequences

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The World Bank

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I. Introduction

With an average gini coefficient of .52, Latin America stands out as one of the two[1] most unequal regions of the world. In addition to the fact that citizens dislike such high levels of inequality (according to the Latinobarometro, in 2001 almost 90 percent of the population of the region considered the distribution of income in the region to be unfair or very unfair), there are good economic reasons for policy makers to be concerned with this situation.

First, for a given average income per capita level, higher inequality implies higher poverty levels. Moreover, beyond this qualitative assertion, the impact of inequality on poverty is quite significant from a quantitative point of view. A simple simulation, assuming a log normal distribution of income per capita,[2] suggests that if Latin America had the inequality levels prevalent in Europe, the poverty rate (headcount, 2$PPP) would be closer to 12 percent than to the current estimate of 25 percent, at current levels of average income per capita.

Second, not only high inequality leads to higher poverty levels at current income levels, but it constitutes a barrier to poverty reduction. There are a number of studies (Bourguignon, 2003; Ravallion, 1997, 2004; Lopez and Serven 2006a; Perry et al, 2006) that show that the growth elasticity of poverty reduction is lower (in absolute value) in countries with high levels of income inequality. In other words, countries with higher inequality levels require a faster growth rate to achieve the same poverty reduction than countries with low inequality. Once again the differences between high and low inequality countries are sizeable. The results in Ravallion (2004) indicate that depending on a country's initial gini coefficient, the growth elasticity of poverty could range from almost -5 (very low inequality countries) to -.5 (very high inequality countries). Thus the growth elasticity of poverty can be multiplied by a factor of 10 as a result of lower inequality. More specifically, a country like Brazil would need to grow at close to 5 percent per annum –if inequality levels remain constant- to achieve the same reduction in poverty levels than Poland could achieve by growing at just 2 percent in per capita terms.

A third reason to be concerned about high inequality is that it appears that countries with higher inequality and poverty levels tend to grow less (see, among others, Alesina and Rodrick 1994; Perotti 1996; Lopez and Serven, 2006; Perry et al, 2006). True, there are also studies that find that inequality leads to faster growth (Li and Zou, 1998; Forbes 2000) and studies that find no relationship at all (Barro, 2000), but in general this is usually the case of studies that focus on the short term impact of changes in inequality on growth.

What are the reasons put forward in the literature to explain these findings? The economic literature suggests several potential channels. There is, first, the political economy argument (Alesina and Rodrick, 1994) by which the median voter of a highly

[1] The other being Sub Saharan Africa.

[2] More specifically to make this simulation we are assuming that per-capita income follows a log-normal distribution (see Lopez and Serven, 2006 for details).

unequal economy may have a tendency to push for higher redistributive public expenditures and transfers and higher taxes (assumed to negatively affect capital accumulation) to finance the additional spending. There is also the so-called sociopolitical instability approach (Alesina and Perotti, 1996) by which individuals in highly unequal societies will have incentives to engage in activities outside legal markets, such as crime and violence. For example, using a large panel of international homicide and robbery rates, Fajnzylber, Lederman and Loayza (2002) show that countries with higher inequality levels tend to have higher crime levels: on average a 1 percentage increase in the Gini coefficient appears to increase crime rates by between 1 and 4 percent. Finally, there are economic arguments linked to the existence of credit constraints (e.g. Galor and Zeira, 1993), by which such constraints coupled with fixed costs and indivisibilities can prevent poorer individuals from investing in education or physical capital.

Thus, there are good economic reasons, in addition to equity reasons, to be concerned about inequality. This paper, tries to contribute to this debate along several dimensions. First, it presents in Section II a review of the current situation of income inequality in the region. It also explores how inequality has evolved over the past few years and discusses some of the limits of standard indicators. Second, it discusses in Section III the reasons that the literature has put forward to understand the high levels of inequality in the region, namely an unequal distribution of assets and the inability of the state to correct income inequality through taxes and transfers. And third, it reflects in Section IV about the channels that may make inequality lead to lower growth rates and presents some new empirical results on the impact of inequality on output volatility.

II. Inequality in Latin America

II.1 Inequality in Latin America

As noted above, the average gini coefficient in Latin America is .52.[3] However this average hides significant regional variation. In fact, there are countries like Bolivia, Haiti or Jamaica with gini coefficients around .6.[4] At the other extreme, we can find two Caribbean countries (Trinidad and Tobago and Guyana) with a gini coefficient of .42 and Venezuela and Uruguay with close to .45 (Panel A, figure 1).

By any standard these levels of income inequality are extremely high. Panel B reproduces the previous chart but now accompanied by the gini coefficients of all the developing countries for which the World Bank povcal database[5] reports data. Inspection of this panel indicates that Latin America has the highest levels of inequality. For example, the average gini index in Sub-Saharan Africa (SSA) is .47. In the other developing regions it is much lower and ranges from .34 in Europe and Central Asia (ECA) to .38 in East Asia and the Pacific. Further, it is also worth noting that the most equal Latin American

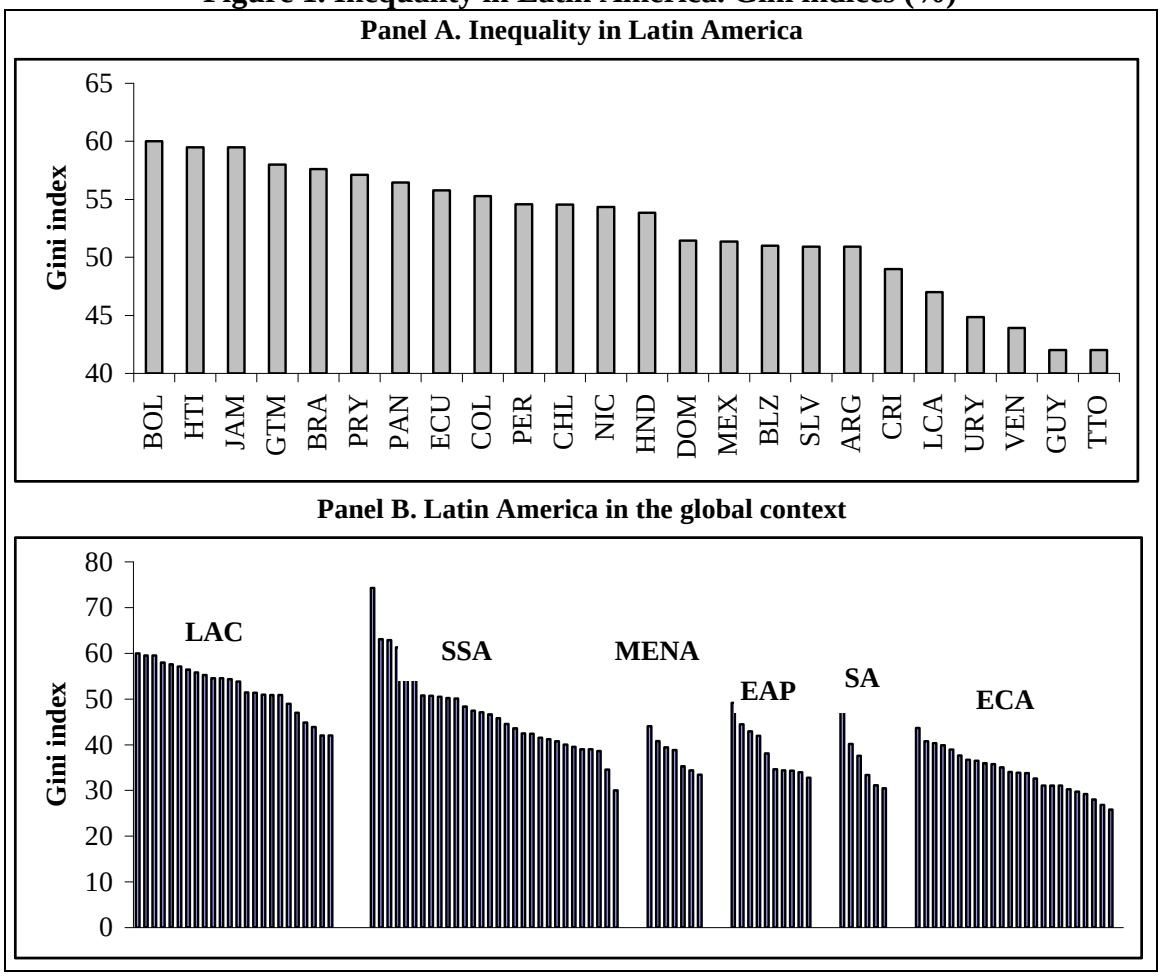
[3] The median gini is slightly higher and equals .54.
[4] The data for Latin America was kindly provided by Leo Gasparini and it is based on the last available survey for each country.
[5] The povcal database can be accessed at http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp

country has a higher Gini than the most unequal of developed countries (Portugal), where the Gini coefficient is below .4.

True, it could be that there are important biases in these statistics. Most of the figures from Latin America come from income data while those in other part of the world are consumption based[6] and this is important because gini indices based on consumption data tend to be substantially lower than gini indices based on income data. In fact, the analysis in the World Development Report (2006) on Equity and Development, suggests that gini coefficients can differ by 10 percentage points depending on whether one uses income or consumption. For example, the income based gini coefficient for Nicaragua is around .54 but that based on consumption data is about .42. Similarly in Peru which has an income-based gini slightly below .55 and a consumption-based gini that is below .45.

Yet, even if these differences held for all the countries, it is still worth noting that the only region that would have inequality levels above those found in Latin America is Sub-Saharan Africa.

Figure 1. Inequality in Latin America. Gini indices (%)



Source: Own calculations based on Gasparini et al. (2007) and povcal data.

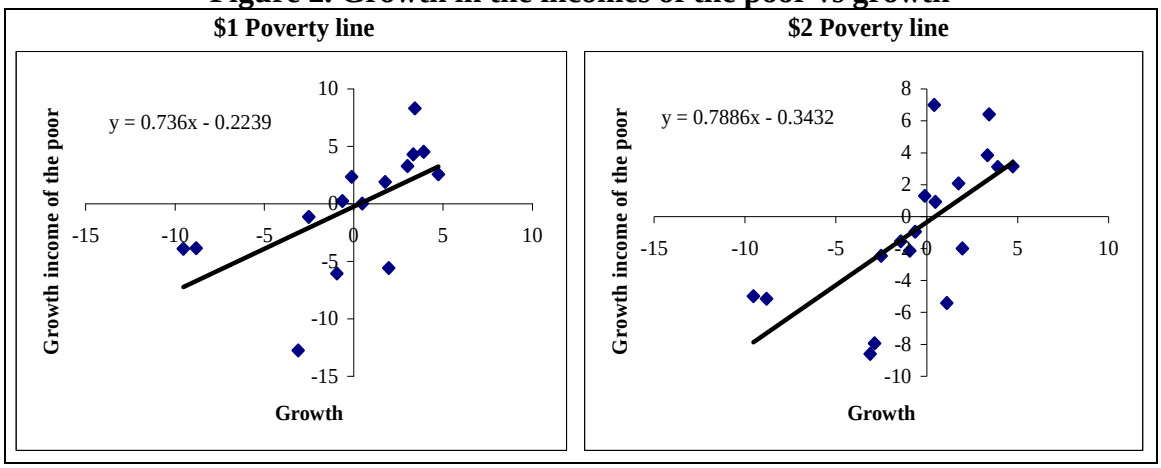
[6] The exceptions are the developed countries and a handful (about 10 percent) of developing countries.

II.2 How have the poor fared over the past years? A look at income levels

We have seen in the previous sub-section that Latin America's income inequality is high. However, what are the recent trends in terms of the evolution of income inequality? To address this issue Figure 2 plots the average growth rate in the incomes of the poor and the average growth rate for the population as a whole. Panel A focuses on the extreme poor (i.e. those with income levels below US$1[7] per person per day) and panel B on the moderate poor (i.e. those with income levels below US$2 per person per day). To construct these figures we have relied on household surveys for 18 countries. The first year of the spell falls typically in the early 1990s (the average initial year for the 18 countries is 1992), and the last year in early 2000s (the average final year for the 18 countries is 2002).

The figures also plot the regression slope. If the slope relating these two variables were equal to 1, it would indicate that on average the income of the poor has been increasing at the same pace as the income for the average individual. If on the other hand, the slope is smaller (larger) than 1, it would indicate that the income of the poor is increasing slower (faster) than the income of the average individual and hence that inequality is increasing (declining).

