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**GROWTH, INEQUALITY, AND POVERTY IN LATIN AMERICA:
A CAUSAL ANALYSIS, 1970-94**

by

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Growth, Inequality, and Poverty in Latin America: A Causal Analysis, 1970-94

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I. Past analyses and positions in the debate

Latin America is a region with exceptionally high levels of inequality and with an incidence of poverty that remains unusually high given the prevailing levels of average per capita income. With countries emerging from severe recessions that had been induced by unsustainable domestic policies and external shocks, the effectiveness of growth in per capita incomes in reducing inequality and poverty has become an important issue of political debate: can growth in per capita incomes be relied upon to reduce poverty and inequality or is it a weak force that needs to be complemented by other policy interventions? This question has been brought to the fore by the derailing of economic recovery in Mexico as a consequence of social instability. In addition, transitions to democracy or improvements in democratic representation and decentralization of governance throughout the continent have given the poor new channels of access to the political process, making their demands for participation to the gains from growth more difficult to ignore. The strength of these demands has been significantly enhanced by proliferation of grassroots organizations and social movements which act as advocates for the poor. Serious losses in purchasing power during the years of crisis and adjustment have created a degree of impatience in these demands which leaves little room for further postponement.

While there has been virtually no systematic causal analysis to identify the roles of growth and other variables on poverty and inequality, there is general agreement on the factual description of trends in poverty and inequality. This has in part been made possible by a significant recent effort in generating comparable data across time and countries, with major contributions by Altimir at the Economic Commission for Latin America and the Caribbean (CEPAL) and Psacharopoulos et al. at the World Bank. Inspection of these data by a number of analysts of Latin American poverty (such as Altimir, Beccaria et al., Fields, Lustig 1995, Morley, and Psacharopoulos et al.) during broad periods of early growth (1950s, 60s, and 70s), recession (early and mid-1980s), and recovery (late 1980s and 1990s) has led to the general conclusion that inequality and poverty have

followed the economic cycle, rising during recession and falling during recovery, with changes in inequality reinforcing the direct impact of changes in income on the evolution of poverty.

Whether future growth will be able to sufficiently reduce inequality and poverty to accommodate political demands and not threaten the sustainability of recoveries remains a matter of debate. Opinions range from optimism (Morley), to calls on the need to complement the impact of growth with attention to education and employment creation (Psacharopoulos et al., Lustig), and to advocacy of the need for extensive inequality-reducing and anti-poverty interventions (Beccaria; Fujii and Aguilar).

Analysis of the relation between growth and inequality/poverty and of the role of other causal factors remains highly unsatisfactory for four reasons. First, there has been no systematic econometric analysis of the sources of change in inequality and poverty. Historically, this was due to paucity of comparable data. With the recent effort at generating comparable data, however imperfect these data clearly still are (Lustig, 1994), this problem can at last be partially overcome. Second, causal analysis has been done by observing changes in inequality and poverty during broad periods of growth and recession instead of conducting a detailed spells analysis where country-specific periods of growth and decline are treated as observation units. In general, data for the 1970s have been associated with growth, for the mid-1980s with recession, and for the late 1980s and early 1990s with growth recovery. This is inadequate since countries had highly idiosyncratic phases of growth and recession, with some countries like Colombia and Costa Rica largely avoiding recession, and countries like Brazil and Peru still in recession in the late 1980s and even early 1990s. Clearly, analysis of the association between growth and poverty/inequality need allow for this country heterogeneity by looking at country-specific spells of growth and recession as opposed to a continental definition of epochs of growth and recession. Third, if care is not taken to separate periods of growth and recession, the overall negative relation that has been established between changes in income and changes in poverty/inequality may derive from recession, from growth, or from both. If the strongest relation occurs during recession, the optimistic predictions about the role of income growth in reducing poverty/inequality may be

dangerously overstated. Fourth, there are important qualitative differences between growth before and after the debt crisis that need to be identified. Before the crisis, most Latin American economies were still implementing import substitution industrialization strategies and accumulating debt, thus discriminating against agriculture and favoring employment in government and protected industries. After the crisis, the general prescriptions of the “Washington Consensus” (Williamson, 1990) had been implemented, with severe fiscal discipline, restrictive monetary policies, competitive exchange rates, and trade liberalization.

In this paper, we proceed to construct a systematic data base where the unit of observation is spells of years between data points where complete measurement is available for inequality and rural and/or urban poverty. In section 2, we present the data and descriptive statistics. In section 3, we specify the causal relations that will be empirically quantified. In section 4, we present econometric estimates of the causal determinants of inequality, and urban and rural poverty across growth spells. Finally, in section 5, we extract policy implications regarding the role of growth and the use of additional instruments to reduce inequality and poverty.

II. Data and descriptive statistics

The data characterize 40 spells in twelve countries for which we have data on changes in poverty and inequality for the period 1970-94.¹ To identify the role of income growth and of changes in policy regime, the spells are classified into three groups as follows:

- Early growth: spells with positive average annual growth rate in GDP per capita (\dot{GDPpc}), either preceding a recession period or including the 1970s if there has been uninterrupted growth.
- Recession: spells during which GDP per capita fell.
- Late growth: spells with positive \dot{GDPpc} , either following a recession period or including the 1980's if uninterrupted growth.

¹ Data for Costa Rica are not used as they are inconsistent across sources, with figures given by Altimir indicating an increase in poverty between 1981 and 1990 and figures given by Psacharopoulos et al. a very sharp decline for the same period.

