

# IMF Working Paper

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## Financial Crises, Poverty, and Income Distribution

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**Abstract**

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Developing and transition economies are prone to financial crises, including balance of payments and banking crises. These crises affect poverty and the distribution of income through a variety of channels: slowdowns in economic activity, relative price changes, and fiscal retrenchment, among others. This paper deals with the impact of financial crises on the incidence of poverty and income distribution, and discusses policy options that can be considered by governments in the aftermath of crises. Empirical evidence, based on both macro- and microlevel data, shows that financial crises are associated with an increase in poverty and, in some cases, income inequality. The provision of targeted safety nets and the protection of specific social programs from fiscal retrenchment remain the main short-term propoor policy responses to financial crises.

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## I. INTRODUCTION

Developing and transition economies are prone to financial crises, including balance of payments and banking crises. These crises affect poverty and income distribution through a variety of channels (Box 1). Financial crises typically lead to slowdowns in economic activity and, consequently, rises in formal unemployment and/or falls in real wages. A contractionary policy mix is conventionally implemented in response to a financial crisis, including fiscal retrenchment and a tightening of the monetary stance. Fiscal retrenchment, in turn, often leads to cuts in public outlays on social programs, transfers to households, and wages and salaries, among others (World Bank, 2000). Exchange rate realignments result in changes in relative prices, likely to affect some social groups more adversely than others, and consequently changes in poverty and income distribution indicators. Conventional wisdom is that the poor suffer disproportionately to the nonpoor in periods of crisis.

**The question this paper addresses is how the poor are affected by financial crises.<sup>2</sup>**

Important policy questions are whether income distribution, not only the incidence of poverty, is affected by financial crises and whether the impact of crises on poverty and on income distribution is stronger in countries where the distribution of income is more skewed. Easterly (2001) shows that the poor are hurt less by falling standards of living in countries where the distribution of income is more unequal because the poor have a lower share of income to begin with. In the wake of financial crises, emphasis on poverty headcounts, without reference to changes in income distribution, may lead to inadequate policy recommendations. This is because the impact of financial crises on the incidence of poverty is often estimated under the assumption that the distribution of income remains unchanged in the short term.

The **objectives** of this paper are (1) to estimate the impact of financial crises on the incidence of poverty and on the distribution of income; and (2) to evaluate the policy options considered by governments in the aftermath of crises to mitigate their adverse impact on the poor.<sup>3</sup> The postcrisis impact on the poor is yet to be assessed through a systematic analysis, both from the cross-country perspective and at the microlevel. Macrolevel data allow for the

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<sup>2</sup> Recent research on poverty and income inequality has focused on how the income of the poor is affected by an increase in average income in periods of economic growth (Ravallion and Chen, 1997; Dollar and Kraay, 2000; Ravallion, 2000; Foster and Székely, 2001). Underlying this line of research is the question of whether the relationship between changes in average income and in income distribution and/or the incidence of poverty are symmetrical in the sense that the poor lose in periods of economic downturn as much income as they gain in periods of acceleration, and whether these effects on the poor are temporary or permanent.

<sup>3</sup> The IMF's Fiscal Affairs Department has analyzed the immediate impact of the financial crises in Asia and Brazil. See, for instance, Chu and Gupta, eds. (1998, for more information on social safety nets; Gupta, Gillingham, and de Mello (SM/99/180), for an analysis of the Brazilian experience in the aftermath of the currency devaluation in January, 1999; and Gupta and others (1999), for a preliminary assessment of the likely social impact of the economic crisis and reform programs in Indonesia, Korea, and Thailand.

### **Box 1: Financial Crises, Poverty, and Income Distribution**

The main channels through which financial crises affect poverty and income distribution are

- **A slowdown in economic activity.** A financial crisis may lead to a fall in earnings of both formal and informal-sector workers due to job losses in the formal sector and reduced demand for services in the informal sector. Reduced working hours and real wage cuts also adversely affect the earnings of the poor. Entry of unemployed formal-sector workers into the informal sector puts additional pressure on the informal labor market (Bourguignon and Morrisson, 1992; Morley, 1995; Walton and Manuelyan, 1998; Lustig and Walton, 1998).
- **Relative price changes.** After a currency depreciation, the price of tradables rises relative to nontradables, leading to a fall in earnings of those employed in the nontrade sector. At the same time, there may be an increase in the demand for exports, and consequently, employment and earnings in the sectors producing exportables increase, thereby offsetting some of the losses due to the decline in GDP. The exchange rate change may affect the price of imported food, increasing domestic food prices; this increase in turn hurts poor individuals and households that are net consumers of food (Sahn and others, 1997).
- **Fiscal retrenchment.** Spending cuts affect the volume of publicly provided critical social services, including social assistance outlays, and limit the access of the poor to these services at a time when their incomes are declining (Lanjouw and Ravallion, 1999).
- **Changes in assets.** Wealth effects or changes in the value of assets have a significant impact on income distribution (Datt and Ravallion, 1998; Blejer and Guerrero, 1990). Changes in interest rates, as well as in asset and real estate prices, affect the wealth of the better off.<sup>1</sup>

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<sup>1</sup> Trade liberalization, the removal of price subsidies, and privatization are likely to affect social groups asymmetrically over the medium term. Easterly (2001) shows that IMF or World Bank adjustment programs tend to reduce the impact of recessions on the poor. The poor also benefit less from expansions in the presence of an adjustment program.

estimation of the empirical relationship between financial crisis and poverty from a cross-country perspective. Microlevel data allow for a more in-depth analysis of the individual and household characteristics that are correlated with poverty, including demographics and earnings by occupation. We also assess whether the cross-country evidence presented here is consistent with that based on microlevel data. In this study, we use microlevel data for Mexico.

With regard to **policy implications**, the empirical analysis will shed light on (1) the main channels through which financial crises are likely to have an impact on poverty, as well as the magnitude of the impact; (2) the short-run policy instruments that can be used to shelter the poor before, during, and after financial crises; and (3) the characteristics of poverty and inequality that should be taken into account in the policy responses to crises.

## II. THE METHODOLOGY

### A. The Cross-Country Analysis

**The cross-country analysis will be carried out by analogy with the differences-in-differences methodology used conventionally in microdata analysis.** The empirical literature on currency crises and leading indicators (summarized in Box 2), also uses methodologies conventionally applied to the analysis of microeconomic phenomena, such as the event analysis borrowed from the microfinance literature. In a nutshell, the methodology consists of examining outcomes, such as the impact of a financial crisis on poverty, using observations in a treatment group (i.e., the crisis-stricken countries) relative to a control group (i.e., countries unaffected by the crisis) that are not randomly assigned. In other words, the methodology (1) assesses precrisis and postcrisis average changes in poverty and income distribution indicators in countries affected by financial crises; and (2) compares these changes in poverty and income distribution indicators relative to a sample of control countries that have not been affected by financial crises.<sup>4</sup> All relevant variables are defined as differences between the crisis-affected countries under examination and the control group.<sup>5</sup>

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<sup>4</sup> The literature offers analogous examples of the use of this methodology. For instance, Simon (1966) examines liquor sales before and after state price increases, using as a control group states that did not have law or price changes.

<sup>5</sup> This methodology is standard in the empirical study of a broad class of microeconomic issues, including tax incidence, migration, and consumption behavior, among other issues. See Meyer (1994), for more information on quasi-experiments in economics. The main advantage of the differences-in-differences methodology is that it allows the study of the effects of exogenous variations in a given explanatory variable that, in other situations, may be endogenously related to the outcome of interest. In the case of financial crises and poverty, it is difficult to distinguish the effect of fiscal retrenchment on poverty in response to a financial crisis from the effects of poverty on the structure of government spending, and hence the programs affected by fiscal retrenchment in the wake of financial crises. Note that this methodology differs from that of Dollar and Kraay (2000), who estimate the correlation between poverty and growth by regressing mean income on the income of the poor (in first differences).



## **Box 2: The Financial Crisis Literature: An Overview**

There have been important developments in the literature on currency and banking crises (e.g., Eichengreen, Rose and Wyplosz, 1995; Flood and Marion, 1997; Milesi-Ferretti and Razin, 1996 and 1998; Kaminsky, Lizondo, and Reinhart, 1997). Financial crises are attributed to rapid reversals in international capital flows and prompted chiefly by changes in international investment conditions. Flow reversals are likely to trigger sudden current account adjustments, and subsequently currency and banking crises (e.g., Frankel and Rose, 1996; Eichengreen and Rose, 1998).

A first generation of currency crisis models—pioneered by Krugman (1979)—explained the collapse of exchange rate regimes on the grounds that weak fundamentals lead foreign investors to pull resources out of the country, and as a result the depletion of foreign reserves needed to sustain the currency leads to the collapse of the exchange rate regime. A second generation of models suggests that currency crises may also occur despite sound fundamentals, as in the case of self-fulfilling expectations (Obstfeld, 1996), speculative attacks, and changes in market sentiment (Frankel and Rose, 1996; Flood and Marion, 1997).

### **Identifying crises**

The currency/banking crisis literature favors the event analysis methodology for identifying crises. Frankel and Rose (1996) define a currency crash “as a nominal depreciation of the currency of at least 25 percent that is also a 10 percent increase in the rate of depreciation” (p. 3). A three-year window is also considered between crisis episodes to avoid counting the same crisis twice. Eichengreen, Rose, and Wyplosz (1995) define a currency crisis not only in terms of large nominal depreciations, but also in terms of speculative attacks that are successfully warded off. Noncrisis observations are defined as “tranquil” observations. The methodology allows for the analysis of the chronology of crisis episodes and their characteristics. It also allows for multivariate analysis of the crisis episodes and other macroeconomic variables. Kaminsky, Lizondo, and Reinhart (1997) also use event analysis and construct an index of currency market turbulence defined as a weighted average of exchange rate changes and reserve changes.

The estimating equation can be defined as

$$(1) \quad \Delta P_i(t) - \Delta P_j(t) = a_0 + a_1 \Delta[F_i(t) - F_j(t)] + a_2 \Delta[X_i(t) - X_j(t)] + u_i(t),$$

where  $\Delta P_i(t) = \ln P_i(t) - \ln P_i(t-s)$  denotes the change in a poverty/income distribution indicator (for instance, poverty headcount ratios, Gini coefficient, and income shares, among others) of a crisis-stricken country  $i$  between a postcrisis period  $t$  and a precrisis period  $t-s$ ;  $\Delta P_j(t) = \ln P_j(t) - \ln P_j(t-s)$  denotes the change in the poverty indicator in a control country  $j$  (or control sample) over the time periods defined as precrisis and postcrisis for the crisis-affected country  $i$ ;  $\Delta F_i(t) = \ln F_i(t) - \ln F_i(t-s)$  denotes the change between a postcrisis period  $t$  and the precrisis period  $t-s$  in the explanatory variables capturing the channels through which financial/economic crises are expected to affect poverty in country  $i$  (the same variable is defined for the control country  $j$ );  $\Delta X_i(t) = \ln X_i(t) - \ln X_i(t-s)$  denotes the change in a set of variables controlling for noncrisis poverty determinants between precrisis and postcrisis periods in the crisis-affected country  $i$  (the same variable is defined for the control country  $j$ ); and  $u_i(t)$  is an error term.

## B. The Microlevel Analysis

The cross-country approach described above is complemented with **microlevel analysis** to assess the effect of financial crises on poverty. In particular, cross-sectional **Mexican household survey data are used to estimate the probability of being poor before and in the wake of the 1994–95 Financial crisis.**<sup>6</sup> A two-step strategy is followed for the microlevel empirical analysis: first, the factors affecting the probability of being poor in each year (i.e., before and after the crisis) are estimated using a logit model; then a logit regression is estimated using the pooled data set, in order to assess the impact over time of the financial crisis on the stability of the relevant parameter estimates. Exogenous variables are chosen among the set of structural factors that are deemed to affect poverty (i.e., household socioeconomic characteristics and demographics, among other factors) and those that are more likely to proxy the impact of financial crises on the living conditions of the population.

