

**RISING INEQUALITY DURING
ECONOMIC LIBERALISATION AND CRISIS:
MACRO OR MICRO CAUSES IN ECUADOR'S CASE?**

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ABSTRACT

Ecuador started to liberalise its trade in goods and services in 1990 and opened up its capital account in a short period of time. Simultaneously, between 1992 and 1995, a credible macroeconomic stabilisation programme was implemented alongside. This led initially to a modest recovery of economic growth and price stabilisation. However, a string of external and domestic economic and political shocks created a severe setback and in 1998-99 the economy plunged into a severe crisis.

Application of a methodology of “microsimulations” to these two episodes in Ecuadorian economic history allows us to analyse in detail which labour market factors are associated with most of the changes in income distribution (and poverty, for that matter). This way, one might be able to hypothesize better how different aspects of policy reforms may have impacted on observed distributional outcomes. The “counterfactual” created in the microsimulations is one of what poverty and income distribution would have looked like if the observed labour market shifts would not have taken place.

The results suggest that the observed rise in income inequality seems to be closely associated with the effects of trade liberalisation, which has led to greater demand for skilled workers and pushed unskilled workers into unemployment or (informal) self-employed activities. This appears to have been counteracted somewhat by rising participation rates, falling unemployment and real wage increases during the period of stabilisation and growth (1990-95), facilitated by greater capital inflows. The macroeconomic downturn made these factors compound the rise in inequality, as much as explain the steep rise in poverty.

1. INTRODUCTION

Trade and financial liberalisation aim at improving economic efficiency and hence are expected to enhance growth. In developing countries, economic growth is typically seen as a central ingredient to poverty reduction. Attempts at economic liberalisation less often are justified with objectives of a more equitable income distribution in mind. However, traditional trade theory – through the Stolper-Samuelson theorem – would predict that trade liberalisation improves income distribution, since the remuneration of the relatively abundant production factor (assuming this is unskilled labour) is expected to rise with respect to the scarce factor (say, capital and/or skilled labour). Several recent empirical studies have found a contrary trend, that is inequality between workers and other factors seem to have risen in favour of skilled workers and capital income in many parts of the world, most notoriously in Latin America (e.g. Robbins 1996; Wood 1994, 1997; Berry 1998; Vos, Taylor and Paes de Barros 2000). This departure from theory in practice has been explained by various factors. One of them of course being that during the 1980s, and particularly the 1990s, many developing countries engaged in process of macroeconomic adjustment and a range of drastic economic reforms; trade liberalisation being only one component. This raises the question how much of the observed rise in income inequality (and change in poverty) can actually be assigned to trade liberalisation and how much to other policy shifts?

One approach to answering this question would be to construct a Computable General equilibrium (CGE) model in order to derive the appropriate counterfactuals (“with and without”) which would enable to disentangle the effects of the different elements of policy reform. This route has some obvious limitations, including difficulties to adequately model economic behaviour before and after liberalisation. Another limitation is that CGEs typically only model income distribution in terms of earnings differentials among aggregate labour groups and production factors and by broad categories of household groups, hence not accounting for all dimensions of the income distribution. An alternative route could be to look in more detail how income distribution (and poverty, for that matter) has changed among workers and households and which labour market factors can explain most of the change. By understanding better the types of changes that have taken place and which are the most important, one might be able to hypothesise better

how different aspects of policy reforms may have impacted on the observed distributional outcomes. Without a CGE, the counterfactual created in the “microsimulations”, as we label the approach followed in this paper, is one of what poverty and income distribution would have looked like if the observed labour market shifts would not have taken place (say, a sophisticated “before-and-after” approach). The approach could also well be applied, as we shall conclude, in conjunction with a CGE with a sufficiently detailed labour market block. In that case the observed labour market shifts would be replaced by the counterfactual(s) simulated through the CGE.

In this paper, we adapt the microsimulations approach developed by Ricardo Paes de Barros and others (see e.g. Paes de Barros and Leite 1998) to disentangle the major sources shifts of in income distribution and poverty in Ecuador during its period of drastic economic reforms in the 1990s. Starting in 1990 and after a prolonged period of macroeconomic instability, Ecuador liberalised its trade in goods and services and opened up its capital account in a short period of time. Simultaneously, between 1992 and 1995, a credible macroeconomic stabilisation programme was implemented along side (Vos 2000). In the first part of the 1990s this appears to have produced a modest recovery of economic growth, price stabilisation and a stark reduction in (urban) poverty, but a rise in inequality. A string of external and domestic economic and political shocks created a severe setback and in 1998-99 the economy plunged into a severe crisis. During the crisis both poverty and inequality increased. Application of the microsimulations approach to these two episodes in Ecuadorian economic history leads us to suggest that the observed rise in income inequality seems to be closely associated with the effects of trade liberalisation, which has led to greater demand for skilled workers and pushed unskilled workers into unemployment or (informal) self-employed activities. This appears to have been counteracted by rising participation rates, falling unemployment and real wage increases during the period of stabilisation and growth (1990-95), facilitated by greater capital inflows. The macroeconomic downturn made these factors compound the rise in inequality, as much as explain the steep rise in poverty.

The remainder of this paper is organised as follows. Section 2 gives a brief description of Ecuador’s policy reforms and the observed trends in poverty and inequality. Section 3 details the microsimulations approach, compares it to other similar methods

and lists its main advantages as well as its limitations. Section 4 presents the main results of the application of the approach to Ecuadorian data. Section 5 summarises the main conclusions.

2. ECONOMIC REFORMS, DISTRIBUTION AND POVERTY IN ECUADOR

Alike its politics and its economy, inequality in labour earnings and household incomes has been subject to a substantial degree of volatility in Ecuador since the initiation of economic liberalisation in the early 1990s (Vos 2000 and Figures 1 and 2). The liberalisation process started in earnest in 1990 with the freeing up of trade in the context of the Andean Pact, followed later around 1992 by the freeing of capital flows and lifting of controls to the domestic financial system. Urban income inequality increased quite strongly during the first years of the liberalisation process, roughly up to 1993, after which inequality fell somewhat until 1996. Economic stabilisation, lower inflation and real wage increases (and particularly minimum wage increases) during 1993-96 probably contributed to lower inequality and poverty (see Figures 1 and 2). From 1996 onwards, real wages lost purchasing power and poverty and inequality were on the rise again.

The economy plunged into a severe currency and financial crisis early 1999, following the bad economic news of 1998 when the price of the major export commodity, oil, reached a down point, while the weather shock “El Niño” had created important losses to agricultural production and transport infrastructure. Inflation accelerated during 1998 and hit the 60% mark by the end of 1999. Open urban unemployment increased from 9% to 14.5% between 1997 and 1999, and the real minimum wage dropped by almost 20%. In a companion paper (Vos 2000), it is pointed out that the gains in urban poverty reduction achieved during the 1990s had already been fully offset when the first effects of the emerging economic crisis were felt in 1998. Naturally, with inflation up and a drop in GDP by 7.3% in 1999, poverty increased dramatically nation-wide in recent

years. From a different source,¹ Table 1 indicates that the poverty incidence increased by 10 percentage points, implying a rise in the number of poor of 1.2 million Ecuadorians. Major part of the poverty increase was in 1998-99 (Vos, et al. 2000). The growth of poverty has been nation-wide, but more severe in urban areas, particularly in the cities of the Costa region. Nation-wide income inequality is also on the rise with the Gini coefficient reaching 0.535 in 1999, up from 0.529 in 1995 and with inequality rising more strongly in urban than in rural areas.

Table 1:
Poverty and Inequality in Ecuador, 1995-99

	National		Urban		Rural	
	1995	1999	1995	1999	1995	1999
Poverty						
Poverty incidence (P_0)	32%	42%	18%	29%	53%	59%
Poverty gap (P_1)	14%	17%	6%	11%	24%	27%
Poverty severity (P_2)	8%	10%	3%	6%	15%	16%
Inequality						
Gini of p.c. household income	0.529	0.535	0.499	0.522	0.464	0.465
Gini of primary labour income	0.555	0.562	0.537	0.555	0.510	0.513

Source: INEC, *Encuesta de Condiciones de Vida* (LSMS) 1995 and 1999.

Note: Poverty estimates are based on per capita household incomes and a poverty line of US\$ 60 at PPP (as used for the urban survey data above).

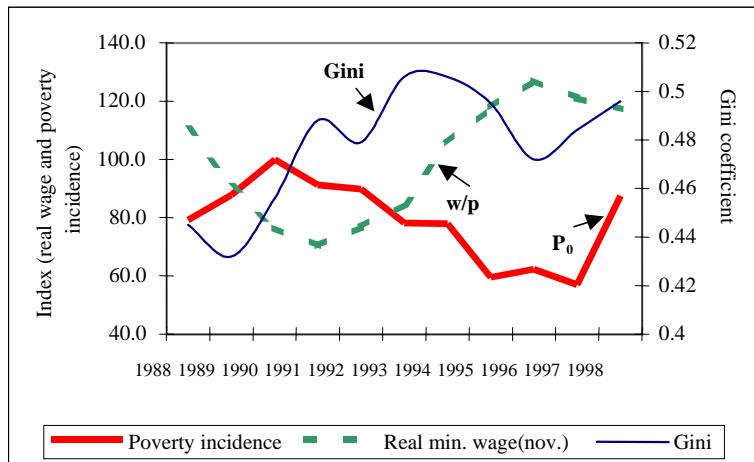
Amidst the economic crisis, it seems difficult to take a step back and assess the effects of the liberalisation process on income distribution during the 1990s, even more so given the macroeconomic instability that also had a major impact on the overall outcome. Yet, the companion paper on the macroeconomic adjustment and sectoral productivity changes during the period of liberalisation of trade, capital account and financial sector concluded that urban living conditions are still overwhelmingly influenced by macroeconomic shocks and policies, particularly inflation and real wage trends (Vos 2000). With inflation down and real wages up, inequality and poverty could fall. At the same time, however, important structural labour market shifts have become visible as a consequence of the liberalisation process and which can explain a counteracting trend towards rising

¹ The data for Figures 1 and 2 are based on the urban labour force surveys (INEC), while Table 1 uses the 1995 and 1999 LSMS surveys. Unfortunately there are no comparable LSMS (ECV) surveys prior to 1995. The ECV of 1994 has a different coverage, particularly for rural areas and hence is not strictly comparable to the subsequent ones.

income disparity. The production structure has shifted towards greater export orientation, mostly in capital-intensive sectors. Demand for modern sector wage labour has fallen behind overall labour supply growth and has become more skill-intensive. On balance, urban informal sector and self-employed job creation seems to have been residual in this process. As a result, (urban) household-survey evidence showed income differentials by levels of skill (education), wage earners and self-employed and formal and informal sector workers.

The transmission mechanisms of the crisis to poverty and inequality at the household level are likely to essentially concern changes in macro variables, in particular the overall drop in real incomes (GDP per capita fell by 9% in 1999) and the doubling of the urban unemployment rate. Further, more excess labour was pushed into informal activities which could explain (part of) the rise in urban inequality as well as poverty.