The spells, the corresponding \dot{GDP}_{pc} , and their classification in three groups are given in Table 1. We give in Table 2 descriptive statistics by growth spell with the data weighted by population size. The 11 countries in the sample account for 87% of the Latin American and Caribbean population (Inter-American Development Bank, 1993). The data are average annual growth rates in per capita GDP, in the indicators of poverty (number of rural (RP) and urban (UP) poor; headcount ratio for the rural (RP_0), urban (UP_0), and total population (TP_0)), and in the indicator of inequality ($Gini$).

The data confirm the general observation made by others regarding changes in overall poverty in relation to the economic cycle: the overall headcount ratio fell during early growth (an average annual growth rate of -0.5%), rose sharply during recession (2.7%), and declined again during recovery (-3.3%). However, this general cyclical behavior of poverty does not hold to sectoral disaggregation. Both the number of rural poor and the incidence of rural poverty declined steadily during all periods of growth and recession, a remarkable fact. The decline was higher per point of \dot{GDP}_{pc} during late than early growth, an apparently hopeful sign for the future role of growth.

By contrast to overall poverty, and to conventional wisdom, the number of urban poor and the headcount ratio were increasing during early growth. Observations by others are correct that recession was devastating on urban poverty. The average annual growth rate in the number of urban poor during years of recession was 8.9% , and it was 5.9% in the headcount ratio. By contrast to early growth, late growth was effective in reducing both the number and the incidence of urban poverty.

The sectoral composition of poverty changed with the crisis. Before recession, total poverty was dominated by rural poverty. As a consequence, the incidence of total poverty fell along with the decline in rural poverty in early growth. During the crisis, the rise in urban poverty overwhelmed the decline in rural poverty and total poverty rose, while the majority of the poor were displaced to the urban environment. With recovery, both urban and rural poverty fell, and so did total poverty.

Finally, inequality follows the pro-cyclical pattern observed by others. During early growth, the Gini index experienced a modest decline. Inequality rose very sharply during recession, and fell with recovery. Asymmetry in the relation between income and inequality across periods of growth and recession is evidenced by the observation that one year of recession had 11 times the (negative) impact on inequality that one year of early growth was able to achieve, and four times the impact of one year of late growth.

In the econometric analysis that follows, each country is considered as a separate experience and the data are consequently not weighted by population size. By contrast, they are weighted by years of duration of each spell since a longer spell is equivalent to a repeat of observations of years of growth or recession compared to a shorter spell. The descriptive statistics used for the analysis are given in Table 3. Spells were longer in early than in late growth since we have data starting in 1970 while most countries were hit by recession in the early 1980s; and the latest data point is for 1994 while recoveries usually started in the late 1980s.

The data in Table 3 are more pessimistic about the role of growth in reducing poverty and inequality than those in Table 2, suggesting that small countries did not perform as well as a few large countries that dominate the averages in Table 2. Across country experiences, the number of urban poor was growing rapidly under early growth while the number of rural poor was stagnant, as opposed to declining. The incidence of total poverty thus failed to decline in early growth. Under recession, not only did urban poverty surge, but rural poverty stagnated or rose, as opposed to continuing to decline. And, under late growth, urban poverty remained stagnant. Finally, inequality was not falling under early growth, it increased sharply under recession as expected, and declined under late growth. It is these data which we use for an econometric analysis of the determinants of poverty and inequality.

III. Measurements and model specification

The rate of rural-urban migration is fundamental in affecting sectoral poverty and inequality. Migration was measured as the ratio of the flow of rural migrants to the stock of rural population. To measure this rate, we use the ratio of the natural rate of growth of rural population

to that of urban population, $\lambda = \dot{NRP} / \dot{NUP}$, computed for each country by Lattes and Villa (1994). These ratios are held constant for the period of analysis. From this, we calculate the natural rate of growth of rural population as:

$$\dot{NRP} = \dot{Pop} / \left(\frac{1}{\lambda} UR + (1 - UR) \right),$$

and the annual rate of rural migration as:

$$M/RPop = \dot{NRP} - R\dot{Pop},$$

where M is the annual flow of migrants, UR the urbanization ratio (= urban population / total population), \dot{Pop} the rate of growth of total population, and $R\dot{Pop}$ the rate of growth of rural population. We use the average value of $M/RPop$ to characterize migration in each spell.

In deciding on the specification of the relationship between income growth and changes in poverty/inequality, we need to establish which causal relations prevail. In principle, the rate of urban poverty growth \dot{UP} , the rate of rural poverty growth \dot{RP} , the growth rate in inequality $Gini$, and the migration rate are simultaneously determined. $Gini$ is affected by \dot{UP} and \dot{RP} . \dot{UP} is affected by \dot{RP} , and reciprocally, but this occurs through the migration rate. And \dot{UP} and \dot{RP} are affected by $Gini$. We thus started by estimating a full system of equations where \dot{UP} , \dot{RP} , and $Gini$ are endogenous variables as follows:

$Gini$ is a function of \dot{UP} , \dot{RP} , \dot{GDPpc} , migration rate, and exogenous variables;

\dot{UP} is a function of $Gini$, \dot{GDPpc} , migration rate, and exogenous variables;

\dot{RP} is a function of $Gini$, \dot{GDPpc} , migration rate, and exogenous variables.

The $Gini$, \dot{UP} , and \dot{RP} equations are estimated both with \dot{GDPpc} for all periods and for \dot{GDPpc} separately for each period of early growth, recession, and late growth. Poverty is also specified either as the growth rate in the number of poor (\dot{UP} and \dot{RP}) or as the sectoral headcount ratios (\dot{UP}_0, \dot{RP}_0). $Gini$, \dot{UP} , and \dot{RP} , when on the right-hand side, are instrumentalized. The migration rate is always instrumentalized.