Figure 2. Growth in the incomes of the poor vs growth



Source: Authors' calculations

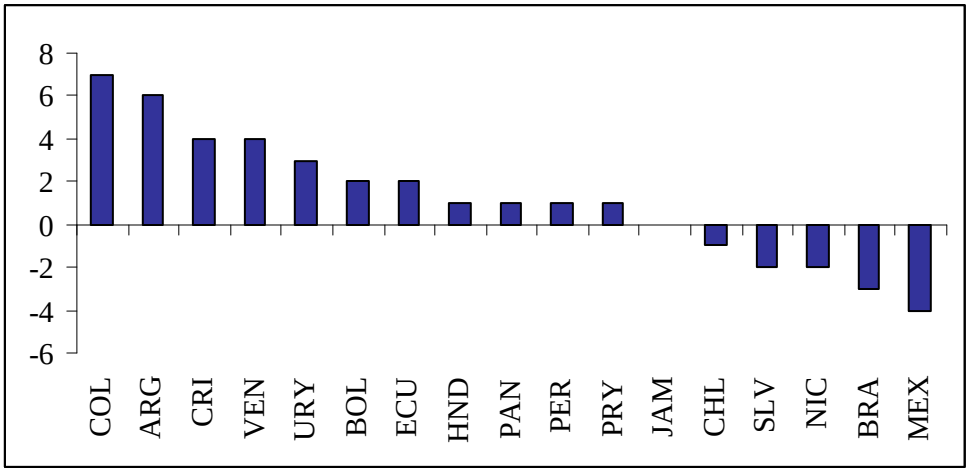
Inspection of these two figures suggests that during the 1990s the Latin American poor have been benefiting from growth less than the average individual. Panel A in figure 2 has an associated slope of .74; the slope in Panel B is slightly higher (.78) but it still indicates that the incomes of the poor have increased less than proportionally than those of the non poor.[8] There are two ways to look at this data. On the one hand, it is difficult to defend that the Latin American poor have not benefited from growth during the 1990s. Indeed, save a couple of exceptions the income of the poor has increased when average

[7] All international poverty lines are expressed in US$ adjusted for purchasing power parity differences.
[8] It is likely that these results are affected by the presence of important outliers. Yet, re-estimation of the slopes using robust estimates to outliers tends to lower the slopes even further to between .5-.6 in the case of the US$1 a day and to .6-.7 in the case of the US$2 a day.

income has increased and declined when growth has declined. Yet, on the other hand the data suggest that they may have not benefited as much as the non poor.

Trends, of course, have varied by country as the variance in Figure 2 indicates. In particular, while during the 1990s the Gini has increased in about two-thirds of the countries (especially in some of the previously less unequal countries, such as Argentina or Costa Rica), there are also countries that have experienced a marked decline in inequality. For example, in Brazil (one of the most unequal countries of the region) the Gini coefficient fell by 3 percentage points between 1990 and 2003. The country with the most dramatic decline in inequality over this period was Mexico: between 1992 and 2002 the Gini coefficient declined by 4 percentage points.

Figure 3. Latin America: Change in Gini coefficients in the 90's (%)



Source: own calculations using data in Gasparini et al. (2007)

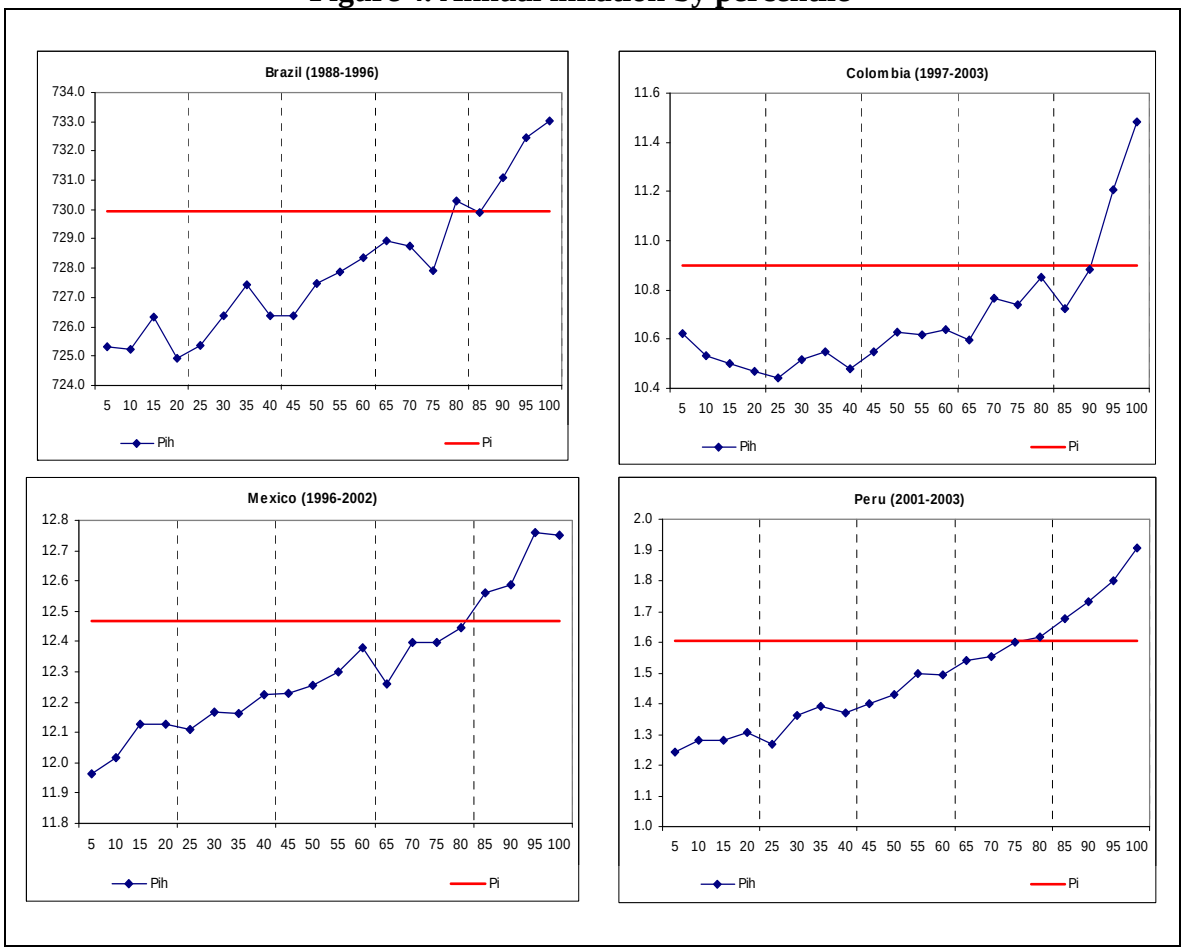
II.3 How have the poor really fared over the past years? A look at price levels

When we compute the evolution of income for a particular group of the population (as in figure 2 above) there is a need to deflate the nominal income levels of each individual, typically using the consumer price index or other suitable deflator. If all the households in the economy faced the same inflation levels, this action should not introduce any bias in the analysis.

However, rich and poor families consume different baskets of goods and the inflation rates of these baskets can differ greatly. Goñi, Lopez, and Serven (2005) and Perry et al (2006) show that using the aggregate CPI can greatly mislead actual trends and policies. First, tax brackets, pensions, social transfers, and minimum wages are often indexed to the CPI and using an inappropriate aggregate index can lead to engineering real transfers among income classes that were not intended. Further, our picture of the evolution of inequality (and hence poverty) can be sharply distorted by assuming that deflators are similar across income classes, either by working with un-deflated nominal baskets of

goods, or by using aggregate deflators, and contaminating inference about the relationship between these variables and growth or policy.[9]

Figure 4. Annual inflation by percentile



Source: Goñi, Lopez and Serven (2005)

To explore these issues Figure 4 shows the "actual" inflation rate suffered by different viniventiles of the income distribution for Brazil (1988-1996), Colombia (1997-2003), Mexico (1996-2002) and Peru (2001-2003). These estimates have been constructed on the basis of the consumption baskets of different population groups and on the different evolution of the prices of the different components of those baskets. The Figure also plots the average inflation rate (the horizontal bar).[10]

[9] A previous literature has addressed this issue for some economies: Busso et al. (2000) estimate the difference between the standard *cpi*-index and a democratic version for Argentina over the period 1989-1998; Ruiz-Castillo et. al. (2002) study the Spanish experience while Hobijn and Lagakos (2003) have analyzed the effective inflation rate suffered by different groups in U.S, just to mention some of them. Beyond literature, Hong Kong Census and Statistics Department computes, in addition to an overall *cpi*, consumer price indexes by income bracket and Colombia has begun to follow this steps. Within this strand, our interest is to dig in LAC data to see if differences in consumption patterns among quintiles and differences in price variations among products are strong enough to validate *cpi*'s disarticulation

[10] Goñi, Lopez, and Serven (2005) show that these patterns persist even after adjusting for quality change bias and after recomputing Paasche indices to control for potential substitution effects.

There are a couple of interesting elements that emerge from this figure. First, as it can be seen the two lines cross between the 80th and 90th percentiles, an indication that the reported inflation rate in practice tends to correspond to the consumption basket of the very rich. In other words, observed inflation rates can offer limited information when interest center on the welfare of the poor. Second, on a more positive note, the curve measuring the inflation rate of the different viniventiles of the distribution trends up very markedly. This is a reflection that for these spells the inflation rate suffered by the poor has been consistently lower than the average inflation rate.[11]

The implications of these findings are far reaching. To begin, the message that emerges from figure 2 may exaggerate the relative loss of welfare of the Latin American poor. True, the income of the non poor may have increased faster but the prices they have faced have also increased faster. Second, it is possible that concerns about the negative distributional impacts of reforms have probably been overstated. Third, incorrect deflation potentially confuses the relationship between different types of growth strategies and their impact on poverty.

For instance, liberalizations, devaluations etc. all have, *by their design*, the goal of changing relative prices of goods within the economy. When we ask what the impact of, for instance, trade liberalization is on the poor, then, we need to ask not only what the impact is on the side of real incomes, but also on the basket of goods that they consume. NAFTA's liberalization of trade in corn in Mexico might have led to lower prices that negatively impact the income of poor corn producers. But we must also take into account the fact that the cost of maize, a key element in the consumption basket of the poor fell, and hence the CPI of the poor fell relative to that of the well-off which, as shown above, is what the national CPI measures. The poor are in fact better off than using the national CPI would suggest.

II.4 Inequality and mobility

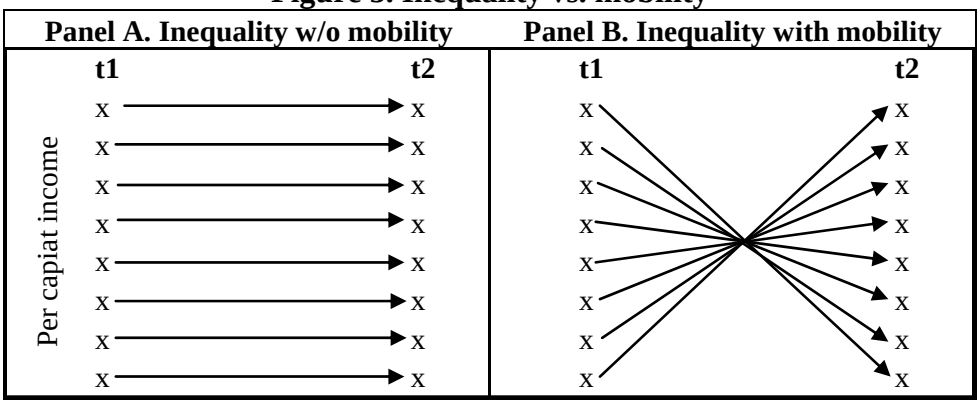
So far we have been talking about contemporaneous measures of income inequality. Yet, it could be argued that measures of income inequality (such as the gini coefficient) provide a very limited picture of the fairness of the income distribution. For example, income inequality can measure differences in opportunities (undesired from a social point of view) but also rewards to differences in effort or risk taking aversion by the different members of society (desired from a social point of view). Moreover, high inequality combined with equality of opportunities can be good for growth, because it would provide individuals with the incentives to put effort, be innovative, and take risks, all elements conductive to faster growth. On the contrary high inequality with low mobility will provide few incentives to work. If you are born poor (rich) and you have few chances to escape poverty (become poor) then you will find few reasons to work hard and take risks. In other words, standard income inequality indicators provide just a snapshot at a point in time and do not consider lifetime dynamics (i.e. in absence of additional

[11] Goñi, Lopez, and Serven (2005) analysis covers 9 spells and find that there is only one example where prices exert a negative contribution on nominal inequality.

information it may be difficult to reach any conclusion regarding the desirability of attacking income inequality from the point of view of growth).

These measurement problems are illustrated in figure 5. In both panels we have ordered a hypothetical population by per capita income in two periods of time (t1 and t2), and the arrows follows the individual across time. Also, in both cases, the dispersion of income (i.e. income inequality) is the same in time t1 and time t2. That is, the Gini coefficient would remain unchanged between t1 and t2. Yet, the picture that emerges from Panels A and B is completely different. Panel A indicates that those at the top (bottom) of the ladder in period t1 are also at the top (bottom) in period t2. On the contrary, Panel B suggests significant income mobility.