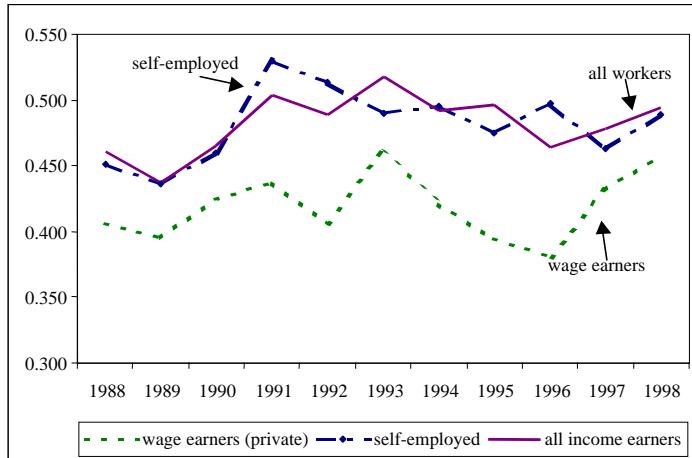
Figure 1
Ecuador: Urban poverty, inequality and the minimum wage, 1988-98



Source: INEC, Encuestas de Empleo Urbano; Vos (2000).

Note: Real minimum wage and poverty incidence expressed as indices (1990=100) on left-hand scale. Gini coefficient is on right-hand scale. Reference period for all variables is November of each year.

Figure 2
Ecuador: Gini coefficients wage earners and self-employed, 1988-98



Source: INEC, *Encuestas de Empleo Urbano*; León and Vos (2000).

Through the microsimulations methodology we try to assess more precisely the relative importance of shifts in aggregate labour demand, mean incomes, employment structure and earnings gaps on poverty and inequality.

3. THE MICROSIMULATION METHODOLOGY

The basic idea of the microsimulations is to isolate the effect of each of the main determinants of the changes in poverty and inequality and associate these changes to the process of macroeconomic adjustment and stabilisation, and to trade and capital account liberalisation. The methodology was originally developed by Almeida dos Reis and Paes de Barros in 1991 for an analysis of earnings inequality. Later the method was generalised to analyse total per capita household income inequality and poverty (cf. Paes de Barros and Leite 1998; Paes de Barros 1999; Frenkel and González 2000). The methodology consists of creating a counterfactual in the form of labour market parameters representing the employment and remuneration structure, which would prevail – allegedly – if liberalisation had not taken place. This counterfactual may be obtained by either model simulations to generate a case of ‘with-and-without’ or by taking the structure prevailing at the beginning of the liberalisation process to get a sophisticated ‘before-and-after’ comparison. For lack of a sufficiently disaggregated and operational CGE model, the ‘before-and-after’ option is chosen here.

The labour market structure can be defined in terms of economic participation, unemployment, employment and remuneration structure, as well as the general level of remuneration. The population at working age can be classified according to type of individual j , defined on the basis of both sex and educational attainment (e.g. skilled vs. unskilled). For all these types of individuals, the labour force participation and unemployment rates determine part of the labour market structure. The latter is further determined by the structure of employment. The employed workforce can be classified according to segment k , defined on the basis of for instance sector of activity and occupational category. For all groups jk in the labour market the average remuneration can be calculated and those averages can be expressed as a ratio of the overall average. Hence, the structure of the labour market can be expressed by the following function:

$$\lambda = f(W, E, U, P, M)$$

where the matrix $W=[w_{kj}]$ represents the remuneration structure and matrix $E=[e_{kj}]$, represents the employment structure,² the elements of which represent the proportion of individuals of type j who are employed in segment k of the labour market. Vectors $P=[p_j]$ and $U=[u_j]$ represent respectively the vectors of labour force participation and unemployment rates per group of individuals of type j . Finally, matrix M represents different socio-demographic characteristics, e.g. educational attainment.

Counterfactual simulations are used to obtain a new income distribution, whereby one or more parameters of the labour market structure are changed. The problem is to determine what for example income inequality would be if the labour market structure were to be given by $\lambda^* = f^*(W^*, E^*, U^*, P^*, M^*)$ instead of by the actual structure $\lambda = f(W, E, U, P, M)$ (see also Frenkel and González 2000). Alteration of parameters of the labour market structure can be analysed in isolation or sequentially. This includes an assessment of the impact of overall growth of labour incomes on poverty and inequality.

Using the data sets for Ecuador, counterfactuals for the following labour market parameters are used: the rate of participation P , the unemployment rate U , the employ-

² In the application to Ecuador, the employment structure will be defined in terms of both sector of activity (S) and occupational category (O), see below.

ment structure E will be defined in two components, respectively sector of economic activity S (*traded/non-traded*) and occupational category O (*wage and non-wage earners*), the structure of remuneration W_1 (labour income of each employment category vis-à-vis the mean), the average level of remuneration W_2 , and, finally, the employment structure in terms of education M (*skilled/ unskilled*). The details on the definition of the labour market structure are described in Box 1.

The “before-liberalisation” (initial year) parameters are applied to the “after-liberalisation” (final year) household survey data to simulate what poverty and income distribution would be if changes in each of the parameters had not taken place in the period. Simulations are performed separately for each parameter change and in sequence (cumulative) in the order as indicated (see Appendix A.1).

The methodology was applied using the LSMS data for both urban and rural areas for the crisis period 1995-99 and – in combination with the urban labour force surveys – for urban areas for the recession and liberalisation periods 1988-90 and 1990-95.³ The year 1990 marks the beginning of the macroeconomic stabilisation and liberalisation process with most of the reforms being implemented in 1990-92. The period 1988-90 is one of economic recession and largely failed attempts at stabilisation.

In order to assign the counterfactual labour market values to households and individuals in the survey data, a few important assumptions have to be made. First, a segmented labour market is assumed in the sense that workers are assumed not to move between urban and rural labour markets. (This assumption is relaxed in the simulation for the country as a whole.) Second, for lack of a full model of the labour market, a *randomised process* is applied to simulate the effects of changes in the labour market structure. That is, random numbers are used to determine: which persons at working age change their labour force status; who will change from one segment of the labour market to another (sector or occupational category); which employed persons obtained a different level of education; and how new mean labour incomes are assigned to individuals in the sample. The assumption is that, on average, the effect of the random changes reflects the

³ See Appendix A.2 for a description of the matching of LSMS with labour force survey data.

impact of the actual changes in the labour market.⁴

Box 4.1: Structure of the labour market

The population of 10 years and above is classified into *four types* according to sex and two educational categories (0-8 years and 9 years or more, or unskilled and skilled). The different types of persons are identified with the index j .

The individuals of type j are classified into three categories according to *labour force status*:

- economically inactive persons;
- unemployed persons; and
- employed persons.

For each group j the rates of participation and unemployment were calculated.

With the aim of defining the *employment structure*, the labour market was divided into *four segments* k according to both sector of activity (traded/non-traded) and occupational category (wage employees and non-wage earners). Wage employees are public and private sector employees, as well as domestic servants.

To define the employment structure in terms of *sector of activity*, the proportion of persons employed in the traded sector is calculated for wage employees and non-wage workers of type j . To define the employment structure in terms of *occupational category*, the proportion of wage employees is calculated for each type j within each sector of activity. Finally, to define the employment structure in terms of *skill*, the proportion of unskilled workers among men/women within each segment k is calculated.

The *remuneration structure* is calculated according to sector of activity, occupational category, sex and skill of the employed persons. Each element jk of the total of 16 elements that define the remuneration structure represents the mean income of an employed person of type j in segment k of the labour market.

Because of the introduction of a process of random assignation, the microsimulations were repeated several (32) times. This allows us to construct 95% confidence intervals for the indices of inequality and poverty, except in the case of the simulations of the effect of change in the structure and level of remuneration, which do not involve random numbers.

In each simulation we calculated the incidence, depth and severity of poverty and the Gini and Theil coefficients of the distribution of both per capita income and primary incomes.⁵

⁴ The possibility of incorporating conditional probabilities to decide who will change labour force status will be explored in future research.

⁵ Mean incomes per decile were calculated in the simulations. These means were assigned to new employed or to already employed persons who changed their sector of economic activity, occupational category or moved from one educational group to another. In principle, to assess the impact of changes in the labour market structure, one would have to calibrate the data base prior to simulating the effect of said changes – that is, replace the original labour incomes by mean incomes per decile. A test showed that both the direction of change and the magnitude of the effect does not change if one uses the original values of the labour incomes instead of calibrated values. For this reason, we depart from the original values, because then the interpretation of the results is easier.

The Paes de Barros simulation methodology has clear advantages over descriptive decomposition analyses of changes in inequality. Dynamic decomposition analyses are based on summary statistics, such as applied in e.g. Mookherjee and Shorrocks (1982), Jenkins (1995) and Ferreira and Litchfield (1998). In these dynamic decomposition analyses the total change in an inequality index is decomposed into increases or decreases in inequality due to changes in relative remuneration, changes in relative size of groups defined on the basis of socioeconomic characteristics and changes in inequality within groups. The advantages of the microsimulations methodology are that it:

- simulates the impact of changes in the labour market structure on the full income distribution, which allows for presenting the results either graphically or in the form of summary statistics;
- takes explicitly into account the effect of household composition on living standards and participation decisions and hence go beyond a pure labour market analysis.

Similarly, CGE models typically only specify income distribution by aggregate labour and household groups, focusing on between-group earnings differentials. The microsimulations methodology - since it simulates the impact on the full income distribution - has the advantage that it can account for between and within group differentials by the full range of labour and household characteristics. Another advantage is that it requires relatively little information beyond the basic household survey data. The microsimulations methodology can already be applied if one has access to the micro data of a single survey and obtains comparable summary information on the parameters of an alternative (counterfactual) labour market structure.

Weaknesses of the methodology are that the results may be path dependent and that, in a sequential simulation, the results may be sensitive to the order in which various effects are analysed. We will provide full tests for the robustness of results in this sense in subsequent research. However, a preliminary test based on urban labour force data suggests that the results are not path dependent and that the relative importance of the labour market parameter shifts underlying changes in poverty and inequality remains the same when the sequence is different. Thus, although further robustness tests need to be made, we take it that our aggregate results are not path dependent.

4. THE IMPACT ON POVERTY AND INEQUALITY OF LABOUR MARKET CHANGES DURING MACRO ADJUSTMENT AND LIBERALISATION

4.1 Labour market changes

As mentioned, the effects of labour market adjustment on poverty and inequality during the period of stabilisation and liberalisation could only be simulated for urban areas, while for the crisis period (1995-99) outcomes for both the urban and rural population could be analysed.

Labour force participation (P) in the **urban** labour market increased for practically all groups of workers (skilled, unskilled, males, females) in all sub-periods (see Table A.1a). *Unemployment* (U) increased most strongly in 1988-90 and 1995-99 and barely changed in 1990-95.⁶ *Sectoral labour demand* (S) shifted towards the traded sector during 1988-90, towards non-traded activities during 1990-95, but there was again some move back into traded sectors during the crisis years 1995-99. For most labour groups a shift towards *non-wage employment* (O) was predominant in the recession and liberalisation period 1988-95, except for male workers in the traded sector, who found more opportunities in wage employment. The share of *skilled workers* (M) in total employment increased for all groups of individuals throughout 1988-99.

The *remuneration structure* (W₁) among urban workers moved in opposite directions during 1988-95 and 1995-99 (see Table A.1b). The greater shifts took place in the recession and liberalisation periods 1988-90 and 1990-95, with most gains going to male skilled non-wage earners and to their female counterparts in the traded goods sector. Other female workers and unskilled male workers lost ground in the primary income distribution in both the liberalisation and the crisis periods. Both overall *mean earnings* (W₂) and those for all types of workers increased in 1990-95; they fell strongly in 1995-99 for virtually all groups, especially those of (female) non-wage earners (see Table A.2).