The results for the relevant variables are presented in Table 4². They show the following:

² In the estimations, the variable selection procedure consists in starting with all candidate explanatory variables. We proceed stepwisely by removing the variable with the lowest t-statistic for as long as the adjusted R^2 continues to increase. We stop eliminating non-significant variables when the adjusted R^2 fails to increase. This explains

(1) The only *Gini* equation where a poverty variable has a significant impact is the equation for all periods when poverty is specified in terms of incidence (headcount ratios).

Estimates will be obtained from the full system of equations.

(2) For the other three *Gini* equations, the poverty variables are not significant and their removal would lower the adjusted R^2 . We can thus proceed with a recursive system where poverty is affected by inequality, but inequality is not affected by poverty.

(3) In the urban poverty equations for all periods, the *Gini* has no significant impact. It will consequently not be included in the all period equations in Table 6.

The total effect of \dot{GDP}_{pc} on poverty is thus the solution of the system of simultaneous equations in (1), and the sum of a direct effect and an indirect effect through inequality in (2) as follows:

$$(1) \quad \frac{d\dot{UP}}{d\dot{GDP}_{pc}} = \frac{\partial \dot{UP}}{\partial \dot{GDP}_{pc}} + \frac{\partial \dot{UP}}{\partial Gini} \frac{\partial Gini}{\partial \dot{GDP}_{pc}},$$

and similarly for \dot{RP} .

The effect of migration on \dot{UP} and \dot{RP} can similarly be decomposed into direct effects, indirect effects through inequality, and total effects.

Estimation of the effects of growth in three separate periods allows to test the asymmetry hypothesis according to which several points of \dot{GDP}_{pc} growth are needed to compensate for the poverty effect of one point of \dot{GDP}_{pc} decline in recession. Open to question as well is whether late growth is more effective in reducing poverty per unit of \dot{GDP}_{pc} than early growth.

The regressions that follow are in the average annual growth rates of the indicators of poverty and inequality during the corresponding spells. Candidate explanatory variables for inequality and poverty are:

Economic growth

why some explanatory variables which are not significant remain in the equations. While this variable selection path is unique, other selection criteria could have terminated including an alternative set of explanatory variables. To hedge against this risk, once we reach the point where the adjusted R^2 fails to increase, the most relevant excluded variables are tried one at a time for potential improvement in the adjusted R^2 . These variables are kept only if they help improve the adjusted R^2 . While, here again, the selected variables may not be unique, in practice little ambiguity remains about the choice of candidate variables.

\dot{GDP}_{pc} for the whole period, or by sub-periods of early growth, recession, and late growth.

Qualitative features of growth

Predicted growth rate of the Gini coefficient (for the poverty equations)

Length of growth or recession sequence: number of consecutive years of growth or decline in GDP per capita for the whole period, or by sub-periods of early growth, recession, and late growth

Difference in growth of value added between agriculture and manufacturing for the whole period, or by sub-periods of early growth, recession, and late growth

Difference in growth of value added between agriculture and services for the whole period, or by sub-periods of early growth, recession, and late growth

Hyperinflation dummy (= 1 when annual inflation exceeds 100%)

Real exchange rate growth

International terms of trade (price of exports over price of imports) growth

Coefficient of variation of GDP per capita around trend

Migration rate (instrumentalized):

 Migration as a share of urban population

 Migration as a share of rural population

Urban minimum wage growth for the whole period, or by sub-periods of early growth, recession, and late growth

Structural features of growth

Initial (in first year of spell) GDP per capita, in thousands of 1987 US\$

Share of agriculture in GDP

Initial level of inequality: Gini

Initial urban poverty headcount ratio

Initial rural poverty headcount ratio

Natural growth rate of urban population

Natural growth rate of rural population

Initial share of urban in total population

Initial share of rural in total population

IV. Determinants of inequality, urban poverty, and rural poverty

4.1. Inequality

We present in Table 5 the determinants of inequality, both across all periods and with period-specific income coefficients. With R^2 s between 0.62 and 0.73, the quality of adjustment is reasonably good, given reservations emitted about the quality of income distribution data in Latin America (Lustig, 1994). Across all periods, GDP_{pc} has a significant mildly negative impact on inequality (an elasticity of -0.16). However, when growth is decomposed by periods, we see that the role of income growth was to increase inequality significantly in all three periods: positively in early growth with an elasticity of 0.39, strongly in recession (the regression coefficient is negative, but GDP_{pc} was also negative, hence inequality increased) with an elasticity of -0.52 , and very strongly in late growth with an elasticity of 1.05. This reflects the frequently expressed pessimism of the link between growth and inequality in Latin America (e.g., Berry, 1995). The crisis accelerated inequality: one percentage point of decline in per capita income increased inequality by 30% more than one point of growth before the crisis. Late growth is the most inequalizing.

The β coefficients, however, indicate that growth is not a strong determinant of the change in inequality. This positive but weak relationship between growth and increasing inequality can be directly seen from the raw data. Among the country experiences that pertain to the late growth period, cases which have experienced the highest growth have most often had increasing inequality (Chile and Venezuela) but in one case decreasing inequality (Argentina), while cases of low growth exhibited either very good performance in declining inequality (Colombia, Honduras 86–90, and Uruguay) or increasing inequality (Honduras 90–92, Guatemala).