Figure 5. Inequality vs. mobility

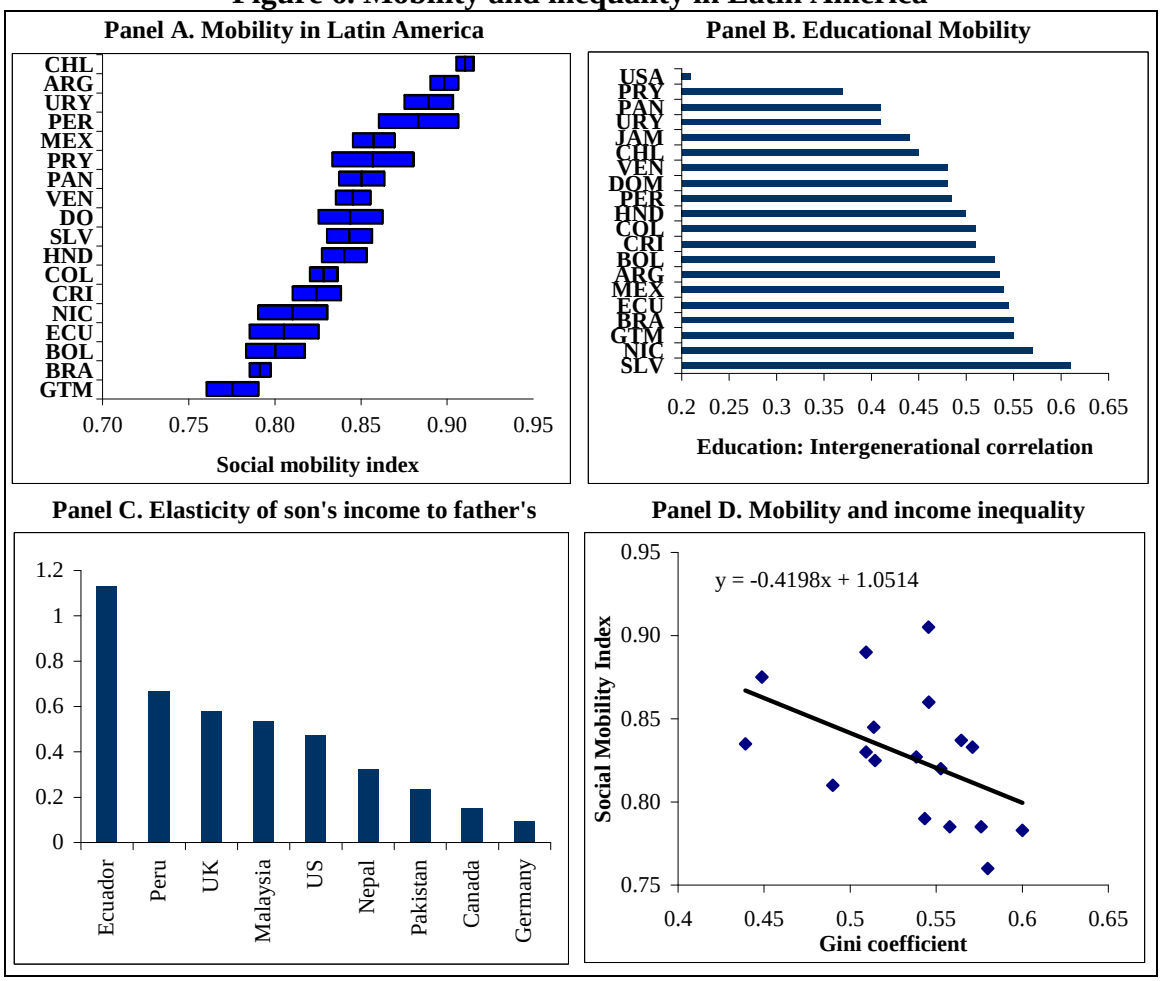


What do we know about social mobility/equity of opportunities in Latin America? There are very few studies on the topic because of data limitations: a study on mobility would require a panel that follows a number of households over a long period of time. Yet, some authors have made an attempt at measuring social mobility using alternative indicators. Panel A of figure 6 plots Andersen's index of social mobility (see Andersen, 2001) for a number of Latin American countries. Briefly, this index tries to determine the importance of family background in the schooling gap, defined as the disparity between the years of education that a children in the household would have completed if she/he entered school at normal school starting age (6 or 7 depending on the countries) and advanced one grade each year, and the actual years of education. In other words, the schooling gap measures the number of years of missing education and can be taken as a simple indicator of future opportunities. When household factors are very important in determining educational gaps Andersen index will approach zero. When on the contrary household factors play a limited role, then the index will approach 1.

Panel A of Figure 6 suggests that Chile, Argentina, Uruguay, Peru, and Mexico are countries with relatively high social mobility. At the other extreme, we have Guatemala, Brazil, and Ecuador which would have (also in relative terms) low social mobility. Although the work of Andersen does not allow for a comparison of social mobility in Latin America and in the developed countries, the existing evidence indicates that this is lower in the region.

For example, Panel B of figure 6 plots the correlation coefficient between parents' and children's schooling tabulated by Behrman, Birdsall, and Szekely (1999). It indicates that these correlations are much higher in Latin America (between .4 and .6) than in the US (.2). Similarly, Panel C of the same figure reports the elasticity of children's income relative to their father computed by Grawe (2002) for a handful of countries reveling that for the countries for which we have information, this elasticity is larger among the Latin Americans than among the Europeans or the US.

Figure 6. Mobility and inequality in Latin America



Source: Panel A is from Andersen (2001). Panel B is from Behrman, Gaviria and Szekely (2001). Panel C is from Grawe (2002). Panel D is own calculations.

One key question is whether there is any relation between this mobility index and the level of income inequality. In fact, there is evidence (see Aaberge et al, 2004) indicating that high income inequality tends to be associated with low income mobility, something that in turn would contribute to low social mobility and less equality of opportunities. We explore this element in Panel D of Figure 6.[12] It suggests that indeed there is a marked

[12] Andersen (2001) presents a similar plot but finds a very modest correlation (-.12). The main difference between his and our calculations is that he uses adjusted gini indices to correct for lack of comparability, whereas ours are computed using comparable data and hence are not subject to adjustment.

correlation between inequality and mobility (i.e. more income inequality is correlated with less social mobility). In other words, while in principle there may be examples of countries with relatively high social mobility and high income inequality (e.g. Chile), on the whole it seems that lack of mobility and inequality tend to move together.

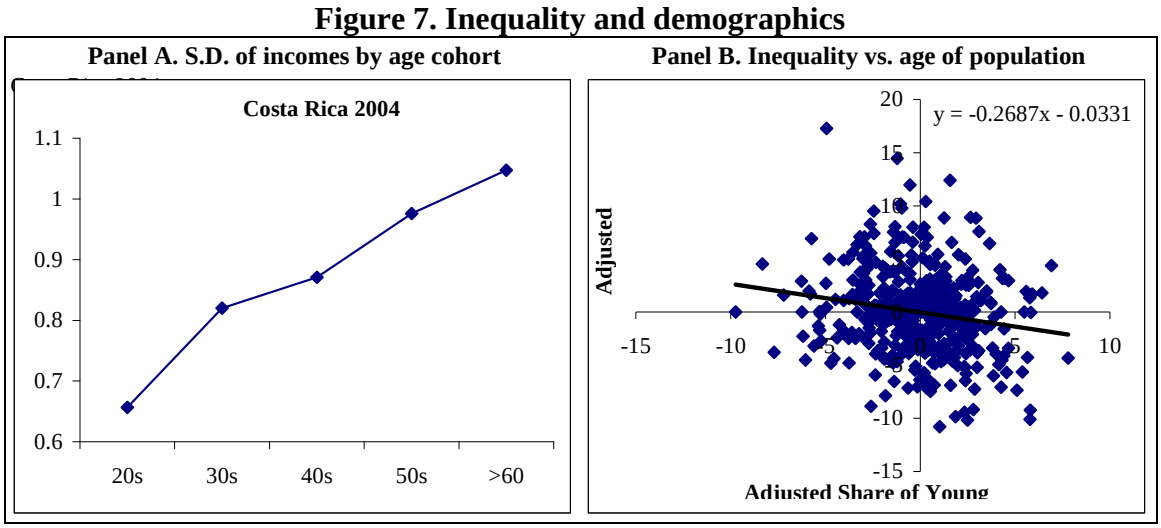
II.5 Inequality and demographics: Could things become worse before getting better?

The introduction of mobility and time horizons in the analysis of income inequality enriches significantly the analysis. For example, as argued by Deaton and Paxton (1994) the observed cross sectional inequality in a given period of time, is just the average distribution of the income of successive cohorts, which in principle should show very different distributions of income. For example, if per capita income *y* evolves according to the following simple law of motion:

$$y_t = y_{t-1} + v_{it} \qquad (1)$$

where *v* is a random shock independent of y_{t-1} that has variance σ^2, then if follows that the variance of the income of a person of age T is given by $T\sigma^2$. In other words, inequality should increase with the age of the cohort. As a result, countries with older populations will have a tendency to have higher levels of income inequality.

Figure 7. Inequality and demographics



Source: Perry et al. (2006).

Panel A of Figure 7 lends support to the hypothesis that inequality increases with the age of the cohort. More specifically, this panel presents the standard deviation for five Costa Rican population cohorts in 2004. Inspection of this figure indicates that the standard deviation of income increases steadily with age and the cohort of those in their 60s have a standard deviation of income that is almost twice as large as that of the cohort in their 20s. Moreover, these effects are not small.

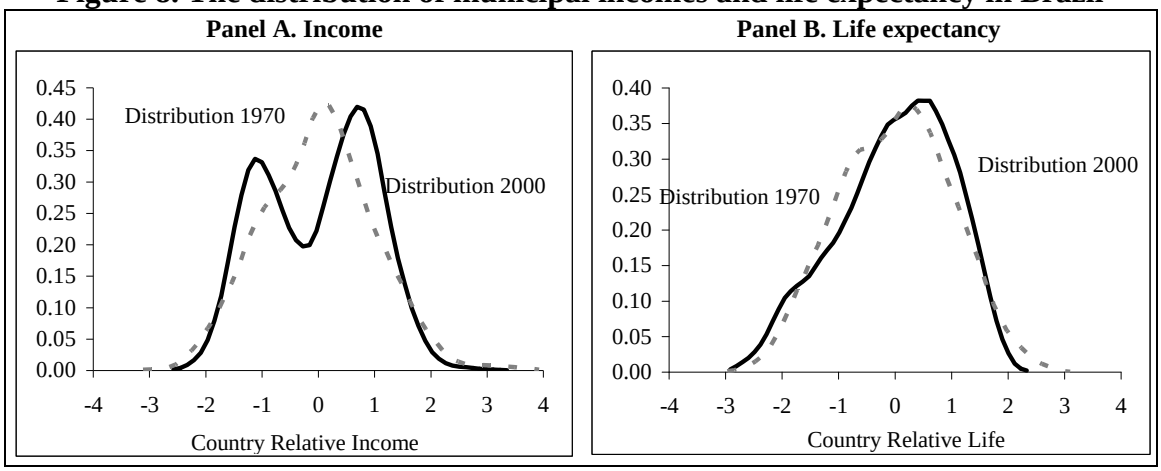
More generally, Panel B of Figure 7 presents the cross national partial correlation[13] of the Gini coefficient and share of people below age 14. This panel indicates that the correlation between these two variables is negative (and significantly different from zero). That is, younger societies have lower Gini coefficients.

What does this mean in practice? Well, if Latin America had the demographic structure of aging Europe, its Gini coefficients could be higher by 4 percentage points. Moreover, in some of the comparatively young countries such as Bolivia, Guatemala or Honduras the Gini coefficient could be up to 7 percentage points higher. Thus everything else equal and to the extent that the region starts aging, it is possible that income inequality levels become worse before getting better.

II. 6 Beyond income inequality

Income measures are highly correlated with most aspects of household welfare. However, it must be recognized that in some important dimensions of welfare, such as health and life expectancy, there has been significant progress and convergence among income groups. This is illustrated in figure 8 where we plot the distribution of income (Panel A) and the distribution of life expectancy (Panel B) across Brazilian municipalities in 1970 and 2000. Inspection of this figure indicates that whereas on the income front there has been some increased dispersion and the emergence of a bimodal distribution, this has not been the case with life expectancy, which if anything has experienced a decline in dispersion (i.e. a decline in inequality). In other words, regional distribution trends in some welfare indicators may be improving, and this would suggest an important role for some policies that fight poverty independently of those aimed to growth.

Figure 8. The distribution of municipal incomes and life expectancy in Brazil



Source: Perry et al. (2006)

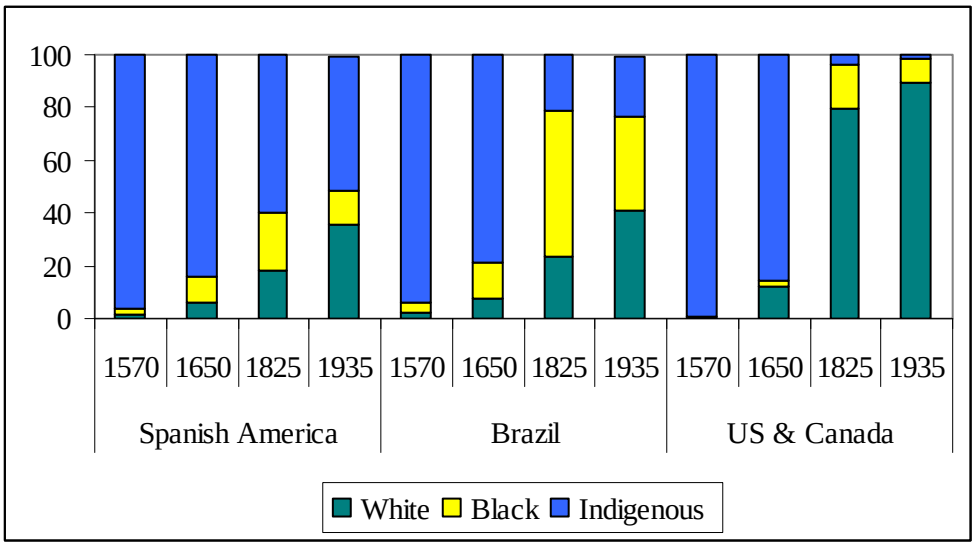
[13] We control for level of development.