During the crisis years of 1995-99, **nation-wide** labour force *participation* con-

⁶ Unemployment, as defined here, is including employed persons with zero or non-reported labour income. The rate of unemployment is thus defined as the proportion of the economically active population that is not a labour income recipient.

tinued to increase, but notably most strongly among unskilled women in rural areas. At the same time *unemployment* increased. In rural areas the unemployment rate for unskilled women increased, while it fell for other types of rural workers. In urban areas, as expected, unemployment increased for all types of workers. The proportion working in the *traded sector* increased, except for skilled, female workers in urban non-wage activities. The highest increases took place among other non-wage workers – in particular among less-educated women. When looking at shifts by *occupational category*, it can be seen that despite the fact that on average the proportion in wage employment did not change, the prevalence of wage-employment diminished within several groups of employed persons. The pattern of the shifts is somewhat different for men and women. With respect to the *skill* composition, there was a large increase in skilled labour among female non-wage earners in the non-tradables sector. More generally, in terms of employment, skilled workers seem to have been less affected by the crisis than the unskilled. But this was not always the case in terms of remuneration. With some exceptions, the *remuneration structure* turned in favour of unskilled wage labour and against (especially female) non-wage earners. In urban areas, women in non-wage activities were generally harder hit than men by the overall reduction in real labour income.

4.2 Results of sequential simulations

What was the impact of these changes in the labour market structure on poverty and inequality? The cumulative results are presented in summary form in Table 2, while the main details for urban households during 1988-99 appear below in Table 4 and those for all households during the 1995-99 crisis in Table 5.

The outcomes have to be read as follows. We simulate what poverty and income distribution in, say, 1999 would look like, should labour market conditions of, say, 1995 still prevail. Thus, if we simulate the 1995 sectoral employment structure on the 1999 survey data and this yields, say, a *lower* than observed poverty rate, this means that the shift in sectoral labour demand that took place between 1995 and 1999 has been poverty-*enhancing*.

Table 2
Microsimulations: Impact on poverty and inequality of
imposing alternative labour market structure

(sequential simulations: magnitude and direction of change relative to original value)

		Poverty			Inequality			
		P ₀	P ₁	P ₂	Gini YPC	Theil YPC	Gini YPI	Theil YPI
LSMS surveys								
1999 (1995 parameters)	National	-	-	-	0	-	(-)	-
1999 (1995 parameters)	Rural	-	-	-	(+)	(-)	(-)	-
1999 (1995 parameters)	Urban	-	-	-	(-)	-	(-)	(-)
1999 (1990 parameters)	Urban	(-)	+	+	-	-	-	-
1999 (1988 parameters)	Urban	-	-	-	-	-	-	-
1995 (1990 parameters)	Urban	+	+	+	-	-	-	-
1995 (1988 parameters)	Urban	+	+	+	-	-	-	-
Labour force surveys								
1995 (1990 parameters)	Urban	+	+	+	-	-	-	-
1995 (1988 parameters)	Urban	+	+	+	-	-	-	-
1990 (1988 parameters)	Urban	-	-	-	-	-	(-)	-

Source: Authors' calculations based on LSMS and urban labour force surveys.

Note: P₀, P₁, and P₂ refer to FGT poverty indices (incidence, gap and severity). Inequality measures (Gini and Theil indices) refer to per capita household incomes (YPC) and primary incomes (YPI) respectively.

A zero indicates a not significant or near-zero effect; a sign in parentheses indicates a small effect (less than 2% of original value); a minus sign has to be interpreted as a simulated increase in poverty during the period, a plus sign as a simulated decrease.

Looking at the overall results (Table 2) it becomes clear that the urban labour market shifts that occurred during the liberalisation period (1990-95) helped to reduce poverty (as shown by the '+'- sign), while these produced a rise in inequality in both per worker primary incomes and per capita household incomes. This result is consistent with the observed patterns described in the previous sections. The more interesting aspects of the simulation exercise are in the details.

4.3 Observed and simulated changes in poverty and inequality

To see to what extent the observed changes in the poverty and inequality coefficients can be explained by the impact of the changes in the labour market, the actual and simulated changes are presented in Table 3. It can be seen that the rise in poverty during the crisis period is very well explained by observed changes in the labour market.

Table 3
Observed and simulated changes in poverty and inequality indices

Changes		Poverty				Inequality			
		P0	P1	P2	Gini YPC	Theil YPC	Gini YPI	Theil YPI	
<i>LSMS surveys:</i>									
Observed 1995-99	National	0.10	0.04	0.02	0.01	0.06	0.01	-0.01	
Simulated 1995-99		0.11	0.04	0.02	0.00	0.01	0.01	0.02	
Observed 1995-99	Rural	0.07	0.03	0.02	0.00	0.05	0.00	0.01	
Simulated 1995-99		0.06	0.02	0.01	-0.01	0.01	0.01	0.03	
Observed 1995-99	Urban	0.12	0.04	0.02	0.02	0.09	0.02	0.01	
Simulated 1995-99		0.12	0.04	0.02	0.00	0.02	0.01	0.01	
<i>Labour force surveys:</i>									
Observed 1990-95	Urban	-0.20	-0.09	-0.05	0.04	0.10	0.03	0.07	
Simulated 1990-95		-0.17	-0.08	-0.05	0.02	0.03	0.03	0.06	
Observed 1988-90	Urban	0.10	0.05	0.03	0.01	0.01	0.01	0.01	
Simulated 1988-90		0.09	0.05	0.03	0.01	0.03	0.01	0.02	

Source: Authors' calculations based on LSMS and labour force surveys

Notes: P₀, P₁, and P₂ refer to FGT poverty indices (incidence, gap and severity). Inequality measures (Gini and Theil indices) refer to per capita household incomes (YPC) and primary incomes (YPI) respectively.

Simulated changes in bold indicate statistically significant change relative to final year values.

Shaded figures indicate changes that are statistically significant and at least 2% change relative to final year values.

The shifts in the labour market structure that took place during the recession and liberalisation periods 1988-90 and 1990-95 also contribute a lot to the explanation of the rise and subsequent reduction in poverty. The change in earnings inequality is also rather

well explained by these changes, except in rural areas and, consequently, in the country as a whole during the 1995-99 crisis period, if the Theil coefficient is considered. The reason that not all changes in earnings inequality according to the Theil coefficient are explained may be related to the fact that in the decomposition methodology the within-group inequality changes are not taken into consideration when the remuneration structure is altered. The simulated changes in per capita income inequality do in several cases deviate quite substantially from the observed changes. This can be attributed to other missing elements in the decomposition, *viz.* the change in the distribution of non-labour incomes and changes in household size and age structure (*i.e.* the proportion of household members at working age).

4.4 Detailed simulation results

As shown by Table 4 and Annex Table A.4a, the key factors underlying the observed reduction in poverty and rise in inequality during the *liberalisation* period were:

- the rise in the level of remuneration, which by far explains most of the poverty reduction in this period, while it contributed to some reduction in inequality;
- the change in the remuneration structure (favouring skilled wage earners), which explains most of the rise in income inequality in this period.

Other factors, but of lesser importance were:

- the rise in the participation rate, which contributed to a fall in both poverty and inequality, while the greater supply of skilled workers helped to reduce poverty, but caused an increase in inequality;
- the shift towards non-traded employment, which helped to reduce poverty, but hardly affected inequality.

In all, the macroeconomic factors underlying the real wage increases clearly dominated the urban poverty reduction achieved during the liberalisation period, while the widening income gaps (by skill and between wage and non-wage income earners) associated with trade liberalisation dominated the observed rise in urban inequality.

Table 4:
Effects of changes in the labour market on urban poverty incidence and inequality

	Poverty (P_0)								Inequality (Gini of per capita income)							
	Labour force Survey				LSMS				Labour force survey				LSMS			
	88-90	90-95	90-95	95-99	88-90	90-95	90-95	95-99	88-90	90-95	90-95	95-99	88-90	90-95	90-95	95-99
Value observed in final year					0.4912	0.2921	0.1767	0.2931	0.4564	0.4946	0.4988	0.5221				
	-2%	0.4814	0.2863	0.1732	0.2872	0.4473	0.4848	0.4888	0.5117							
	+2%	0.5010	0.2980	0.1803	0.2989	0.4655	0.5045	0.5088	0.5325							
<i>Values in case of change of the:</i>																
(1) rate of participation	Mean	0.4926	0.3003	0.1927	0.3085	0.4565	0.4951	0.5023	0.5265							
	Lower limit	0.4922	0.2996	0.1915	0.3076	0.4563	0.4947	0.5039	0.5259							
	Upper limit	0.4930	0.3010	0.1939	0.3093	0.4567	0.4955	0.5033	0.5271							
(2) rate of unemployment	Mean	0.4806	0.2929	0.1768	0.2835	0.4519	0.4946	0.4983	0.5182							
	Lower limit	0.4802	0.2927	0.1766	0.2829	0.4518	0.4945	0.4982	0.5181							
	Upper limit	0.4811	0.2931	0.1770	0.2841	0.4520	0.4948	0.4985	0.5183							
(3) employment structure (sectors)	Mean	0.4891	0.2931	0.1774	0.2874	0.4557	0.4946	0.4972	0.5205							
	Lower limit	0.4885	0.2926	0.1767	0.2868	0.4555	0.4943	0.4963	0.5201							
	Upper limit	0.4898	0.2935	0.1781	0.2880	0.4560	0.4950	0.4981	0.5209							
(4) employment structure (occupational categories)	Mean	0.4917	0.2908	0.1762	0.2902	0.4561	0.4942	0.4969	0.5215							
	Lower limit	0.4908	0.2905	0.1757	0.2895	0.4558	0.4941	0.4961	0.5211							
	Upper limit	0.4925	0.2910	0.1767	0.2908	0.4565	0.4944	0.4976	0.5219							
(5) remuneration structure		0.4990	0.2607	0.1498	0.2857	0.4528	0.4770	0.4864	0.5270							
(6) level of remuneration		0.4158	0.4830	0.3034	0.1854	0.4545	0.5016	0.5012	0.5226							
(7) employment structure (education)	Mean	0.4863	0.3038	0.1856	0.2966	0.4555	0.4878	0.4937	0.5188							
	Lower limit	0.4856	0.3029	0.1848	0.2957	0.4551	0.4871	0.4923	0.5181							
	Upper limit	0.4870	0.3047	0.1863	0.2975	0.4558	0.4886	0.4951	0.5196							
<i>Values in case of change of parameters:</i>																
(1-2)	Mean	0.4823	0.3054	0.1930	0.2995	0.4519	0.4952	0.5028	0.5226							
	Lower limit	0.4816	0.3047	0.1917	0.2985	0.4517	0.4946	0.5019	0.5221							
	Upper limit	0.4829	0.3060	0.1943	0.3006	0.4521	0.4958	0.5036	0.5232							
(1-3)	Mean	0.4683	0.3061	0.1922	0.2833	0.4496	0.4950	0.5012	0.5181							
	Lower limit	0.4673	0.3053	0.1909	0.2820	0.4492	0.4943	0.4999	0.5172							
	Upper limit	0.4693	0.3069	0.1935	0.2846	0.4499	0.4957	0.5026	0.5190							
(1-4)	Mean	0.4743	0.3068	0.1921	0.2791	0.4478	0.4949	0.5003	0.5151							
	Lower limit	0.4731	0.3059	0.1905	0.2774	0.4472	0.4941	0.4987	0.5140							
	Upper limit	0.4756	0.3077	0.1938	0.2807	0.4483	0.4957	0.5019	0.5162							
(1-5)	Mean	0.4878	0.2764	0.1644	0.2775	0.4460	0.4761	0.4865	0.5199							
	Lower limit	0.4866	0.2753	0.1629	0.2757	0.4455	0.4754	0.4848	0.5189							
	Upper limit	0.4890	0.2775	0.1659	0.2793	0.4465	0.4767	0.4883	0.5209							
(1-6)	Mean	0.4032	0.4532	0.2802	0.1748	0.4438	0.4834	0.4888	0.5202							
	Lower limit	0.4020	0.4522	0.2788	0.1731	0.4433	0.4827	0.4871	0.5192							
	Upper limit	0.4043	0.4543	0.2816	0.1766	0.4444	0.4840	0.4904	0.5212							
(1-7)	Mean	0.3978	0.4591	0.2874	0.1771	0.4436	0.4786	0.4866	0.5174							
	Lower limit	0.3966	0.4578	0.2857	0.1753	0.4429	0.4778	0.4847	0.5164							
	Upper limit	0.3991	0.4604	0.2891	0.1789	0.4443	0.4795	0.4886	0.5185							
Value observed in initial year		0.3895	0.4912	..	0.1767	0.4446	0.4564	..	0.4988							