What are then the determinants of the evolution of inequality? The β coefficients reveal that the main cause of increasing inequality is migration. This is further explained by the regression on rural poverty below. In that regression, we will see that migration reduces the absolute number of

rural poor, but induces an increase in the poverty incidence. This implies that migration attracts more non-poor than poor, which then raises the level of inequality. A number of other qualitative features of growth which increase inequality are:

- In late growth, a pattern of growth biased toward agriculture as opposed to services (measured by the difference between the growth rates in value added in agriculture and services) increases inequality. Growth increases the return to assets (Adelman, 1975). With land highly unequally distributed in Latin America, the benefits of differential agricultural growth are captured by the landed elites, contributing to increased inequality.
- Hyperinflation, a highly regressive tax, is very strongly inequalizing.
- Depreciation of the real exchange rate increases inequality, expectedly through its contribution to the price of staple goods and the consequent erosion in real incomes of wage earners, in a situation where more than half the population is urbanized. The late growth has also been accompanied by privatizations, repatriation of capital that had left during recession and benefits from exchange rate depreciation which all brought strong benefits to the upper incomes (Lustig, 1992).

By contrast, the most important factors that contribute to a decrease in inequality are structural characteristic of the countries. Hence the observed general trend of declining inequality during growth periods is stronger with:

- A higher level of GDP per capita (see also Lustig, 1995). This is in accordance with the Kuznets inverted-U hypothesis, where the Latin American countries have per capita income levels in excess of the \$500 per capita threshold at which inequality peaks (Adelman and Fuwa, 1994).
- A higher share of agriculture in GDP or a higher share of urban in total population. This indicates the difficulty of reducing inequality for countries with large impoverished rural sector. Also a higher rate of natural growth of the rural population, at given population share and share of agriculture. The reason for this is not clear.

- A higher initial level of inequality. This suggests that there are decreasing returns in inequality reduction, with easier gains in inequality reduction achieved when the initial levels of inequality are higher.

Finally, instability of per capita income growth, measured by the coefficient of variation of GDP per capita around the trend value, reduces inequality. While one would expect the opposite, it suggests that income instability is most detrimental to the upper incomes, while lower incomes are more sheltered from income instability through access to the informal urban economy and subsistence agriculture, possibilities which have been used to explain resilience of the poor to income instability.

4.2. Urban poverty

We now turn to an analysis of the determinants of urban poverty as characterized by both the average annual growth rate in the number of poor (UP) and the average annual growth rate in the headcount ratio in urban poverty (UP_0). In Table 6, the impact of $GDPpc$ on poverty is analyzed both through all periods as well as specifically for each sub-period. The predicted level of inequality (from corresponding regressions of Table 5) and the instrumentalized level of rural-urban migration are causal factors in the observed level of poverty. We discuss in detail the results for UP and only the relevant differences in the UP_0 equation.

As already evidenced by other analysts (Morley, Psacharopoulos, Altimir, Fields, Lustig 1995), $GDPpc$ has an important direct negative effect on UP . The direct elasticity across all periods is -0.91 . When disaggregating by periods of growth, we see that early growth and recession had no significant direct effect on poverty but that late growth had a large negative effect with an elasticity equal to -0.9 .

Inequality contributes to increasing the number of urban poor, with an elasticity of 0.91 in the analysis by periods. Since we have seen that $GDPpc$ increases inequality, there is consequently an indirect negative effect of $GDPpc$ on poverty through inequality. Thus, the direct gains in late growth are mitigated by this indirect effect, a calculation that we will present later.

Other variables of significance in explaining the growth rate in urban poverty are:

- The qualitative nature of growth affects poverty through hyperinflation and growth in the real exchange rate. Like for inequality, the coefficient of variation of GDP per capita decreases poverty, suggesting (surprisingly) that unstable growth has not been detrimental to poverty, to the contrary. Decrease in the urban minimum wage also increased poverty during recession. The coefficient in early growth is barely significant, with, however, a positive sign which indicates that the observed decline in the real wage would have tended to reduce poverty increase.

- Results on the structural features of the economy which affect urban poverty indicates that reduction of poverty is relatively easier for countries with higher level of GDP_{pc} , and, at given GDP_{pc} , higher initial level of poverty (implying that there are decreasing returns to the ability to reduce poverty). Higher natural growth rate of urban population increases the number of urban poor (as suggested by Lustig (1995) who stresses the role of population policies in reducing poverty).

The determinants of the average annual growth rate in the urban headcount ratio are essentially the same, with the difference that, across all periods, a decline in the urban real minimum wage contributes to increase the incidence of poverty with an elasticity of -0.15 . This relation mainly comes from recession periods.

4.3. Rural poverty

Like in the urban sector, \dot{GDP}_{pc} was a significant force in reducing the number of rural poor, with an elasticity of -0.24 (Table 7). By periods, the impact of \dot{GDP}_{pc} on growth of the number of rural poor differs from the urban pattern as poverty was falling with income growth under early growth and rising during recession. The elasticities for the three periods are, respectively, -0.26 , -0.46 (which corresponds to an increase in poverty as income per capita was falling during recession), and -0.80 . Recession was thus severe on poverty, but late growth was more effective than early growth. Rising inequality increases rural poverty with an elasticity of 0.41 . Hence, the direct poverty reducing effect of growth was partially canceled by the fact that growth increases inequality, which in turn increases poverty.

An additional feature of the effect of growth on poverty is the length of the recession periods: the longer the number of years of declining GDP per capita, the less poverty increases annually. This suggests that sustained recessions offer more possibilities of income adjustment to the poor than brief shocks, not an unreasonable observation. A growth pattern biased toward agriculture as opposed to services helped reduce rural poverty during periods of recession. The growth performance of agriculture was indeed better than that of the other sectors of the economy during recession, including services (see Table 3). A high coefficient variation in GDP per capita increases poverty (the opposite direction of the effects observed for inequality and urban poverty). The magnitude of rural migration as a share of rural population decreases rural poverty. Since migration increases inequality and inequality increases poverty, the total effect of migration on rural poverty is given by:

$$\frac{d\dot{R}P}{dM/RPop} = \frac{\partial \dot{R}P}{\partial M/RPop} + \frac{\partial \dot{R}P}{\partial Gini} \frac{\partial Gini}{\partial M/RPop} = -0.8 + 0.41 \times 5.20 = 1.33.$$

The direct negative effect is canceled by the indirect effect of migration through inequality. Finally, the rural poor have highly diversified sources of income and the real urban minimum wage affects their welfare importantly.