III. Why is inequality so high in Latin America?

III.1 Asset inequality in Latin America

The existing differences in terms of development and more concretely in inequality between the region and the developed world did not appear overnight. In fact, they are likely to be the result of historical processes that in go back at least to the colonial period. Several authors (see among others Engerman and Sokoloff, 2000 and Acemoglu, Johnson and Robinson, 2001) have argued that in order to understand the high inequality levels observed in Latin America today it is important to understand the institutional framework created by the colonial powers which allowed a small group of elites to protect the large rents they were enjoying and excluded most of the population from access to land, education and political power.

Figure 9 Composition of the population in the New World



Source: Engerman y Sokoloff (1997)

Sokoloff and Robinson (2005) synthesize much of this literature. They argue that the combination of high settler mortality rates and the availability of rich factor endowments (mineral riches and indigenous labor in Mexico, Mesoamerica and the Andes; and land adequate for sugar plantations in Brazil, the Caribbean and the South of the US[14], coupled with the availability of slave labor imports) determined a colonization strategy that led to highly exclusionary institutions in much of Latin America and the Caribbean, where a large fraction of the population (of indigenous or African origin) remained for a long time excluded from access to land, education and political power. In contrast, the lack of such initial endowments and lower settler mortality rates led in the north of North America to the progressive dominance of large settlements of Europeans (see Figure 9) and to the establishment of more inclusive institutions.

[14] The South of the US evolved similar institutions than most of the Caribbean Bassin, but there was rapid convergence with the North after the South lost the civil war

These authors show the high persistence of such institutional traits. As a consequence, higher inequality of land holdings, access to education and political power characterized most of Latin America and the Caribbean through the nineteen and early twentieth century, as indicated in Table 1. As this Table shows, both levels of education and indicators of political participation evolved much slower in those countries in which large indigenous populations and mineral riches existed at the time of European colonization, or in which plantations based on slave labor could evolve, than on those countries in which these conditions were not present and European mortality rates were lower (Argentina, Chile [15] and specially, the US).

Table 1. Education and Voice (Latin America and the US)

	Literacy rates (%)				Political institutions: Lack of secrecy in balloting		
	1860/1870	1890/1900	1920/1925	1940/1950	1840-80	1881-1920	1921-40
Bolivia		17					
Colombia			32	62		No	No
Ecuador					Yes	No	No
Guatemala		11.3	15	20			
México		22	36	48.4	Yes	No	No
Perú			38			Yes	No
Brazil	15.8	14.8 - 25.6	30	57		Yes	Yes
Jamaica	16.3	32		67.9			
Argentina	23.8	45.6 – 52.0	73			1896: Yes/ 1916: No	No
Chile	18 – 25.7	30.3 - 43.0	66	76	No	No	No
Costa Rica		23.6 – 33.0	64		Yes	Yes	No
Canadá	82.5				1897: Yes/ 1878: No	No	No
E.U Blancos Norte	96.9						
E.U Total	80	86.7	92.3		No	No	No

Source: Engerman and Sokoloff (2002)

Still today, asset inequality plays an important role in the persistence of high income inequality. In fact, whereas the gini coefficient for operational holdings of agricultural land is estimated at .81 for Latin America (see Deininger and Olinto, 2000), in other regions it tends to hover around .60.[16] More importantly, whereas the gini coefficient of the distribution of years of education in Latin America is around .42, in the developed countries it is closer to .27. See Panel A of Figure 10.

This high inequality in educational levels is particularly dramatic in Latin America because of the low intergenerational educational mobility illustrated in Section II 5. Indeed, differences in educational achievement among children from higher and lower income percentiles in the region are striking, as illustrated in Panel B of Figure 10 for Argentina, a country where the ample availability of schools and teachers do not appear to restrict access to kids from lower social strata.

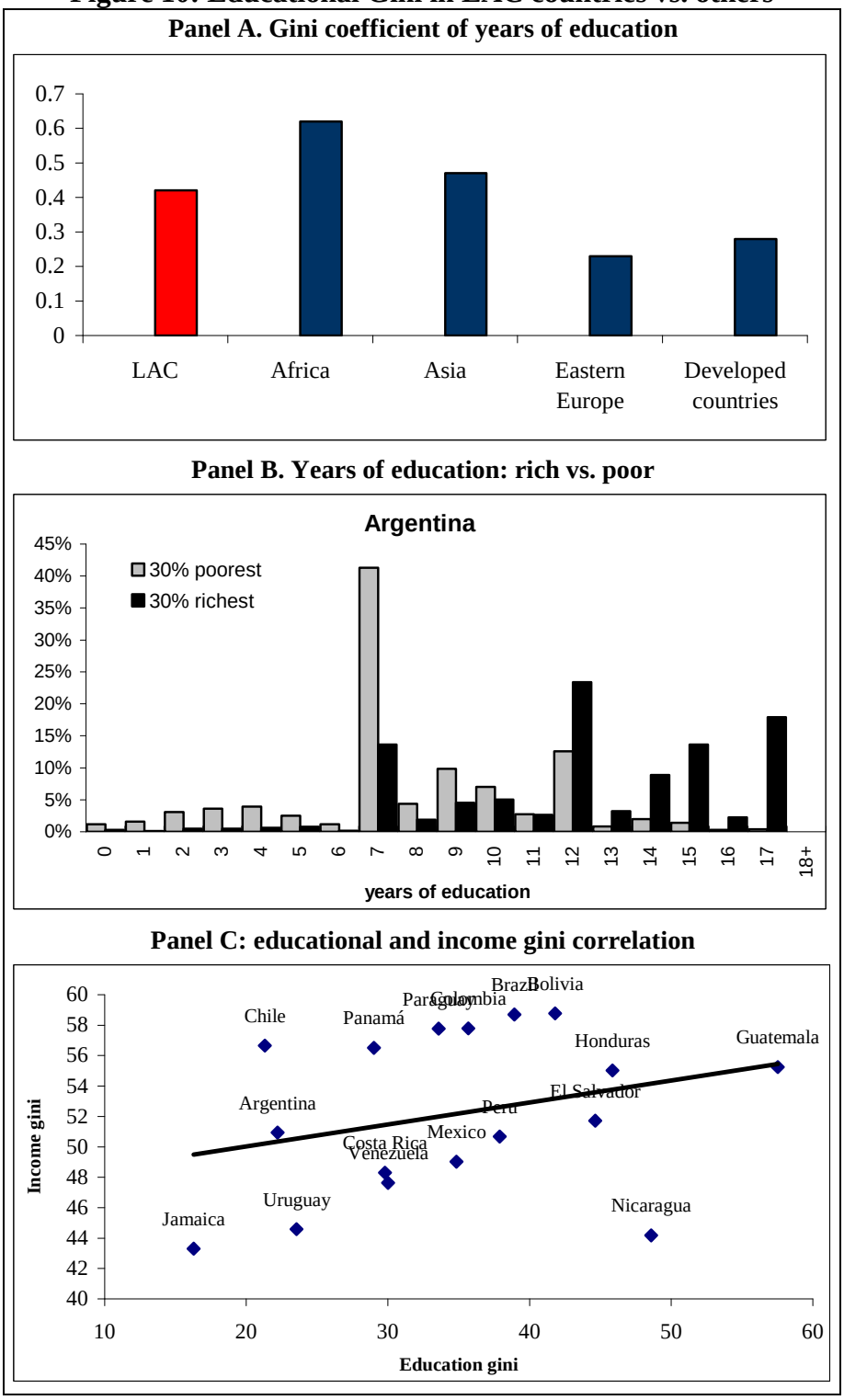
In turn, differences in education are today the most important predictor of differences in income levels among households in Latin American countries (see Perry et al, 2006, Chapter 8). Thus low educational mobility constitutes a major channel of reproduction of

[15] Also Costa Rica

[16] After Latin America the region with the highest land inequality would be the Middle East and North Africa with a Gini of .67.

high income inequality, leading to the low intergenerational social mobility shown in Section II.5. It should not come as a surprise, then, that we find a significant correlation among educational and income Gini's in the region.

Figure 10: Educational Gini in LAC countries vs. others

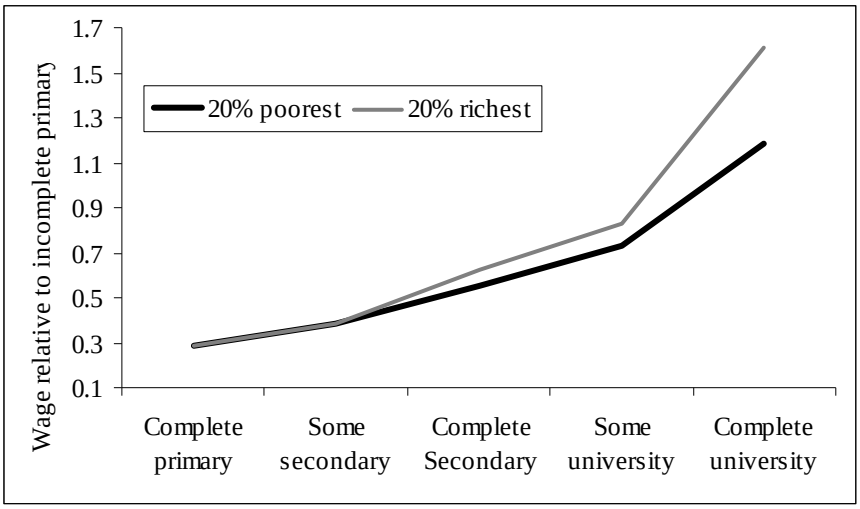


Source: Panel A. De Ferranti et al. (2004). Panel B, Perry et al. (2006).

The differences in educational attainment between the poor and the rich lead to much higher differences in incomes due to the convexity of returns to education, as illustrated in Figure 11. This Figure shows, indeed, that the returns to education increase significantly after finishing secondary school –a condition rarely met by children from lower quintile households. This fact not only helps explain the strong persistence of high income inequality given the low observed educational mobility, but actually –in conjunction with the presence of credit constraints- contributes to explain the low educational mobility itself. Poor parents, who face the need to keep children in school for an extended period of time to actually reap the benefits of their investment in education, also face very high opportunity costs from income forgone from children work, specially during periods of adverse income shocks. The high desertion rates observed among children from poor households should hence not come as a surprise. Actually, this is the main economic rationale of the Conditional Cash Transfers programs that have become so popular in many countries of Latin America in recent years. By lifting the credit constraint, such transfers help effectively reduce the opportunity cost of keeping children in school for poor households that enter the program.

To complicate matters further, Figure 11 shows that educational returns for the children of the poor are lower than for children of the rich. This maybe due to a variety of factors: lower quality of schools, lower availability of assets that are complementary to education in income generation (land, public infrastructure, credit), discrimination in labor markets and unobservable factors (linked to differential access to pre schooling facilities, in nutrition levels, etc). Such differential (and probably more uncertain) returns also help explain the high difference in educational outcomes among children of the poor and the rich, adding to the complexity of the problem and of its solutions. Of course, in many countries in the region there are in addition severe limitations in the supply of schools and teachers in poor neighborhoods, especially in rural areas.