The underlying model can be specified in terms of an unobservable latent variable  $\lambda_i^*$  measuring deprivation, lack of welfare, or poverty in its multidimensional form.<sup>7</sup> The probability of being poor can be specified and estimated as

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<sup>6</sup> Other studies have used household survey data to estimate changes in poverty and inequality during crises. For instance, for the case of Mexico, see Cunningham and Maloney (2000), and for Peru, see Glewwe and Hall (1994, 1998).

<sup>7</sup> Since the multiple dimensions of poverty are difficult to measure, household deprivation can be proxied by the difference between the poverty line ( $y^p$ ) and the level of welfare of the household ( $y_i^*$ ) as  $\lambda_i^* = y^p - y_i^*$ , which can be parameterized as  $\lambda_i^* = \mathbf{x}_i' \boldsymbol{\beta} + \varepsilon_i$ , where  $\mathbf{x}_i$  is a vector of explanatory variables. Although the latent variable is not

(continued...)

$$(2) \quad P(d_i = 1) = P(\lambda_i^* \geq 0) = P(\varepsilon_i < E(\lambda_i^* / \mathbf{x}_i)) = F(\mathbf{x}_i' \boldsymbol{\beta}),$$

where  $d_i$  is a binary variable equal to one if household  $i$  lies below the poverty line at time  $t$  ( $t = 1992, 1994, 1996$ ) and zero otherwise.<sup>8</sup> The vector of independent variables  $\mathbf{x}_i$  includes individual control variables, as well as variables proxying for the fiscal and macroeconomic policy stance (i.e., public transfers, unemployment, level of wages and salaries, among others).

We first compare the parameter vector  $\boldsymbol{\beta}$  estimated before and after the crisis to assess the impact of the crisis on the logistic regression coefficients. This effect is measured by changes in the odds ratios  $\Omega$ .<sup>9</sup> We then use the pooled data set of the two years to estimate the following logit model:

$$(3) \quad p_{i,t} = P(d_{i,t} = 1) = F(\mathbf{x}_{i,t}' \boldsymbol{\beta} + \mathbf{z}_{i,t}' \boldsymbol{\gamma}),$$

where  $d_{i,t}$  is the probability of being poor in period  $t$  ( $t = 1992$  and  $1996$ , or alternatively  $1994$  and  $1996$ ) for household  $i$ . This probability can be defined as a function of the set of independent variables used in the previous step, and of a dummy variable  $\mathbf{z}_{i,t}$  that assumes a unit value for the postcrisis year, and zero otherwise. Hypothesis testing on the significance of vector  $\boldsymbol{\gamma}$  of parameter estimates allows for the assessment of the impact of the financial crisis on the link between poverty and its causal factors.

Some caution is needed in the interpretation of the results of equation (3). The estimate of  $\boldsymbol{\gamma}$  does not account solely for the effects of financial crisis. In fact, this parameter measures the change in the factors underlying the probability of being poor in the period of analysis. Other factors could be responsible for a change in the structure of the poverty risk between 1994 and 1996. During this period there were major reforms that affected agriculture and the rural areas, large changes in commodity prices, and NAFTA came into effect (Lustig, 1998). However, given the relatively short period of time, it is very unlikely that profound modifications of the structure of poverty would have taken place in the absence of the crisis

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observable, an index function can be constructed using a dummy variable which indicates whether the household is above the poverty line:  $d_i = 1$ , if  $\lambda_i^* \geq 0$ , and  $d_i = 0$ , otherwise. For a description of latent variable models and this type of formalization, see Maddala (1986).

<sup>8</sup> We recognize the caveats of specifying poverty as a discrete variable. In doing so, the multiple dimensions of poverty are ignored and emphasis is placed on the level, rather than the depth, of poverty. See Sen (1976), Wiegand (2000), and Foster and Székely (2001), for a discussion of these problems. However, we use the standard measure of poverty, the headcount ratio, because it is a conventional eligibility criterion for most targeted social programs, thus leading to readily usable policy implications.

<sup>9</sup> The odds ratio measures the relative risk of being poor versus the probability of lying above the poverty line for a household with given specific characteristics relative to a given reference category.

and, therefore, we refer to the estimate of  $\gamma$  as a first approximation for the impact of the 1994–95 financial crisis on the probability of being poor in Mexico.

### III. THE CROSS-COUNTRY REGRESSIONS

#### A. Identifying a Financial Crisis and Selecting a Control Group

**Financial crises are conventionally characterized by currency crashes.** Recent studies have attempted to define financial crises by focusing on event analysis and leading indicators (i.e., Kaminsky, Lizondo, and Reinhart, 1997). In line with this body of literature, we have used Frankel and Rose’s (1996) definition of a currency crash “as a nominal depreciation of the currency of at least 25 percent that is also a 10 percent increase in the rate of depreciation” (p. 3). The Frankel-Rose methodology has been used for a number of reasons. First, it focuses on currency crises, rather than balance of payments and banking crises, and therefore country-specific information, which is hard to come by and/or quantify, is not required. Second, low-frequency (annual) data are used, given the availability of poverty indicators. Third, information is not needed on changes in nominal interest rates, which are not market determined in most countries in the sample, and on foreign exchange reserves.<sup>10</sup>

**We have also examined an alternative definition of financial crisis that takes account of the association between currency crashes and income losses.** However, most definitions of financial crises, summarized in Box 2, are based exclusively on currency crashes or indicators of exchange rate pressure.<sup>11</sup> The alternative definition considered in the sensitivity analysis that follows focuses on those currency crash episodes in which the rate of growth of GDP per capita was negative between the crisis year and the precrisis year. Motivation for this alternative definition is that depreciations may be expansionary, particularly if the economy has been in a recession due to, for example, high interest rates to defend a currency peg; in this case, a currency crash may not necessarily lead to a fall in average income. Also, as discussed later, the economy may recover from the exchange rate depreciation during the year in which the crisis episode takes place, leading therefore to no average income losses in the crisis year relative to the precrisis year.

**Several options were entertained but we have opted for treating the sample of OECD countries that did not experience a financial crisis in the period under examination as the control group.** This is due to two main reasons. First, unlike for most developing

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<sup>10</sup> Note that the definition of financial crisis based on currency crashes excludes episodes of financial distress, such as banking crises, which are not associated with drastic exchange rate movements. A case in point is banking crises in industrial countries, such as the S&L crisis in the United States.

<sup>11</sup> Alternative definitions of crisis are less common in the literature. For instance, Ferreira, Prennushi and Ravallion (1999) define a crisis episode as a decline in gross national product following a financial crisis, or an increase in the country’s monthly rate of inflation to above 40 percent per year within the 12-month period, or both.

countries, information on the relevant indicators is available for most OECD countries on a yearly basis. Crisis episodes have been identified for different time periods, thereby requiring information on these indicators for the control group for all the years in which a crisis episode was identified in the treatment group. Second, the quality of the data for these OECD countries is typically higher than for most developing countries.<sup>12</sup> Despite the data constraints, we are aware that the choice of the OECD group as the control group has some pitfalls. Although OECD and non-OECD countries are inherently different, the methodology analyzes the difference in changes between the control and crisis countries, rather than at the differences in levels. The methodology would be invalidated if these two groups differed significantly in their responses to crises. In other words, the question is whether the impact on poverty and income distribution would be significantly different in the OECD countries if they experienced the same crisis episodes as the treatment group.

Problems would arise if the channels through which crises affect poverty and income distribution were significantly different in the OECD group (before and after the crisis episodes) and in the treatment group before the crisis.

To address this issue, we performed a simple specification test consisting of rewriting equation (1) as:

$$(4) \Delta P_i(t) = \beta_0 + \beta_1 \Delta P_j(t) + \beta_2 \Delta F_i(t) + \beta_3 \Delta F_j(t) + \beta_4 \Delta X_i(t) + \beta_5 \Delta X_j(t) + v_i(t),$$

and testing the following hypothesis:

$$(5) \quad H_0 : \beta_1 = 1, \beta_2 + \beta_3 = 0, \text{ and } \beta_4 + \beta_5 = 0.$$

Acceptance of this hypothesis, based on standard F-tests (reported below), allows for the definition of the main variables as differences relative to the control group. If this is the case, the control group provides a valid representation of the behavior of the crisis-stricken countries in the absence of the crisis.

## **B. The Macrolevel Data**

Data on bilateral exchange rates are available from the IMF's International Financial Statistics (IFS). Annual data have been collected for developing and industrial countries since the late 1960s. The poverty incidence data are available from the World Bank (Chen and Ravallion, 2000). Information based on household expenditure/income surveys is available on mean household income, poverty headcount ratios, and poverty gaps for a

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<sup>12</sup> We also tried to define the control group as the noncrisis periods for all countries that experienced financial crises. Unfortunately, for a number of crisis countries, information on poverty indicators is scarce and typically not available for a sufficiently large number of years.

sample of developing countries starting with the early 1980s.<sup>13</sup> The income distribution data used are available from the Deininger and Squire (1998) database. Information is available on the Gini coefficient and the distribution of income per quintile for developing and industrial countries starting with the early 1980s. The caveats in using these cross-country data are well documented (Deininger and Squire, 1998; Chen and Ravallion, 2000; Ravallion, 2000).

After identifying the crisis episodes using the methodology above and matching these episodes with the available data on poverty incidence and income distribution, **we are left with at most 65 observations in the sample**. The construction of the database is described in detail in Appendix I. Our sample contains a cross-section of crisis episodes, covering a variety of countries, mainly in the developing world. Data on the relevant macroeconomic indicators are available for most crisis-stricken countries. Nevertheless, information is not always available for the poverty and income distribution indicators for all the countries identified as having had a crisis episode. Collection of internationally comparable time series for poverty/inequality indicators is a relatively recent endeavor and information for the 1970s and 1980s is not readily available. The sample is much smaller for the poverty incidence indicators than for the income inequality indicators. As a result, caution is recommended in interpreting the parameter estimates reported below.

### C. Financial Crises and Poverty: Preliminary Findings

In the sample under examination, **financial crises—defined as currency crashes—are associated with sizeable changes in the macroeconomic indicators used to capture the main channels** through which crises are expected to affect poverty and income distribution (Table 1). For example, consumer price inflation increases in the crisis year by nearly 62 percent relative to the precrisis year. Formal unemployment rises by 1.1 percent in crisis years relative to precrisis years. GDP per capita rises by nearly 1 percent relative to precrisis years. Government spending on education and health care also decline slightly.<sup>14</sup>

**Financial crises are also associated with a deterioration in poverty indicators.** On average, poverty headcount ratios increase during financial crises. Notwithstanding the increase in the incidence of poverty, the poor in the lowest income quintile do not suffer the

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<sup>13</sup> The poverty headcount data are based on the internationally comparable poverty line of US\$ 1 per day expressed in Purchasing Power Parity (PPP) terms. The choice of a poverty line is always difficult and arbitrary. Although international low-income standards marginalize poverty in rich countries, the use of country-specific poverty lines in cross-country studies introduces idiosyncratic elements in the definition of poverty. However, in country-specific studies, the use of the national, rather than the international, poverty line is preferred. The poverty gap is defined as the income shortfall of the poor, or the average difference between the income of those below the poverty line and the income level that defines the poverty line.

<sup>14</sup> Social spending tends to be procyclical in many crisis-prone countries, thereby making a poor social safety net during recessions. See Ravallion (2000), for more information on the Argentine experience.