Structural features of importance shows that, as for urban poverty, higher level of GDPpc and higher initial level of poverty which both facilitates reduction in rural poverty. Finally, as expected, the natural growth rate of rural population increases the growth of rural poverty.

Analysis of the growth rate in the headcount ratio in the rural population shows similar results, except for the role of migration and urban minimum wage. Note that urban wages and migration are never both significant in an equation. This suggest that some of the effect of urban wages on rural poverty is channeled through migration. Both of these variables, when significant, reduces $R\dot{P}$, but have a significant positive effect on $R\dot{P}_0$. This implies that the incidence of migration around the poverty line is biased toward the nonpoor: migration reduces total rural population by more than it reduces the number of rural poor. Hence, the nonpoor migrate more than the poor, an observation frequently made by analysts of rural migration (Lipton, 1980). Similarly an increase in the urban minimum wage, while it has a positive effect on the welfare of

the poor, may also induce more migration of the non-poor than the poor, hence increasing the incidence of poverty.

4.4. Total effects of growth

Since income growth affects poverty both directly and indirectly through inequality, the total effect of income on poverty (\dot{P}) is given by equation (1). The results are given in Table 8. The income inequality correction is positive and important, except in the all periods analysis for urban poverty. The impact of this correction is to reduce the role of late growth in reducing poverty. In the urban sector, poverty was rising with early growth, rose very sharply with recession, and rising inequality has neutralized the poverty reducing effect of late growth. The total effects show that the all periods negative relation between income and poverty, both urban and rural, is mainly established during recession. For the number of rural poor, one annual percentage point of decline in GDP per capita erased the gains achieved by 6.7 years of one annual percentage point of early growth in GDP per capita; for late growth, it would erase 1.8 years of growth. For the rural headcount ratio, the ratios are 6.6 and 3.1, respectively.

Late growth is more effective than early growth in reducing poverty, particularly in the rural sector. Available data are for relatively short periods of recovery. Morley suggests that the elasticity of poverty with respect to income is high in recovery immediately after recession, but is likely to decline with sustained growth. In the data analyzed, we could not isolate an early versus late recovery effect. More years will have to go by to prove whether this positive effect of growth on poverty reduction is sustained at the same rate.

4.5. Analysis of time paths

To further assess the relative role of income growth and other variables in explaining inequality and poverty, we decompose in Table 9 the total predicted changes in inequality and poverty in each of the three periods between the three sets of variables which appear in Tables 5, 6, and 7:

- Economic growth.
- The qualitative features of growth.

- The structural features of the economies.

Results show that structural features play a large role in decreasing inequality and poverty in all periods. These characteristics, by being structural, are relatively constant through the three periods. They show that there is a structural drift toward decreasing inequality and poverty. By contrast, the qualitative features of growth have an overall strong effect in increasing inequality and poverty in all periods, i.e., whether the economies are in growth or in recession. In particular, these variable are even more damaging to inequality and poverty than falling income during recession. Among the qualitative features of growth, the most important contribution to rising inequality and poverty comes from migration, followed by real exchange rate depreciation. The dominant role of migration in explaining inequality is reflected in the beta coefficient of this variable in Table 5. Separate calculation of direct and total effects shows that it is through inequality that migration affects poverty, not directly, a result that is corroborated by the beta coefficients of migration in the poverty equations in Tables 6 and 7. The only qualitative feature of growth which helps reduce inequality and poverty is the sectoral bias toward agriculture. It is clearly these qualitative features of growth that should figure prominently in the definition of policies to reduce inequality and poverty. Relative to these structural and qualitative variables, the role of income growth is very small and its total effect often perverse. While recession increases inequality and poverty, late growth also increases inequality and urban poverty while reducing rural poverty. Hence, only modest effects can be expected from income growth to reduce poverty, and these effects will require controlling for the inequalizing effect of growth so the direct effects which growth has on poverty reduction are not canceled by rising inequality.

5. Summary and policy implications

The main observations which derive from this causal analysis of the determinants of inequality, urban poverty, and rural poverty through spells of growth and recession are the following:

Inequality, and the regressive nature of both growth and recession, are a serious problem for poverty reduction in Latin America. Not only has recession been highly regressive, but so has

growth and particularly late growth. The level of urban poverty is more sensitive to inequality than the level of rural poverty. Rising inequality with late growth has seriously weakened the strong direct poverty reduction effects of late growth. This brings to the fore the need to address the politics of inequality in Latin America and to identify politically feasible inequality-reducing instruments. If the inequalizing effect of growth is not reduced, the poverty-reducing effects of growth are seriously weakened, requiring reliance on unrealistic levels of growth to achieve poverty reduction.

Across all periods, the effect of per capita income growth on poverty has been favorable for poverty reduction, both urban and rural. However, the main link between income and poverty is established through recession. There is consequently an asymmetry in the relation between income and poverty, with a few points of recession canceling the gains in poverty reduction established through many more points of income growth. This is not surprising given the severity of the crisis and the choice of instruments that were used to manage stabilization and adjustment in Latin America, which implied severe wage repression and loss of employment in the public sector and import substitution industries. Economic shocks have been devastating on inequality and poverty, suggesting the importance of policies to smooth the impact of shocks, particularly when their origin is external (Lustig, 1995). Nevertheless, the hopeful sign is that late growth has been more effective at reducing poverty than early growth. Whether this will be sustained will require further years of observation on the impact of economic recovery.

