The effects of growth *and economic reform* on income distribution *in Latin America*

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The purpose of this article is to investigate the determinants of the distribution of income in Latin America, focusing in particular on two questions: one is the relationship between the distribution and income, while the other is the impact of the package of structural economic reforms that have been adopted in Latin America in recent years. Two main conclusions are drawn from the econometric evidence. There appears to be a robust and significant relationship between the distribution and income. It has the inverted U-shape that Kuznets predicted, but this relationship has been shifting in a regressive direction over time. Growth is now a good deal less progressive than it used to be. In the aggregate that means that further growth in Latin America is unlikely to improve the distribution much, if at all, so supplementary measures will have to be taken. Among those suggested by the regressions are the maintenance of low inflation rates and investment in education. Generally speaking, the structural reforms appear to have a regressive effect on distribution, but that effect is small and not very robust statistically. Reforms in different areas have differing effects on equity. Trade reform is regressive in all of our specifications, but it is insignificant in all but the nationwide sample. Tax reform is unambiguously regressive, and opening up the capital account is unambiguously progressive. The results for trade and tax reform and capital account liberalization are the most robust and significant. For the other two reforms –privatization and financial reform– the available data were not good enough to give a clear answer.

I

Introduction

There have been many previous efforts to econometrically estimate models of the relationship between the level or growth rate of income and its distribution. Most have been estimations of the Kuznets relationship, using cross-country distribution and income data[1] (Ahluwalia, 1976; Anand and Kanbur, 1993; Bruno, Ravallion and Squire, 1996; Clarke, 1995; Deininger and Squire, 1996; De Janvry and Sadoulet (forthcoming); Fields,1994; Ravallion and Chen, 1997). All but the last of these studies use a world-wide sample of countries. The difficulty with that approach, as Fields points out, is that since Latin America is a middle-income region and has the highest inequality in the world, one can get an apparent inverse U-shaped Kuznets curve simply because of the choice of the sample. Fields found that if he put in a dummy for the Latin American observations, the supposed relationship between income and inequality disappeared. Deininger and Squire (1996) found exactly the same thing. Bruno, Ravallion and Squire (1996), using data from 63 surveys covering 44 countries, tested the Kuznets hypothesis for both levels and changes over time. In no case could they find evidence of an inverted U shape, and in no case was the relationship between the distribution and income significantly different from zero. Ravallion and Chen (1997) regressed changes in the Gini against changes in mean real consumption over 64 periods in 67 countries and found a negative and significant relationship between the two in the full sample. However, when they excluded the observations from Eastern Europe and Central Asia from the sample, the relationship disappeared.

In this study, we will econometrically estimate a distribution function using a pooled cross-section time series of observations from 16 countries in Latin America. Clearly there are serious econometric difficulties in attempting to use pooled cross section time series evidence to capture a time series relationship for a single country. Essentially one is assuming that the relationship between distribution and income in today's high income countries is similar to what the less developed countries can expect when they reach the income level of more advanced countries. In other words unknown country-specific effects do not affect the relationship between income and the distribution. Obviously there are many factors that vary across countries that might be expected to have an impact on the distribution or on its responsiveness to changes in income, and these need to be included in the model. In addition we use a fixed-effects model with country- specific constants to capture any unknown country-specific factors affecting the distribution relationship.

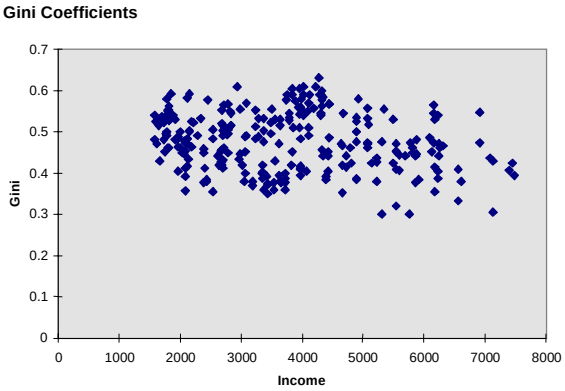
The data base used in our econometric estimation is much larger than those typically used in Kuznets curve estimation in the Latin American region, and it owes a large debt to the pioneering work in data collection by ECLAC, the IDB and the World Bank. The sample consists of 261 observations in 16 countries from 1960 to 1997. No country was included in the survey unless it had at least four separate observations.

Figure 1 gives a simple plot of the Ginis and income levels for all the observations in our sample. There are obviously serious problems of comparability between many of the surveys and therefore also between the distribution estimates that come from those surveys. Some of the surveys are based on the distribution of family income, others on family income per capita. Most of the surveys are based on income, but there are some that use expenditure data instead because it is measured with so much less error and is a better indicator of permanent income.

☐ This article, which forms part of a research project on "Growth, Employment, and Equity: The Impact of the Economic Reforms in Latin America and the Caribbean", carried out by ECLAC researchers in nine countries of the region and financed by the governments of the Netherlands and Sweden, the International Development Research Center of Canada, and the Ford Foundation, summarizes the results set out in greater detail in Morley (forthcoming), chapter 4. The author wishes to thank Oscar Altimir, Al Berry, Nancy Birdsall, François Bourguignon, Hubert Escaith, Luis Felipe Jiménez, Osvaldo Larrañaga, Arturo León, Eduardo Lora, Richard Newfarmer, Miguel Szekely, Jaime Saavedra, Barbara Stallings, Anthony Tillett, Jurgen Weller and the participants in seminars at LACEA, Brookings Carnegie and ECLAC for their comments on previous drafts of the paper. Needless to say, they bear no responsibility for any errors, data problems or analytical gaps which may still exist in the article.

[1] Simon Kuznets (1955) found an inverted "U" shaped relationship between income and income distribution, using historical data for England and the United States, and hypothesized that it was mainly explainable by the movement of population from the low-income rural economy to the higher-income urban economy.

FIGURE 1



Another important distinction is between urban and national surveys. Both Fields (1994) and Deininger and Squire (1996) have argued strongly that one should only use national surveys in any analysis of the distribution of income. But in many countries (Bolivia, Ecuador and Paraguay, for example) until very recently urban surveys were all that were available, and in another two (Argentina and Uruguay) they are still the only surveys available. One therefore has the choice of excluding these countries from any analytical work or of attempting to control for systematic differences between urban and national surveys by the use of dummy variables. We have chosen the latter strategy. Not only does this expand substantially the size of our sample but it also permits us to see whether there are any systematic differences of reaction in income or income growth between the urban sector and the national surveys. To check on the sensitivity of the estimates to this aggregation, we will display results for the urban and national samples separately.