Table 1. Financial Crisis Episodes: Summary Statistics  
(All variables are defined as rates of change (in percent) in the crisis year relative to precrisis year)

	Mean Minimum	Standard Deviation	Minimum	Maximum	Sample Size
Macroeconomic variables					
GDP per capita	1.02	4.56	-14.61	13.73	64
Inflation (CPI)	62.16	189.90	-65.57	1322.05	59
Unemployment rate	1.11	2.37	-2.00	9.40	23
Government spending on:					
Education	-0.13	0.74	-4.06	0.90	45
Health care	-0.05	0.45	-1.61	1.20	45
Social security	0.07	1.58	-6.52	3.93	41
Total	0.51	3.81	-7.55	14.73	53
Poverty incidence					
Mean income	5.48	17.33	-29.86	40.46	25
Poverty headcount	14.76	143.77	-93.17	629.03	21
Poverty gap	93.48	508.56	-97.36	2308.33	21
Poverty gap squared	328.40	1575.00	-98.53	7200.00	21
Income distribution					
Gini coefficient	0.22	12.39	-43.89	34.11	65
Q1 income share	3.32	18.04	-23.68	60.57	38
Q2 income share	-1.61	9.34	-20.75	20.75	38
Q3 income share	0.56	7.92	-11.85	22.32	38
Q4 income share	1.72	10.09	-10.59	41.68	38
Q5 income share	-0.16	6.81	-20.93	15.82	38

Sources: World Bank and IMF data sets; and IMF staff calculations.

greatest income losses during crises (Table 1). The main losers in terms of changes in income shares are not the poorest (lowest income quintile) but those in the second (lowest) income quintile. The income share of the highest income quintile also falls in crisis years relative to precrisis years.<sup>15</sup> It can be argued that the very poor may find income in informal-sector activities, thereby protecting themselves from income losses due to financial crises.<sup>16</sup> The poor also tend to recover their income losses faster than the wealthy in the recovery periods following financial crises.

**The association between crises and poverty/distribution indicators is stronger if financial crises are followed by average income losses.** Based on the alternative definition of financial crisis, which focuses on currency crashes that are also associated with average income losses, GDP per capita contracts by 1.4 percent on average in the crisis year relative to the precrisis year. Inflation increases by nearly 92 percent and unemployment increases by nearly 1.6 percent relative to the precrisis year. Based on the Gini coefficient, inequality also increases by 0.63 percent relative to the precrisis year. The fall in the income share of the highest quintile is lower (-0.03 percent) and the increase in the income share of the fourth quintile (nearly 2 percent) is higher, relative to the financial crisis episodes defined as currency crashes alone.

#### **D. The Cross-Country Evidence**

**Because of the limited sample size, the association between each channel and poverty/income distribution indicators is estimated separately.**<sup>17</sup> Parameter estimates are reported in Tables 2 and 3 for a variety of variables capturing the channels through which financial crises affect poverty:

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<sup>15</sup> Recent cross-country evidence reported by Dollar and Kraay (2000) confirms these results by suggesting that the income of the poor does not fall disproportionately to that of the rich during crises. This is also in line with the evidence presented below based on microlevel data.

<sup>16</sup> There is some Mexican evidence that informal-sector workers do not suffer disproportionately higher income losses during crises (Cunningham and Maloney, 2000).

<sup>17</sup> The raw bivariate correlations between the proxies for the transmission mechanisms (not reported but available upon request) are in general low, varying between 0.2 and 0.5 in absolute terms. The argument for including the proxies together in the estimating equation, rather than one at a time, is therefore less compelling. In any case, the results remain broadly unchanged, in most models, if all the relevant proxies are included together in the equation. Another argument is favor of using one regressor at a time in the estimation of the model, is that this allows one to assess the contribution of each transmission mechanism to the change observed in the dependent variable.



Table 2. Income, Inflation, Unemployment, and Poverty 1/

	GDP Per Capita			Inflation			Unemployment		
	Coefficient	R-squared	No. of Obs.	Coefficient	R-squared	No. of Obs.	Coefficient	R-squared	No. of Obs.
Mean household income	0.9 ** (2.244)	0.15	25	0.01 (0.788)	0.09	23	-0.11 (-0.266)	0.09	9
Poverty headcount	-8.73 (-1.187)	0.18	21	0.65 (1.127)	0.19	20	1.92 (1.078)	0.25	7
Poverty gap	-27.89 (-1.044)	0.13	21	2.31 (1.084)	0.15	20	5.13 (0.663)	0.23	7
Poverty gap squared	-84.51 (-1.018)	0.13	21	7.09 (1.071)	0.15	20	13.46 (0.515)	0.23	7
Gini coefficient	-0.36 * (-1.634)	0.02	62	-0.005 (-0.495)	0.03	56	-0.001 (-0.010)	0.05	23
Income shares									
Q1	1.98 *** (7.167)	0.32	37	0.02 (0.899)	0.28	33	-0.31 (-1.731)	0.74	11
Specification test	9.694 ***			2.950 **			1.054		
Q2	0.98 *** (4.298)	0.22	37	0.01 (0.820)	0.29	33	-0.09 (-1.179)	0.71	11
Specification test	13.465 ***			7.972 ***			0.700		
Q3	0.52 ** (2.484)	0.15	37	0.01 * (1.859)	0.16	33	-0.03 (-0.385)	0.13	11
Specification test	3.475 **			4.487 ***			0.228		
Q4	0.12 (0.592)	0.01	37	0.004 (0.857)	0.03	33	0.01 (0.115)	0.01	11
Specification test	4.654 **			6.387 ***			0.196		
Q5	-0.67 *** (-4.533)	0.23	37	-0.01 * (-1.694)	0.24	33	-0.005 (-0.069)	0.53	11
Specification test	11.060 ***			7.032 ***			0.225		

1/ All models are estimated by OLS and include an intercept. The rate of change in per capita GDP is used as a control variable in all models, except when it is the main transmission mechanism under examination (first column). In this case, inflation is used as the control variable. Heteroscedasticity-consistent t-ratios in parentheses.

Note: (\*\*\*), (\*\*), and (\*) denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively. The specification test is an F-test. Significant values of the F-test reject the specification restrictions.

Table 3. Public Spending and Poverty 1/

	Education			Health care			Social security		
	Coefficient	R-squared	No. of Obs.	Coefficient	R-squared	No. of Obs.	Coefficient	R-squared	No. of Obs.
Mean household income	-0.02 * (-1.815)	0.38	17	-0.22 *** (-3.446)	0.50	17	-0.02 (-1.532)	0.35	15
Poverty headcount	0.01 (0.439)	0.00	14	0.36 * (1.771)	0.10	14	0.01 (0.261)	0.05	12
Poverty gap	0.02 (0.734)	0.00	14	0.45 * (1.945)	0.09	14	0.02 (0.488)	0.05	12
Poverty gap squared	0.03 (1.085)	0.00	14	0.54 * (1.864)	0.05	14	0.03 (0.907)	0.06	12
Gini coefficient	-0.007 ** (-2.072)	0.04	0	-0.05 (-1.191)	0.05	44	-0.006 (-1.017)	0.04	40
Income shares									
Q1	0.02 * (1.937)	0.41	25	0.26 ** (2.086)	0.42	25	0.04 ** (2.197)	0.35	22
Specification test	1.060			0.960			0.734		
Q2	0.15 ** (2.146)	0.49	25	0.16 ** (2.057)	0.48	25	0.02 * (1.984)	0.42	22
Specification test	5.939 ***			6.680 ***			6.622 ***		
Q3	0.002 (0.534)	0.27	25	0.02 (0.450)	0.26	25	0.001 (0.082)	0.11	22
Specification test	1.036			1.003			1.182		
Q4	-0.01 (-0.891)	0.03	25	-0.09 (-0.973)	0.04	25	-0.02 (1.172)	0.11	22
Specification test	3.499 **			3.450 **			4.634 ***		
Q5	-0.005 (-1.086)	0.37	25	-0.05 (-1.007)	0.37	25	-0.004 (-0.583)	0.22	22
Specification test	2.033			2.323 *			1.921		

1/ All models are estimated by OLS and include an intercept. The rate of change in per capita GDP is used as a control variable in all models. Heteroscedasticity-consistent t-ratios in parentheses.

Note: (\*), (\*\*), and (\*\*\*) denote significance at the 1, 5, and 10 percent levels, respectively. The specification test is an F-test. Significant values of the F-test reject the specification restrictions.

- **A fall in GDP per capita in the wake of financial crisis is associated with an increase in the incidence of poverty and a deterioration in income distribution, measured by the Gini coefficient** (Table 2).<sup>18</sup> A fall in per capita income is associated with falling mean household income, as expected, and an increase in income inequality, measured by the Gini coefficient.<sup>19</sup> Declining per capita income explains about 15–30 percent of the observed change in the poverty and inequality indicators. Because the Gini coefficient is a summary statistic that is too sensitive to changes in the middle of the income distribution, we also focused on income shares.<sup>20</sup> The deterioration in income distribution as a result of crisis-induced average income losses is due to a more-than-proportional fall in the income share of the lowest income quintiles, and an increase in the income share of the highest quintile.
- **A rise in inflation is associated with an increase in the income share of the middle-income quintile.** In the aftermath of a financial crisis, rising inflation is associated with a fall in the income share of the highest quintile and an increase in the income share of the middle-income quintile. The correlation between changes in inflation and in poverty indicators is not statistically significant at classical levels.
- **The analysis for formal unemployment is inconclusive.** The association between changes in formal unemployment and in indicators of poverty and income distribution is not statistically significant at classical levels. The lower number of observations would also compromise the statistical validity of the results.
- **Fiscal retrenchment in the aftermath of crises is associated with a deterioration in the distribution of income.**<sup>21</sup> An increase in government spending on education,

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<sup>18</sup> Changes in income cannot be interpreted as changes in consumption, unless individuals have no ability to smooth out consumption variations in the presence of income shocks. This issue is discussed in greater detail in the microlevel analysis below. Chen and Ravallion (2000) construct a time series of cross-country consumption-based poverty indicators by multiplying income by 1 minus the saving rate.

<sup>19</sup> Changes in income, measured in the national accounts, may differ from average household living standards as measured in household surveys. Because of differences in the definition of income and measurement errors, average household income based on national accounts data may not fully reflect changes in income based on household surveys. For instance, short-term changes in national income may involve the nonhousehold sector predominantly.

<sup>20</sup> An alternative option would be to assess the effects of the transmission mechanisms on the average income of the poorest quintile. The average income of the poorest quintile is not readily available in our data set. A simple way to estimate it is to multiply the income shares by per capita GDP and divide it by 0.2 (Deininger and Squire, 1998). While this measure would combine income and inequality effects in one indicator, in practice it would be highly collinear to the change in per capita growth, which is also a transmission channel for the effects of financial crises on poverty and inequality.

<sup>21</sup> It can be argued that cuts in public spending on social programs may force the poor to pay for similar services provided by the private sector, thereby putting more pressure on their budget at times when earning opportunities are reduced. Lower public spending on health care may also affect poverty because sickness reduces the ability of the poor to earn a living. Collection of informal charges in the provision of public social services may also affect poverty (continued...)

health care, and social security programs is associated with a rise in the income share of the lowest quintiles. The elasticities are small in magnitude, reflecting, at least in part, the fact that outlays on social programs are often poorly targeted. Higher spending on health care programs is also associated with a reduction in the incidence of poverty.<sup>22 23</sup> This provides evidence in support of preserving social spending programs from cuts in the aftermath of financial crises. Incidentally, Dollar and Kraay (2000) show that a rise in inflation and a fall in government spending have an adverse impact on the income of the poor, controlling for changes in mean income.

### E. Robustness Analysis

A variety of **robustness checks** have been carried out and can be summarized as follows:

- The parameter estimates reported above do not account for the impact on poverty of differences in initial levels of inequality within countries. This may affect the impact of changes of income on the incidence of poverty. Typically, the higher the level of inequality in a country, the lower the elasticity of poverty incidence to economic growth. **The equations were reestimated for the sample of low-inequality countries, defined as those with a Gini coefficient less than 0.45. Parameter estimates are typically higher for the low-inequality sample**, as expected. Significance levels are comparable to those reported for the full sample.
- **The baseline results are robust to alternative definitions of financial crisis.** In this case, the crisis episodes in which per capita GDP rises, rather than falls, in the aftermath of crises are eliminated from the sample. **The elasticities are slightly higher when currency crashes are associated with average income losses**, as expected.