A growth pattern biased toward agriculture is effective for rural poverty reduction. Due to the highly unequal pattern of land ownership in Latin America, agricultural growth is however unfavorable for overall equality. The result is that the direct beneficial effect of agricultural growth on rural poverty reduction is wasted by the indirect effect of rising inequality, resulting in a net effect of greater poverty. A rural poverty reduction strategy thus requires simultaneous interventions to both promote agricultural growth and improve equity in participation to the benefits of this growth, through effective programs of land reform and rural development which improve linking the poor to the benefits of agricultural growth (de Janvry and Sadoulet, 1993).

Finally, the direct effect of rural-urban migration has been an effective force to reduce the number of rural poor. Here again, however, migration has increased inequality and the direct benefits have been canceled by larger indirect effects, resulting in an increase in rural poverty. The benefits of migration for poverty reduction are consequently lost to rising inequality. In addition, migration has increased the rural headcount ratio, indicating that while it serves to decrease (directly) the number of rural poor, it benefits the nonpoor more than the poor. Hence, the selective bias of migration in favor of the nonpoor weakens its force as an instrument to reduce rural poverty. This large role of migration on inequality and poverty calls the attention to the need to both develop better data to measure migration and analyze the nature of this process in greater detail, seeking to identify policy variables that could transform it into a positive force for inequality and poverty reduction.

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Table 1. Growth spells and GDP per capita annual growth rates, Latin America, 1970-94
(average annual growth rates in percent)

	Early growth GDPpc > 0	Recession GDPpc < 0	Late growth GDPpc > 0
Countries			
Argentina	1970-80: 0.77	1980-86: -1.91 1986-90: -3.15	1990-92: 7.43
Brazil	1970-79: 5.85 1979-87: 0.56	1987-90: -2.00	
Chile	1970-80: 0.19		1980-87: 0.43 1987-90: 5.34 1990-92: 6.43 1992-94: 4.18
Colombia	1970-80: 3.12		1980-86: 0.62 1986-90: 2.29 1990-92: 1.16
Guatemala		1980-86: -3.87	1986-90: 0.73
Honduras	1970-86: 0.76		1986-90: 0.73 1990-92: 0.80
Mexico	1970-84: 2.90	1984-89: -1.06	1989-92: 1.65
Panama	1970-79: 1.25 1979-86: 1.55	1986-89: -7.87	1989-91: 4.92
Peru	1970-79: 0.85	1979-86: -1.59 1986-91: -6.52	1991-94: 4.25
Uruguay	1970-81: 2.83	1981-86: -3.28	1986-89: 2.18 1989-92: 2.83
Venezuela		1970-81: -0.33 1981-86: -2.55 1986-90: -1.50	1990-92: 6.33
Number of observations	11	12	17

Table 2. Poverty and inequality by growth spells, weighted by population size

Weighted by population size [†]	Units	Early growth	Recession	Late growth
Number of observations	No	11	12	17
Economic performance				
GDP per capita growth	aagr [°]	2.6	-2.1	3.0
Poverty				
Growth in number of urban poor (UP)	aagr	4.8	8.9	-2.4
Growth in number of rural poor (RP)	aagr	-1.1	-0.9	-2.0
Growth in incidence of urban poverty (UP ₀)	aagr	1.2	5.9	-5.1
Growth in incidence of rural poverty (RP ₀)	aagr	-0.9	-0.2	-2.2
Growth in total incidence of poverty (TP ₀)	aagr	-0.5	2.7	-3.3
Inequality				
Growth in Gini	aagr	-0.16	1.41	-0.51

[†] Sectoral poverty indicators are weighted by the corresponding sectoral population

[°] aagr = average annual growth rate in percent.

Table 3. Economic performance, poverty and inequality by growth spells, weighted by spell duration

Weighted by spell duration	Units	Early growth	Recession	Late growth
Number of observations		11	12	17
Average length of spell	years	10.3	5.3	3.2
Economic performance				
GDP growth (constant prices)	aagr	4.2	-0.4	4.3
GDP per capita growth (constant prices)	aagr	1.9	-2.6	2.5
Agriculture value added growth (constant prices)	aagr	2.6	1.1	3.6
Manufacturing value added growth (constant prices)	aagr	3.5	-0.4	4.0
Services value added growth (constant prices)	aagr	4.7	0.2	4.3
Inflation: CPI growth	aagr	55	285	30
Coefficient of variation of GDPpc around trend	%	4.1	3.4	1.8
Policy instruments				
Real exchange rate growth	aagr	0.6	3.1	2.4
Real minimum wage growth	aagr	-2.1	-7.3	0.1
Poverty				
Growth in number of urban poor (UP)	aagr	5.4	8.3	-0.1
Growth in number of rural poor (RP)	aagr	0.3	0.0	-1.8
Growth in incidence of urban poverty (UP_0)	aagr	2.0	5.2	-3.1
Growth in incidence of rural poverty (RP_0)	aagr	-0.3	0.7	-2.1
Growth in total incidence of poverty (TP_0)	aagr	0.6	2.8	-2.0
Inequality				
Growth in Gini	aagr	0.25	1.36	-0.86

aagr = average annual growth rate in percent

Table 4. Tests of simultaneity between inequality and poverty
 (partial results: coefficients on growth, migration, and exogenous variables not reported)