II

The model for the determinants of income distribution

We can write the general regression model for the distribution as follows:

$$Gini_{it} = A_i + B_i Y_{it} + C_i 1/Y_{it} + DZ_{it} + ER_{it} + FS_i + GT_t Y_{it} + HT + \text{error} \qquad [1]$$

where *i* denotes countries and *t* denotes year.

The Gini coefficient will be our measure of income distribution. *A* is a regression constant which may vary across countries but, in our model, not across years. *Y* is income. *Z* is a vector of variables such as inflation, land distribution and education which we hypothesize may have an effect on the distribution. *R* is an index of economic reform and *S* is a vector of dummies which reflect various sample characteristics such as whether the sample is urban and whether it is based on household income or income per capita or on expenditure rather than income. *T* is a trend variable.

The first two income terms represent the Kuznets relationship. Our hypothesis is that this relationship has an inverted U shape in which inequality rises with income growth at low levels of income, but falls with growth above a given income level. This hypothesis translates into the expectation that both *B* and *C* will be negative and significant.

With regard to trend, we introduced two separate trend terms in equation [1] to test the hypothesis that there are significant shifts in the K-curve over time. If *H* is negative, the Kuznets curve shifts down over time (i.e., the distribution becomes more progressive). But we also hypothesize that there may be a systematic change in the relationship between income and income distribution. Our hypothesis is that this change is regressive: i.e., that *G* is positive. Perhaps for technological reasons, growth now is more regressive than it used to be. If *G* is positive, the slope of the K-curve changes over time. To the left of the inflection point, where the curve itself is upward-sloping, the slope gradually gets steeper. To the right of the inflection point, where the slope itself is negative, the trend makes the slope gradually flatter. Furthermore, the interaction term makes the inflection point itself shift gradually to the right over time, extending the range over which growth is regressive. Thus the trend terms tell two opposing stories. The trend term on the intercept is progressive and shifts the K-curve down, but the interaction term is regressive.

We have argued that the distribution of assets should have an effect on the distribution of income. We will include two measures of asset distribution here, one for the distribution of land, the other for the distribution of education. The first is a dummy variable which equals one for those countries with an unequal distribution of land.[2] We have used two variants of this variable, one which takes a value of one for all observations in the countries with unequal land distribution, while the other has a value of one for the national but not the urban observations. This means, for example, that in the second variant all the Paraguay observations have a zero for this variable even though Paraguay has a very unequal distribution of land. This is because all the observations for that country are urban.

With respect to education, our hypothesis is that the relative supply of more and less educated labour will have a significant effect on relative wages and the distribution of income. We have used a number of separate indicators of the supply of educated and less educated labour. NOSCHOOL is the percentage of the adult population with no schooling, PRIMARY is the percentage with no more than primary schooling, and HIGH is the percentage with more than secondary education. We also attempted to use measures of the variance of education levels across the adult population, but the problem with this variable is that educational improvements which increase the supply of high school and university graduates will in many case increase the measured variance instead of reducing it.

Inflation is another important variable which could be expected to have a powerful effect on the distribution. Labour markets react fairly quickly to moderate but not to extreme rates of inflation. When the inflation rate is low, nominal wages adjust and there may be little change in wage structure due to price changes. This does not happen in episodes of hyperinflation, when wage adjustments (particularly in the minimum wage) may lag behind the rate of inflation. Furthermore, even if nominal wages are raised by the full amount of inflation, it is still true that the average level of the real wage over the adjustment period is a negative function of inflation. This factor is not particularly important when the rate of inflation is low, but it becomes exceedingly important when the rate is high, which is one of the reasons why the interval between adjustments gets shorter in periods of hyperinflation. The implication of all of this is that high rates of inflation may have an impact on income distribution, but the relationship is highly non-linear. To test for this we have included an inflation dummy which takes a value of one for any year in which the annual inflation exceeds 1,000% but is zero elsewhere.

III

The structural economic reforms

Given our interest in the impact of the economic reforms, it was essential to have some sort of quantifiable index with which to compare the extent of reforms between countries or the progress of reforms over time in a single country. Our attempt to do this is described more fully in Morley, Machado and Pettinato (1999) and is an extension of the work initiated by Eduardo Lora at the IDB (see Lora, 1998).

Our index is a simple average of reform indexes in five areas: trade, finance, tax, privatization and capital account. In each area we tried to choose indicators such as tariff or tax rates which reflect government policy, rather than proxies for those policies such as openness to trade or the government deficit. Each index is normalized to come between zero and 100, with the latter being assigned to the country and year in which the sector was the most reformed or free from distortion or government intervention, and zero, to the country and year with the greatest degree of intervention.[3] We do not mean to imply by this procedure that a high value for an index is necessarily better than a low one, but only that the sector is closer to a pure market solution without government intervention.

The trade reform index is the average of two subcomponents: the average level and the dispersion of tar-

[2] We were forced to use a dummy for this variable rather than a numerical estimate because estimates are not available for some countries, while in others they appear to be based on different measures.

[3] Formally, each sub-index is defined as $I_{it} = (IR_{it} - Min)/(Max-Min)$, where *IR* is the raw value of the index in country *I*, year *t*, and *Max* and *Min* are the maximum and minimum values of the raw index for all countries over the period 1970-1995.

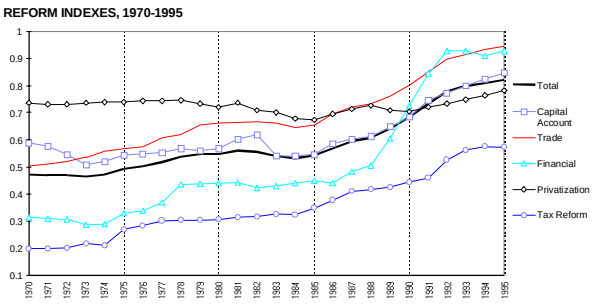
iffs. We were unable to obtain a satisfactory measure of non-tariff restrictions, and this represents a weakness of the index because in some cases such as Brazil such restrictions significantly affected the timing of trade reform. Domestic financial reform is the average of three sub-indexes: the control of bank borrowing and lending rates and the reserves-to-deposits ratio. Tax reform has four subcomponents: the maximum marginal tax rate on corporate and personal incomes, the value added tax (VAT) rate, and the efficiency of the VAT. Our index for privatization is equal to 100 minus the percentage of value added in State-owned enterprises in the non-agricultural GDP. Capital account reform is the average of four subcomponents reflecting the extent of government control of foreign investment, limits on repatriation of profits and interest, controls on external borrowing, and capital outflows. Unlike the other indexes, this one is based on a subjective interpretation of the descriptions in the IMF's annual Balance of Payments Arrangements publication.