Source: Authors' calculations based on LSMS Surveys of 1995 and 1999 and labour force surveys of 1988, 1990 and 1995.

Note: Bold values: difference statistically significant.

Highlighted values: difference statistically significant and at least 2%.

Underlined values: poverty/inequality would have been higher if rate/structure were to be that in initial year.

Upper and lower limits are of the 95% confidence intervals.

Table 5:
Microsimulations: Labour market adjustment, poverty and inequality during the crisis

LSMS data	Poverty (P_0)			Inequality (Gini of per capita income)		
	National 95-99	Urban 95-99	Rural 95-99	National 95-99	Urban 95-99	Rural 95-99
Value observed in final year						
-2%	0.4160	0.2931	0.5945	0.5349	0.5221	0.4645
+2%	0.4077	0.2872	0.5826	0.5242	0.5117	0.4552
	0.4243	0.2989	0.6064	0.5456	0.5325	0.4738
<i>Values in case of change of the:</i>						
(1) rate of participation	Mean	0.4342	0.3085	0.6166	0.5389	0.5265
	Lower limit	0.4335	0.3076	0.6153	0.5384	0.5259
	Upper limit	0.4350	0.3093	0.6180	0.5395	0.5271
(2) rate of unemployment	Mean	0.4134	0.2835	0.6115	0.5330	0.5182
	Lower limit	0.4128	0.2829	0.6105	0.5326	0.5181
	Upper limit	0.4140	0.2841	0.6125	0.5333	0.5183
(3) employment structure (sectors)	Mean	0.4085	0.2874	0.5870	0.5323	0.5205
	Lower limit	0.4078	0.2868	0.5857	0.5318	0.5201
	Upper limit	0.4091	0.2880	0.5883	0.5329	0.5209
(4) employment structure (occupational categories)	Mean	0.4138	0.2902	0.5938	0.5337	0.5215
	Lower limit	0.4133	0.2895	0.5927	0.5334	0.5211
	Upper limit	0.4143	0.2908	0.5949	0.5340	0.5219
(5) remuneration structure		0.4177	0.2857	0.6001	0.5410	0.5270
(6) level of remuneration		0.2987	0.1854	0.5113	0.5377	0.5226
(7) employment structure (education)	Mean	0.4216	0.2966	0.6004	0.5307	0.5188
	Lower limit	0.4207	0.2957	0.5994	0.5300	0.5181
	Upper limit	0.4224	0.2975	0.6015	0.5314	0.5196
<i>Values in case of change of parameters:</i>						
(1-2)	Mean	0.4317	0.2995	0.6306	0.5378	0.5226
	Lower limit	0.4307	0.2985	0.6293	0.5370	0.5221
	Upper limit	0.4326	0.3006	0.6319	0.5385	0.5232
(1-3)	Mean	0.4174	0.2833	0.6211	0.5357	0.5181
	Lower limit	0.4163	0.2820	0.6194	0.5347	0.5172
	Upper limit	0.4185	0.2846	0.6228	0.5366	0.5190
(1-4)	Mean	0.4115	0.2791	0.6169	0.5324	0.5151
	Lower limit	0.4102	0.2774	0.6150	0.5312	0.5140
	Upper limit	0.4128	0.2807	0.6187	0.5335	0.5162
(1-5)	Mean	0.4045	0.2775	0.6026	0.5375	0.5199
	Lower limit	0.4032	0.2757	0.6002	0.5365	0.5189
	Upper limit	0.4059	0.2793	0.6050	0.5386	0.5209
(1-6)	Mean	0.3074	0.1748	0.5369	0.5401	0.5202
	Lower limit	0.3063	0.1731	0.5344	0.5391	0.5192
	Upper limit	0.3085	0.1766	0.5395	0.5411	0.5212
(1-7)	Mean	0.3101	0.1771	0.5371	0.5360	0.5174
	Lower limit	0.3090	0.1753	0.5346	0.5349	0.5164
	Upper limit	0.3112	0.1789	0.5397	0.5372	0.5185
Value observed in initial year		0.3194	0.1767	0.5263	0.5290	0.4988
						0.4639

Source: Authors' calculations based on LSMS Surveys of 1995 and 1999.

Note: Bold values: difference statistically significant.

Highlighted values: difference statistically significant and at least 2%.

Underlined values: poverty/inequality would have been higher if rate/structure were to be that in initial year.

Upper and lower limits are of the 95% confidence intervals.

The relative importance of these factors is rather similar for the period before liberalisation started (1988-90) and the crisis period (1995-99). However, some important differences are that (see also Tables A.3c and A.4b):

- the rise in unemployment and the fall in real wages contributed to the rise in urban poverty in the recession periods 1988-90 and 1995-99;
- the shift in remuneration structure in the 1995-99 crisis period contributed to higher poverty, despite producing lower inequality;
- in both periods rising participation rates helped to reduce urban poverty and inequality, while rising skill levels of workers supported falling poverty, but rising inequality;
- the increase in unemployment contributed to a reduction in earnings inequality.

The drop in mean income levels was also the predominant factor explaining the rise in poverty in both urban and rural areas in the 1995-99 crisis (Table 4 and Tables A3a-c). Inequality could fall, as incomes fell (generally) more strongly among skilled workers and non-wage earners. The shift in remuneration structure was less favourable in rural areas, contributing to rising inequality, as unskilled female workers were among the major losers and skilled, male workers in non-traded activities (commerce) among the winners. This trend towards greater rural inequality was offset, however, by the effect of a falling unemployment rate. In contrast, urban inequality fell because of the shift in remuneration structure, but the rise in unemployment and the reduction in the share of unskilled wage earners among the employed offset this effect. The change in the remuneration structure and the shift to skilled labour were also important elements in explaining the rise in urban poverty.

The cumulative simulated changes in the poverty incidence in Figures 3a-c also show that the change in the average remuneration explains most of the increase in the poverty incidence in the recession and crisis periods, and of its reduction during the liberalisation period. Figure 4b confirms that between 1990 and 1995 it was the change in the remuneration structure that contributed most to the increase in inequality, while the shift to skilled labour also had an inequality-enhancing impact. In the other two periods, the changes in the employment structure had relatively large effects on inequality. The changes in employment structure themselves may be associated with the recessions and

policy reforms in the periods analysed

In sum, the macroeconomic stabilisation that supported real wage and employment growth during 1990-95 was strong enough to push for poverty reduction, despite the effects against equity of trade liberalisation. This means that, all other things being equal, more poverty reduction could have been achieved, had inequality not increased. During the crisis the macro factors worked adversely without reversing the employment structure in a more equitable direction, hence both poverty and inequality worsened.

5. CONCLUDING REMARKS

In this paper we have tried to shed some more light on the sources of rising and falling poverty and income inequality during Ecuador's rather volatile economic development during the 1990s. The reforms that were initiated in 1990 liberalised most of the country's economic system. Sweeping reforms took place in particular in trade, the capital account, the financial sector and much of the domestic pricing system. The more liberal regime was not reverted during the 1990s. However, macroeconomic policies showed more of a 'stop-go' pattern. In the first half of the 1990s policies were rather orthodox with fiscal and monetary retrenchment. Inflation went down, the exchange could be kept rather stable and real wages went up. This more stable macroeconomic environment and a rise in capital inflows associated with the process of economic opening allowed for moderate growth. In this period, (urban) poverty fell. Income inequality increased steeply initially (1990-93), but fell somewhat thereafter (1993-95). Macro policies became less restrictive, but also less predictable after 1995. Together with a range of adverse external shocks this led to increasing instability and, eventually, economic collapse towards the end of the decade. Both poverty and inequality increased steeply in 1995-99.

The microsimulations methodology allowed us to identify that labour market outcomes that are most strongly associated with macroeconomic factors explain most of the shifts in poverty during these episodes. The trend in average remuneration levels forms one such factor and has been strongly related to the degree of inflation control and wage policies (see Vos 2000). Rising unemployment was a complementary factor behind the rise in poverty during the 1988-90 and 1995-99 recessions. The overall trend towards

rising inequality during the reform and crisis periods, on the other hand, should be ascribed largely to widening earnings differentials between skilled and unskilled workers (see Tables A1.b and A.2). This labour market shift, alike elsewhere in the region (see e.g. Vos, Taylor and Paes de Barros 2000; Morley 2000; and Robbins 1996), appears to be closely associated with the process of trade liberalisation. During the crisis period, however, the push of workers into (informal) self-employed activities was more critical in explaining the rise in inequality. These ‘microeconomic’ causes of greater inequality (and poverty) were counteracted somewhat by a rise in labour participation. Improved access to education of women explains much of the rising participation rates. However, the speed of closing the educational deficits has been far from sufficient to compensate for the widening earnings differentials that have emerged as part of the structural adjustment pattern.

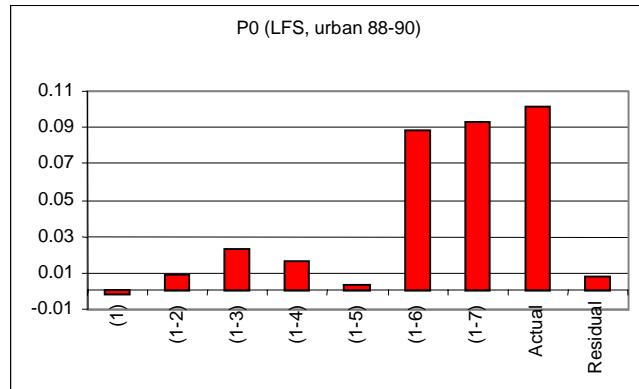
The microsimulations methodology has shown to be quite instrumental to disentangle the various forces underlying the poverty and inequality trends. In Ecuador’s case the method has been rather accurate in explaining poverty trends (see Table 3 and residuals in Figures 3a-c), but less precisely the inequality trend.