	Inequality (Gini)				Urban poverty				Rural poverty			
	All periods		By periods		Annual growth rates in		Annual growth rates in		Annual growth rates in		Annual growth rates in	
	All periods	By periods	All periods	By periods	Number of poor	Incidence of poverty	Number of poor	Incidence of poverty	Number of poor	Incidence of poverty	Number of poor	Incidence of poverty
Gini growth rate ^o					0.25 (0.5)	0.62 (1.7)	0.50 (1.1)	0.37 (0.9)	0.31 (1.5)	0.41 (2.0)	0.33 (1.4)	0.61 (2.5)
Urban poverty												
Number of poor ^o	-0.03 (0.0)	-0.34 (-0.8)										
Poverty incidence ^o			0.33 (1.5)	-0.53 (-0.9)								
Rural poverty												
Number of poor ^o	0.137 (0.6)	1.28 (1.1)										
Poverty incidence ^o			-0.65 (-1.5)	1.85 (1.1)								
Number of observations	38	38	38	38	39	37	39	37	32	32	32	32
R2	0.64	0.75	0.64	0.75	0.61	0.84	0.73	0.82	0.82	0.87	0.76	0.84

Coefficients highlighted are not significantly different from zero at a 92% confidence level ($t \leq 1.4$) and removal from the corresponding equation increases the adjusted R-square.

^o Instrumentalized

Table 5. Determinants of change in inequality

	Gini coefficient annual growth rate			
	All periods	All periods	By periods	
			Beta coefficients	
Economic growth and poverty				
GDP per capita annual growth				
All periods	-0.16 (-1.6)	-0.15 (-1.1)		
Early growth periods			0.39 (1.9)	0.32
Recession periods			-0.52 (-3.6)	-0.47
Late growth periods			1.05 (2.7)	0.89
Annual growth in incidence of poverty				
Urban (instrumentalized)		0.33 (1.5)		
Rural (instrumentalized)		-0.65 (-1.5)		
Qualitative features of growth				
Value added growth Agriculture - Services			0.86 (2.3)	0.57
Late growth periods				
Hyperinflation dummy	1.5 (2.1)	0.95 (1.2)	4.11 (4.9)	0.94
Real exchange rate growth			0.09 (2.6)	0.38
International terms of trade growth	-0.08 (-2.1)	-0.07 (-1.7)		
Coefficient of variation of GDP per capita	-0.12 (-0.8)		-0.75 (-3.5)	-0.80
Migration/rural population (instrumentalized)	2.21 (2.7)	2.44 (3.0)	5.20 (4.2)	3.30
Structural features				
GDP per capita ('000 1987\$)			-2.14 (-3.9)	-0.97
Share of agriculture in GDP	-0.18 (-2.0)	-0.25 (-2.4)	-0.39 (-3.9)	-1.10
Level of inequality: Gini	-12.86 (-3.5)	-13.74 (-3.6)	-24.58 (-5.9)	-1.34
Urban poverty headcount ratio	0.06 (2.2)	0.09 (2.5)		
Natural growth rate of rural population	-2.89 (-2.5)	-3.68 (-2.9)	-6.17 (-4.1)	-2.68
Share of urban in total population	-0.26 (-3.0)	-0.30 (-3.3)	-0.57 (-4.5)	-4.34
Intercept	25.91 (3.2)	29.19 (3.5)	61.24 (5.1)	
Number of observations	38	38	38	
R2	0.62	0.64	0.73	
Adjusted R2	0.48	0.49	0.58	

t-statistics in parentheses

The two spells omitted from the initial 40 spells due to missing data are: Honduras 70-86 and Panama 70-79.

Table 6. Determinants of change in urban poverty

	Annual growth rate in			
	number of poor (UP)		incidence of poverty (UP ₀)	
	All periods	By periods	All periods	By periods
	Beta coefficients			
Economic growth				
GDP per capita annual growth				
All periods	-0.91 (-4.1)		-0.54 (-2.3)	
Early growth periods				
Recession periods				
Late growth periods		-0.90 (-2.5)	-0.25	-0.76 (-2.1)
Qualitative features of growth				
Gini coefficient growth rate (predicted)		0.91 (2.5)	0.26	0.69 (2.2)
Hyperinflation dummy	4.20 (2.5)	4.69 (3.7)	0.36	4.23 (3.1)
Real exchange rate growth		0.35 (4.9)	0.49	0.30 (3.9)
International terms of trade growth				
Coefficient of variation of GDP per capita		-0.66 (-2.1)	-0.23	-0.56 (-1.8)
Urban minimum wage growth				
All periods				-0.15 (-1.5)
Early growth		0.42 (1.5)	0.16	
Recession periods		-0.28 (-3.0)	-0.30	-0.35 (-3.8)
Structural features				
GDP per capita ('000 1987\$)	-2.88 (-2.7)	-2.62 (-2.6)	-0.39	-1.90 (-2.2)
Urban poverty headcount ratio	-0.22 (-2.9)	-0.22 (-2.8)	-0.51	-0.14 (-2.2)
Natural growth rate of urban population	3.01 (3.4)	2.61 (3.4)	0.35	1.30 (1.8)
Intercept	9.91 (2.7)	10.97 (2.8)		5.14 (1.6)
Number of observations	39	37		39
R2	0.61	0.84		0.73
Adjusted R2	0.56	0.78		0.67

t-statistics in parentheses.

The three spells omitted from the initial 40 spells due to missing data are: Guatemala 86-90, Honduras 70-86, and Panama 70-79.