In this definition of reform we make a clear distinction between what we call structural reform and macroeconomic policy reforms such as government deficit reduction, inflation control and exchange rate management, which could be called stabilization reforms. In many countries the two types of reforms were adopted together to deal with balance of payments or hyperinflation crises. Here, we are explicitly studying only the structural reforms. The impact of stabilization reforms will be captured through their effect on inflation and the level of income.

To some extent, the choice of what to include in our measurement of structural reform was arbitrary. Arguably the two most important excluded reforms were those in the labour market and financial market regulation. We excluded the former because in Lora's study the labour reform index by countries changed very little between 1985 and 1995, and because his measure would not have captured the important changes that occurred in the Southern Cone countries in the 1970s. We excluded financial market regulation because of the lack of an adequate measure for it. Elimination of price subsidies is another reform which was not included, but which probably had important effects in some countries.

Figure 2 is a graphic presentation of the region-wide averages for each of our reform indexes. It gives a quick picture of what has been reformed most and when the process occurred. Figure 3 shows the progression of reforms in each of the countries in our regression sample. Note that these indexes are non-weighted, simple averages of the values of the indexes for each of the countries.

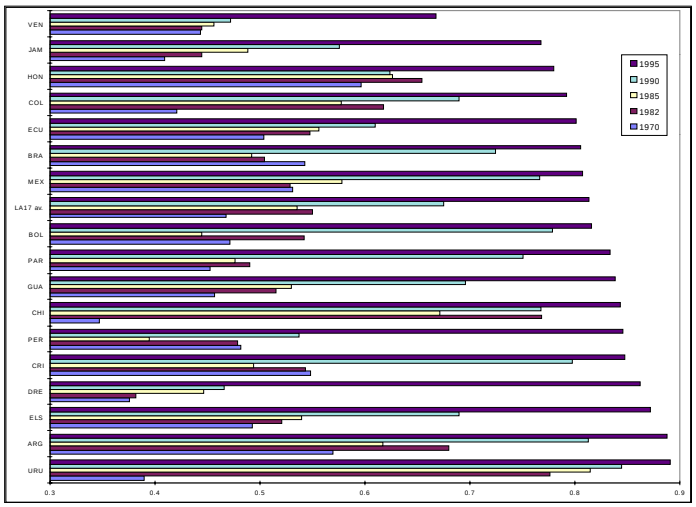
FIGURE 2



Source Morley, Machado, Pettinato: Indexes of Structural Reform in Latin America (1999)

FIGURE 3

Latin America and the Caribbean (17 countries): Reform indexes by country, 1970-1995



Source: Morley, Machado and Pettinato (1999).

IV

The impact of the reforms

What effect might these reforms be expected to have on equity? When one analyses the effects of the reform package as a whole, the broad thrust is to remove any sort of insulation from the market's determination of the allocation of resources. Trade reforms remove tariff protection from domestic production, while financial reforms and privatization reduce government influence over the allocation of resources. Balance of payment reforms integrate foreign and domestic capital markets and reduce the capacity of government to control capital movements. Similarly, labour market reform increases labour flexibility or, to put it another way, reduces labour's ability to defend itself against either market-driven fluctuations in demand, or alternatively wage reductions. Altogether, this adds up to quite a big leap into a new world whose transition costs are justified by expected increases in efficiency, income and growth. Whether or not the reforms have had these positive expected benefits, it is quite clear that very little attention has been paid to the winners and losers in the process or to its distributional implications.

There have been several recent attempts to examine the relationship between reforms and income distribution. Albert Berry recently published a set of case studies on nine countries of the region (see Berry, ed., 1998) in which he finds that in every case but Costa Rica, and possibly Colombia, the period of reforms coincided with a very sharp increase in inequality. The expectation that trade reform would lead to a narrowing in wage differentials has not been borne out in practice, indicating either that Latin America's comparative advantage does not lie in unskilled-labour-intensive products or that the opening has forced a shift in technology in favour of more capital- and skill-intensive production. The data for his study end fairly early in the decade of the reforms, so it is unclear whether the rises in inequality that he observed are part of a short-run adjustment or an unfavourable long-run trend.

Victor Bulmer-Thomas's study (Bulmer-Thomas, 1996) comes to equally pessimistic conclusions, though for somewhat different reasons. A theoretical analysis of each of the different reforms leads the contributors to his volume to the conclusion that, taking all the reforms together, real wages will fall, unemployment will go up, real interest rates will rise, there will be a rise in informalization and there will be an increase in the concentration of wealth, all of which are regressive. But the evidence to decide whether or not these predictions are reasonable was weak, since his study only extended up to 1992. Basically, his conclusion was that the problem with the new economic model was not so much connected with equity as with whether or not the new dependence on markets and the private sector would be capable of producing adequate, steady and sustainable growth rates of per capita income.

Londoño and Szekely (1998) of the IDB come to quite a different conclusion. Using cross-country regressions as opposed to country case studies, they find that equity is positively related to both growth and investment. These in turn are positively related to the structural reforms of the new economic model, leading to the conclusion that the reforms are progressive. This is confirmed by a direct correlation of income shares of different quintiles of the population with indexes of the different reforms. While there was no significant relationship between income shares and most of the indexes, trade liberalization was positively related to the income share of the bottom quintile and negatively related to the share of the top quintile. In the view of these authors, unlike many other researchers, trade reform helped the poor and unskilled.

There is a growing literature on the effects of trade reform on wage inequality (Robbins, 1995 and 1996; Wood, 1994 and 1997; Edwards, 1997; Ocampo and Taylor, 1998). The general conclusion of all these studies is that wage inequality has risen in those countries which opened their internal markets to external competition. While an increase in wage inequality does not necessarily translate into an increase in inequality of total income, these results suggest caution in accepting the Hecksher-Ohlin assertion that trade should help countries with large supplies of unskilled labour. Wood (1994) argues that the experience of East Asia in the 1960s and 1970s supports the theory that greater trade openness tends to narrow the wage gap between skilled and unskilled workers in developing countries. In Latin American, however, since the mid-1980s increased openness has widened wage differentials. Wood (1997) thinks that this conflict of evidence is probably not the result of differences between East Asia and Latin America but rather

the result of differences between the 1960s and the 1980s: specifically, the entry of China into the world market and perhaps the advent of new technologies biased against unskilled workers.