As we have compared observed labour market structures at the beginning and the end of the analysed periods, the counterfactuals produced through the microsimulations cannot be considered fully as “with-and-without” (reform policy) cases. They do give a much more insightful “before-and-after” comparison than what would be obtained from merely descriptive statistics on poverty and inequality. A more “truly” with-without comparison could be obtained when using the labour market outcomes as simulated by an appropriate (CGE) model and then apply this “without” case in the microsimulations procedure. This, together, with additional robustness tests for the microsimulations method itself (for path dependence and sequencing), are elements for further research to test the appropriateness of the approach. Even with these limitations, we can safely conclude that the method has effectively disentangled the key labour market factors that appear to underpin the trends in poverty and inequality in Ecuador.

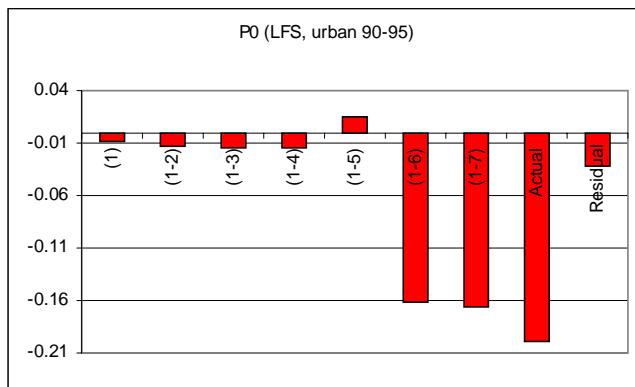
FIGURES

Figures 3a-c: Microsimulations: Labour market shifts contributing to the change in urban poverty

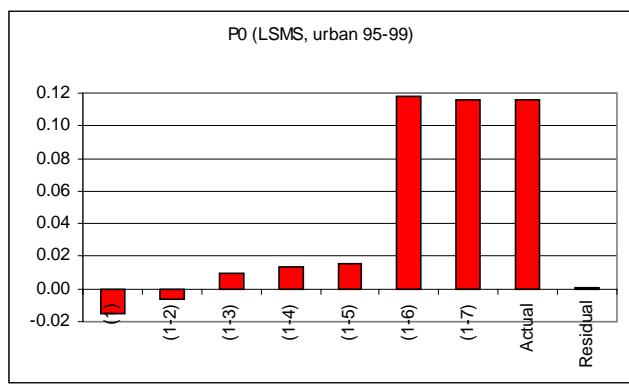
3a: 1988-90



3b: 1990-95



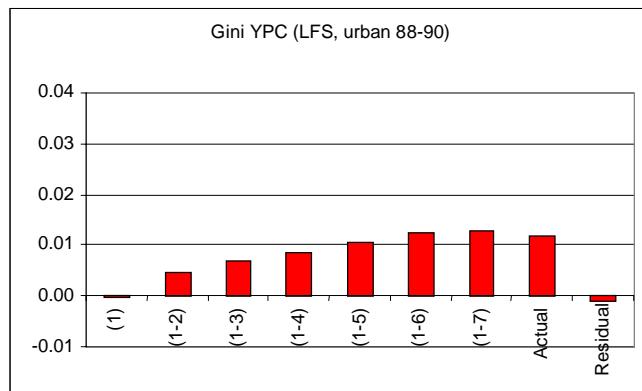
3c: 1995-99



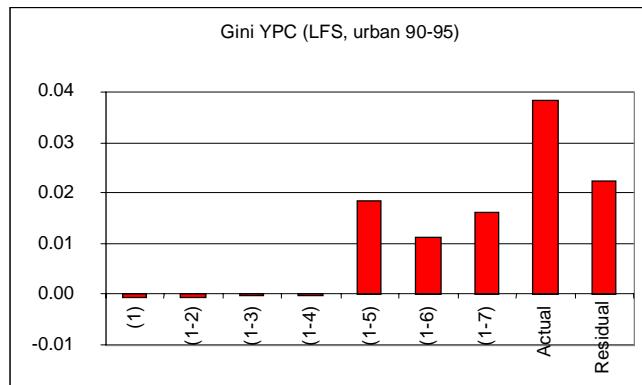
Source: Tables 4 and 5 and A.3 and A.4.

Figures 4a-c:
Microsimulations: Labour market shifts contributing to the
change in urban income inequality

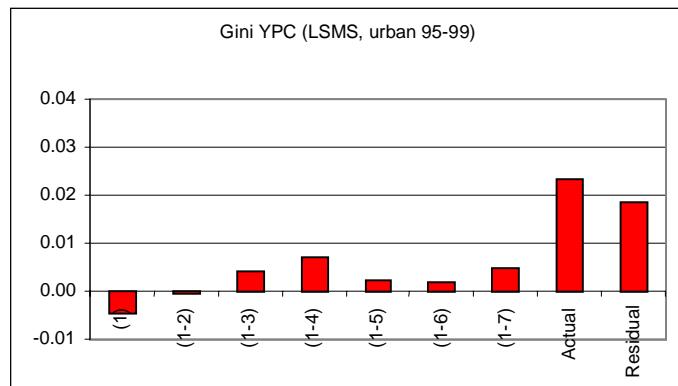
4a: 1988-90



4b: 1990-95



4c: 1995-99



Source: Tables 4 and 5 and A.3 and A.4.

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APPENDICES

Appendix A.1: The Microsimulations

The microsimulations were carried out at the national level and separately for urban and rural areas on the basis of data of the LSMS surveys. Additional simulations were run for urban areas using either a combination of LSMS and urban household survey data, or the latter only. The following describes the way the simulations were carried out for 1999 with 1995 parameters. The methodology for the other simulations is similar.

For 1999 an alternative structure of the labour market was defined on the basis of data of the 1995 LSMS. In each iteration of the microsimulations a random number was assigned to each individual (of a sub-group) of the population in 1999. This number was used to rank the individuals. An analysis was made of the effects on poverty and inequality of the following changes in the structure of the labour market (which were considered separately or sequentially):

1. Change of the participation rate of each group j of the population.

- *Objective:* Determine the indices of poverty and inequality if the participation rates in 1999 were to be equal to those in 1995.
- *Procedure:* Within each group j the persons of 10 years and older were in the first place ranked according to labour force status – starting with the economically active – and in the second place on the basis of the random numbers. Because for each type j the participation rate in 1995 was lower than in 1999, the last economically active persons of type j were reclassified as economically inactive and their labour income was set to zero.

2. Change of the unemployment rate of economically active persons of type j .

- *Objective:* Determine the indices of poverty and inequality if the unemployment rates in 1999 were to be equal to those in 1995.
- *Procedure:* Only the economically active population was considered. Within each group j the individuals were in the first place ranked according to employment condition – starting with the employed – and in the second place on the basis of the random numbers. For the types j with higher rates of unemployment in 1995 than in 1999, the last employed persons of each type j were reclassified as unemployed and their labour income was set to zero. In case of types j with lower rates of unemployment in 1995, the new employed were grouped into deciles on the basis of the random numbers and assigned the mean labour income of the corresponding decile of employed persons in 1999.

3. Change of the sector of activity of wage employees and non-wage workers of type j

- *Objective:* Determine the indices of poverty and inequality if the proportion of persons employed in the tradable sector would not have changed between 1995 and 1999.
- *Procedure:* Only the employed population was considered. Mean incomes per decile of employed persons of type j in each sector were calculated for both occupational categories. Within each group j the individuals were in the first place ranked according to sector of activity – starting with the tradable sector – and in the second place on the basis of the random numbers. In groups in which the proportion of persons working in the non-tradable sector was lower in 1995 than in 1999, the first persons of the non-tradable sector moved to the tradable sector. In groups j in which the proportion of persons in the non-tradable sector was higher in 1995 than in 1999, the last persons of the tradable sector moved to the non-tradable sector. Within each group j the persons who changed from one sector to the other were classified into deciles on the basis of their random number and their labour income was replaced by the corresponding mean income of the decile of all persons who in 1999 were actually working in the sector of destination.

4. Change of the occupational category of employed persons of type j in each sector of activity.

- *Objective:* Determine the indices of poverty and inequality if the proportion of wage employees in 1999 were to be the same as in 1995.
- *Procedure:* Only the employed population was considered. Mean incomes were calculated per decile of wage employees and non-wage workers of type j in each sector of activity. For both sectors of activity within each group j the individuals were in the first place ranked according to occupational cate-

gory – starting with the wage employees – and in the second place on the basis of the random numbers. In groups in which the proportion of wage employees was lower in 1995 than in 1999, the last wage employees became non-wage workers. In groups in which the proportion of wage employees was higher in 1995 than in 1999, the first non-wage workers became wage employees. Within each group j the persons who changed from one occupational category to the other were classified into deciles on the basis of their random number and their labour income was replaced by the corresponding mean income of the decile of all persons who in 1999 were actually working in the occupational category of destination.

5. Change of the *remuneration structure*.

- *Objective*: Determine the indices of poverty and inequality if the structure of labour incomes in 1999 were to be that of 1995.
- *Procedure*: Only the employed population was considered. Mean labour incomes were calculated for each of the 16 groups jk of employed persons, as well as an overall mean, for both 1995 and 1999. Subsequently, the following relative mean incomes were calculated for 1995:

$$s_{jk} = \frac{\overline{yl95}_{jk}}{\overline{yl95}}$$

The mean labour income in 1999 of each group was multiplied by the corresponding s_{jk} in order to obtain a new mean labour income for each group jk in prices of 1999:

$$\overline{yl}_{jk}^* = \frac{\overline{yl95}_{jk}}{\overline{yl95}} \cdot \overline{yl99}$$

In turn, the new mean incomes of the groups jk were expressed as a proportion of the corresponding mean in 1999, and subsequently the 1999 labour income of each individual i in group jk was multiplied by the proportion for the group:

$$yl_{jki}^* = \frac{\overline{yl}_{jk}^*}{\overline{yl99}_{jk}} \cdot yl99_{jki}$$

6. Change of the *level of remuneration*.

- *Objective*: Determine the indices of poverty and inequality if the level of real incomes of 1999 were to be that of 1995.
- *Procedure*: Only the employed population was considered. New labour incomes were calculated by multiplying the 1999 labour income of each income recipient by the ratio of mean income in 1995 (in Sucres of 1999) to that in 1999:

$$yl_{jki}^{**} = \frac{\overline{yl95}}{\overline{yl99}} \cdot yl99_{jki}$$

7. Change of the *level of skill of employed men/women in segment k* .

- *Objective*: Determine the indices of poverty and inequality if the proportion of skilled workers in 1999 were to be same as in 1995.
- *Procedure*: Only the employed population was considered. Mean incomes were calculated per decile of employed men/women in each segment k . Individuals within each group defined by sex and segment were in the first place classified according to skill – starting with the unskilled workers – and in the second place on the basis of the random numbers. In groups in which the proportion of skilled workers was higher in 1995 than in 1999, the last unskilled workers were reclassified as skilled workers. In case of groups with lower proportions of skilled workers 1995, the first skilled workers move to

the category of unskilled workers. Within each group j the persons who changed from unskilled to skilled were classified into deciles on the basis of their random number and their labour income was replaced by the mean income of the corresponding decile of all persons who were actually skilled in 1999. In the reverse case, the actual 1999 incomes were replaced by that of the corresponding decile of unskilled workers.