Table 7. Determinants of changes in rural poverty

	Annual growth rate in				
	number of poor (RP)		incidence of poverty (RP ₀)		
	All periods	By periods	All periods	By periods	
	Beta coefficients				
Economic growth					
GDP per capita growth					
All periods	-0.24 (-2.1)			-0.31 (2.8)	
Early growth periods		-0.26 (-1.4)	-0.15	-0.41 (-1.8)	
Recession periods		-0.46 (-1.9)	-0.30	-0.81 (-1.8)	
Late growth periods		-0.80 (-4.2)	-0.45	-1.00 (-4.2)	
Qualitative features of growth					
Gini coefficient growth rate (predicted)	0.31 (1.5)	0.41 (2.0)	0.24	0.33 (1.4)	0.61 (2.5)
Length of sequence (years)		-0.23 (-1.4)	-0.19		-0.49 (-2.1)
Value added growth Agriculture - Services		-0.24 (-1.1)	-0.14		-0.45 (-1.4)
Coefficient of variation of GDP per capita	0.55 (4.1)	0.37 (2.6)	0.29	0.59 (3.9)	0.35 (2.1)
Migration / rural population (instrumentalized)		-0.80 (-2.7)	-0.37	0.93 (2.2)	
Urban minimum wage growth					
All periods	-0.05 (-1.1)				
Early growth periods					0.32 (1.8)
Recession periods					0.11 (1.2)
Structural features					
GDP per capita ('000 1987\$)	-1.66 (-2.8)	-1.84 (-3.2)	-0.60	-1.58 (-2.5)	-1.68 (-2.4)
Rural poverty headcount ratio	-0.10 (-3.6)	-0.09 (-3.2)	-0.66	-0.09 (-3.0)	-0.07 (-2.1)
Natural growth rate of rural population	0.75 (1.3)	1.76 (3.2)	0.46		1.47 (2.0)
Share of rural in total population	0.12 (3.9)			0.10 (2.4)	-0.06 (-1.4)
Intercept	0.07 (0.0)	4.36 (2.4)		-0.45 (-0.2)	4.48 (1.9)
Number of observations	32	32		32	32
R2	0.82	0.87		0.76	0.84
Adjusted R2	0.76	0.79		0.68	0.73

t-statistics in parentheses.

The eight spells omitted from the initial 40 spells due to missing data are: Argentina 86-90 & 90-92, Colombia 86-90 & 90-92, Honduras 70-86, Panama 70-79, and Uruguay 70-81 & 89-92.

Table 8. Direct and indirect effects of per capita income growth on poverty

	Direct effect of GDP per capita growth on poverty $\frac{\partial \dot{P}}{\partial GDP_{pc}}$ 1	Inequality effect on poverty $\frac{\partial \dot{P}}{\partial Gini}$ 2	Effect of GDP per capita growth on inequality $\frac{\partial Gini}{\partial GDP_{pc}}$ 3	Indirect effect of GDP per capita growth through inequality $\frac{\partial \dot{P}}{\partial Gini} \frac{\partial Gini}{\partial GDP_{pc}}$ 4	Total effect of GDP per capita growth $\frac{d\dot{P}}{dGDP_{pc}}$ 5
	(Table 6 or 7)	(Table 6 or 7)	(Table 5)	col.2 x col.3	col.1 + col.4
Urban poverty					
Annual growth rate in number of urban poor ($U\dot{P}$)					
All periods	-0.91	0	-0.16	0	-0.91
Early growth periods	0	0.91	0.39	0.35	0.35
Recession periods	0	0.91	-0.52	-0.47	-0.47
Late growth periods	-0.90	0.91	1.05	0.96	0.06
Annual growth rate in the incidence of urban poverty ($U\dot{P}_0$)					
All periods*	-0.54	0	-0.15	0	-0.54
Early growth periods	0	0.69	0.39	0.27	0.27
Recession periods	0	0.69	-0.52	-0.36	-0.36
Late growth periods	-0.76	0.69	1.05	0.72	-0.04
Rural poverty					
Annual growth rate in number of rural poor ($R\dot{P}$)					
All periods	-0.24	0.31	-0.16	-0.05	-0.29
Early growth periods	-0.26	0.41	0.39	0.16	-0.10
Recession periods	-0.46	0.41	-0.52	-0.21	-0.67
Late growth periods	-0.80	0.41	1.05	0.43	-0.37
Annual growth rate in the incidence of rural poverty ($R\dot{P}_0$)					
All periods*	-0.31	0.33	-0.15	-0.03	-0.34
Early growth periods	-0.41	0.61	0.39	0.24	-0.17
Recession periods	-0.81	0.61	-0.52	-0.32	-1.13
Late growth periods	-1.00	0.61	1.05	0.64	-0.36

* Solving the system of equations in $U\dot{P}_0$, $R\dot{P}_0$, and $Gini$

Table 9. Contributions to changes in poverty
(at sample means in each period)

	Early growth	Recession	Late growth
GDP per capita growth	1.9	-2.6	2.3
Inequality (growth rate of Gini index)			
Observed	0.2	1.2	-0.5
Predicted ^o	0.2	1.1	-0.5
Economic growth	0.8	1.3	2.6
Qualitative features of growth	10.3	14.7	8.8
Structural features	-10.9	-14.9	-11.9
Urban Poverty (growth rate in number of poor)			
Observed	5.4	8.3	-0.1
Predicted ^o	5.5	8.4	0.2
Economic growth	0.7	1.2	0.2
Qualitative features of growth	6.8	15.6	7.7
Structural features	-1.9	-8.5	-7.7
Rural Poverty (growth rate in number of poor)			
Observed	0.3	0.0	-1.8
Predicted ^o	0.4	-0.1	-2.1
Economic growth	-0.2	1.7	-0.8
Qualitative features of growth	3.7	3.8	2.9
Structural features	-3.1	-5.6	-4.1

^o Total effects, i.e., with inequality replaced by its estimated expression.