Spilimbergo, Londoño and Szekely (1997) point out that what really matters is each country's factor endowments, including land, relative to the average world effective supply of each factor. They too find that trade openness is associated with higher inequality, for constant factor endowments, but the effect depends on the relative abundance of each type of factor. Inequality increases in countries that are relatively well endowed with skills, but it declines in countries which are well endowed with physical capital and land. Since, in their sample, the factor endowments for Latin America are relatively close to world averages, the effect of trade openness on inequality is modest: a rise of 10% in the Latin American countries' openness index only raises the average Gini coefficient by 0.63 of a point.

One should not ignore the demand side in considering this question. The purpose of trade reform is to switch the production of tradeables away from inefficient import substitutes to exportables in which countries have a comparative advantage. The connection with income distribution comes from the differences in factor demands between these two types of products. It is thus a question of relative factor-intensity. But there is a demand side to consider as well. The success of the old import-substitution, inward-looking development strategy depended to a large extent on a growing internal market. If there is going to be satisfactory growth under that sort of strategy, there has to be a growing middle class with growing purchasing power. Growing real wages are an integral part of that strategy. The mature capitalist economies long ago discovered that both the owners of capital and their workers could profit from a strategy in which rising wages increased both costs and profits at the same time, thanks to increases in the size of the internal market induced by rising wage payments.

The export-led growth strategy is quite a different matter. Its success depends on controlling costs, and the internal market is irrelevant. In the export model, rising real wages are a clear threat to growth. They do not have the positive indirect effect through demand that they have in the inward-looking growth strategy. Countries embarking on the outward-looking growth path are making their wage levels hostage to wage levels and labour costs in other countries. It may well be that the advantages of greater efficiency in export production compared with import substitution outweigh the disadvantages of this wage competition, so that workers are better off. But the grounds for that presumption certainly are not immediately obvious, particularly in the large economies.

What is the likely effect of liberalizing the capital account? What this reform does is to integrate more closely the local and international capital markets, thus bringing local interest and profit rates, adjusted for risk, closer to rates in the rest of the world. Whether or not this is progressive depends on the reactions of foreign and domestic owners of capital. If foreign investors have been deterred from a country because of controls on repatriation of capital and profits, the reforms should induce a foreign capital inflow. The distributional effect of this is ambiguous. Wage/profit ratios should fall because of the rise in the capital/labour ratio, which is a progressive development, but at the same time, if capital and skilled labour are complementary, the skill differential will rise, which is regressive. A similar ambiguity results from the actions of domestic owners of capital. One of the reasons for liberalizing the capital account was to lift restrictions on capital outflows by domestic savers and investors, and if there was previously excess demand for foreign exchange under capital controls, the reforms should cause a capital outflow, with results just the reverse of those described for foreign capital inflows.

Aside from the effect of these reforms on factor supply and factor demand, removing barriers to capital movements increases the bargaining power of capital in its negotiations with both labour and the government. That is likely to be regressive, for if investors are free to move from one country to another, governments will find it far more difficult to tax capital or to pass regulations that force businesses to shoulder more of the cost of infrastructure or labour regulation. Indeed, in a world of perfect capital mobility, countries will be forced to compete in offering generous tax holidays, subsidized credits and other costly assistance as a way of attracting foreign capital. But it is not only foreign capital that is affected. The same argument is valid for domestic capital. Both government and labour will be forced to accept arrangements that are sufficiently generous to ensure that domestic entrepreneurs and holders of wealth are content to leave their money invested in their home country. In this way, opening up the capital account shifts the balance of power in favor of the holders of capital. This is one of the reasons why there has been a shift away from the taxation of corporate profits and a big reduction in the top marginal income tax rate in most Latin American countries in recent years.

Financial reforms eliminated controls on interest rates, reduced compulsory reserve requirements of banks and reduced the use of directed or subsidized credit. The

direct effect of this on income distribution is probably small, but to the extent that these reforms increased private saving and investment, they should be progressive.

The fourth component of the reform project is tax reform. Two major measures have been widely adopted in this respect. The first was the value added tax. Reformers favoured this tax because they argued that while all taxes have distorting effects on private decisions, these are less with an across-the-board value added tax than with either tariffs or high marginal income tax rates. In addition, of course, there should be less tax evasion with VAT than with an income tax based system. VAT was introduced in the 1970s in nine of the 17 countries for which we have data. In the 1980s it was adopted in all the remaining countries in the region, and in addition there was an increase in the coverage or efficiency of this tax in most countries.

A second element of tax reform was the reduction in marginal tax rates on corporate and personal income, which significantly reduced the progressiveness of income tax. Every country in the region has reduced its top marginal tax rate since 1970. Not all have gone as far as Uruguay, which eliminated personal income tax altogether, but overall the average marginal rate on personal income has fallen from around 50% in 1970 to about 25% in 1995, while the corporate rate has fallen from 37% in 1970 to 29% in 1995. Almost all these changes have taken place since 1985.

From the distributional standpoint, the effect of these changes in the tax system was to shift the burden of the tax system away from the wealthy and toward the middle and lower classes. The introduction and later expansion of the value added tax was a shift away from the taxation of income toward the taxation of consumption. Since the poor consume a greater fraction of their income than the rich, this change must have been regressive, except in certain countries which exempted basic necessities from the tax.

The changes in income tax amplified the trend toward greater regressiveness. Top marginal tax rates on personal income were lowered and the corporate tax rate was cut by over 20%. In addition to increased non-neutrality, the impact of the tax reforms should also depend on the fraction of national income being taxed. This aspect has not been included in our index of reform. While a full analysis of the incidence of all these changes is beyond the scope of this paper, it is almost certain that they were regressive, although it should be noted that if tax reform was part of a programme of deficit reduction and inflation control, its overall impact may well have been progressive.

Another important component of the reforms made in the region was privatization. State enterprises were a key component of the old development model, which has been dramatically redesigned by the reforms we are analyzing. The impact of privatization on income distribution depends on three elements. First, whether or not the sales price of the assets of the State-owned enterprises reflects their true market value. If it is less, buyers have received a gift from taxpayers. Second, for public utilities like electricity, telephone and water companies, the impact depends on what happens to the price of the services they provide to the public. In many cases publicly-owned utilities subsidized their customers by selling below cost. Transferring that sort of company to the private sector and eliminating the subsidy could be either progressive or regressive, depending on who their customers were. One might expect that to be regressive, but a recent study of gasoline and electricity pricing in Venezuela and Peru came to the opposite conclusion, considering that those wealthy enough to have electric appliances and cars came from the top, not the bottom of the distribution (Márquez and others, 1993). In fact, most of this sort of subsidy probably benefited the middle class.