The simulations were carried out both separately and sequentially. Simulations 1 to 4, 7 and the sequential simulations were repeated 32 times with the aim of constructing a 95% confidence interval.

Due to changes in the participation rate and the unemployment rate it is possible that persons become classified as employed, but that there is no information concerning occupational category for these persons. For this reason, in the part of the sequential simulations in which the employment structure according to sector of activity is changed, mean proportions of persons employed in the non-tradable sector in 1995 were used (instead of different proportions for wage employees and non-wage workers separately) in cases of lack of information concerning the occupational category.

Appendix A.2 Construction of the “pseudo” 1990 LSMS labour market structure

The changes in the labour market structure according to the urban household surveys of 1999 and 1995 were applied to the parameters of the labour market structure according to the 1995 LSMS survey. The proportions of wage earners, persons working in the tradable sector and unskilled employed according to the 1995 LSMS survey was multiplied by respectively the 1999/1995 ratio of these proportion according to the household surveys, e.g.:

$$O90_{jk}^* = \frac{O90_{jk}}{O95_{jk}} \cdot O95_{jk}^*$$

where $O95_{jk}^*$ is the proportion of wage earners among all male/female skilled/unskilled persons employed in the tradable/non-tradable sector according to the 1995 LSMS, and $O95_{jk}$ the corresponding proportion according to the 1995 household survey. (Of course, also the complements, $1 - O95_{jk}^*$ etc., could be used to match the two types of surveys. This gives slightly different results.)

The relative mean labour income of group jk ($s90_{jk} = \overline{Y90}_{jk} / \overline{Y90}$) was multiplied by the ratio of the mean labour incomes of group jk according to respectively the 1995 LSMS and household survey and divided by the ratio of overall mean labour incomes:

$$s90_{jk}^* = s90_{jk} \cdot \left[\left(\frac{\overline{Y95}_{jk}^*}{\overline{Y95}_{jk}} \right) \left(\frac{\overline{Y95}}{\overline{Y95}} \right) \right]$$

This can also be written as:

$$s90_{jk}^* = s90_{jk} \cdot \left[\left(\frac{\overline{Y95}_{jk}^*}{\overline{Y95}_{jk}} \right) / \left(\frac{\overline{Y95}_{jk}}{\overline{Y95}} \right) \right]$$

which is equal to:

$$s90_{jk}^* = s90_{jk} \cdot (s95_{jk}^* / s95_{jk})$$

or

$$s90_{jk}^* = (s90_{jk} / s95_{jk}) \cdot s95_{jk}^*$$

Hence, the relative mean income of each group according to the 1995 LSMS is multiplied by the ratio of relative mean incomes of those groups according to the household surveys of 1999 and 1995 to arrive at a relative mean income of the group in 1999 that is comparable to that according to the LSMS surveys of 1995 and 1999.

Similarly, the level of real labour income in 1999 was obtained by multiplying the level according to the 1995 LSMS by the ratio of real labour incomes according to the household surveys of 1999 and 1995:

$$\overline{Y88}^* = (\overline{Y88} / \overline{Y95}) \cdot \overline{Y95}^*$$

TABLES

Table A.1a:
Labour market parameters (participation, unemployment, employment structure)

		Labour Force Surveys			LSMS Surveys						
		Urban			Urban		Rural		National		
		1988	1990	1995	1995	1999	1995	1999	1995	1999	
Labour force participation rate		0.51	0.52	0.56	0.62	0.66	0.71	0.76	0.66	0.70	
Female	Unskilled	0.29	0.29	0.33	0.43	0.47	0.54	0.63	0.48	0.55	
	Skilled	0.44	0.48	0.53	0.58	0.61	0.57	0.62	0.58	0.62	
Male	Unskilled	0.64	0.64	0.63	0.70	0.71	0.87	0.89	0.79	0.80	
	Skilled	0.75	0.74	0.77	0.83	0.85	0.85	0.91	0.83	0.86	
Unemployment rate		0.11	0.17	0.18	0.16	0.19	0.38	0.37	0.25	0.27	
Female	Unskilled	0.15	0.23	0.24	0.21	0.27	0.55	0.57	0.40	0.44	
	Skilled	0.19	0.25	0.26	0.22	0.24	0.43	0.42	0.25	0.27	
Male	Unskilled	0.07	0.11	0.13	0.13	0.16	0.30	0.25	0.23	0.22	
	Skilled	0.09	0.15	0.14	0.11	0.14	0.27	0.26	0.14	0.17	
Proportion in traded sector		0.24	0.26	0.22	0.20	0.21	0.61	0.64	0.34	0.37	
Female	Unskilled	Wage earner	0.17	0.20	0.17	0.12	0.13	0.50	0.55	0.26	0.30
		Non-wage earner	0.24	0.19	0.18	0.16	0.24	0.49	0.62	0.30	0.42
	Skilled	Wage earner	0.14	0.14	0.12	0.11	0.14	0.14	0.15	0.12	0.14
		Non-wage earner	0.27	0.26	0.20	0.25	0.24	0.30	0.33	0.26	0.25
Male	Unskilled	Wage earner	0.32	0.41	0.37	0.27	0.29	0.68	0.67	0.47	0.48
		Non-wage earner	0.28	0.27	0.25	0.21	0.23	0.76	0.80	0.53	0.59
	Skilled	Wage earner	0.22	0.24	0.21	0.21	0.22	0.39	0.45	0.23	0.26
		Non-wage earner	0.22	0.21	0.15	0.19	0.20	0.54	0.61	0.25	0.27
Proportion in wage employment		0.65	0.63	0.63	0.64	0.64	0.53	0.52	0.60	0.60	
Female	Unskilled	Traded sector	0.48	0.51	0.49	0.41	0.33	0.39	0.35	0.39	0.34
		Non-traded sector	0.59	0.48	0.51	0.48	0.50	0.38	0.42	0.45	0.47
	Skilled	Traded sector	0.63	0.63	0.61	0.49	0.53	0.50	0.43	0.50	0.52
		Non-traded sector	0.79	0.78	0.74	0.72	0.70	0.72	0.68	0.72	0.69
Male	Unskilled	Traded sector	0.60	0.68	0.67	0.69	0.71	0.52	0.49	0.56	0.54
		Non-traded sector	0.55	0.53	0.53	0.62	0.64	0.62	0.66	0.62	0.65
	Skilled	Traded sector	0.72	0.70	0.74	0.73	0.72	0.59	0.63	0.69	0.69
		Non-traded sector	0.71	0.66	0.66	0.70	0.69	0.72	0.77	0.70	0.70
Proportion unskilled		0.57	0.58	0.51	0.54	0.51	0.87	0.84	0.67	0.64	
Female	Traded sector	Wage earner	0.44	0.44	0.40	0.39	0.34	0.90	0.91	0.64	0.63
		Non-wage earner	0.60	0.56	0.52	0.47	0.54	0.94	0.93	0.73	0.77
	Non-traded sector	Wage earner	0.40	0.34	0.31	0.37	0.34	0.61	0.58	0.41	0.38
		Non-wage earner	0.64	0.66	0.56	0.62	0.54	0.87	0.80	0.68	0.61
Male	Traded sector	Wage earner	0.56	0.65	0.57	0.54	0.52	0.90	0.85	0.76	0.71
		Non-wage earner	0.68	0.67	0.64	0.59	0.52	0.92	0.91	0.84	0.82
	Non-traded sector	Wage earner	0.43	0.46	0.37	0.46	0.42	0.74	0.70	0.51	0.48
		Non-wage earner	0.60	0.59	0.50	0.54	0.48	0.82	0.80	0.61	0.55

Source: Authors' calculations based on LSMS Surveys of 1995 and 1999 and labour force surveys of 1988, 1990 and 1995.

Table A.1b.:
Labour market parameters (remuneration structure)

Sex	Skill level	Sector	Occupational category	Labour Force Surveys				LSMS Surveys				
				Urban			Urban		Rural		National	
				1988	1990	1995	1995	1999	1995	1999	1995	1999
Female	Unskilled	Traded	Wage earner	0.59	0.57	0.45	0.49	0.64	0.62	0.79	0.43	0.56
			Non-wage earner	0.53	0.46	0.54	0.32	0.15	0.28	0.28	0.22	0.18
		Non-traded	Wage earner	0.37	0.38	0.37	0.43	0.50	0.99	0.84	0.53	0.59
			Non-wage earner	0.67	0.63	0.50	0.56	0.42	0.53	0.52	0.57	0.45
	Skilled	Traded	Wage earner	0.98	0.88	0.95	0.80	0.79	0.90	1.05	0.93	0.93
			Non-wage earner	0.56	0.79	0.88	0.66	0.40	0.62	0.59	0.75	0.46
		Non-traded	Wage earner	1.01	0.98	0.96	1.01	1.10	1.48	1.73	1.21	1.32
			Non-wage earner	1.07	1.00	0.95	1.29	0.85	1.24	1.24	1.51	1.00
Male	Unskilled	Traded	Wage earner	0.81	0.75	0.61	0.62	0.71	0.91	0.98	0.59	0.69
			Non-wage earner	1.01	0.93	0.81	0.80	0.86	0.77	0.75	0.52	0.55
		Non-traded	Wage earner	0.84	0.82	0.66	0.68	0.69	1.42	1.24	0.82	0.82
			Non-wage earner	0.94	0.99	0.92	1.16	0.91	1.72	1.39	1.30	1.03
	Skilled	Traded	Wage earner	1.30	1.35	1.22	1.42	1.42	1.36	1.36	1.52	1.47
			Non-wage earner	1.32	1.59	1.84	1.69	1.63	1.73	1.41	1.69	1.56
		Non-traded	Wage earner	1.37	1.48	1.30	1.35	1.57	1.73	2.19	1.59	1.85
			Non-wage earner	1.51	1.41	1.94	1.79	1.48	1.81	2.92	2.10	1.81

Source: Authors' calculations based on LSMS Surveys of 1995 and 1999 and labour force surveys of 1988, 1990 and 1995.

Table A.2
Change in mean earnings by group of workers (percentage of initial year earnings)

Sex	Skill level	Sector	Occupational category	Urban			Rural		National	
				88-90	90-95	95-99	95-99	95-99	95-99	95-99
Average				-15	48	-28	-19	-19	-27	-27
Female	Unskilled	Traded	Wage earner	-17	16	-6	3	3	-3	-3
			Non-wage earner	-25	73	-67	-18	-18	-43	-43
		Non-traded	Wage earner	-14	44	-14	-31	-31	-19	-19
			Non-wage earner	-20	17	-47	-20	-20	-42	-42
	Skilled	Traded	Wage earner	-24	60	-29	-5	-5	-27	-27
			Non-wage earner	21	65	-56	-23	-23	-55	-55
		Non-traded	Wage earner	-17	44	-22	-5	-5	-21	-21
			Non-wage earner	-20	39	-53	-18	-18	-51	-51
Male	Unskilled	Traded	Wage earner	-22	20	-17	-13	-13	-14	-14
			Non-wage earner	-22	29	-22	-21	-21	-23	-23
		Non-traded	Wage earner	-16	19	-27	-30	-30	-28	-28
			Non-wage earner	-10	37	-44	-35	-35	-42	-42
	Skilled	Traded	Wage earner	-12	34	-28	-19	-19	-30	-30
			Non-wage earner	3	71	-31	-34	-34	-32	-32
		Non-traded	Wage earner	-8	31	-16	3	3	-15	-15
			Non-wage earner	-20	103	-40	30	30	-37	-37

Source: Authors' calculations based on LSMS Surveys of 1995 and 1999 and labour force surveys of 1988, 1990 and 1995.