### The caveats

The cross-country analysis provides preliminary, but by no means conclusive, evidence that financial crises are correlated with poverty and changes in income distribution, and the

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when public spending is reduced in the aftermath of a crisis. Crisis-induced cuts in allocations for social assistance and insurance programs are also likely to affect the poor adversely.

<sup>22</sup> We cannot reject the specification restrictions at classical levels of significance for the income share equations when the unemployment transmission mechanisms are under examination and, for most income share equations, when the fiscal retrenchment mechanisms are being estimated. See equation (5) for the definition of the specification restrictions.

<sup>23</sup> Other studies have suggested that the composition of social spending matters. When it is targeted toward primary education and preventive health care, social spending is more likely to improve social indicators and reduce poverty. See Gupta and others (1999).

empirical results should be interpreted with caution. The cross-country analysis suffers from well-known **caveats**:

- **The use of low-frequency data does not allow for a detailed analysis of when crises peak and bottom out during the year in which they are identified.** As discussed above, economic recovery during, as opposed to after, the crisis year affects indicators constructed on an annual basis.
- **Data on income distribution is hard to come by for a large sample of countries.** Therefore, in certain cases, it was not possible to match the years when crises occurred and those for which data are available. This may cause some discrepancies in the empirical association between financial crises and poverty.
- **Data on income distribution by quintile do not allow for the analysis of intraquintile income distribution.** As shown in the case of the Mexican crisis described below, the association between crises and poverty is likely to be affected by changes in income distribution within the lowest quintiles, particularly in countries where the poor are clustered below that income threshold.

#### IV. THE MEXICAN EXPERIENCE

##### A. The 1994–95 Mexican Crisis

**Mexico was hit particularly hard by the financial crisis of 1994–95.** Following the nominal depreciation of the peso by nearly 47 percent between 1994 and 95, consumer price inflation soared to 52 percent at end-1995, and real GDP fell by more than 6 percent, recovering to the precrisis level in 1997 (Table 4). Concomitantly, fiscal policy was tightened, including some cuts in health and education expenditures. The labor market was affected by the slowdown in economic activity: open unemployment doubled to 7.4 percent in 1995. By end-1996, the economy had started to recover and the rate of open unemployment fell back to 4.7 percent.

##### B. The 1994–95 Crisis: The Microlevel Data

**A number of studies have found that the impact of the Mexican crisis on poverty and income distribution was mixed.**<sup>24</sup> Our results confirm these findings, but go beyond previous studies in that we use a survey that is representative of households both in urban and in rural areas, where poverty is concentrated. Moreover, the use of expenditure data to calculate poverty lines, as opposed to income data, is preferable because it serves as a better proxy for permanent income.

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<sup>24</sup> See Cunningham and Maloney (2000), Lopez-Acevedo and Salinas (2000), and Lustig (2000).

Table 4. Mexico: Selected Indicators  
(Percent changes)

	1994	1995	1996	1997
Real GDP	4.4	-6.2	5.2	7.0
Consumer prices (end of period)	7.0	52.0	27.7	15.7
Consumer prices (average)	7.1	35.0	34.4	20.6
Real effective exchange rate (average, depreciation -)	-3.8	-33.2	13.0	17.3
Nominal exchange rate (average, depreciation -)	-7.7	-47.4	-15.6	4.0
	(In percent of GDP)			
Total expenditures and net lending 1/	23.3	23.0	22.8	23.7
Education	3.9	3.7	3.7	3.7
Health	3.6	3.5	3.3	3.7

Source: Mexican authorities; and IMF staff estimates.

1/ Nonfinancial public sector.

Based on the microlevel data, available from the 1992, 1994, and 1996 National Income and Expenditure Surveys conducted by the Mexican Statistical Institute,<sup>25</sup> **average monthly household income in constant 1994 prices fell by 31 percent between 1994 and 1996, while household consumption experienced a decline** of 25 percent during the same period (Table 5).<sup>26</sup> The number of households with unemployed, self-employed or pensioner household heads rose between 1992 and 1996, in line with worsening conditions in the labor market.

**Mexican microdata show an increase in the incidence of poverty<sup>27</sup> and in the poverty gap<sup>28</sup> relative to the precrisis period.** Higher poverty incidence in the aftermath of the 1994-95 financial crisis resulted from two separate factors: (1) the increase in the number of households that were lying slightly above the poverty line before the crisis and did not benefit from effective social safety nets preventing them from falling into poverty; (2) the worsening of the living conditions of those households that were already classified as poor in 1992 and in 1994. Relevant results of the analysis can be summarized as follows (Table 6):

- The poverty headcount ratio, defining the incidence of poverty, rose to nearly 17 percent of the population in 1996, from 10.6 percent in 1994, reversing the gains made between 1992 and 1994.<sup>29</sup> However, **the characteristics of poor households**

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<sup>25</sup> The 1992 survey covers 10,530 households; the 1994 survey covers 12,814 households; and the 1996 survey covers 14,042 households. The sample presented here excludes households with no information on income or expenditures. Information provided includes income by source and socio-demographic characteristics for each household member, the characteristics of the head of the household, and detailed expenditures by consumption items. Household income and expenditures include an imputed value of owner-occupied housing, as well as the monetary value of gifts, self-production and in-kind payments.

<sup>26</sup> See the robustness check below for comparisons with National Accounts data.

<sup>27</sup> The poverty line is defined by a minimum consumption basket for rural and urban households by the Mexican Statistical Institute, defined as the “extreme poverty line” (INEGI, 1993). Expenditure is defined as per equivalent person expenditure to take into account differences in household size. See Appendix I for a description of the methodology and definitions of the measures of poverty used. An alternative poverty line was defined as 50 percent of mean income in 1992 and then corrected for inflation in 1994 and 1996. Parameter estimates based on this alternative definition of poverty are fully consistent with the estimates based on the definition of poverty adopted in the text. The results based on the alternative poverty line definition are not presented here due to space constraints, but are available upon request.

<sup>28</sup> The poverty gap is calculated as the difference between household equivalent expenditures and the poverty line as a percentage of the poverty line. We also calculated the income gap, or cost of bringing everyone up to at least the poverty line, at 0.08 percent of GDP in 1992, 0.06 percent of GDP in 1994, and 0.12 percent of GDP in 1996.

<sup>29</sup> Lustig and Székely (1997) find an income poverty headcount ratio of 16.1 percent for 1992 and 15.5 percent for 1994 using the same poverty line and same data set, which is consistently higher than the 12.7 and 10.6 percent presented here for 1992 and 1994 respectively. Data for 1996 was not available at the time of their study.

Table 5. Mexico: Descriptive Statistics  
(Percentage values, unless otherwise specified)

	1992	1994	1996
Household consumption 1/	2,348	2,349	1,762
Share of durables	6.4	4.9	4.5
Share of nondurables	93.6	95.1	95.5
Share of food	35.9	35.7	36.2
Household income 1/	2,661	2,772	1,914
Share of wages and salaries	46.9	45.7	46.6
Share of profits	19.5	17.6	17.9
Share of property incomes	0.9	0.8	0.8
Share of cooperative incomes	0.1	0.1	0.1
Share of transfers	7.5	7.5	9.6
Share of self-employed income	11.2	11.8	11.0
Share of other incomes	4.0	3.9	4.1
Household typology			
Single	8.7	9.9	9.2
Single parents	9.1	9.6	10.8
Couples without children	8.7	8.4	8.3
Couples with children	58.6	56.6	56.6
Other	15.0	15.5	15.1
Household size			
1 member	5.0	6.2	5.9
2 members	11.6	11.1	11.9
3 members	15.0	15.6	16.5
4 members	19.2	20.7	20.4
5 or more members	49.3	46.5	45.4
Area of residence			
Urban	62.5	61.0	62.6
North	26.4	26.4	26.7
Centre	54.3	54.6	54.6
South	10.3	10.7	10.1
Yucatán	9.0	8.4	8.5
Household head characteristics			
Share of males	86.0	85.2	83.8
Share of illiterate	14.6	15.6	14.7
Share with technical education	7.9	9.27	11.1
Share with house's ownership	76.7	76.2	76.2
Employee	51.8	48.8	51.0
Self-employed 2/	21.0	24.4	23.3
Farmer	10.4	10.0	8.9
Pensioner	4.1	4.2	4.4
Unemployed	1.1	1.5	1.3
Other	11.6	11.1	11.1
No school	18.3	19.5	16.2
Elementary school	48.5	45.7	45.8
Middle school	15.6	16.5	17.5
High school	7.4	7.5	9.3
College or higher	10.4	10.8	11.2
Less than 40 years of age	45.7	44.0	43.5
40-59 years	36.7	36.6	37.8
60-74 years	14.0	15.7	15.0
75 years and older	3.7	3.7	3.7
Number of household	10,530	12,814	14,037

Source: IMF staff estimates based on 1992, 1994 and 1996 ENIGH.

1/ Local currency at constant 1994 prices.

2/ Other than farmers.



Table 6. Poverty Incidence and Poverty Gap 1/  
(In percent, unless otherwise specified)

	Poverty Head Count			Change 1994-96	Poverty Gap			Change 1994-96
	1992	1994	1996		1992	1994	1996	
Moderate poverty	38.2	36.3	48.0	32	36.3	33.4	37.6	13
Extreme poverty	12.7	10.6	16.9	60	30.3	25.8	28.8	12
Household typology								
Single	4.1	3.2	4.8	49	31.0	15.9	30.0	89
Single parents	8.3	5.1	11.3	119	22.7	29.8	27.9	-6
Couples without children	6.6	4.4	7.3	67	30.7	26.2	24.9	-5
Couples with children	13.6	12.4	18.4	48	30.6	26.0	28.3	9
Other	20.5	15.1	27.7	83	31.3	25.7	30.9	20
Household size								
1 member	1.6	1.4	3.1	127	31.2	15.3	31.3	105
2 members	4.4	3.1	5.2	69	25.9	25.3	24.2	-4
3 members	5.6	4.8	5.7	18	30.4	21.0	21.4	2
4 members	6.6	4.8	10.1	110	29.8	20.6	23.6	14
5 or more members	20.3	18.0	28.8	60	30.6	27.0	30.4	13
Area of residence								
Urban	6.0	4.6	11.4	148	22.8	21.3	24.6	15
Rural	23.9	19.8	26.0	31	33.4	27.5	32.0	16
North	7.2	6.3	11.6	84	28.7	26.8	23.3	-13
Centre	11.0	9.9	14.8	50	27.6	24.3	28.7	18
South	28.3	18.8	28.3	50	32.6	29.4	31.6	8
Yucatán	21.9	17.9	33.1	85	36.6	25.3	32.6	29
Household head characteristics								
Males	13.7	11.3	17.8	57	30.7	25.8	28.8	12
Females	6.8	6.0	12.1	101	25.8	26.4	29.0	10
Home owner	13.9	11.0	17.8	62	30.9	25.7	29.5	15
Does not own household	8.9	9.2	14.0	52	27.1	26.2	26.4	0
Employee	6.3	5.2	10.8	110	22.3	21.6	22.9	6
Self-employed 2/	21.9	14.4	25.5	78	33.0	27.3	31.8	16
Farmer	34.5	31.6	36.2	15	34.8	29.0	33.4	15
Pensioner	1.6	2.4	5.3	121	6.4	19.4	20.3	5
Unemployed	5.6	19.5	20.5	5	16.9	25.4	28.5	12
Other	9.8	8.8	15.4	75	30.1	21.5	30.4	41
No school	25.5	21.3	29.1	37	35.4	27.4	33.3	22
Elementary school	15.2	12.6	22.3	77	28.1	25.4	28.2	11
Middle school	3.9	3.1	8.6	181	18.1	18.0	21.3	18
High school	1.4	0.8	3.8	394	24.5	17.1	19.5	15
College or higher	0.0	0.7	0.8	12	7.6	31.3	26.7	-15
Less than 40 years of age	12.5	11.1	17.3	56	30.5	26.4	29.3	11
40-59 years of age	14.3	10.2	17.6	73	29.4	26.8	28.5	6
60-74 years of age	9.9	9.9	14.0	42	31.1	23.4	27.4	17
75 years and older	10.0	11.1	16.4	48	37.5	19.4	32.9	70
Number of households	10,530	12,814	14,037					

Source: IMF staff estimates based on 1992, 1994, and 1996 ENIGH.