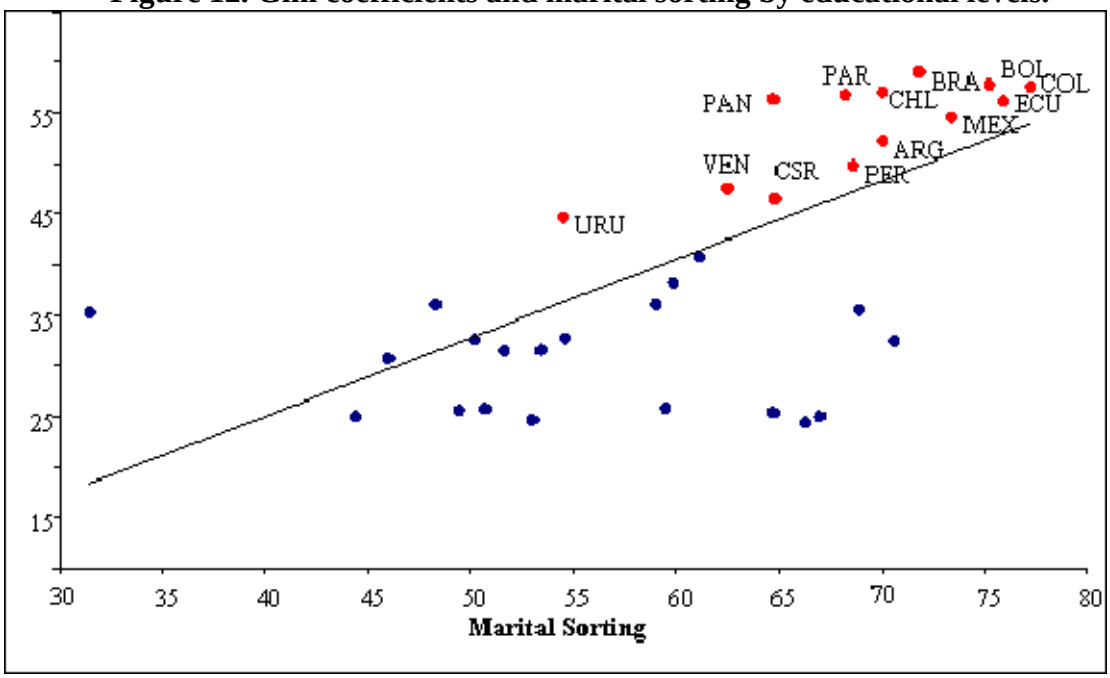
Figure 11. Nicaragua. Returns to education by level.



Source: Perry et al. (2006)

The effect of the high degree of persistence of educational differences on low social mobility is further exacerbated by the high degree of matching among educational groups in the formation of new households. For example, Figure 12 plots the Gini coefficient against marital sorting coefficients (defined as Pearson correlation coefficients for years of schooling between husbands and wives). Two basic messages emerge from this figure. First, there is a strong relationship between the two variables. In fact, the correlation coefficient between marital sorting and the Gini coefficient is above .6. The second message is that the marital sorting coefficients in Latin America are unusually high (at least relative to those in the rest of the world), something that can be taken as a symptom of a severe social stratification problem that not only further concentrates household incomes but reinforces the observed low social mobility.

Figure 12. Gini coefficients and marital sorting by educational levels.



Source: De Ferranti et al. (2004).

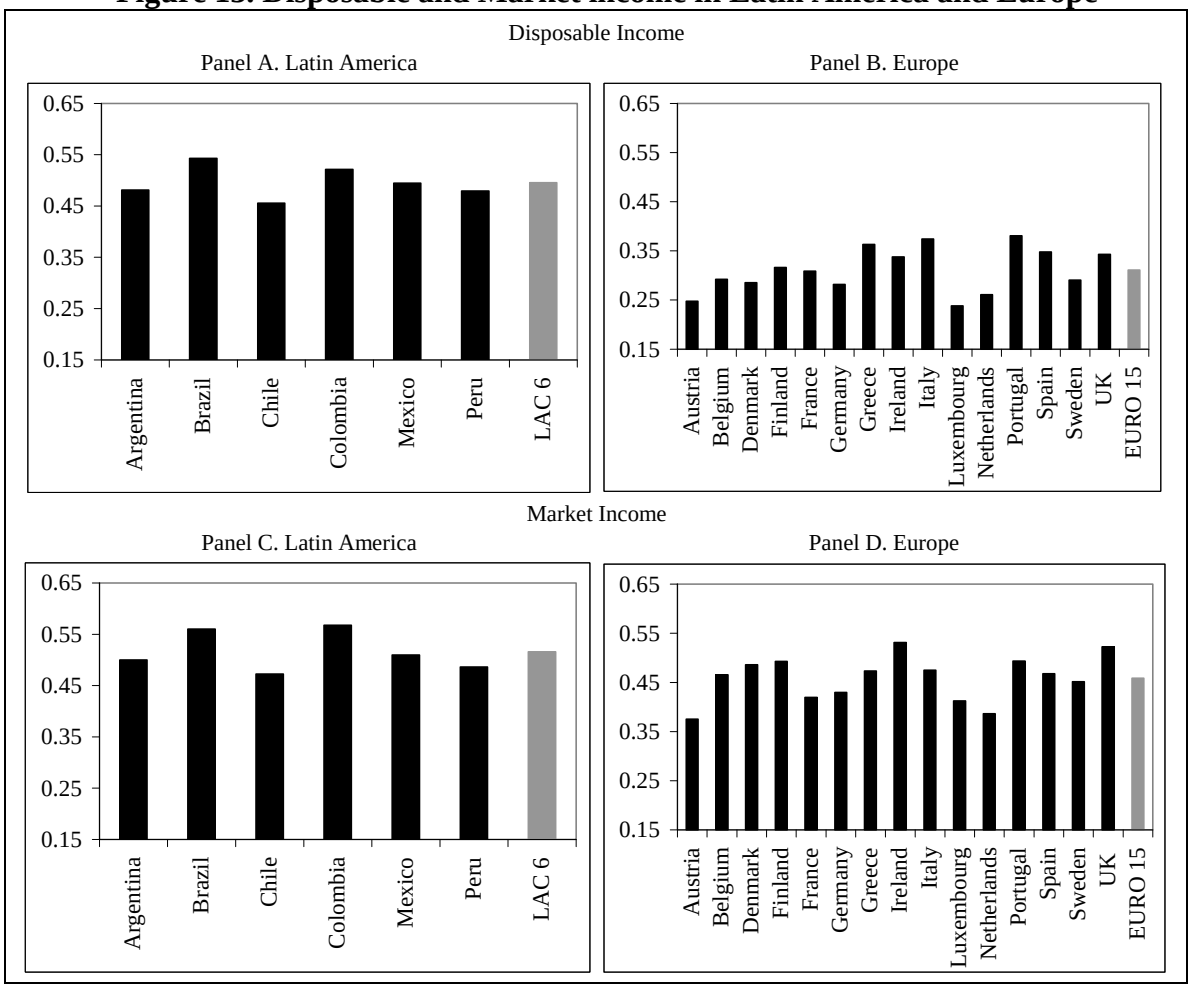
III.2 Fiscal policy and income inequality

Though such differences in educational levels and returns are a major channel of the observed persistence of high income inequality levels, it is by no means the only one. Differences in access to other complementary assets may partially explain differences in returns to education among children from households located in high and low income quintiles. Indeed, previous studies have shown that the persistence of significant differences in "bundles" of assets (education, public infrastructure, institutions) across regions within countries explain the persistence (and frequent divergence) of high spatial income per capita disparities [17]. Indeed, "location" appears as a major predictor of household income differences, together with education.

[17] "Beyond the City: the Rural Contribution to development", WB 2005, and "Poverty Reduction and Growth: Virtuous and Vicious Circles", WB 2006

All these said, high asset inequality does not have to necessarily translate into high disposable income inequality unless taxes and transfers do not have significant corrective effects. In this regard, it may worth looking at the role played by the government in Latin America and compare it with some countries like the Europeans that are well known for having inequality as a policy concern.

Figure 13. Disposable and Market income in Latin America and Europe



Source: Goñi, Lopez, and Serven (2008)

In a recent paper, Goñi, Lopez and Serven (2008), elaborating on a topic highlighted in Perry et al (2006), argued that whereas in Latin America the distribution of *market income* (i.e. the income before taxes and government transfers and thus a measure that is largely determined by market rewards to the private assets and efforts of individuals, and by the underlying distribution of those private assets) and *disposable income* (i.e. the income after government cash benefits such as pensions, unemployment insurance, and social assistance transfers have been received and direct taxes have been paid) are very similar, in Europe this is not the case. Figure 13 (taken from Goñi, Lopez and Serven, 2006) reports the value of the gini coefficient of the distributions of disposable income (Panels A and B) and market income (Panels C and D) in Latin America (Panels A and

C) and Europe (Panels B and D).[18] Panels A and B indicate that Latin America is much more unequal than Europe. In fact, the Latin American country with the lowest Gini coefficient in this sample has inequality levels above those of the most unequal European country (Portugal).[19]

The situation, however, changes significantly when we look at Panels C and D, which show the gini coefficients of the distribution of market incomes: whereas the average gini coefficient of market income for the Latin America sample, at .52,[20] is only 2 percentage points above that of disposable income, the Gini coefficients of the European countries are substantially higher than those in Panel B: the average for the 15 countries in the sample is now .46. That is, it appears that most of the difference between the two regions in the levels of disposable income inequality are due to the different impact of taxes and transfers: they reduce market income inequality considerably in Europe, and very little in Latin America.

A second issue of interest in this context is whether the observed redistribution in Europe operates through the impact of taxes or transfers. This is addressed in Figure 14 which separates the respective impacts of cash transfers and direct taxes. Panel B shows the difference between gross income (market income plus transfers) and market income (i.e. panel B shows the distributional impact of transfers) in Denmark, Finland, Ireland, the UK, and Sweden and indicates that public transfers lower the Gini coefficient of market incomes by 12-14 percentage points, and by 10-11 percentage points in Belgium, Germany, and Luxemburg. At the other extreme, in Portugal transfers lower the Gini coefficient by just 6 percentage points. The average contribution of transfers for the European sample is around 10 percentage points. In contrast, public transfers contribute only slightly to lower inequality in Latin America, lowering the Gini coefficient by between 1 and 2 percentage points, although in some cases (Peru) the distribution of income is even more unequal after transfers than before transfers.

As for the distributional impact taxes, panels C and D of Figure 14 show the difference in the gini coefficient of gross income and disposable income and indicate that the contrast between the two regions is less dramatic. Like with transfers, taxes reduce the levels of income inequality much more in European countries than in Latin America. For example, direct taxation lowers the Gini coefficient of household income by 6-7 percentage points in Austria, Belgium, and Luxemburg, and by an average 5 percentage points for the fifteen countries in the European sample. In contrast, the average decline in the Latin American Gini coefficients as a result of direct taxes is about 1 percentage point, with very little variation across countries. Thus on the whole for the European countries, transfers play a more significant role than taxes: of the 15 percentage points difference

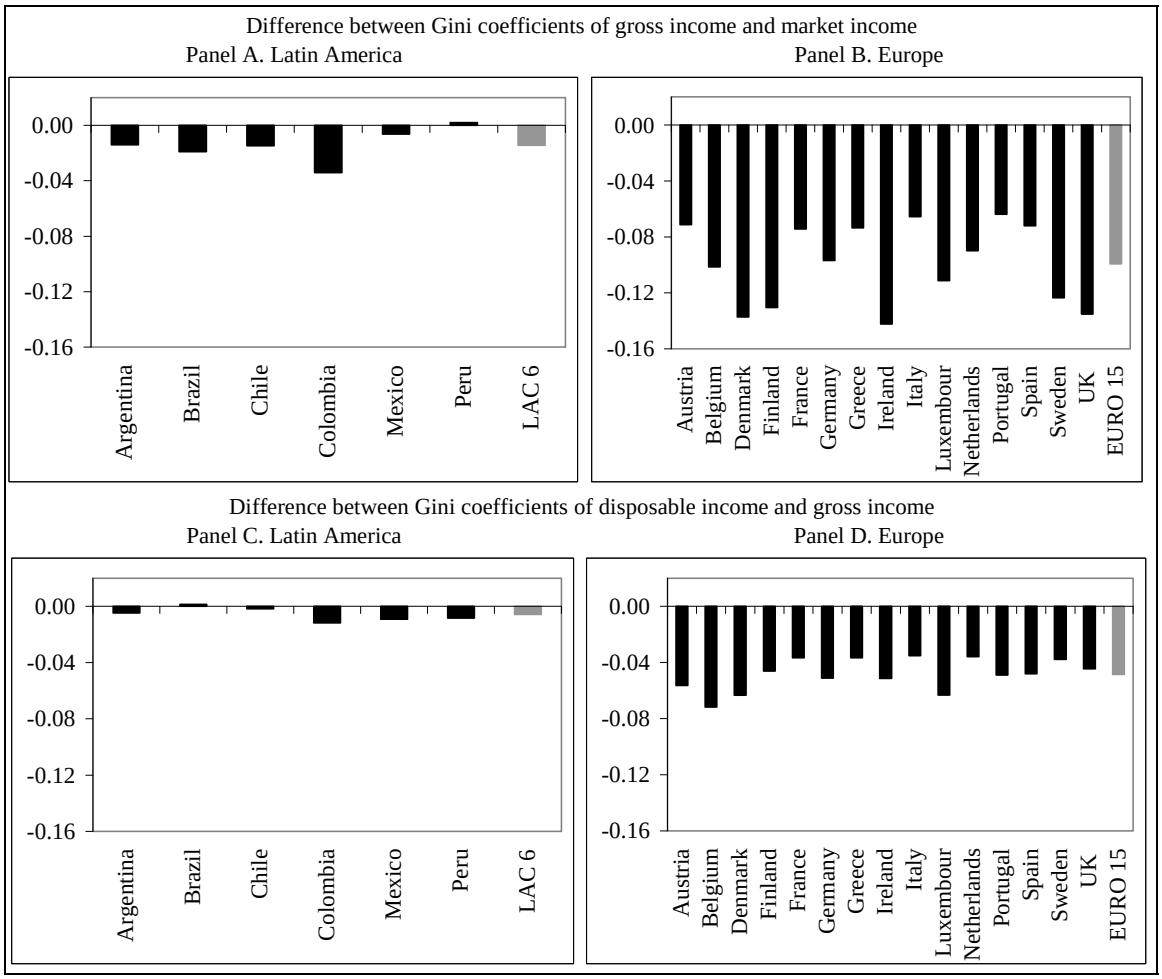
[18] Due to differences in the surveys used, the gini coefficients in figure 6 do not correspond exactly to those in figure 1.