**Table A.3a: Effects of changes in the labour market on poverty and inequality
(national, 1999 with 1995 parameters)**

		Per capita income				Labour income per recipient	
		P ₀	P ₁	P ₂	Gini	Theil	Gini
Value observed in 1999		0.4160	0.1729	0.0990	0.5349	0.6307	0.5624
	-2%	0.4077	0.1694	0.0970	0.5242	0.6181	0.5512
	+2%	0.4243	0.1764	0.1010	0.5456	0.6433	0.5737
<i>Values in case of change of the:</i>							
(1) rate of participation	Mean	0.4342	0.1855	0.1085	0.5389	0.6410	0.5606
	Lower limit	0.4335	0.1851	0.1081	0.5384	0.6383	0.5601
	Upper limit	0.4350	0.1859	0.1089	0.5395	0.6437	0.5611
(2) rate of unemployment	Mean	0.4134	0.1706	0.0972	0.5330	0.6263	0.5643
	Lower limit	0.4128	0.1703	0.0969	0.5326	0.6253	0.5641
	Upper limit	0.4140	0.1708	0.0974	0.5333	0.6272	0.5646
(3) employment structure (sectors)	Mean	0.4085	0.1691	0.0966	0.5323	0.6205	0.5586
	Lower limit	0.4078	0.1688	0.0963	0.5318	0.6193	0.5582
	Upper limit	0.4091	0.1695	0.0969	0.5329	0.6218	0.5590
(4) employment structure (occupational categories)	Mean	0.4138	0.1721	0.0985	0.5337	0.6261	0.5615
	Lower limit	0.4133	0.1719	0.0983	0.5334	0.6248	0.5611
	Upper limit	0.4143	0.1723	0.0986	0.5340	0.6273	0.5618
(5) remuneration structure		0.4177	0.1751	0.1005	0.5410	0.6487	0.5697
(6) level of remuneration		0.2987	0.1247	0.0725	0.5377	0.6274	0.5624
(7) employment structure (education)	Mean	0.4216	0.1756	0.1005	0.5307	0.6229	0.5604
	Lower limit	0.4207	0.1753	0.1003	0.5300	0.6208	0.5597
	Upper limit	0.4224	0.1759	0.1007	0.5314	0.6251	0.5610
<i>Values in case of change of parameters:</i>							
(1-2)	Mean	0.4317	0.1832	0.1066	0.5378	0.6377	0.5626
	Lower limit	0.4307	0.1827	0.1061	0.5370	0.6349	0.5620
	Upper limit	0.4326	0.1837	0.1071	0.5385	0.6405	0.5632
(1-3)	Mean	0.4174	0.1765	0.1027	0.5357	0.6234	0.5593
	Lower limit	0.4163	0.1760	0.1022	0.5347	0.6199	0.5585
	Upper limit	0.4185	0.1771	0.1033	0.5366	0.6269	0.5601
(1-4)	Mean	0.4115	0.1728	0.1001	0.5324	0.6143	0.5528
	Lower limit	0.4102	0.1722	0.0995	0.5312	0.6106	0.5519
	Upper limit	0.4128	0.1733	0.1006	0.5335	0.6179	0.5536
(1-5)	Mean	0.4045	0.1706	0.0989	0.5375	0.6286	0.5591
	Lower limit	0.4032	0.1699	0.0983	0.5365	0.6249	0.5582
	Upper limit	0.4059	0.1712	0.0995	0.5386	0.6323	0.5601
(1-6)	Mean	0.3074	0.1278	0.0750	0.5401	0.6261	0.5591
	Lower limit	0.3063	0.1270	0.0743	0.5391	0.6222	0.5582
	Upper limit	0.3085	0.1286	0.0757	0.5411	0.6300	0.5601
(1-7)	Mean	0.3101	0.1287	0.0755	0.5360	0.6158	0.5556
	Lower limit	0.3090	0.1279	0.0748	0.5349	0.6107	0.5544
	Upper limit	0.3112	0.1295	0.0762	0.5372	0.6209	0.5568
Value observed in 1995		0.3194	0.1354	0.0790	0.5290	0.5714	0.5547
							0.6733

Source: Own calculations based on LSMS Surveys of 1995 and 1999.

Note: Normal values: difference not statistically significant.

Bold values: difference statistically significant.

Highlighted values: difference statistically significant and at least 2%.

Underlined values: poverty/inequality would have been higher if rate/structure were to be that of 1995.

Upper and lower limits are of the 95% confidence intervals.

Table A.3b: Effects of changes in the labour market on poverty and inequality (rural, 1999 with 1995 parameters)

		Per capita income					Labour income per recipient	
		P ₀	P ₁	P ₂	Gini	Theil	Gini	Theil
Value observed in 1999		0.5945	0.2710	0.1611	0.4645	0.4541	0.5126	0.5313
	-2%	0.5826	0.2656	0.1579	0.4552	0.4451	0.5023	0.5206
	+2%	0.6064	0.2764	0.1643	0.4738	0.4632	0.5228	0.5419
<i>Values in case of change of the:</i>								
(1) rate of participation	Mean	0.6166	0.2883	0.1749	0.4657	0.4640	0.5089	0.5252
	Lower limit	0.6153	0.2875	0.1742	0.4642	0.4619	0.5081	0.5223
	Upper limit	0.6180	0.2892	0.1756	0.4672	0.4661	0.5098	0.5281
(2) rate of unemployment	Mean	0.6115	0.2861	0.1738	0.4689	0.4683	0.5139	0.5335
	Lower limit	0.6105	0.2855	0.1731	0.4670	0.4667	0.5129	0.5299
	Upper limit	0.6125	0.2868	0.1745	0.4708	0.4699	0.5149	0.5371
(3) employment structure (sectors)	Mean	0.5870	0.2669	0.1582	0.4643	0.4564	0.5078	0.5225
	Lower limit	0.5857	0.2664	0.1578	0.4628	0.4545	0.5069	0.5190
	Upper limit	0.5883	0.2674	0.1586	0.4657	0.4584	0.5088	0.5260
(4) employment structure (occupational categories)	Mean	0.5938	0.2696	0.1598	0.4631	0.4556	0.5108	0.5278
	Lower limit	0.5927	0.2692	0.1595	0.4615	0.4538	0.5100	0.5245
	Upper limit	0.5949	0.2700	0.1601	0.4647	0.4573	0.5116	0.5312
(5) remuneration structure		0.6001	0.2713	0.1611	0.4540	0.4339	0.5118	0.5211
		0.5113	0.2257	0.1339	0.4655	0.4544	0.5126	0.5313
		0.6004	0.2734	0.1625	0.4565	0.4439	0.5118	0.5303
(7) employment structure (education)	Mean	0.6004	0.2734	0.1625	0.4565	0.4439	0.5118	0.5303
	Lower limit	0.5994	0.2731	0.1622	0.4557	0.4414	0.5109	0.5273
	Upper limit	0.6015	0.2738	0.1627	0.4573	0.4464	0.5127	0.5334
<i>Values in case of change of parameters:</i>								
(1-2)	Mean	0.6306	0.3025	0.1875	0.4734	0.4794	0.5107	0.5299
	Lower limit	0.6293	0.3016	0.1866	0.4719	0.4769	0.5095	0.5262
	Upper limit	0.6319	0.3034	0.1883	0.4749	0.4819	0.5120	0.5337
(1-3)	Mean	0.6211	0.2966	0.1834	0.4769	0.4822	0.5127	0.5342
	Lower limit	0.6194	0.2955	0.1825	0.4748	0.4791	0.5112	0.5298
	Upper limit	0.6228	0.2976	0.1843	0.4790	0.4854	0.5143	0.5386
(1-4)	Mean	0.6169	0.2937	0.1813	0.4790	0.4850	0.5128	0.5367
	Lower limit	0.6150	0.2926	0.1803	0.4766	0.4815	0.5107	0.5302
	Upper limit	0.6187	0.2948	0.1822	0.4814	0.4886	0.5150	0.5432
(1-5)	Mean	0.6026	0.2826	0.1741	0.4689	0.4510	0.5060	0.5056
	Lower limit	0.6002	0.2813	0.1730	0.4669	0.4488	0.5044	0.5008
	Upper limit	0.6050	0.2839	0.1752	0.4709	0.4532	0.5075	0.5104
(1-6)	Mean	0.5369	0.2502	0.1545	0.4732	0.4519	0.5060	0.5056
	Lower limit	0.5344	0.2491	0.1535	0.4714	0.4497	0.5044	0.5008
	Upper limit	0.5395	0.2514	0.1556	0.4750	0.4542	0.5075	0.5104
(1-7)	Mean	0.5371	0.2498	0.1541	0.4708	0.4453	0.5041	0.5000
	Lower limit	0.5346	0.2486	0.1531	0.4688	0.4426	0.5023	0.4946
	Upper limit	0.5397	0.2509	0.1552	0.4729	0.4481	0.5058	0.5053
Value observed in 1995		0.5263	0.2407	0.1460	0.4639	0.4063	0.5095	0.5199

Source: Own calculations based on LSMS Surveys of 1995 and 1999.

Note: Normal values: difference not statistically significant.

Bold values: difference statistically significant.

Highlighted values: difference statistically significant and at least 2%.

Underlined values: poverty/inequality would have been higher if rate/structure were to be that of 1995.

Upper and lower limits are of the 95% confidence intervals.

Table A.3c: Effects of changes in the labour market on poverty and inequality (urban, 1999 with 1995 parameters)