1/ Poverty is measured as consumption relative to a basic basket as defined by INEGI in 1992.

2/ Other than farmers.

**did not change significantly relative to the precrisis period.** Poverty rates are higher among households headed by farmers or self-employed persons; less-educated individuals; those living in rural areas, the southern states, and the Yucatán peninsula; and households with numerous family members.

- **The poverty gap, defining the income shortfall of the poor, increased in the 1994–96 period, although this increase was insufficient to reverse the gains made in reducing the depth of poverty between 1992 and 1994.** This result was determined by the increase in poverty depth for those household groups that had experienced the largest reduction in the poverty gap in the 1992–94 period. Thus, in the aftermath of the 1994–95 crisis, some of the poor households that had climbed closer to the poverty line in the 1992–94 period may have experienced a sharp reduction in their living conditions. In addition, those households that became poor as a result of the crisis could have experienced a large drop in their consumption levels, which brought them far below the poverty line. The poverty gap remained highest after the crisis for households headed by farmers, self-employed, elderly, and less educated heads; for those living in rural areas, the Yucatán peninsula, and the southern states; and for larger households.
- **The households that were already poor before the crisis were not necessarily the hardest hit by the crisis.** The increase in poverty rates was worst for single-parent households and those headed by individuals with middle school or high school educations, by pensioners, by the self-employed, and by employees. Note that the gains in poverty reduction for the self-employed between 1992 and 1994 were reversed by 1996, while the large increase in poverty among the unemployed observed in 1994 persisted after the crisis. **In the wake of the crisis, the poverty gap increased relatively more for single-parent and single-person households, and those headed by individuals with no schooling, elderly above 75 years of age, and in those living in the Yucatán peninsula.** For these households, the depth of poverty increased, implying that they were especially hard hit by the crisis and therefore fell deeper into poverty.

**All the estimates of income inequality presented in Table 7 point to a significant reduction in the differences between the upper and the lower tail of the income distribution in the 1992–96 period.**<sup>30</sup> This is unlike the cross-country evidence reported above, and the evidence of some Latin American countries hit by recession in the late 1980s and in the early 1990s (Lustig, 2000).<sup>31</sup> **In Mexico, the income and expenditure shares of**

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<sup>30</sup> Inequality fell both in the rural and in the urban areas in the same period.

<sup>31</sup> This result is, however, consistent with previous findings for the case of Brazil (1992), Costa Rica (1984), Uruguay (1983) and Venezuela (1991). The Gini coefficient for 1992 presented in Table 7 is consistent with Lustig and Székely (1997), who find a Gini of 0.53 for income in 1992 using the same 1992 Mexican data.

Table 7. Mexico: Inequality Measures  
(Percentage values)

	1992	1994	1996
Household consumption			
Gini coefficient	52.7	51.6	50.2
Theil index	55.4	51.1	50.9
Atkinson index ( $\epsilon=0.5$ ) 1/	22.9	21.7	20.9
Atkinson index ( $\epsilon=1.0$ ) 1/	37.9	37.1	35.4
Atkinson index ( $\epsilon=2.0$ ) 1/	59.3	56.5	54.2
Household income			
Gini coefficient	54.1	54.2	51.6
Theil index	61.6	59.0	53.2
Atkinson index ( $\epsilon=0.5$ ) 1/	24.5	24.3	22.0
Atkinson index ( $\epsilon=1.0$ ) 1/	40.7	40.8	37.5
Atkinson index ( $\epsilon=2.0$ ) 1/	61.3	62.0	58.3

Source: IMF staff estimates based on 1992, 1994, and 1996 ENIGH.

1/ Inequality aversion parameter.

**the lowest quintile increased relative to the precrisis period by over 10 percent, while the income and expenditure shares of the highest quintile decreased by over 2 percent between 1994 and 1996** (Figure 1). This confirms the results presented in Cunningham and Maloney (2000).<sup>32</sup> It is also important to note that monthly average expenditures of the poorest 20 percent of the population, despite its growing share in total income, fell in absolute terms from M\$433 in 1994 to M\$386 in 1996 measured in 1994 Mexican pesos. Given their margin of survival, this may be extremely significant and should continue to merit the attention of public policy. When looking at the subsample of poor households, one notes that the average expenditures loss between 1994 and 1996 was 1.6 percent, but the poorest 10 percent of the poor experienced an expenditure loss of 12 percent. This confirms the fact that the depth of poverty increased despite an improvement in income distribution (Table 8).

**Changes in income distribution can be attributed, at least in part, to a disproportionate fall in the income of the richest deciles relative to the precrisis period.** In particular, as shown in Table 9, average wages for the richest decile fell by nearly 41 percent, relative to an average drop in wages of 34 percent.<sup>33</sup> The decrease in profits was 25 percent on average, with the greatest decrease among the richest 50 percent of the population, suggesting a possible channel for the fall in the relative income of the wealthy.<sup>34</sup> Average transfers fell by 13 percent for the poorest decile, compared to a drop by 37 percent for the richest decile between 1994 and 1996.

To assess the **impact of transfers on poverty**, a simulation was performed by excluding all transfers from household income and then comparing the resulting poverty headcount with that calculated with after-transfer income. The results imply that transfers kept only a slightly higher share of the population out of poverty in 1996 than in 1994. In 1994, 4.5 percent of the population was kept out of poverty because of transfers, against 6.1 percent of the population in 1996. This points to the fact that **the targeting of transfers did not improve substantially after the crisis, nor did transfers prevent many people from becoming**

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<sup>32</sup> Cunningham and Maloney (2000) find that the lowest quintile did better than the highest quintile in terms of changes in income during the 1995 crisis. The authors conclude that the poor recovered their income losses faster than the wealthy during upturns after crises.

<sup>33</sup> The share of income derived from wages is lower among low-income households, thus confirming the previous findings by Lopez-Acevedo and Salinas (2000). Self-employed income represents 18.5 percent of total income of poorer households as compared to only 6 percent for those in the highest deciles.

<sup>34</sup> Lopez-Acevedo and Salinas (2000) show that the higher income loss of the highest income decile is due to loss not only in capital income, as expected, but also in labor income, given that the rich tend to work in the nontrade sector. This result is consistent with our findings.

Figure 1. Mexico: Distribution of Equivalent Expenditure in 1994 Pesos

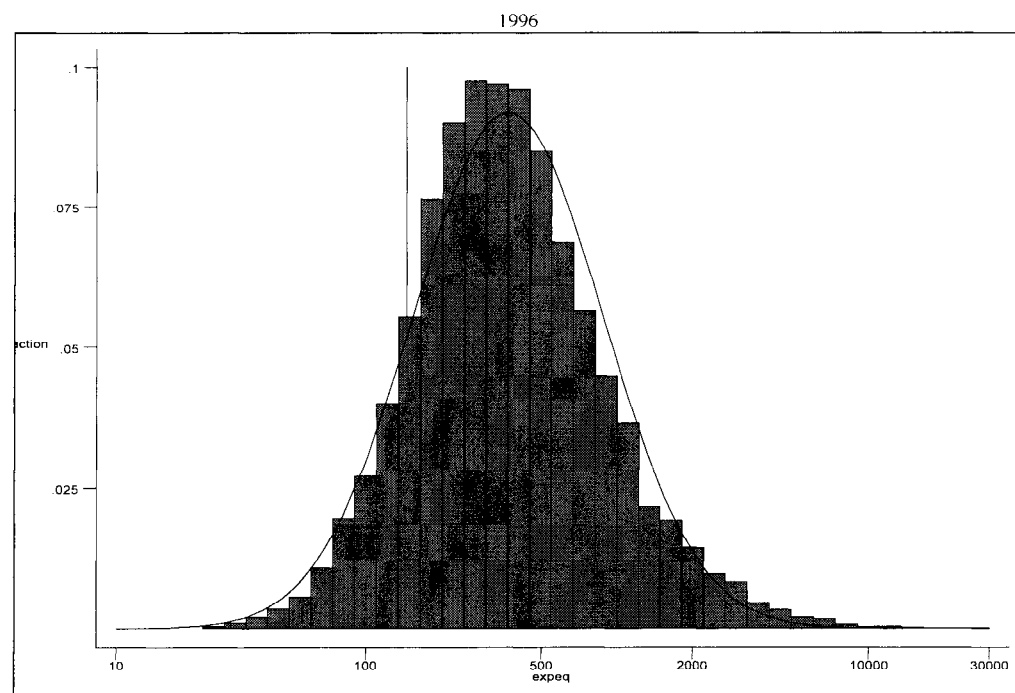
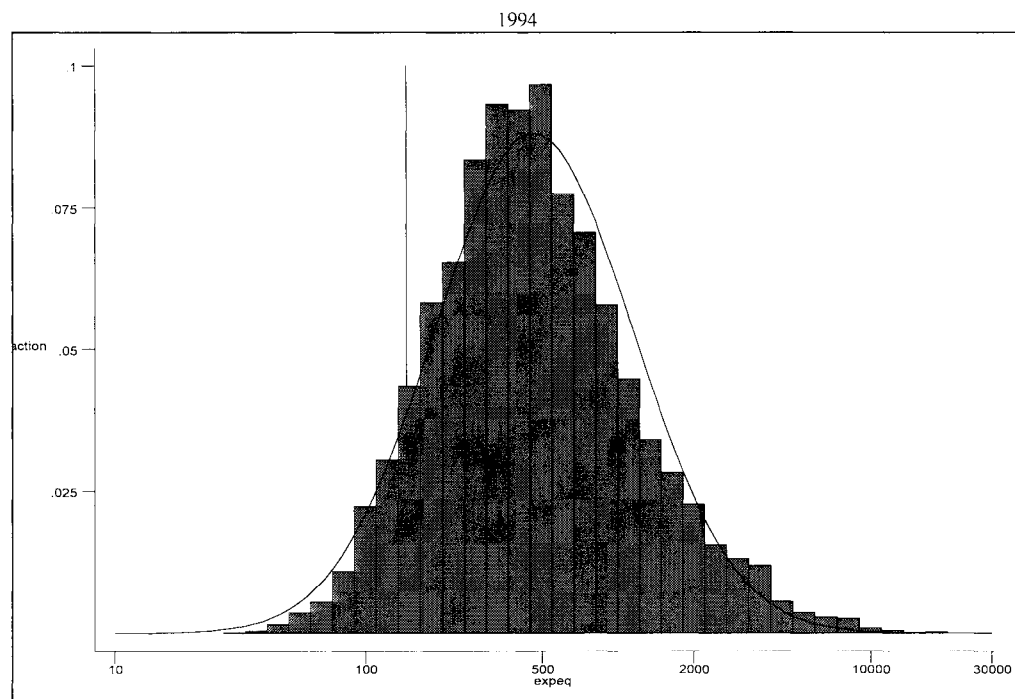


Table 8. Mexico: Changes in Average Income and Expenditure by Decile  
Subsample of Poor Households