Neither of the effects we have been discussing so far will be reflected in our distribution data, because the latter are based on earnings and not on expenditure or wealth. A result of privatization which *is* reflected in the earnings data, however, is its effect on labour demand and employment. Labour productivity in the typical State-owned enterprises (SOEs) was low. For political reasons many governments seemed more interested in using these enterprises to create jobs than to provide good service at the lowest possible cost, but when the enterprises were sold, all this had to change. Privatization operations in places like Chile and Argentina were blamed for a good deal of the job destruction and rising unemployment that accompanied reform. The distributional impact of this depends on who the displaced employees were. There is no good study of this question, but judging by the labour force profile of the typical State-owned enterprise, these jobs were largely in the middle of the earnings distribution scale. Thus, privatization is likely to have mainly hurt the middle class, both because they were the main users of subsidized SOE services and also the main employees of State-owned firms.

V

Econometric results

Tables 1-4 give our best estimates of the determinants of the distribution. Table 1 shows the results for the overall average reform index, using all 262 observations, both national and urban. Table 2 separates the urban and national samples as a check on the robustness of our results to alternative aggregations. Tables 3 and 4 show the effect of each of the five different areas of reform, first for the entire sample and then for the national and urban samples considered separately.

In table 1 we show four alternative regressions, three with fixed effects and one with a common constant. The first two regressions (columns 1 and 2) use the same variables to show the difference between using cross-section weights or pooled least squares. Cross-section weights are used in all the remaining reported results. The third regression shows the effect of adding a trend to the constant terms. The fourth gives some idea of what explains differences between the constants across countries.

Perhaps the most important result is that the general regression model fits the data well, explaining between 85% and 97% of the total variance in the Gini coefficient over time and across countries. In addition the coefficient estimates and significance appear to be robust and consistent across the alternative fixed effects regressions. Of the four specifications, those with fixed effects

TABLE 1

Combined sample results

	Fixed effects						Single intercept	
	Pooled least squares —1—		Cross-sectional weights —2—		—3—		—4—	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Income	-0.0001	-7.0504	-0.0001	-7.317398	-0.0001	-7.9707	-0.000102	-5.2978
1/Income	-260.3067	-2.9407	-208.7411	-2.671	-336.4263	-4.0021	-69.31056	-1.1264
Urban	-0.0336	-5.3983	-0.0333	-6.9739	-0.0320	-6.7043	-0.0278	-3.7291
ECLAC	-0.0522	-8.3100	-0.0510	-9.2131	-0.0530	-9.4478	-0.0568	-6.8944
Expenditure	-0.0874	-4.6603	0.0875	-2.9325	-0.0838	-2.8620	-0.1109	-9.4870
Inflation	0.0114	1.2774	0.0112	1.3838	0.0138	1.7027	0.0510	3.8580
Household	-0.0089	-1.5645	-0.0118	-2.3858	-0.0154	-3.0176	-0.0144	-1.8140
High	-0.0065	-2.8047	-0.0082	-3.2362	-0.0039	-1.3811	-0.0080	-5.4828
Primary	0.2482	3.1068	0.1965	2.7995	0.2311	3.2581	0.0167	0.3300
Trend*Income	0.0000	6.0880	0.0000	6.2408	0.0000	7.1460	0.0000	4.6505
Reform	0.0261	1.2573	0.0303	1.6333	0.0633	2.8999	-0.0095	-0.3703
Trend					-0.0030	-3.1760	-0.0015	-1.4856
Landdist							0.0364	4.5922
Constant							0.7387	8.2049
R-squared	0.8620		0.9756		0.9755		0.9341	
Adjusted-R-squared	0.8468		0.9729		0.9726		0.9306	
Standard error of regression	0.0274		0.0273		0.0268		0.0467	
Log likelihood	1789.3480		1791.4680		1792.1660		1577.077	
Durbin-Watson	1.5275		1.6061		1.6065		0.6725	
Mean dependent variable	0.4758		0.5256		0.5214		0.5387	
Standard deviation of dependent variable	0.0701		0.1659		0.1623		0.1772	
Sum of squared residuals	0.1768		0.1751		0.1687		0.5402	
F-statistic	146.8103		940.4532		845.5984		270.2431	
df (degree of freedom)	261		261		261		261	

and cross-section weights (nos. 2 and 3) have the best fit, and we will refer to their coefficients in the discussion that follows. A Wald test on the sum of squared residuals of the fixed and common constant regressions (compare regressions 3 and 4) decisively rejects the hypothesis that there is a common Kuznets curve across the different countries. Unspecified country-specific factors significantly affect the level of inequality for a given level of income.

What do our results tell us about the existence and/or shape of the Kuznets curve?

i) *The coefficients of income and the inverse of income.* Both are negative, and both are highly significant in all the fixed effects specifications (table 1). This result means that one cannot reject the hypothesis that there is a stable and identifiable relationship between income and inequality in the region (a Kuznets curve), and that this relationship has the same inverted U shape that Kuznets found for Britain and the United States. Inequality rises at low levels of income, but at some income level there is an inflection point after which inequality begins to decline as income increases. This is an important result. But it leaves open the question of whether there really is a single Kuznets curve for all the countries. To test that, we reran the model, permitting coefficients *B* and *C* of equation [1] to differ across countries (results not shown). Doing that significantly improves the fit of the regression, which means that there are differences between countries in the way that inequality reacts to changes in income. Even in this estimation, however, 12 out of 16 of the B_i coefficients and 10 out of 16 of the C_i coefficients are negative, and only two countries (Bolivia and Paraguay) have a positive and significant B_i. It thus seems fair to conclude that while there are significant differences across countries, the average values of *B* and *C* shown in table 1 are quite representative of the typical or average relationship between income and inequality in the region. It also leaves open the question of whether there is a single curve representing both the urban and national samples. We will look more closely at that question when we discuss the urban and national results below.

ii) *Education.* Education is an important qualifier of our discussion of the Kuznets curve. We included three education variables in the model: the percentage of the adult population with no schooling (NOSCHOOL), the percentage with no more than primary schooling (PRIMARY), and the percentage with university education (HIGH). High percentages of poorly educated workers have quite a large and regressive effect on income distribution. In Argentina, for example, the share of adults with no more than primary school education has fallen from 81% in 1974 to 64% in 1996.[4] According to regression 2 in table 1 that improvement alone should have lowered the Gini coefficient by about three percentage points (197*.17). At the same time the negative coefficient for HIGH tells us that increasing the share of university graduates in the adult population is progressive (shifts the Kuznets curve down). Note that the absolute size of the effect of expanding the university graduate proportion is much smaller than the effect of reducing the share of the poorly educated, suggesting that one gets a bigger distributional impact by spending money to reduce the size of the "primary schooling or less" group than by expanding the coverage of high school education and universities. That is exactly the same message that one gets from the comparison of education profiles between East Asia and Latin America (see Morley (forthcoming), chap. 3).