		Per capita income				Labour income per recipient	
		P ₀	P ₁	P ₂	Gini	Theil	Gini
Value observed in 1999		0.2931	0.1054	0.0563	0.5221	0.5983	0.5553
	-2%	0.2872	0.1033	0.0551	0.5117	0.5864	0.5442
	+2%	0.2989	0.1075	0.0574	0.5325	0.6103	0.5664
<i>Values in case of change of the:</i>							
(1) rate of participation	Mean	0.3085	0.1149	0.0632	0.5265	0.6088	0.5545
	Lower limit	0.3076	0.1144	0.0627	0.5259	0.6068	0.5540
	Upper limit	0.3093	0.1154	0.0636	0.5271	0.6108	0.5551
(2) rate of unemployment	Mean	0.2835	0.0999	0.0522	0.5182	0.5902	0.5617
	Lower limit	0.2829	0.0997	0.0520	0.5181	0.5901	0.5617
	Upper limit	0.2841	0.1001	0.0524	0.5183	0.5904	0.5617
(3) employment structure (sectors)	Mean	0.2874	0.1039	0.0555	0.5205	0.5933	0.5539
	Lower limit	0.2868	0.1037	0.0554	0.5201	0.5920	0.5534
	Upper limit	0.2880	0.1041	0.0557	0.5209	0.5945	0.5543
(4) employment structure (occupational categories)	Mean	0.2902	0.1051	0.0563	0.5215	0.5947	0.5550
	Lower limit	0.2895	0.1048	0.0562	0.5211	0.5937	0.5547
	Upper limit	0.2908	0.1053	0.0565	0.5219	0.5957	0.5553
(5) remuneration structure		0.2857	0.1026	0.0542	0.5270	0.6127	0.5612
(6) level of remuneration		0.1854	0.0676	0.0376	0.5226	0.5909	0.5553
(7) employment structure (education)	Mean	0.2966	0.1075	0.0575	0.5188	0.5900	0.5526
	Lower limit	0.2957	0.1071	0.0572	0.5181	0.5865	0.5517
	Upper limit	0.2975	0.1079	0.0578	0.5196	0.5935	0.5535
<i>Values in case of change of parameters:</i>							
(1-2)	Mean	0.2995	0.1096	0.0592	0.5226	0.6007	0.5607
	Lower limit	0.2985	0.1090	0.0587	0.5221	0.5987	0.5602
	Upper limit	0.3006	0.1101	0.0596	0.5232	0.6027	0.5613
(1-3)	Mean	0.2833	0.1037	0.0561	0.5181	0.5833	0.5532
	Lower limit	0.2820	0.1030	0.0556	0.5172	0.5809	0.5526
	Upper limit	0.2846	0.1044	0.0567	0.5190	0.5856	0.5538
(1-4)	Mean	0.2791	0.1012	0.0543	0.5151	0.5747	0.5458
	Lower limit	0.2774	0.1003	0.0537	0.5140	0.5719	0.5450
	Upper limit	0.2807	0.1022	0.0550	0.5162	0.5776	0.5466
(1-5)	Mean	0.2775	0.0994	0.0528	0.5199	0.5882	0.5518
	Lower limit	0.2757	0.0986	0.0521	0.5189	0.5854	0.5511
	Upper limit	0.2793	0.1002	0.0534	0.5209	0.5910	0.5524
(1-6)	Mean	0.1748	0.0647	0.0359	0.5202	0.5811	0.5518
	Lower limit	0.1731	0.0639	0.0353	0.5192	0.5781	0.5511
	Upper limit	0.1766	0.0655	0.0365	0.5212	0.5841	0.5524
(1-7)	Mean	0.1771	0.0655	0.0363	0.5174	0.5743	0.5496
	Lower limit	0.1753	0.0646	0.0357	0.5164	0.5703	0.5487
	Upper limit	0.1789	0.0663	0.0369	0.5185	0.5784	0.5504
Value observed in 1995		0.1767	0.0628	0.0329	0.4988	0.5101	0.5374
							0.6379

Source: Own calculations based on LSMS Surveys of 1995 and 1999.

Note: Normal values: difference not statistically significant.

Bold values: difference statistically significant.

Highlighted values: difference statistically significant and at least 2%.

Underlined values: poverty/inequality would have been higher if rate/structure were to be that of 1995.

Upper and lower limits are of the 95% confidence intervals.

Table A.4a: Effects of changes in the labour market on poverty and inequality (labour force survey data, urban, 1995 with 1990 parameters)

		Per capita income				Labour income per recipient	
		P ₀	P ₁	P ₂	Gini	Theil	Gini
Value observed in 1995		0.2921	0.1047	0.0528	0.4946	0.4861	0.4818
	-2%	0.2863	0.1026	0.0517	0.4848	0.4764	0.4721
	+2%	0.2980	0.1068	0.0538	0.5045	0.4959	0.4914
<i>Values in case of change of the:</i>							
(1) rate of participation	Mean	0.3003	0.1084	0.0549	0.4951	0.4879	0.4807
	Lower limit	0.2996	0.1082	0.0547	0.4947	0.4869	0.4804
	Upper limit	0.3010	0.1087	0.0551	0.4955	0.4890	0.4811
(2) rate of unemployment	Mean	0.2929	0.1050	0.0529	0.4946	0.4862	0.4839
	Lower limit	0.2927	0.1049	0.0529	0.4945	0.4858	0.4838
	Upper limit	0.2931	0.1051	0.0530	0.4948	0.4866	0.4841
(3) employment structure (sectors)	Mean	0.2931	0.1055	0.0533	0.4946	0.4840	0.4816
	Lower limit	0.2926	0.1053	0.0531	0.4943	0.4829	0.4812
	Upper limit	0.2935	0.1057	0.0534	0.4950	0.4852	0.4821
(4) employment structure (occupational categories)	Mean	0.2908	0.1043	0.0526	0.4942	0.4843	0.4816
	Lower limit	0.2905	0.1042	0.0525	0.4941	0.4837	0.4814
	Upper limit	0.2910	0.1044	0.0526	0.4944	0.4848	0.4818
(5) remuneration structure		0.2607	0.0898	0.0453	0.4770	0.4480	0.4630
(6) level of remuneration		0.4830	0.1926	0.1034	0.5016	0.5055	0.4818
(7) employment structure (education)	Mean	0.3038	0.1098	0.0557	0.4878	0.4728	0.4790
	Lower limit	0.3029	0.1095	0.0555	0.4871	0.4704	0.4783
	Upper limit	0.3047	0.1101	0.0559	0.4886	0.4752	0.4797
<i>Values in case of change of parameters:</i>							
(1-2)	Mean	0.3054	0.1108	0.0563	0.4952	0.4886	0.4803
	Lower limit	0.3047	0.1105	0.0561	0.4946	0.4868	0.4798
	Upper limit	0.3060	0.1111	0.0565	0.4958	0.4904	0.4809
(1-3)	Mean	0.3061	0.1117	0.0570	0.4950	0.4861	0.4813
	Lower limit	0.3053	0.1113	0.0567	0.4943	0.4841	0.4807
	Upper limit	0.3069	0.1121	0.0573	0.4957	0.4881	0.4820
(1-4)	Mean	0.3068	0.1124	0.0575	0.4949	0.4841	0.4806
	Lower limit	0.3059	0.1119	0.0571	0.4941	0.4815	0.4797
	Upper limit	0.3077	0.1129	0.0578	0.4957	0.4866	0.4814
(1-5)	Mean	0.2764	0.0968	0.0494	0.4761	0.4436	0.4603
	Lower limit	0.2753	0.0963	0.0491	0.4754	0.4415	0.4596
	Upper limit	0.2775	0.0973	0.0497	0.4767	0.4458	0.4610
(1-6)	Mean	0.4532	0.1791	0.0957	0.4834	0.4641	0.4603
	Lower limit	0.4522	0.1786	0.0953	0.4827	0.4620	0.4596
	Upper limit	0.4543	0.1796	0.0961	0.4840	0.4661	0.4610
(1-7)	Mean	0.4591	0.1828	0.0982	0.4786	0.4549	0.4563
	Lower limit	0.4578	0.1822	0.0978	0.4778	0.4524	0.4554
	Upper limit	0.4604	0.1834	0.0987	0.4795	0.4574	0.4571
Value observed in 1990		0.4912	0.1966	0.1045	0.4564	0.3909	0.4506
							0.3934

Source: Own calculations based on urban household surveys of 1988 and 1990.

Note: Normal values: difference not statistically significant.

Bold values: difference statistically significant.

Highlighted values: difference statistically significant and at least 2%.

Underlined values: poverty/inequality would have been higher if rate/structure were to be that of 1990.

Upper and lower limits are of the 95% confidence intervals.

**Table A.4b: Effects of changes in the labour market on poverty and inequality
(labour force survey survey data, urban, 1990 with 1988 parameters)**

		Per capita income				Labour income per recipient	
		P ₀	P ₁	P ₂	Gini	Theil	Gini
Value observed in 1990		0.4912	0.1966	0.1045	0.4564	0.3909	0.4506
	-2%	0.4814	0.1927	0.1024	0.4473	0.3831	0.4416
	+2%	0.5010	0.2006	0.1066	0.4655	0.3987	0.4596
<i>Values in case of change of the:</i>							
(1) rate of participation	Mean	0.4926	0.1973	0.1049	0.4565	0.3911	0.4512
	Lower limit	0.4922	0.1972	0.1047	0.4563	0.3906	0.4510
	Upper limit	0.4930	0.1975	0.1050	0.4567	0.3917	0.4513
(2) rate of unemployment	Mean	0.4806	0.1891	0.0991	0.4519	0.3831	0.4575
	Lower limit	0.4802	0.1890	0.0990	0.4518	0.3829	0.4575
	Upper limit	0.4811	0.1893	0.0993	0.4520	0.3832	0.4575
(3) employment structure (sectors)	Mean	0.4891	0.1960	0.1044	0.4557	0.3893	0.4512
	Lower limit	0.4885	0.1958	0.1043	0.4555	0.3888	0.4510
	Upper limit	0.4898	0.1962	0.1046	0.4560	0.3898	0.4514
(4) employment structure (occupational categories)	Mean	0.4917	0.1971	0.1050	0.4561	0.3898	0.4496
	Lower limit	0.4908	0.1968	0.1047	0.4558	0.3890	0.4494
	Upper limit	0.4925	0.1975	0.1052	0.4565	0.3905	0.4499
(5) remuneration structure		0.4990	0.1948	0.1032	0.4528	0.3839	0.4458
(6) level of remuneration		0.4158	0.1540	0.0793	0.4545	0.3872	0.4506
(7) employment structure (education)	Mean	0.4863	0.1946	0.1036	0.4555	0.3878	0.4525
	Lower limit	0.4856	0.1944	0.1034	0.4551	0.3870	0.4522
	Upper limit	0.4870	0.1949	0.1038	0.4558	0.3886	0.4527
<i>Values in case of change of parameters:</i>							
(1-2)	Mean	0.4823	0.1897	0.0995	0.4519	0.3832	0.4577
	Lower limit	0.4816	0.1895	0.0993	0.4517	0.3827	0.4576
	Upper limit	0.4829	0.1898	0.0996	0.4521	0.3837	0.4579
(1-3)	Mean	0.4683	0.1839	0.0964	0.4496	0.3768	0.4508
	Lower limit	0.4673	0.1835	0.0961	0.4492	0.3761	0.4505
	Upper limit	0.4693	0.1843	0.0967	0.4499	0.3774	0.4510
(1-4)	Mean	0.4743	0.1875	0.0987	0.4478	0.3730	0.4444
	Lower limit	0.4731	0.1870	0.0983	0.4472	0.3718	0.4439
	Upper limit	0.4756	0.1879	0.0991	0.4483	0.3742	0.4449
(1-5)	Mean	0.4878	0.1909	0.1008	0.4460	0.3695	0.4419
	Lower limit	0.4866	0.1904	0.1004	0.4455	0.3683	0.4414
	Upper limit	0.4890	0.1914	0.1012	0.4465	0.3706	0.4424
(1-6)	Mean	0.4032	0.1489	0.0761	0.4438	0.3653	0.4419
	Lower limit	0.4020	0.1484	0.0757	0.4433	0.3642	0.4414
	Upper limit	0.4043	0.1494	0.0765	0.4444	0.3664	0.4424
(1-7)	Mean	0.3978	0.1468	0.0750	0.4436	0.3636	0.4426
	Lower limit	0.3966	0.1462	0.0746	0.4429	0.3622	0.4420
	Upper limit	0.3991	0.1474	0.0754	0.4443	0.3650	0.4431
Value observed in 1988		0.3895	0.1421	0.0728	0.4446	0.3842	0.4380
							0.3854

Source: Own calculations based on urban household surveys of 1988 and 1990.

Note: Normal values: difference not statistically significant.

Bold values: difference statistically significant.

Highlighted values: difference statistically significant and at least 2%.

Underlined values: poverty/inequality would have been higher if rate/structure were to be that of 1988.

Upper and lower limits are of the 95% confidence intervals.