Relative Growth Per Decile 1992-94						
	Average Total Expenditures	Average Total Income	Average Wage	Average Transfer	Average Profit	Average Other Income
1	46.9	17.1	13.4	31.1	-11.2	50.2
2	17.1	1.1	43.6	-35.9	-32.2	8.6
3	9.9	-1.2	-3.7	31.2	-21.3	26.7
4	1.6	-5.2	15.7	21.3	-17.0	8.5
5	7.5	-9.9	-25.5	21.1	-20.2	19.6
6	6.9	9.0	28.2	0.6	-30.4	22.2
7	-2.5	-5.2	10.1	-8.3	-10.3	-0.1
8	-5.7	-4.0	24.8	85.4	-41.2	0.1
9	0.9	0.1	13.2	-33.4	-20.9	19.6
10	-3.3	-9.0	-9.8	-0.8	18.5	31.5
Total	3.0	-3.1	1.7	8.2	-18.3	16.9

Relative Growth Per Decile 1994-96						
	Average Total Expenditures	Average Total Income	Average Wage	Average Transfer	Average Profit	Average Other Income
1	-11.9	-21.6	-24.0	-20.7	-14.9	-15.8
2	-5.2	-5.3	-27.3	124.4	7.7	-3.6
3	-4.7	-10.5	-17.6	-12.6	2.6	-21.3
4	-1.1	1.1	-13.3	-21.5	43.0	-19.8
5	4.1	1.0	2.1	57.7	16.3	-7.4
6	0.5	-8.3	-4.8	21.4	18.3	-28.1
7	2.2	-7.2	-12.1	4.5	10.3	-13.6
8	1.7	-7.0	-23.8	-34.9	31.5	-16.8
9	4.1	0.3	-7.7	19.4	3.7	-18.4
10	-8.9	-14.4	-18.0	-14.5	-19.3	-34.2
Total	-1.6	-7.0	-12.1	0.0	6.8	-19.6

Source: IMF staff estimates based on 1992, 1994 and 1996 ENIGH.

Table 9. Mexico: Changes in Average Income and Expenditure by Expenditure Decile

Relative Growth Per Decile 1992–94						
	Average Total Expenditures	Average Total Income	Average Wage	Average Transfer	Average Profit	Average Other Income
1	15.5	5.7	13.5	28.7	-16.5	21.2
2	0.2	-3.4	11.5	16.7	-25.2	14.0
3	4.2	1.6	9.0	20.7	-20.2	16.9
4	7.6	8.3	18.7	13.9	-19.2	33.0
5	4.9	3.7	1.0	43.7	-6.3	17.6
6	-0.6	2.3	-2.2	-10.5	0.5	19.5
7	1.6	3.2	5.4	-32.6	-3.3	15.4
8	3.3	13.3	11.3	35.5	24.1	16.3
9	0.3	1.6	2.8	-26.0	-10.1	11.4
10	-2.3	5.1	30.7	30.5	-36.0	9.9
Total	0.0	4.2	14.9	11.4	-21.2	12.9

Relative Growth Per Decile 1994–96						
	Average Total Expenditures	Average Total Income	Average Wage	Average Transfer	Average Profit	Average Other Income
1	-13.0	-17.2	-24.5	-12.6	-0.3	-19.3
2	-13.1	-17.5	-23.6	1.5	-19.4	-28.8
3	-18.9	-26.0	-30.5	-16.1	-25.7	-32.7
4	-21.6	-29.0	-34.2	-18.7	-33.4	-32.1
5	-22.8	-28.1	-26.7	-25.7	-34.2	-35.6
6	-20.7	-25.1	-24.2	0.8	-31.8	-35.4
7	-22.7	-28.3	-31.6	4.9	-25.3	-36.2
8	-23.0	-27.2	-25.7	-22.4	-23.0	-43.1
9	-25.3	-28.3	-28.2	14.2	-20.6	-40.5
10	-28.0	-36.2	-40.5	-36.8	-25.0	-38.1
Total	-25.0	-31.0	-33.8	-23.0	-25.2	-37.8

Source: IMF staff estimates based on 1992, 1994 and 1996 ENIGH.

**poor given the large increase in the number of poor.**<sup>35</sup> This is also confirmed by the fact that the shares of transfers in total income remained highest in the top deciles.<sup>36</sup>

### C. The Determinants of Poverty: The Empirical Findings

The results of the logit estimations allow for comparisons of the probability of being poor for the precrisis and postcrisis periods as follows:

- **In 1992, 1994, and 1996, the probability of being poor was found to be higher for larger households; for those living in rural regions, in the southern states and in the Yucatán peninsula; and for households headed by less-educated individuals, by the self-employed, or by farmers** (Table 10). The risk of being poor is significantly lower for those households headed by pensioners and more-educated individuals, and for household heads in the 60- to 74-year-old range. A higher share of nondurable and food consumption in total household expenditures is generally associated with a higher risk of poverty.

**The 1994–95 crisis changed slightly the profile of poverty risk by household characteristics.** When comparing the logit results for 1994 and 1996, we find that the probability of being poor increased for households headed by employees and pensioners.<sup>37</sup> Households that were disproportionately hit by the crisis include those headed by individuals having a middle-school or high-school education, by those aged between 40 and 59 years, and by those living in the South and the Yucatán peninsula. Urban households were affected more adversely by the crisis than rural households. The probability of being poor fell for households headed by farmers, by adults aged 60 and older, and by those with elementary school education. Residents in the central states and those with three or four household members also experienced a moderate decline in their relative risk of poverty. **Gender of the household head was found to have no significant impact on the risk of poverty** once all other determinants are held constant.

- **Home ownership further became a protection against poverty after the crisis.** Because other sources of income, including labor income, typically fall during crises, owning a home can protect the household from the risk of falling into poverty as

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<sup>35</sup> Note that the transfers measured here do not include the more recent PROGRESA transfer scheme initiated in 1997.

<sup>36</sup> The share of transfers in total income varies across expenditure deciles, with a peak of around 9 percent in the richest decile in 1994. In 1996, transfers peak at around 10.8 percent in the eighth and ninth deciles. See Table A1.

<sup>37</sup> This suggests that pensions may be an ineffective social safety net for the elderly. However, pensioners continued to have a lower risk of poverty among the different occupational categories in 1996.



Table 10. Results of the Estimates of the Logit Model—Dependent Variable: Probability of Being Poor  
(Percent values, unless otherwise specified, consumption-based definition of poverty)

	1992			1994			1996		
	$\beta$	Wald	$\Omega$	$\beta$	Wald	$\Omega$	$\beta$	Wald	$\Omega$
Household consumption									
Share of nondurables	6.94 ***	119.77	1,034.65	10.24 ***	105.55	8,000.78	10.94 ***	165.27	6,288.22
Share of food	-0.63 **	6.52	0.54	1.32 ***	23.79	3.74	0.88 ***	14.67	2.40
Household income									
Share of wages and salaries	0.30	1.87	1.35	-0.31	2.61	0.73	-0.09	0.22	0.92
Share of profits	-0.04	0.02	0.96	-1.37 ***	18.75	0.26	-0.26	1.24	0.77
Share of property incomes	1.44 **	4.33	4.21	-2.38 *	3.76	0.09	-1.10	1.77	0.33
Share of cooperative incomes	-31.10	0.20	0.00	-5.31	0.94	0.00	-11.36	0.34	0.00
Share of transfers	0.20	0.46	1.22	-0.44	2.50	0.65	-0.53 **	6.09	0.59
Share of self-employed income	0.19	0.41	1.20	1.09 ***	9.64	2.96	0.31	1.37	1.36
Share of other incomes	-8.87 ***	74.51	0.00	-9.10 ***	47.50	0.00	-7.32 ***	88.80	0.00
Household size									
2 members	-0.29 **	4.04	0.75	-0.62 ***	15.48	0.54	-0.47 ***	17.45	0.62
3 members	0.06	0.25	1.06	0.21 *	2.84	1.23	-0.29 ***	8.94	0.74
4 members	0.31 **	6.84	1.36	0.47 ***	15.68	1.60	0.43 ***	26.13	1.53
5 or more members	1.38 ***	203.58	3.96	1.62 ***	291.77	5.06	1.55 ***	497.74	4.69
Area of residence									
Urban	-0.53 ***	41.02	0.59	-0.68 ***	60.01	0.51	-0.11 *	2.74	0.89
Centre	-0.19 ***	12.08	0.83	-0.16 ***	8.41	0.85	-0.38 ***	72.28	0.68
South	0.41 ***	34.94	1.51	0.18 **	5.43	1.19	0.29 ***	19.51	1.33
Yucatán	0.25 ***	10.00	1.28	0.29 ***	11.72	1.34	0.45 ***	43.89	1.57
Household head characteristics									
Males	-0.13	0.97	0.88	-0.10	0.67	0.90	-0.05	0.31	0.95
Literate	-1.30 ***	48.37	0.27	-0.20	1.42	0.82	-0.79 ***	36.82	0.45
Home owner	-0.07	0.59	0.93	-0.19 **	4.06	0.83	-0.23 ***	9.39	0.79
Technical education 1	-5.76	0.67	0.00	0.37	0.56	1.45	-0.31	1.17	0.73
Technical education 2	-3.62 ***	8.97	0.03	-1.90 ***	9.56	0.15	-0.39 **	4.71	0.67
Employee	-0.18	2.05	0.84	-0.36 ***	11.46	0.70	-0.29 ***	12.67	0.75
Self-employed 1/	0.74 ***	24.21	2.09	0.15	1.46	1.17	0.30 ***	7.89	1.34
Farmer	1.02 ***	61.92	2.77	0.81 ***	58.58	2.25	0.54 ***	32.71	1.71
Pensioner	-1.29 ***	13.71	0.28	-0.87 ***	10.04	0.42	-0.65 ***	12.49	0.52
Other	-0.17	1.45	0.84	-0.39 ***	10.00	0.68	-0.31 ***	10.31	0.73
Elementary school	1.64 ***	17.76	5.14	0.77 ***	41.36	2.17	1.00 ***	146.77	2.72
Middle school	0.79 **	3.92	2.21	-0.24	2.27	0.79	0.13	1.71	1.14
High school	0.04	0.01	1.05	-1.00 ***	9.30	0.37	-0.50 ***	11.28	0.61
College or higher	-3.79 **	6.26	0.02	-0.80 ***	7.74	0.45	-1.59 ***	41.24	0.20
40–59 years of age	0.03	0.17	1.03	-0.46 ***	40.13	0.63	-0.22 ***	14.51	0.80
60–74 years of age	-0.40 ***	19.11	0.67	-0.24 ***	7.71	0.79	-0.45 ***	38.92	0.63
75 years and older	0.02	0.01	1.02	0.48 ***	10.49	1.62	0.40 ***	10.82	1.50
Constant	-9.40 ***	148.88		-13.06 ***	165.71		-12.75 ***	222.18	
Chi square	2,422			2,339			180		
Goodness of fit test	8.4			18.4			5.5		
Percent of correct classified cases	88.6			90.5			85.6		
Number of household	10,530			12,814			14,037		

Source: Data provided by the 1992, 1994 and 1996 Mexican income and expenditure surveys (ENIGH), and IMF staff estimations.

1/ Other than farmers.

Note: (\*), (\*\*), and (\*\*\*) denote statistical significance at the 10, 5, and 1 percent levels, respectively.

homeowners do not need to spend their income on rent.<sup>38</sup> **The relative risk of poverty was also reduced for individuals living in households headed by farmers, or with more than three family members.** In these cases, consumption of self-production and pooling of household resources across family members could have helped to protect from declining household welfare.