iii) *Urban vs. national*. In table 1 the urban dummy is negative, significant and robust. On average the Gini coefficient can be expected to be about 3 percentage points lower in the urban surveys than in the national ones. If one compares the Kuznets curves implied by the regressions reported in table 1 with those for the urban and national samples reported separately in table 2, one sees that while the general form is the same (all three have an inverted U shape), the coefficients and significance for the various income and trend terms are different enough to make it worth displaying the curves from all three estimations (figure 4). As expected, the urban curve in the figure is lower than the national curve over the relevant income range. It also peaks earlier and is slightly flatter than the national curve. That is consistent with the rationale that Kuznets described for the relationship. According to him, the distribution changes with development because people move from the low-income rural sector to the higher-income urban sector. At low levels of aggregate income, the urban sector is small, so this change in structure increases inequality (i.e., the national curve is upward sloping). After a certain point, however, when the urban sector has got big enough, continued rural-urban migration reduces inequality because it shrinks the size of the group that is poor (i.e., after the inflection point the curve turns down). But *within* the urban sector there is much less reason to expect income growth to have these effects. The urban sector is more homogeneous, so the gains from income growth ought to spread more evenly through it. This implies that the

[4] This finding is consistent with results from other cross-section studies. See the discussion in Bruno, Ravallion and Squire (1996).

urban Kuznets curve should be quite flat –flatter than the national curve- which indeed it is.

iv) *Inflation.* As we assumed in our hypothesis, episodes of high inflation (more than 1,000% per year in our model) are regressive. On average these episodes add about one percentage point to the Gini coefficient. This effect is robust to alternative estimation methods, but it is not significant in any regressions with an interaction term between the trend and income.

v) *Sample characteristics.* All of the sample characteristics had a significant effect on the level of the Kuznets curve. Distribution measures based on expenditure rather than income had Gini's about nine percentage points lower than those based on income. They also had significantly flatter slopes, which we found by putting an interaction term (not shown) in the regression. This is what one would expect. To the extent that variations in income are temporary and not permanent, expenditures should reflect the latter more than the former. That will tend to imply that expenditures tend to change less than measured income across different levels of income, signifying that the distribution of expenditures is more equal than the distribution of measured income. Another sample characteristic is whether or not the distribution is based on family income or per capita family income. Surveys based on family income have Gini's which are about one percentage point below those based on per capita family income, and this difference is significant. It reflects the fact that poor families tend to systematically have more family members. Finally, the ECLAC distributions are

FIGURE 4
Kuznets curves

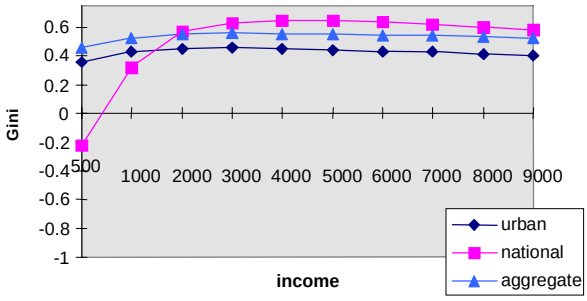


TABLE 2
Results for aggregate reform index

Variable	Urban sample				National sample	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
	—1—		—2—		—3—	
Constant	0.638532	7.192282	0.63856	7.220107	0.909964	14.38141
Income	-0.0000655	-3.460007	-0.0000649	-3.458332	-0.0000788	-6.047558
1/Income	-77.0826	-0.834087	-78.90591	-0.858713	-557.4071	-6.043466
ECLAC	-0.058326	-6.515791	-0.058633	-6.613158		
Inflation	0.050199	3.27413	0.049649	3.271231	0.02444	1.198074
Reform	0.012198	0.320243			0.136146	3.457715
Noschool	0.001908	3.415206	0.001871	3.437436	0.002566	5.538963
Trend	-0.003353	-1.493729	-0.003089	-1.485051	-0.003769	-2.996997
Trend*Income	0.00000136	2.952585	0.00000135	2.946409	0.00000124	3.677888
High					-0.010499	-7.236491
Per household					-0.063041	-6.952319
Expenditure					-0.076538	-5.187983
R-squared		0.499424		0.498985		0.705668
Adjusted R-squared		0.465197		0.469264		0.682121
Standard error of regression		0.040767		0.040611		0.041473
Sum of squared residues		0.194446		0.194616		0.215004
Log likelihood		229.0684		229.0132		245.6077
Durbin-Watson statistic		0.721265		0.716844		1.062467
Mean dependent variable		0.449939		0.449939		0.49977
Standard deviation of dependent variable		0.055745		0.055745		0.073559
F-statistic		14.59135		16.78887		29.96904
Prob(F-statistic)		0		0		0
df (degree of freedom)		125		125		136

systematically 5-6 percentage points more equal than the others because of their treatment of home consumption and other sources of under-reporting.

vi) *Reforms*. Here, we look first at the effects of the average reform index, deferring consideration of each of the sub-indices for later. As the reader can see from tables 1 to 3, overall the reforms have a regressive effect on the distribution. The coefficient is positive in all three samples, and is significant in some of them. The effect, however, is relatively small. According to the reform coefficient for regressions 2 and 3 in table 1, increasing the average reform index by 10% can be expected to increase the Gini coefficient by between 1/3 and 2/3 of a percentage point. While this effect is not large, the sign does confirm the assertions of Berry (ed.) (1998) and Bulmer-Thomas (ed.) (1996). They used historical evidence up to about 1994 for a smaller cross-section of countries to show that inequality had widened after the imposition of the neoliberal reform package. The evidence here comes from a much larger cross-section of countries and a far longer time period, but it points to the same conclusion.