[19] This result continues to hold in a broader sample of Latin American countries, because the lowest Gini in the region (Trinidad and Tobago's) is 42.

[20] Somewhat surprisingly the average gini in this Latin American sample and in the broader sample in figure 1 is the same.

between the average Gini coefficients of market and disposable income across European countries, about two-thirds (10 percentage points) are due to transfers.

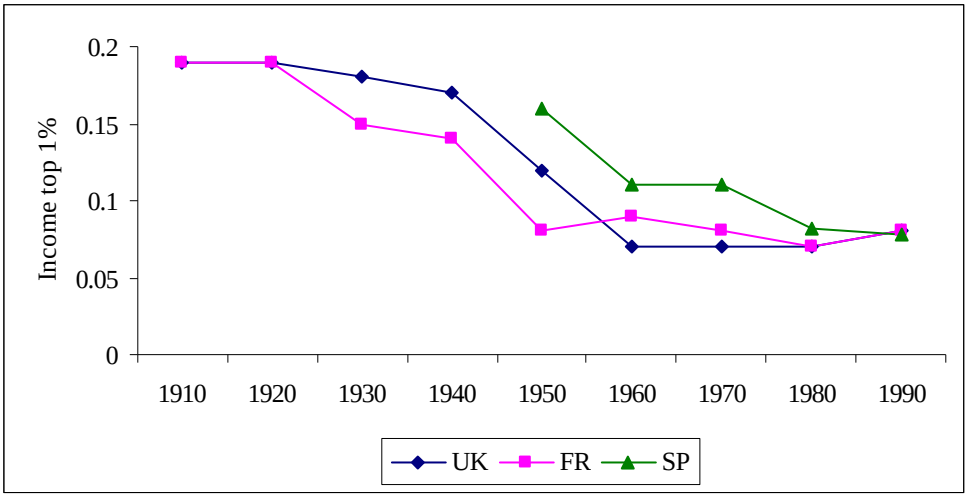
Figure 14. The role of taxes and transfers in Europe and Latin America



Source: Goñi, Lopez, and Serven (2008)

Such low levels of income redistribution through the State may be a reflection of high levels of State capture, and this in turn a reflection of high inequality levels as discussed below. But the fact that Europe was able to "break" with a history of high inequality during the twentieth century as indicated in Figure 15 below, suggest that such an event is not an impossibility going forward in Latin America.

Figure 15. Historical inequality trends (UK, France, Spain)



Source: Perry et al. (2006)

IV. Why is reducing inequality important?

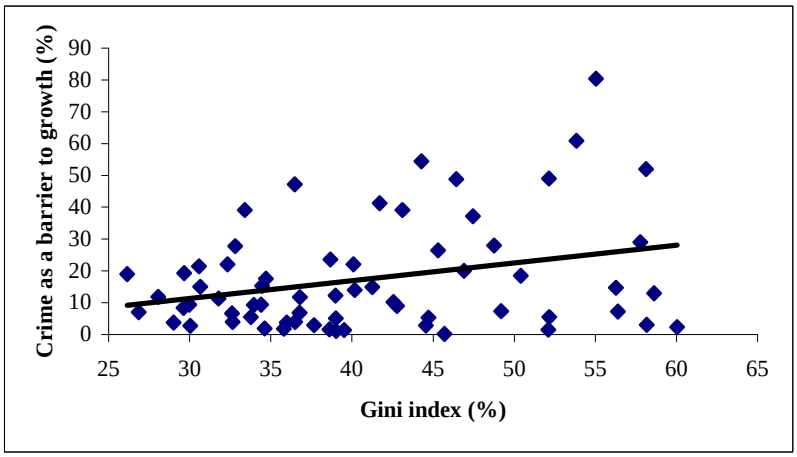
As noted in the introduction there are several reasons why policy makers should be concerned with such levels of high inequality, including that high inequality appears to lower long-run growth. In this section we review three of them.

IV.1 Inequality and crime

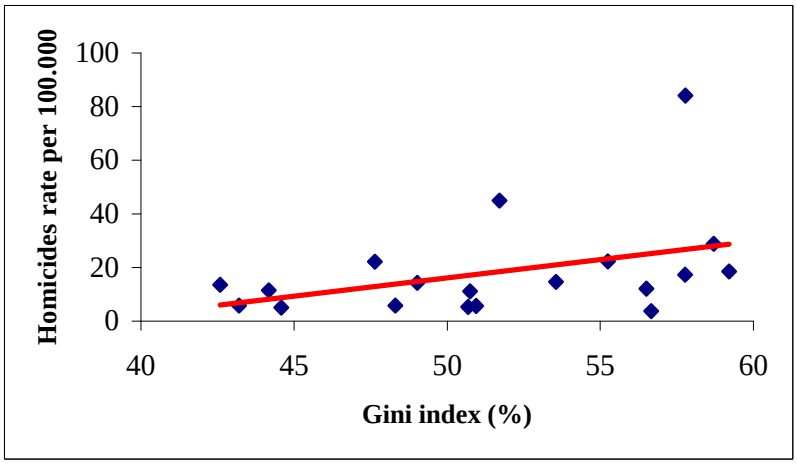
First, there is now significant evidence that high crime and violence levels lower growth prospects (see Alessina and Perotti, 1996 for macro evidence of how crime levels lower growth) More recently, Alaimo et al. 2007 have presented micro evidence based on 10,000+ Latin American firms suggesting a negative impact of crime on firm productivity. In turn, as shown by Fajnzylber, Lederman and Loayza (1998) income inequality appears to be a major determinant of crime and violence levels (see Panel A, Figure 16 for the correlation between the Gini coefficient and the % of firms that find crime to be a major constraint to growth and Panel B for the correlation between income Ginis and homicide rates. Nor surprisingly then, the percentage of firms that find crime and violence to be a major constraint to growth in Latin America is much larger than in other regions (Panel C, Figure 16).

Figure 16: Crime and Violence as a constraint to growth

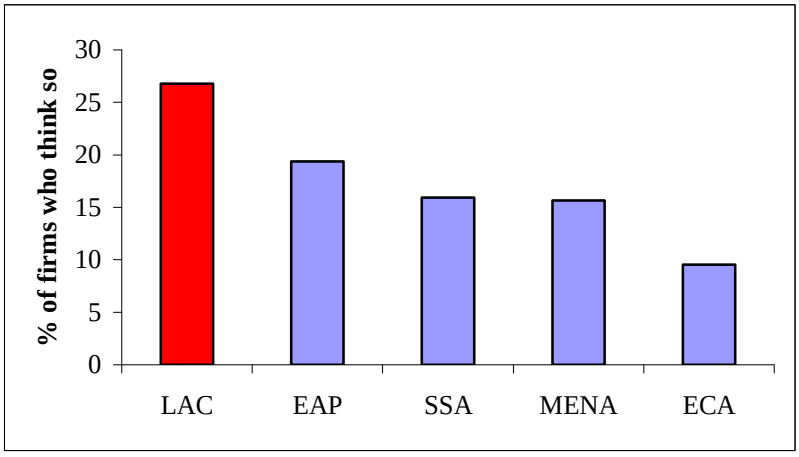
Panel A. Inequality and crime as a barrier to growth



Panel B. Inequality and crime



Panel C. Crime as a barrier to growth



Note: Crime as a barrier to growth indicates the % of firms that find crime and violence to be a major constraint to growth in each country.
Source: World Bank Enterprise surveys

IV.2 Inequality, poverty and growth

Second, it has been argued that inequality, coupled with credit constraints, reduce physical and human capital accumulation (see, for example, Galor and Zeira, 1993). As shown by Perry et al 2006 and Lopez and Serven, 2006, this is really an argument about why poverty (rather than inequality) can be a drag on growth. Lopez and Serven, 2006 show, indeed, that when poverty is included in cross country panel regressions as an additional independent variable it has a significant negative effect on growth and the negative effect of inequality losses its statistical significance. Further, they show that, as proposed by theory, such an effect takes place mostly through a negative effect on investment in countries with low financial deepening (see Table 2). As high inequality leads to higher poverty levels –for the same level of average income per capita-, this should be seen as an *indirect* negative effect of high inequality on growth.

Table 2: The impact of poverty on investment

		Model 1		**Model 2**	
		GFCF	**GCF**	**GFCF**	**GCF**
		(1)	**(2)**	**(3)**	**(4)**
Investment (t-1)		0.658	0.652	0.721	0.653
t-stat		*11.15*	*19.05*	*16.36*	*24.34*
Income (in logs) (t-1)		-0.009	-0.012	-0.005	-0.005
t-stat		*-1.58*	*-2.29*	*-1.55*	*-1.61*
Growth (t)		0.539	0.550	0.524	0.620
t-stat		*8.87*	*9.28*	*14.59*	*14.39*
PPP (t-1)		-0.010	-0.014	-0.004	0.000
t-stat		*-1.66*	*-1.84*	*-0.81*	*-0.06*
Terms of Trade (t)		0.064	0.132	0.079	0.071
t-stat		*1.60*	*3.02*	*3.97*	*3.02*
P_0 ($2) (t-1)		-0.079	-0.105		
t-stat		*-1.88*	*-2.74*		
P_0^{HFD} ($2) (t-1)				0.031	0.016
t-stat				*0.90*	*0.47*
P_0^{LFD} ($2) (t-1)				-0.055	-0.057
t-stat				*-2.03*	*-2.52*
# Observations		338	345	308	311
# Countries		108	108	103	103
Hansen Test	p-value	0.29	0.34	0.47	0.28
AR(2)	p-value	0.33	0.30	0.36	0.43

Notes: The table reports regression results with investment (i.e., gross fixed capital formation –GFCF- or gross capital formation –GCF-) as dependent variable; and lagged investment, the lagged per capita income (in logs), the income growth rate, a lagged measure of market distortion (given by the price of investment goods), the terms of trade, and headcount poverty (US$2 poverty line). The models in columns (3) and (4) use the same controls but separate the poverty data according to whether the country in question has a high

level of financial deepening (above the median sample) or not. All regressions include a constant. The regressions are calculated using system GMM estimators and allowing the instrument set to start with lagged levels at t-1. Robust t-statistics are reported below the coefficients.

One additional potential channel through which poverty can negatively affect growth is through education. As noted in the previous section, the existing microeconomic evidence suggests that poor people have less incentives to get educated than richer people. Yet, to the best of our knowledge this hypothesis has not been tested in a cross national context. We now explore it on the basis of the following empirical model

$$Educ_{it} = \alpha Educ_{it-1} + \beta X_{it} + \delta p_{it} + \eta_i + \upsilon_{it} \qquad (2)$$

where *Educ* is the secondary net enrollment rate, *X* is a set of control variables to be discussed shortly, *p* is the poverty headcount (using a poverty line of US$2 a day) η_i is a country-specific effect, and υ_{it} is an i.i.d error term. Our parameter of interest in (2) is δ. If poverty acts as a barrier to increases in human capital, then we would expect to find δ <0.

As for the control set in *X* we include variables that capture both the availability of school resources and family factors.[21]

To measure availability of resources we rely on two variables. One is the share of GDP spent by the public sector on education and (logged) per capita GDP. We would expect that both variables carry a positive sign in the education equation: countries that spent more could be expected to have higher enrollment rates.

To measure family factors we use the fertility rate and the infant mortality rate. The first of these variables is a proxy for the average number of children in a household and hence for the individual time that parents can dedicate to each children. That is, implicitly we are assuming that there is a trade-off between child quantity and child quality. For example, both Leibowtz (1974) and Hanushek (1992) find that children's educational attainment and family size are negatively correlated. The second of our variables, the infant mortality rate, would aim at capturing health status in the early years of a children's life, a factor that has been found to also correlate with academic achievement (Glewwe, Jacoby and King, 2001). Thus we would expect both the fertility rate and the infant mortality rate to carry a negative sign.

Table 3 presents the results for different specifications depending on the different controls included. First thing to note is that the Sargan test of overidentifying restrictions and the test for second order serial correlation do not indicate any problem with the selected specifications. As for the parameters of the control variables, in general they have the expected sign. The only exception is column (6) where per capita income appears with a negative parameter (although not statistically significant at the 10

[21] There are several studies that argue that family background and socioeconomic factors are more important determinants of student achievement that school resources.

percent). In all the other cases, the fertility rate and the infant mortality rates have negative parameters whereas public spending and income positive.