- **The regression analysis using the pooled data for both 1994 and 1996 confirms the previous results and sheds some light on the gap in poverty incidence between urban and rural areas** (Table 11). The pooled regression analysis shows that the risk of becoming poor in the aftermath of the crisis increased disproportionately for those resident in urban areas, for the households in the Yucatán, and for those that are headed by either very young or very old individuals. Despite the long-term trend towards widening inequality between rural and urban areas, as documented in other empirical studies (Bouillon, Legovini and Lustig, 1998), **rural households were better protected than urban households from the risk of poverty during the 1994–95 financial crisis, once all the other determinants of the probability of being poor are held constant.** A possible explanation for this result is that higher unemployment and soaring inflation had a stronger impact on the living conditions of the urban poor, particularly those households slightly above the poverty line. At the same time, the incidence of poverty remained much higher in rural areas than in urban areas: the relative risk of poverty for households living in rural areas was more than twice that of urban households.

#### D. Data Quality and Robustness of Estimates

**Previous studies using Mexican data have noted the discrepancies between national accounts data and household survey data.** In particular, aggregate private consumption data available from the national accounts statistics include purchases by nonprofit institutions providing services to households, such as religious organizations, which household surveys do not include. In addition, in contrast to household surveys, national accounts data incorporate purchases by nonresidents and exclude purchases by resident household members in the foreign market. These differences have led to an underestimation of private expenditures in household surveys.<sup>39</sup> As noted by Lustig and Székely (1997), these discrepancies are problematic to the extent that the directions of changes in private consumption differ over time between household survey and national accounts data, as the authors find for the period between 1984 and 1989.

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<sup>38</sup> According to the definitions of consumption and income used in this study, consistent with international practice, household income and consumption include imputed rents from owner-occupied housing. Therefore, home losses could increase the risk of becoming poor.

<sup>39</sup> Lustig (1981) finds that household survey consumption accounts for only 80 percent of the private consumption estimates in the national accounts in 1968, and 64 percent in 1977. Castro-Leal Talamás (1995) reports this ratio at 45 percent in 1984 and 54 percent in 1989. Calculations in this study suggest that this ratio fell to 41 percent in 1992, 41 percent in 1994, and 37 percent in 1996.

Table 11. Results of the Estimates of the Pooled Logit Model—Dependent Variable: Probability of Being Poor  
(Percent values, unless otherwise specified; consumption-based definition of poverty)

	1992/1996			1994/96		
	$\beta$	Wald	$\Omega$	$\beta$	Wald	$\Omega$
Household consumption						
Share of nondurables	8.42 ***	259.17	4,518.84	10.6 ***	295.1	42,639.38
Share of food	0.09	0.29	1.10	1.02 ***	36.69	2.76
Household income						
Share of wages and salaries	0.10	0.51	1.11	-0.20	2.57	0.82
Share of profits	-0.16	0.71	0.86	-0.66 ***	13.83	0.51
Share of property incomes	0.28	0.28	1.33	-1.59 **	5.79	0.20
Share of cooperative incomes	-15.12	0.80	0.00	-6.49	1.96	0.00
Share of transfers	-0.26	2.10	0.77	-0.52 ***	10.29	0.60
Share of self-employed income	0.27	1.81	1.31	0.53 ***	7.18	1.71
Share of other incomes	-8.11 ***	156.36	0.00	-7.87 ***	146.52	0.00
Household size						
2 members	-0.27 **	3.51	0.77	-0.62 ***	17.42	0.54
3 members	0.08	0.43	1.08	0.21 *	3.38	1.24
4 members	0.29 **	6.18	1.33	0.46 ***	17.86	1.59
5 or more members	1.37 ***	214.78	3.92	1.58 ***	330.9	4.85
Area of residence						
Centre	-0.19 ***	12.19	0.83	-0.15 ***	8.81	0.78
South	0.40 ***	33.48	1.49	0.20 ***	8.15	1.07
Yucatán	0.21 ***	7.09	1.23	0.26 ***	11.00	1.11
Household head characteristics						
Males	-0.08	1.00	0.92	-0.04	0.34	0.96
Literate	-0.98 ***	78.57	0.37	-0.55 ***	30.67	0.96
Homeowner	-0.12	1.55	0.89	-0.27 ***	9.29	0.77
Urban residence	-0.56 ***	47.23	0.57	-0.73 ***	80.82	0.48
Technical education 1	-0.14	0.46	0.87	0.09	0.31	1.10
Technical education 2	-0.33 **	4.53	0.72	-0.36 ***	7.17	0.70
Employee	-0.19	2.59	0.83	-0.35 ***	14.67	0.71
Self-employed	0.62 ***	22.52	1.86	0.15	2.18	1.16
Farmer	1.00 ***	64.64	2.73	0.76 ***	64.08	2.14
Pensioner	-1.27 ***	13.60	0.28	-0.78 ***	9.54	0.46
Other	-0.07	0.28	0.93	-0.42 ***	14.42	0.66
Elementary school	1.10 ***	192.77	3.02	0.92 ***	212.49	2.51
Middle school	0.20 **	4.58	1.23	-0.04	0.23	0.96
High school	-0.45 ***	10.24	0.64	-0.69 ***	28.66	0.50
College or higher	-1.84 ***	51.57	0.16	-1.28 ***	51.75	0.28
40–59 years of age	0.06	0.94	1.06	-0.26 ***	21.61	0.77
60–74 years of age	-0.31 ***	24.09	0.74	-0.25 ***	20.22	0.78
75 years and older	0.00	0.00	1.00	0.42 ***	13.47	1.52

Table 11. Results of the Estimates of the Pooled Logit Model—Dependent Variable: Probability of Being Poor (concluded)  
(Percent values, unless otherwise specified; consumption-based definition of poverty)

	1992/1996			1994/1996		
	$\beta$	Wald	$\Omega$	$\beta$	Wald	$\Omega$
Interactions with dummy (1996=1)						
Employee	-0.13	0.84	0.88	0.05	0.20	1.05
Self-employed 1/	-0.26 *	3.54	0.77	0.18 *	2.93	1.20
Farmer	-0.49 *	9.94	0.62	-0.22 *	2.96	0.81
Pensioner	0.58	2.19	1.79	0.11	0.13	1.11
Other	-0.31 *	3.62	0.73	0.09	0.40	1.09
2 members	-0.23	1.52	0.79	0.13	0.47	1.14
3 members	-0.44 ***	7.29	0.64	-0.57 ***	14.07	0.57
4 members	0.13	0.75	1.13	-0.04	0.10	0.96
5 or more members	0.25 **	4.39	1.28	0.04	0.17	1.05
Centre	-0.18 ***	6.68	0.83	-0.22 ***	11.11	0.80
South	-0.12	1.41	0.89	0.09	0.87	1.09
Yucatán	0.28 ***	7.07	1.32	0.18 *	3.13	1.20
Homeowner	-0.03	0.05	0.97	0.11	0.99	1.12
Urban residence	0.48 ***	20.58	1.62	0.65 ***	41.24	1.92
Age	-0.11 ***	54.00	0.90	-0.07 ***	25.37	0.93
Age squared	0.00 ***	45.88	1.00	0.00 ***	16.94	1.00
Constant	-11.15 ***	395.74	0.00	-13.42 ***	441.10	0.00
Chi square	5.224			6.182		
Goodness of fit test	10.55			8.34		
Percent of correct classified cases	87.2			88.0		
Number of household	24,567			26,851		

Source: Data provided by the 1992 and 1996 Mexican income and expenditure surveys (ENIGH), and IMF staff estimations.

1/ Other than farmers.

Note: (\*), (\*\*), and (\*\*\*) denote statistical significance at the 10, 5, and 1 percent levels, respectively.

**To address these discrepancies, several adjustments to household survey data have been suggested.**<sup>40</sup> We adjusted the 1994 and 1996 household data to maintain the ratio to national accounts private consumption at the estimated 41 percent in 1992 and found that this leads to a poverty headcount ratio of 13 percent in 1996, rather than 17 percent reported earlier in the unadjusted sample. However, **the estimation results using the adjusted 1994 and 1996 samples are not significantly different.**<sup>41</sup> This is expected, as the adjustment leads to a change in the level of consumption for all households, and therefore the relative impact across household types remains unchanged.

## V. CONCLUSIONS AND POLICY RECOMMENDATIONS

**Both macro and microlevel data show an increase in poverty due to a financial crisis.**

The macrolevel analysis presents stronger results for changes in income distribution than in the incidence of poverty, unless the income share of the lowest quintile is interpreted as an indicator of poverty. The four transmission mechanisms of the effects of financial crises on poverty and inequality identified in this paper, namely inflation, unemployment, growth, and government spending, explain approximately 60-70 percent of the total observed change in the dependent variable. The decline in per capita GDP alone only explains up to one third of the change in the poverty indicator during a financial crisis. It is nevertheless deceptive to conclude, based on cross-country data, that crises have a limited impact on poverty. The poverty rate may change little over time but the number of people falling into poverty and escaping poverty over the same period may be large and the depth of poverty could widen. Aggregate statistics only show the average balance of gains and losses. Macrolevel data on poverty and income distribution are fraught with deficiencies; this calls for caution in interpreting cross-country evidence of an association between financial crises and poverty and income distribution.

**The incidence of poverty was found to increase relative to the precrisis period based on Mexican data.** Poverty rates soared, with a disproportionate increase in the probability of being poor for households in urban areas and in the Yucatán region, and those headed by either very young or very old individuals. This latter result is related to the increase in formal unemployment, notably in urban areas, and the insufficient adjustment of the level of social benefits in the wake of rising inflation. Along with the increase in the incidence of poverty, **the poverty gap widened, leading to an increase in the depth of poverty.** As the overall income distribution shifted to the left, owing to the decline in average real consumption resulting from the crisis, the poorest 10 percent of the poor became poorer. In addition, those households that were marginally above the poverty line before the crisis are likely to have fallen into poverty in the aftermath of the crisis, pointing to the absence of an adequate social

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<sup>40</sup> See Lustig and Székely (1997).

<sup>41</sup> Results of the logit and pooled logit estimations using the adjusted 1994 and 1996 sample are not presented here due to space constraints, but are available upon request.

safety net to prevent them from falling into poverty. The poverty gap increased relatively more for single parents, single-person households, households headed by individuals with no education and by elderly, and those in the Yucatán region.

**In contrast to the macrolevel results, income and expenditure inequality did not rise in the aftermath of the crisis.** Inequality fell between 1994 and 1996, in line with the trend observed between 1992 and 1994. Differences between the upper and the lower tail of the income/consumption distribution fell in the aftermath of the financial crisis, despite the overall increase in the incidence of poverty. This confirms previous results in the literature based on selected subsamples of the population, and can be explained by a disproportionate decline in the consumption/income of the wealthiest quintiles relative to the precrisis period. In fact, the microlevel analysis shows that households that were already poor before the crisis were not necessarily the hardest hit. This result points to the evidence that the poorest segment of the vulnerable groups in the population is more likely to be engaged in informal-sector activities, thereby being more protected from revenue losses during a financial crisis.

**Adequate social safety nets, through small, well-targeted income transfers, would have prevented many households from falling into poverty as a result of the crisis.** The simulations reported above show that transfers to individuals/households did little to prevent them from falling into poverty and the targeting of the existing transfer schemes did not improve substantially after the crisis. **At the same time, some households that were already poor before the crisis suffered disproportionately to the average poor, as a consequence of the absence of an adequate social safety net.** In particular, the existing public sector programs did not prevent declining consumption for households headed by single parents, less-educated individuals, and individuals aged 75 years or more. This decline contributed to an increase in the depth of poverty for groups of the population that were already among the most vulnerable in the precrisis period.

The empirical findings above support some specific policy recommendations.