Two notes of caution are called for here: first, it should be remembered that when we talk here about the effect of these structural reforms, we mean their direct impact, and not whatever effect the reforms may have had through inflation or income. If the reforms increased the growth rate or led to lower inflation, as they seem to have done in some countries, the positive effect of those two factors may outweigh the direct regressive effect on inequality of the reforms themselves.[5] Second, as we will see below, different reforms appear to have quite dramatically different and offsetting effects on the distribution. One will get quite different conclusions if the pattern of reform differs from the across-the-board average change being considered here.

vii) *Land distribution.* In regression 4 of table 1 we re-estimated the model with a single constant and added a measure of land distribution to see whether this may be one of the reasons why country-specific intercept terms differ. As the reader can see, the land distribution variable is highly significant and positive, adding about

[5] In a recent paper Escaith and Morley (forthcoming) have estimated the effect of this same package of reforms on economic growth. Their results show that the average reform index did not have a significant effect on the growth rate, because the various components of the reform package had different and sometimes opposing effects on growth.

TABLE 3

Effects of subindexes of reform on level of inequality

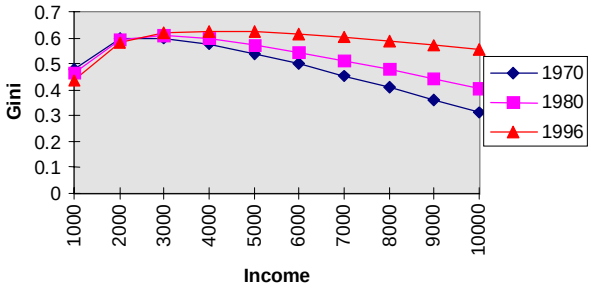
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Urban	-0.0305	-6.3250	-0.0314	-6.6106	-0.0307	-6.4613
ECLAC	-0.0523	-9.5654	-0.0513	-9.5852	-0.0516	-9.6664
Expenditure	-0.0813	-2.7260	-0.0851	-2.8787	-0.0876	-2.9229
Inflation	0.0165	1.9793	0.0179	2.1863	0.0186	2.2736
Household	-0.0132	-2.7286	-0.0133	-2.7530	-0.0127	-2.6238
High	-0.0093	-3.5635	-0.0088	-3.4433	-0.0084	-3.2990
Primary	0.1441	2.0320	0.1519	2.1561	0.1467	2.0859
Trend*Income	0.0000	5.7801	0.0000	5.7123	0.0000	5.9264
Income	-0.0001	-7.2460	-0.0001	-7.1979	-0.0001	-7.3759
1/Income	-251.9838	-3.3943	-250.8982	-3.3851	-234.4582	-3.2187
Privatization	0.0604	3.0108	0.0567	2.8810	0.0587	2.9490
Tax reform	0.0514	2.7174	0.0473	2.5774	0.0521	2.9200
Financial reform	-0.0228	-2.3371	-0.0245	-2.5559	-0.0177	-2.0436
Trade reform	0.0282	1.6202	0.0247	1.4514		
Capital account	-0.0156	-0.9176				
R-squared	0.9785		0.9782		0.9778	
Adjusted R-squared	0.9757		0.9755		0.9751	
Standard error of regression	0.0269		0.0269		0.0269	
Mean dependent var	0.5375		0.5371		0.5359	
S.D. dependent variable	0.1726		0.1717		0.1706	
Sum of squared residues	0.1670		0.1674		0.1686	
F-statistic	751.4683		802.2768		855.2841	
Prob (F-statistic)	0.0000		0.0000		0.0000	
df (degree of fredom)	261		261		261	

3.6 percentage points to the average Gini, which is a large effect. The change also affects the significance and/or size of some of the other variables as well. Inflation, for example, becomes a larger and more significant factor. So do differences in the university education variable. All this suggests that differences in inflation, in educational profile and in the distribution of land are among the reasons why income distributions differ across the countries in the region. But they are not the only differences. If they were, we would not have been able to significantly improve the fit of the model by using country-specific constants.

viii) *Trend.* Our results indicate that there are important shifts in the K-curve over time. We attempted to capture this by introducing two trend terms, one in the constant and the other in the K-curve itself. Regression 3 in table 1 puts the trend in the intercept term. It is negative and significant, suggesting a gradual improvement in inequality over time, other things being equal. But the interaction term tells a different story. It is positive and significant in all of the regressions, including the one with the common constant, and in the regressions for the urban and national samples considered separately. This means that the slope of the K-curve changes over time. Since the coefficient is positive, it means that to the left of the inflection point, where the curve itself is upward sloping, the slope is gradually getting steeper, while to the right of the inflection point, where the slope itself is negative, the trend is making the slope gradually flatter. Furthermore, the interaction term makes the inflection point itself shift gradually to the right over time, extending the range over which growth is regressive. Thus the trend terms tell two opposing stories. The trend term on the intercept is progressive, shifting the K-curve down. But the interaction term is regressive, so that growth has become systematically less progressive than it used to be. To illustrate all this we show the K-curve for Brazil for 1970, 1980 and 1996 (figure 5). For purposes of comparison, all the relevant variables other than trend are set at their 1996 values. We used the coefficients from regression 3 of table 1 for this calculation. Series one is 1970, two is 1980 and three is 1996. As the reader can see, the progressive shift downward in the intercept is increasingly dominated by the outward shift in the curve and its change of slope. Both these changes make growth less progressive than it would otherwise be, for not only is the interaction reducing the slope of the curve but it also means that the country is moving from one curve to another, thus making the improvement in inequality per unit of growth less than it would be if the country was moving down a stationary K-curve.

FIGURE 5

Kuznets Curves for Brazil



VI

Sub-indexes of reform

We will now look at tables 3 (on page 34) and 4, which show the results for each of the five areas of reform. Table 3 uses the entire sample, while table 4 shows the results for the urban and national samples separately. Table 5 summarizes the results. It is quite clear from table 5 that the various reforms have different and offsetting effects on equity. In all three samples some of the reforms have a significant regressive and some a significant progressive effect. This explains why the overall average reform indexes seem to have little effect on inequality.