Moving now to assess the role of poverty, table 3 indicates that poverty levels indeed reduce enrolment rates. Depending on the specification being considered we find that a 1 percentage change in the poverty rate would translate into a decline in secondary enrolment rates ranging between .5 and 1.5 percentage points. That is, beyond being statistically significant, the magnitude of these estimates indicates that they are also economically significant. Thus this analysis indicates an additional channel through which poverty can affect growth.

Table 3: The impact of poverty on education

	Dependent variable is the secondary_net_enrollment rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Persistence	1.004	0.560	0.383	0.435	0.533	0.524	0.332
(lagged dependent)	*13.67*	*14.20*	*10.22*	*15.28*	*4.86*	*22.15*	*7.93*
Public spending on education	3.495	2.974	3.212	2.883	2.853	3.912	2.217
(% of GDP)	*2.31*	*4.98*	*10.51*	*13.68*	*4.71*	*10.38*	*7.17*
Fertility rate			-5.562	-3.014		-6.622	-2.431
(births per woman)			*-7.93*	*-3.33*		*-8.38*	*-1.67*
Infant Mortality				-0.169			-0.214
(per thousand live births)				*-3.37*			*-2.46*
Income					1.881	-3.878	3.557
(log GDP per capita)					*7.51*	*-1.60*	*2.29*
Poverty		-1.467	-1.121	-0.602	-1.392	-0.878	-0.521
(headcount)		*-8.33*	*-8.37*	*-3.61*	*-8.27*	*-6.35*	*-2.35*
Observations	163	105	105	99	105	105	99
Countries	73	55	55	53	55	55	53
Sargan test. p-val	0.18	0.24	0.35	0.78	0.20	0.67	0.98
Second order correlation. p-val	0.58	0.25	0.13	0.12	0.26	0.13	1.40

Note: The table reports the results of regressing the secondary net enrolment rates on the variables in the first column. The data is in non-overlapping 5-year averages. Estimation method is GMM and the instrument set is the same in all the specifications and includes the lagged values of the dependent varaibles. The null hypotheses in the Sargan test of overidentifying restrictions and the test for second order serial correlation are (i) no correlation between the residuals and the instrument set and (ii) no second order correlation in the residuals (i.e. a large p-value indicates that there is no evidence against the null hypothesis).

IV.3 Inequality and output volatility

In the remainder of this section we focus on a third rather unexplored channel: on how inequality can raise output volatility, which in turn is known to reduce growth. In fact, the last few years have witnessed a renewed interest in the relationship between macroeconomic volatility and economic growth (among others see Ramey and Ramey, 1995; Martin and Rogers, 2000; Fatas, 2002; Wolf, 2003; Hnatkovska and Loayza, 2004). To a large extent the main conclusion of these papers is that volatility and long-run economic growth tend to be negatively related.

One possible explanation behind this finding is that if volatility is viewed as a measure of risk, then other things being equal, countries with higher volatility will have a tendency to under-invest or undertake inefficient investment projects (see Bertola and Caballero, 1994) and therefore grow less. A similar argument is made by Krebs, Krishna and Maloney (2005) focusing on the impact of risk on education (rather than on physical capital) and of education on growth. Another potential explanation is that there may be asymmetries in the process of capital or knowledge accumulation. If the negative effects of recessions on learning by doing are larger than the positive effects of expansions, then we would also expect that high volatility leads to lower growth (Martin and Rogers, 1997). Similarly, if firm entry and exit rates differ dramatically in good and bad times along the business cycle, then volatility would also lead to lower investment and growth. This can be the case if for example there are important fixed costs (such as establishing an important sales network) associated to market entry.

Thus a natural question that arises is whether inequality contributes to income volatility. If so, this would be uncovering another potential channel by which inequality may have a negative impact on economic growth. Moreover, recent work by Calderon and Levi-Yeyati (2007) suggests that periods of economic turmoil tend to be associated with deteriorations in the income distribution. In other words, it could that higher volatility leads to higher inequality so that there is a potential for a vicious circle in which high inequality and high volatility reinforce each other.

Figure 17. Volatility and inequality

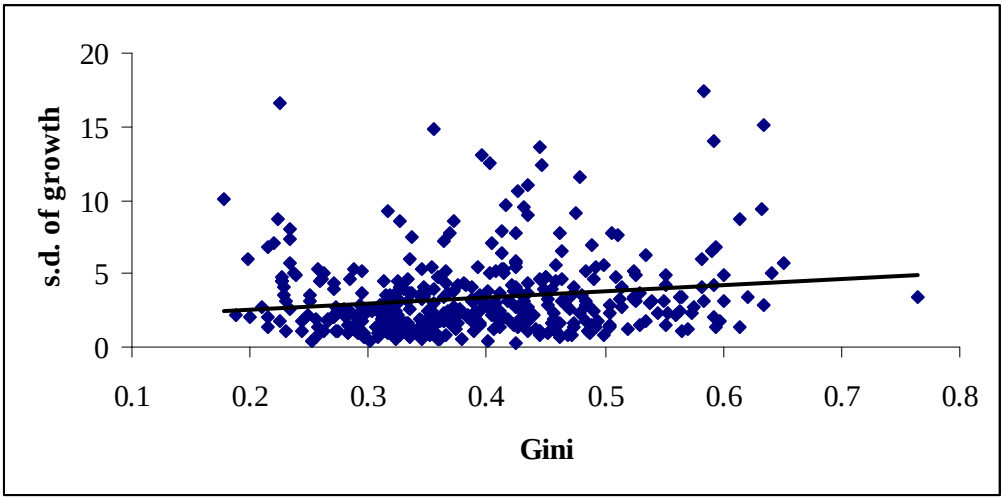


Figure 17 presents the scatter plot of output volatility and inequality based on panel data for 118 countries spanning 1960-2000. Each pair represents the volatility of growth over half a decade and the gini coefficient at the beginning of the period. The figure shows that there is significant dispersion around the regression line, but also a positive slope which is significant at standard levels (4.1 with a robust s.e. of 1.6). The existence of a positive and significant correlation between the standard deviation of output and income

inequality gini coefficients is robust to controlling for the many apparent outliers in the sample.[22]

Which reasons could be behind inequality leading to higher volatility? On the one hand, there is the possibility that more unequal societies are not able to isolate themselves from external shocks as more equal ones. For example, Rodrik (1998) argues that when there is an external shock (say a sharp decline in the price of a commodity which to simplify is the country's main export) the policy response (e.g. devaluation and fiscal retrenchment) would be much more difficult to implement in a country with potential for social conflict because of the distributional implications of the policies. Thus countries with high inequality could in principle suffer more severe consequences form external shocks.

This channel could be particularly important in the Latin American context, not only because of the high inequality levels in the region but also because Latin America has been traditionally subject to large external disturbances from world goods and financial markets. For example, according to de Ferranti et al.(2000), over the past two decades Latin America has suffered terms of trade disturbances that were much larger than those affecting industrial economies and the East Asian countries, and on par with the rest of the developing world.

On the other hand, inequality could negatively affect the quality and volatility of policies if policy makers reflect the view of the median voter and she/he feels that has more to gain from policies that aim at solely redistribution even if those have a negative impact on growth. For example, this is the theoretical result obtained by Alesina and Rodrik (1994) who assumed that taxes are proportional to income, public spending is equally distributed among individuals, and the median voter rules. Taking this view to the extreme, one can imagine a situation where a populist government applies policies based more on their acceptance by the median voter than on whether they are more or less appropriate in a particular context (i.e. where the government makes policy mistakes because of popular pressure).

Clearly, these are just hypotheses, which to the best of our knowledge have not been explored empirically[23]. We next explore what the data have to say. To explore the role played by inequality in the transmission of international shocks, our empirical strategy is based on the following econometric specification:

$$\sigma_{it} = \alpha\sigma_{it-1} + \beta\eta_{it} + \delta\eta_{it}g_{it} + \chi X_{it} + \nu_i + \upsilon_{it} \qquad (3)$$

where σ is the standard deviation of GDP growth over a 5 year period, η is a variable that captures the magnitude of external shocks (such as the standard deviation of the trading partners growth rate or the standard deviation of the terms of trade), g is the gini

[22] A regression estimate of the slope coefficient robust to the presence of outliers be 2.6 with an associated s.e. of .86 (i.e. it continues to be significant).

[23] Rodrik (1998) explored whether external shocks affect growth more in high inequality economies but we do not know of any study that has explored the impact on inequality on output volatitility.

coefficient at the beginning of the period, X is a set of control variables, ν_i is a country-specific effect, and υ_{it} is an i.i.d error term. According to (3), output volatility depends on past volatility, external conditions, inequality and a set of control variables to capture the economic environment. Among these controls, we include inflation, government spending, openness to trade, and a measure of financial deepening. We also explore the role played by a measure of fiscal policy volatility (denoted σ_F) and a measure of monetary policy volatility (denoted σ_M). As noted by Fatas and Mihov (2007) policy volatility is probably a better indicator of macroeconomic policy than standard measures reflecting levels of policy instruments. That is, one could view σ_F and σ_M as measures of policy "quality".

Briefly, to compute σ_F we first filter government consumption growth from business cycle fluctuations by projecting that variable over GDP growth and a constant and then proceed to compute the standard deviation of the residual over non-overlapping 5 year periods. Similarly, we compute σ_M on the basis of the residual of a regression[24] of money growth on inflation and GDP growth and a constant.[25] That is, both σ_F and σ_M are unrelated to the economic cycle.

In (3) our primary focus is the estimate of δ. If inequality leads to higher domestic volatility when there is an external shock then we should find that $\delta > 0$. Note that in this model the relationship between output volatility and the external shock is given by:

$$\frac{\partial \sigma_{it}}{\partial \eta_{it}} = \beta + \delta g_{it} \,. \tag{4}$$

Thus if $\delta > 0$, domestic output volatility would increase with the level of inequality. As for the relationship between output volatility and inequality, it follows from (3) that:

$$\frac{\partial \sigma_{it}}{\partial g_{it}} = \delta \eta_{it} \,, \tag{5}$$

which to the extent that η cannot take negative values will also be positive when $\delta > 0$.

Testing the second hypothesis is much more challenging because the literature (at least the empirical literature) on the determinants of policy quality is much scarcer. One could think of a framework where institutions are behind policy quality and hence policy volatility, perhaps through constraints on the executive (see Fatas and Mihov 2007), or elements such central bank independence, but clearly this unchartered territory. Against this background we rely on a simple econometric model given by:

[24] Due to the existence of important outliers the estimates are robust to the presence of outliers.

[25] We are aware that the measure of monetary policy is likely to be more challenging because different countries rely on different policy instruments (i.e. exchange rates, money, interest rates) and hence any measure we use will have important limits

$$\sigma_{Pit} = \alpha\sigma_{Pit-1} + \beta g_{it} + \chi X_{it} + \nu_i + \upsilon_{it} \qquad (6)$$

where *P=F,M*, and as above *g* is the gini coefficient at the beginning of the period, X is a set of control variables, ν_i is a country-specific effect, and υ_{it} is an i.i.d error term.

Among the control variables we consider are σ_{Mt-1} (σ_{Ft-1})in the regression for σ_F (σ_M), inflation, and external shocks. According to (6), policy volatility depends on past policy volatility (to control for inertia), policy context (i.e. inflation, external conditions), and inequality. Our primary focus is the estimate of β in equation (1). If inequality leads to higher policy volatility then we should find that $\beta > 0$. If one the other hand, inequality does not affect policy volatility, we should find that $\beta = 0$. It could be argued that the previous model is ignoring important elements such as institutions. While we do agree with that point, we would note that to the extent that institutions are more or less permanent or highly persistent (at least within the horizon of the econometric exercise) our fixed effects model should be able to account for them.

Given the dynamic nature of equations (3) and (4) and the presence of fixed effects to account for unobserved country heterogeneity, both equations are estimated using the system GMM estimator.

Tables 4 and 5 report the results corresponding to equation (3) for two different measures of the external shock (the s.d. of the trading partners growth rate in table 1 and the s.d. of terms of trade in table 2) and different specifications depending on the control variables. Inspection of these tables suggests [26] that indeed our parameter of interest is always positive and significant at standard levels. That is countries with higher inequality levels seem to suffer more from external shocks. In a number of cases β is negative but when we solve (4) to find its zero value, the obtained gini coefficient (between .2 and .3) tends to take values that are below the actual distribution of gini coefficients across countries.[27]

As for the values taken by parameters corresponding to the policy controls, it has to be noted that there are important differences depending on whether one considers as our measure of external shock growth volatility in the trading partners or the volatility in the changes in terms of trade. In the first case, the controls carry the expected sign and are in most cases significant, with the exception of the monetary volatility variable. Fiscal volatility leads to higher output volatility. A similar result is found for inflation and for openness to trade. On the contrary, financial deepening and a large government seem to help in mitigating the impact of external shocks. While the results for financial deepening are encouraging because progress on this are would be win-win in the sense that it would contribute to lower volatility and to faster growth (see Levine, 1997), the result for the size of the government appears a bit more problematic because it may somewhat present a trade-off between volatility (countries with smaller governments appear to be more

[26] Hansen test of overidentifying restrictions and the test for second order serial correlation do not indicate any particular problem with the specification of the models.