Comparing the combined regressions with the separate urban and national regressions, the results for trade, capital and tax reform are a good deal more robust than those for the other two reforms. Trade reform has been regressive, more so in the national than in the urban regressions. This suggests that the negative effect on agriculture of the loss of protection and price subsidies was more significant that the loss of protection in the manufacturing sector. The theoretical case for trade reform rested on the idea that increased openness should favour Latin America's most abundant factor, assumed to be unskilled labour. That should have improved the distribution. But our econometric evidence says that it has not worked out that way in practice. If anything, the effect has been the opposite. That is consistent with the findings of Donald Robbins (1996), who has presented evidence that trade liberalization has led to the widening of skill differentials. These results are somewhat stronger

Table 4

Results for the subindexes of reform

	National sample		Urban sample	
Variable	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.617703	9.312883	0.64272	7.573593
Income	-0.0000291	-2.266974	-0.0000613	-3.50241
1/Income	-194.1939	-2.145082	57.34615	0.633523
Trend	-0.001197	-1.103537	-0.003263	-1.587047
Per household	-0.035718	-4.341743		
Expenditure	-0.054946	-4.229492		
Trend*Income	0.000000602	2.038764	0.00000156	3.64106
High	-0.009492	-7.60405		
Noschool	0.002715	6.58017	0.001456	2.318449
Inflation			0.034843	2.458605
ECLAC			-0.067288	-8.141843
Trade	0.081856	3.098284	0.013151	0.435331
Finance	0.017831	0.954765	0.041569	2.327227
Tax	0.108429	3.669748	0.030098	1.255619
Capital	-0.12167	-6.162735	-0.136489	-4.821436
Privatization	0.025497	0.998892	-0.043319	-1.70211
R-squared		0.811166		0.610982
Adjusted R-squared		0.791045		0.56967
Standard error of regression		0.033625		0.036569
Sum of squared residues		0.137939		0.151112
Log likelihood		275.7889		244.9528
Durbin-Watson statistic		1.380068		1.07592
Mean dependent variable		0.49977		0.449939
Standard deviation of dependent variable		0.073559		0.055745
F-statistic		40.31313		14.78958
Prob(F-statistic)		0		0
df (degree of fredom)		136		125

TABLE 5
Effect of Reforms on the Kuznets Curve

	Combined	Urban	National
Privatization	regressive*	progressive	regressive
Financial	progressive*	regressive*	regressive
Tax	regressive*	regressive	regressive*
Trade	regressive	regressive	regressive*
Cap Acct	progressive	progressive*	progressive*

* significant at 1% level

than those of Spilimbergo, Londoño and Szekely (1997), who found that "Trade openness also has a negligible effect over income distribution in Latin America", mainly because relative factor endowments in Latin America are very close to world averages weighted by population and openness (*ibid.*, p. 30). Our conclusions are not consistent with the work of Londoño and Szekely (1998), who found a significant positive relationship between trade reforms in the 1985-1995 period and the income share of the bottom quintile for a panel of 13 countries in the region. However, their regressions did not include urban observations, such as those for Argentina or Bolivia. Nor did they include any variables other than the reform indexes in the regressions. Thus the effects that they assign to the reforms may well actually come from other policies or variables.

In contrast to trade reform, opening the capital account has been progressive. Reducing barriers to capital mobility has attracted a great deal of foreign capital to Latin America, and theoretically this should have reduced profit rates and increased the demand for labour, all of which should be progressive. The results of the present study indicate that this has indeed been the case. The tax reforms, however, have shifted the Kuznets curve up towards greater inequality. There are clear theoretical arguments explaining why this is so. Switching from progressive income taxes to a flatter tax structure and substituting VAT or consumption taxes for income taxes and tariffs shifts the tax burden away from the rich. As for the other two reforms, the variations in the signs and significance of the coefficients on privatization and financial reforms suggest that our data are not good enough to give an unambiguous answer regarding the effect these two reforms have had.

VII

The effect of economic growth on income distribution: an application of the estimated Kuznets curve

One of the central questions facing anyone analysing trends in income distribution is the effect of growth on future inequality. Supposing that there are no policy changes other than growth: will Latin America become more equitable or not? Is high inequality nothing more than a phase which will be overcome by growth?

Our regressions shed a good deal of light on this question. First of all, since the K-curve has an inverted U shape, we know that some countries are undoubtedly to the left of the inflection point. For them growth is going to be inequitable. For the remaining countries growth should improve things. However, there is the complicating factor of the interaction between trend and income, which is making the growth-equity relationship steadily less progressive. This is partly because it moves the inflection point to the right and partly because it makes the curve itself flatter on the downward portion and steeper on the upward portion.

In 1996 the inflection point of the Kuznets curve lay at just under US$ 4,000 per capita. That means that all seven of the high-income countries in the region were beyond the inflection point, so that for them growth was equalizing. The remaining nine were on the rising portion of the K-curve, and for them the Gini coefficient rises with growth. For the region as a whole, a simple average of the individual country elasticities was .0224, indicating that if all countries grew by the same amount, there would be a slight rise in the average Gini coefficient. Overall, growth in 1996 was not equalizing because the weight of those nine countries on the rising portion of the K-curve was greater than the weight of those on the equalizing part of the curve. If one were to weight the elasticities by either population or income, however, that conclusion would be reversed, because all the big and relatively prosperous countries (Argentina, Brazil, Colombia, Mexico and Venezuela) were on the falling part of their curves.

At the same time, one must remember that because of the trend term the high-income country K-curves are tending to get flatter over time, while the low-income curves are getting steeper. This means that growth has become less and less progressive. To show this, we recalculated the elasticities using the parameters of the 1970 K-curve. With those parameters, the aggregate distribution elasticity would have been -0.18, which means that a growth rate that raised average inequality in 1996 would have lowered it in 1970. Some feature of the economy is making economic growth significantly less progressive than it used to be. We suspect that the culprit is skill-intensive growth, but we cannot prove that. Whatever the cause is, however, the implication is that if nothing else changes, the impact of growth on inequality in the future is likely to be more regressive than it is today.

VIII

Conclusions

Two main conclusions may be drawn from the econometric evidence presented above:

1. There appears to be a robust and significant relationship between distribution and income. It has the inverted U-shape that Kuznets predicted, but the relationship has been shifting in a regressive direction over time, so that growth is now a good deal less progressive than it used to be. In the aggregate that means that further growth in Latin America is unlikely to improve the distribution much, if at all. Supplementary measures will therefore have to be taken. Among those suggested by the regressions are maintaining low inflation rates and investing in education. Giving new entrants to the labour force more education at any level is progressive, but countries will get a much bigger reduction in inequality if they start at the bottom, universalizing the coverage of primary education and then broadening the coverage of secondary and university education.

2. On aggregate, the structural reforms appear to have a regressive effect on the distribution, but this effect is both small and not very robust statistically. We refer here only to the structural economic reforms, not the macroeconomic stabilization measures which were often adopted at the same time. It should also be noted that we are referring only to the direct effect of the reforms, apart from whatever impact they may have had through their effect on growth or inflation. The reason the direct effect is small or insignificant seems to be that reforms in different areas have offsetting effects on equity. Trade reform is regressive in all of our specifications, but it is insignificant in all but the national sample. Tax reform is unambiguously regressive, and opening up the capital account is unambiguously progressive. Our results for trade and tax reform and capital account liberalization are the most robust and significant; for the other two reforms, our data were not good enough to give us a clear answer.

(Original: English)

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