[27] We have also explored the extent to which this finding is driven by the fact that more unequal countries are less financially developed, and thus more exposed to external shocks. However, there is no evidence of such hypothesis in the data.

volatile) and growth (there is plenty of evidence indicating that in general countries with larger governments tend to grow less; among others see Loayza, Fajnzylber and Calderon, 2005). When, instead, we look at the results for the specification with the volatility of the changes in the terms of trade, we find that the only variable that appears to matter (apart from the external shock) is the volatility of fiscal policy.

Could it be that inequality is correlated with some missing variables that should belong to the equation and that our results are affected by missing variable bias? To explore this issue we augment equation (3) with the interaction of our external shock variable and two potential candidates: the degree of openness of the economy and financial deepening. This gives rise to four different models depending on the variable used to proxy the shock and the variable used to augment the equation. Table 6 reports the results in a synthetic way, when we exclude the direct effect of individual policies -the equivalent of equation (2i Tables 4 and 5. The main message of this table is that our finding is robust to this departure from our basic specification. While the interaction of our external shock variables and the degree of openness and financial deepening are significant and have the expected signs (positive in the first case and negative in the second one), the interaction of the external shock variables and inequality continue to be significant. These results hold when we include the effect of individual policies (not shown here). Thus, inequality augments the effect of external shocks, even when controlling for the mitigating effect of financial deepening and the augmenting effect of trade opening.

We now move to explore whether inequality affects the quality of policy. Table 7 indicates that in general we cannot reject the null hypothesis that inequality does not affect policy volatility. In fact, the null hypothesis never comes close to rejection.

Table 7 also indicates that there is moderate persistency in the volatility of both fiscal and monetary policy (autoregressive parameters in the .1 to .2 range) and that both external shocks and inflation appear to play a role in this context contributing to higher volatility.[28]

On the whole, from these results one can conclude that indeed inequality contributes to higher volatility through the external shock transmission channel, but it does not appear to contribute through a weaker quality of implemented policies. The latter result should not come as a surprise, given that other predictions of the median voter theory are neither supported by the data. In fact, we already have shown in Section 3 that, contrary to what this theory would predict, countries with higher inequality –as those in Latin America- do not appear to engage in more redistributive policies. We can not rule out, however, that higher inequality could lead to weaker economic institutions (eg, lower property rights protection) and through this channel [29]affect negatively long term growth, as proposed by the median voter theory and suggested by recent events in some countries in the region.

[28] We have also tried with specifications that include public spending but this variable does not seem to belong to the equation.
[29] On this point, see Lederman and Perry, forthcoming.

Table 4. Inequality and the transmission of international shocks

Dependet variable is s.d. of per capita growth rates										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Persistence	0.382	0.287	0.085	0.214	0.124	0.156	0.081	0.267	0.191	0.303
(lagged dependent)	*6.40*	*7.88*	*1.61*	*4.92*	*2.90*	*2.06*	*1.76*	*6.11*	*5.33*	*3.67*
External shock	0.318	-1.443	-1.964	-1.099	-0.515	-1.609	-1.325	-1.422	-1.164	-0.702
(s.d. of annual growth of trading partners)	*4.19*	*2.50*	*3.11*	*2.29*	*1.02*	*2.62*	*2.08*	*2.42*	*2.29*	*1.04*
External shock * inequality		5.538	6.355	3.585	1.937	5.630	4.747	5.245	4.309	4.014
(s.d. of annual growth of trading partners *gini)		*3.49*	*3.65*	*2.95*	*1.51*	*3.42*	*2.67*	*3.26*	*3.07*	*2.39*
Fiscal policy volatility			0.048		0.033					
(s.d. of annual growth of gov. consumption)			*4.72*		*3.41*					
Monetary policy volatility				0.000	0.000					
(s.d. of annual growth of corrected money)				*0.38*	*0.15*					
Price stability						1.027				0.294
(inflation rate)						*2.13*				*1.12*
Access to credit							-0.747			0.129
(credit to the private sector to GDP)							*2.86*			*0.47*
Openness to trade								0.458		1.232
(strcuture-adjusted trade volume to GDP)								*1.45*		*2.52*
Government spending									-1.203	-3.221
(Government consumption to GDP)									*2.04*	*4.71*
# of countries	110	107	104	94	92	105	102	104	106	99
# of observations	685	364	339	288	275	348	337	341	349	313
Hansen test of overident. Restrictions (p-val)	0.16	0.49	0.53	0.62	0.58	0.55	0.53	0.43	0.37	0.13
Test for second order serial correlation (p-val)	0.23	0.17	0.18	0.20	0.25	0.23	0.20	0.20	0.28	0.15

Note: The table reports the results of regressing the s.d. of a country's growth rate on the variables in the first column. The data is in non-overlapping 5-year averages. Estimation method is GMM and the instrument set is the same in all the specifications and includes the lagged values of monetary policy volatility, fiscal policy Volatility, price stability, access to credit, openness to trade, government spending and the gini coefficient. The external shock is treated as exogenous. t-stat in italics. The null hypotheses in the Hansen test of overidentifying restrictions and the test for second order serial correlation are no correlation between the residuals and the instrument set and no second order correlation (i.e. a large p-value indicates that there is no evidence against the null hypothesis).

Table 5. Inequality and the transmission of international shocks.

	Dependet variable is s.d. of per capita growth rates									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Persistence	0.272	0.009	-0.193	0.035	-0.066	0.024	-0.064	0.008	-0.008	-0.033
(lagged dependent)	*4.65*	*0.26*	*3.47*	*0.99*	*1.59*	*0.43*	*1.29*	*0.25*	*0.17*	*0.79*
External shock	0.097	-0.382	-0.418	-0.240	-0.266	-0.318	-0.550	-0.319	-0.353	-0.230
(s.d. of annual change in terms of trade)	*10.67*	*5.36*	*5.34*	*4.09*	*3.93*	*4.13*	*6.70*	*4.90*	*5.10*	*3.25*
External shock * inequality		1.179	1.319	0.757	0.854	0.990	1.648	1.050	1.111	0.830
(s.d. of annual change in terms of trade *gini)		*6.41*	*6.43*	*4.97*	*4.78*	*5.05*	*7.66*	*6.14*	*6.17*	*4.60*
Fiscal policy volatility			0.043		0.038					
(s.d. of annual growth of gov. consumption)			*3.91*		*4.15*					
Monetary policy volatility				0.000	-0.001					
(s.d. of annual growth of corrected money)				*0.05*	*0.63*					
Price stability						-0.057				-0.052
(inflation rate)						*0.17*				*0.14*
Access to credit							0.171			-0.248
(credit to the private sector to GDP)							*0.56*			*0.76*
Openness to trade								0.304		1.204
(strcuture-adjusted trade volume to GDP)								*1.35*		*3.11*
Government spending									0.357	-0.823
(Government consumption to GDP)									*0.72*	*1.27*
# of countries	110	107	104	94	92	105	102	104	106	99
# of observations	685	364	339	288	275	348	337	341	349	313
Hansen test of overident. Restrictions (p-val)	0.20	0.72	0.84	0.87	0.73	0.62	0.60	0.72	0.73	0.46
Test for second order serial correlation (p-val)	0.34	0.48	0.68	0.33	0.42	0.51	0.36	0.46	0.43	0.31

Note: The table reports the results of regressing the s.d. of a country's growth rate on the variables in the first column. The data is in non-overlapping 5-year averages. Estimation method is GMM and the instrument set is the same in all the specifications and includes the lagged values of monetary policy volatility, fiscal policy volatility, price stability, access to credit, openness to trade, government spending and the gini coefficient. The external shock is treated as exogenous. t-stat in italics. The null hypotheses in the Hansen test of overidentifying restrictions and the test for second order serial correlation are no correlation between the residuals and the instrument set and no second order correlation (i.e. a large p-value indicates that there is no evidence against the null hypothesis).

Table 6. Inequality and the transmission of international shocks: augmented models.

Dependet variable is s.d. of per capita growth rates		
	s.d. of annual growth of trading partners	s.d. of annual change in terms of trade
	(1)	(2)
External shock * inequality	6.194	1.498
	3.63	*8.47*
External shock * credit	-0.206	-0.029
	1.04	*0.77*
External shock * inequality	5.115	0.837
	3.22	*4.76*
External shock * trade openness	0.258	0.040
	1.54	*2.34*

Note: The table reports the parameter and t-stat in regressions like those in column (2) of tables 4 and 5, augmented with an interaction of the external shock with either financial deepening or trade openness.

Table 7. Inequality and the transmission of international shocks.

	Dependet variable is fiscal policy volatilility					Dependet variable is monetary policy volatilility				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lagged fiscal policy volatility	0.206	0.202	0.049	0.068	0.212			0.450	0.404	0.086
(s.d. of annual growth of gov. consumption)	*5.28*	*5.16*	*1.13*	*1.37*	*2.59*			*1.76*	*1.17*	*0.24*
Lagged monetary policy volatility			-0.194	-0.647	-0.004	0.251	0.141	0.108	-0.093	-0.148
(s.d. of annual growth of corrected money)			*-0.91*	*0.45*	*-0.73*	*7.70*	*7.84*	*4.75*	*-8.01*	*-3.98*
Inequality		3.810	0.007	0.004	-1.290		-0.905	-1.341	0.118	1.000
(gini coefficient)		*0.40*	*0.87*	*1.28*	*-0.08*		*-1.44*	*-1.52*	*0.23*	*1.40*
External shock				0.600					-1.07	
(s.d. of annual growth of trading partners)				*2.60*					-0.97	
Price stability					1.581					2.352
(inflation rate)					1.73					*3.38*
# of countries	121	110	95	90	94	115	105	95	90	94
# of observations	551	312	245	239	238	523	272	246	240	239
Hansen test of overident. Restrictions (p-val)	0.68	0.38	0.69	0.68	0.53	0.18	0.67	0.71	0.51	0.69
Test for second order serial correlation (p-val)	0.28	0.20	0.61	0.62	0.54	0.36	0.32	0.32	0.32	0.24

Note: The table reports the results of regressing the s.d. of fiscal policy and monetary policy volatility on the variables in the first column. The data is in non-overlapping 5-year averages. Estimation method is GMM and the instrument set is the same in all the specifications and includes the lagged values of monetary policy volatility, fiscal policy, and the gini coefficient. The external shock is treated as exogenous. t-stat in italics. The null hypotheses in the Hansen test of overidentifying restrictions and the test for second order serial correlation are no correlation between the residuals and the instrument set and no second order correlation (i.e. a large p-value indicates that there is no evidence against the null hypothesis).

V. Conclusions

Inequality is high in Latin America however we measure it. The region has among the highest traditional income inequality measures and it does not fare better with respect to more dynamic indicators of social or educational mobility. Income inequality tended to increase in most countries during the 1990s, with significant variation across countries, though trends look somewhat better when we use the right price deflators by income ventiviles.

Such high inequality levels must be a concern for policy makers, not just on equity but on efficiency grounds. We illustrate three channels through which high inequality reduces economic growth, based on previous research but also on new evidence. First, high inequality is partly responsible for the high levels of crime and violence in most countries of the region, which in turn affect their growth performance. Second, high inequality leads to high poverty levels (for a given income per capita average), and high poverty in turn is a drag on physical and human capital accumulation, thus indirectly lowering growth rates. Third, high inequality contributes to high output volatility (by augmenting the effect of external shocks), which in turn affects economic growth adversely through several channels.

Various factors are behind the persistence of high inequality levels. Inequality of assets, especially of human capital, is a major determinant of current income inequality. Convexity of returns to education and high degrees of marital sorting exacerbate the importance of the existing high concentration in educational attainment. Low educational mobility becomes thus a critical factor behind the persistence of high income inequality. Overcoming low educational mobility requires attention both to supply side (availability of schools and teachers) and demand side issues: given the convexity of returns (marginal returns become significant only after completion of secondary schooling), credit constraints and increasingly high opportunity costs for the poor in terms of forgone income from youth in school, wisely designed and implement conditional cash transfers appear as a potentially key instrument for breaking this vicious circle. At the same time, attention must be paid to factors that determine differences in returns to education across income groups: quality of schools, access to pre schooling facilities and, most importantly, access to complementary assets (financial services, public infrastructure, etc). Equalizing access to assets is part of a broader Agenda of equalizing opportunities, which would have the major advantage of contributing to both higher equality of incomes and higher growth. The State has of course a central role in guaranteeing higher equality of opportunities.

But equalizing access to assets and opportunities take time and the state can do significant income redistribution in the short term, without incurring in high growth costs. Indeed, we have shown that the extent of income redistribution through taxes and, specially, transfers explain more than half of the observed differences in disposable income distribution between Latin American and developed countries. Overall, public expenditures in Latin America are much less progressive in Latin America than in OECD countries. This is both due to the weight of big expenditure items that benefit

disproportionately the well to do (generalized subsidies to energy consumption, pensions and higher education) and the still relatively minor importance of targeted transfers. Transforming the Latin American state, so that it becomes an agent of equalization of opportunities and efficient income redistribution, is perhaps the most significant challenge in our regional development agenda.

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