**The results reported earlier suggest that policy should focus on avoiding an acceleration of inflation while keeping unemployment rates low in the wake of the crisis.** Increasing inflation is particularly bad for the poor as it affects negatively their real disposable income. The poor are also less likely to protect themselves against a decline in real consumption by dissaving, as they do not have sufficient financial assets. Sound macroeconomic policies (e.g., those leading to balanced economic growth and low inflation) reduce the risk of crisis and allow for the return to macroeconomic stability in the aftermath of financial crisis. The main challenge in the aftermath of financial crises is the choice of a policy mix that restores macroeconomic equilibrium while at the same time it reduces the social costs of the crisis. In doing this, the negative effect of unemployment on the poor documented in this paper has to be addressed by adequate labor policies. This paper, however, does not allow to reach specific conclusions on the possible trade off between unemployment and inflation. According to the empirical results, both factors are channels through which financial crises can affect the poor with a similar strength.

**The provision of safety nets and the protection from cuts of specific social programs remain the main short-term propoor policy response to financial crisis.** The key goal of safety nets is to insure the poor against the risk of income losses.

- **Propoor spending should be protected in the wake of a financial crisis.** Adequate mechanisms must be put in place so that propoor spending is protected during times of austerity. The protection of social spending from cuts ensures continuity of development policies but often does not ensure short-term social protection, particularly when spending under these programs is poorly targeted.
- **A social safety net system should be in place prior to a crisis.** The aim should be to have safety nets as permanent institutions to be deployed as needed. Medium-term planning is crucial in this respect. Setting up safety nets takes time and requires the ability of the government to react at short notice. Social safety nets should be flexible, so that they can be adjusted to changes in the size and the characteristics of the poor when the economy is hit by a shock, such as a financial crisis. As shown in the case of Mexico, had such a social safety net been in place before the crisis, it would have prevented many households from falling into poverty. In particular, the Mexican experience highlighted the absence of safety nets targeted at the urban poor.
- **The design of a safety net should take account of the poverty risks of different population groups,** with effective targeting to the most vulnerable groups. As the poorest of the poor are often engaged in informal-sector activities, policies targeted at this group should be designed differently from those programs aimed at helping the vulnerable groups of workers in the formal sector. **The Mexican case highlights the vulnerability of the urban poor.** PROGRESA—a targeted human development program implemented in 1997, hence after the period under study—provides cash transfers to rural households, school supplies, and nutrition supplements conditional on children's school attendance, and regular preventive health care visits. Although these efforts are welcome, PROGRESA does not target urban groups who may have the most to lose during crisis.

**Geographical targeting could also be used in the design of safety nets for Mexico.** As noted above, the incidence of poverty increased disproportionately for residents living in certain parts of the country during the financial crisis. Moreover, the differences among the North, South and Yucatán regions need to be addressed in the effort to reduce poverty and inequality. Finally, the results have shown that the effect of the crisis have not been gender-specific but exhibit a marked age-related profile, with the households headed by the youngest and the oldest individuals suffering from the largest increase in the depth of poverty. This points to the need to promote employment of young people in the aftermath of crisis (e.g., through self-selecting public work schemes) and to revise the current system of social protection for the elderly, guarding the level of lower social benefits against price increases.

## Data and Methods

### The cross-country methodology

**Control group:** The control group comprises the OECD countries that did not experience a crisis episode between 1960–98. The following countries were excluded: Finland, France, Greece, Iceland, Italy, New Zealand, Portugal, Spain, Sweden, and the United Kingdom. Most of these countries experienced a currency crisis in the early 1990s related to the Exchange Rate Mechanism realignment in 1992. Mexico, the Republic of Korea, and Turkey were not included in the OECD sample.

Information on income distribution and poverty is scarcer than on macroeconomic indicators of financial crises. Therefore, some adjustments were needed. In particular:

- Data on poverty and income distribution are not available for some countries that have experienced a crisis episode. Sometimes, data are available but not for the years near the crisis episodes (e.g., Sudan). These countries were dropped from the sample; they include the Islamic State of Afghanistan, Benin, Bhutan, Burundi, Cambodia, Cape Verde, Chad, the Comoros, the Democratic Republic of Congo, the Republic of Congo, Côte d'Ivoire, Egypt, Equatorial Guinea, Fiji, The Gambia, Iceland, the Lao People's Democratic Republic, Lebanon, the former Yugoslav Republic of Macedonia, Maldives, Mongolia, Morocco, Mozambique, Namibia, Nepal, Niger, Papua New Guinea, Paraguay, Rwanda, Samoa, São Tomé and Príncipe, Sierra Leone, the Solomon Islands, Sudan, Suriname, Swaziland, Togo, Ukraine, Uruguay, and Vietnam.
- Data on income distribution and poverty are available for one time period only for some countries that have experienced a crisis episode. These countries were also excluded from the sample; they include (with the time period in parenthesis) Algeria (1988), Argentina (1961), Botswana (1986), Burkina Faso (1995), Cameroon (1983), the Central African Republic (1992), Guinea-Bissau (1991), Guyana (1993), Lesotho (1987), Madagascar (1993), Malawi (1993), Mali (1994), Nicaragua (1993), Senegal (1991), Uganda (1989), and Zimbabwe (1990).
- Certain crisis episodes, rather than countries, were eliminated due to lack of information on income/poverty for the relevant years. These episodes were in Bolivia, Brazil, Chile, Colombia, Ecuador, Gabon, Ghana, Israel, Kenya, South Africa, Tanzania, Turkey, and Zambia.
- The period for which data are available for the income and poverty indicators do not necessarily coincide with the crisis episodes. In this case, the income/poverty data used are the ones nearest in time to the crisis episode. These adjustments include (with the data points of the income/poverty data in parentheses): Bolivia (1968 and 1990), Botswana (1986), Brazil (1960 and 1970, 1972, 1996), Burkina Faso (1991), Cameroon (1983), the Central African Republic (1992), Chile (1971 and 1980), China (1988 and 1995), Colombia (1978), Costa Rica (1971 and 1969, 1979, 1986 and 1989), the Dominican



Republic (1984, 1989), Ecuador (1968, 1993 and 1994), France (1979), Gabon (1975 and 1977), Ghana (1988 and 1989), Greece (1981 and 1988), Guatemala (1987), Honduras (1992 and 1994), Indonesia (1980 and 1981, 1987 and 1990), Israel 1979, 1986, and 1992), Italy (1993), the Republic of Korea (1985 and 1988), the Kyrgyz Republic (1988 and 1990), Mauritius (1986 and 1991), Mexico (1977 and 1984, 1989), New Zealand (1973, 1985), Nigeria (1982 and 1986), Peru (1981, 1986), the Philippines (1985, 1988, 1994), Portugal (1973 and 1980, 1990 and 1991), the Russian Federation (1995 and 1996), South Africa (1995 and 1996), Spain (1980 and 1985), Sri Lanka ( 1973 and 1979), Tanzania (1977 and 1991), Thailand (1992 and 1996), Turkey (1987), Venezuela (1981 and 1987, 1989 and 1990), and Zambia (1993 and 1996).

- Sometimes data are available for the relevant years but more information is available on different income/poverty indicators for a year that is close enough. In this case, the close enough information is used (e.g., Sweden).

With the adjustments above, a sample of 65 crisis episodes is available. Further adjustments were made to take into account the differences in the income/poverty data. These include the following:

- To maximize the degrees of freedom, different Gini coefficients were conflated. Information on the Gini coefficient is most readily available for gross income (40 episodes), followed by net income (19 episodes). When information was available for the same crisis episode for more than one Gini coefficient, preference was given to the indicators constructed for gross income, followed by net income. Because Gini coefficients are typically higher for income than expenditures, conflating these indicators for the same crisis episode was avoided.
- Information on the distribution of income per quintile is harder to come by than on the Gini coefficient. Data are available for income distribution based on gross income (28 episodes), followed by net income (10 episodes). After conflating the available information, a sample of 38 episodes is obtained. Again, the data were not conflated for income distribution based on expenditure and income.

Additional variables used in the cross-country analysis are the following:

- Social spending variables are defined in percent of GDP to construct the differences between crisis and precrisis values.
- Annual inflation is defined in percent.
- GDP per capita is defined in constant 1995 US dollars to construct percent rates of change in crisis years relative to precrisis years.

## The microlevel methodology

The data used in the analysis are drawn from the annual household budget surveys conducted by the Mexican Statistics Bureau. The sample includes 10,508 households for 1992; 12,814 for 1994; and 14,020 for 1996 after the elimination of those households that did not report income or consumption levels. The original data were converted into 1994 prices to ensure intertemporal comparability.

In the microlevel analysis, poverty is defined as the inability to attain a minimum standard of living as measured by the poverty line. Due to the multidimensional nature of poverty, both income- and expenditure-based poverty measures were used.<sup>42</sup> The expenditure-based poverty line, presented in the text, was calculated on the basis of a minimum consumption basket based on a daily caloric intake by the Mexican Statistical Institute.<sup>43</sup> The main advantage of this poverty line is that it may better proxy for the permanent income losses of the crisis. In order to check the robustness of the results to alternative definitions of poverty, an income-based poverty line was set equal to 50 percent of the sample average per capita income in 1992, and then adjusted in line with price changes.<sup>44</sup> Results using this definition confirmed the findings presented in the text.

Two different measures of poverty are used: (1) the headcount ratio, measuring the share of poor households in the sample; and (2) the poverty gap, measuring the difference in household consumption/income to the poverty line as a percent of the poverty line.<sup>45</sup> Consumption/income

is defined in per equivalent person terms according to the following formula:  $y_i^{eq} = \frac{y_i}{(N_i)^\varepsilon}$ ,

where  $y$  is household consumption/income,  $\varepsilon$  is an elasticity parameter equal to  $\frac{\partial y^{eq}}{\partial N}$ , and  $N$  is the household size.<sup>46</sup>

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<sup>42</sup> Both income and expenditures are defined as the sum of all monetary and nonmonetary components (in-kind payments, gifts and self-production) and the imputed values of the home owner's property. Results based on the income definition of poverty are available upon request.

<sup>43</sup> The poverty lines used here refer to the 1992 "extreme" and "moderate" poverty lines defined by INEGI. The extreme poverty line is N\$167,955 for urban households and N\$124,751 for rural households. The moderate poverty line is N\$335,910 for urban households and N\$218,314 for rural households in current Mexican pesos per month.

<sup>44</sup> This poverty line lies between the extreme and the intermediate poverty lines calculated by UN/ECLAC and INEGI (1993) for the 1992 ENIGH taking into account the cost of the minimum consumption basket.

<sup>45</sup> Both headcount and poverty gap ratios are insensitive to the extent of inequality among the poor.

<sup>46</sup> In the estimates presented in the paper,  $\varepsilon$  is set equal to 0.8.

Appendix Table 12. Distribution by Average Equivalent Expenditure Deciles of Selected Indicators

Deciles	1992														
	Age	Educ- ation	Size	Wage Share	Transfer Share	Self- Employed Share	Business Share	Property Share	Average Expend- iture	Average Income	Average Wage	Average Transfer	Average Profit	Average Other Income	Poverty
1	43.4	3.1	6.6	34.3	5.9	22.2	32.0	0.3	469	616	409	230	260	148	100.0
2	44.1	3.9	6.3	41.0	6.8	16.6	27.5	0.6	815	1,014	640	324	517	218	49.3
3	43.8	4.4	5.7	48.5	6.9	14.7	22.1	0.4	990	1,238	852	422	614	252	7.2
4	42.3	5.0	5.2	49.4	6.5	14.1	21.9	0.2	1,173	1,416	972	461	844	279	0.0
5	43.7	5.5	4.8	51.1	7.7	10.8	16.8	0.6	1,365	1,611	1,153	415	829	365	0.0
6	43.7	6.0	4.8	52.0	8.3	8.8	15.5	0.5	1,673	1,880	1,353	627	933	442	0.0
7	45.6	6.7	4.4	49.6	7.9	9.3	16.6	1.3	1,934	2,230	1,542	866	1,115	546	0.0
8	43.8	6.9	3.9	48.3	8.6	8.0	14.0	1.1	2,292	2,477	1,698	651	1,158	696	0.0
9	43.7	8.5	3.7	49.1	7.9	9.1	15.1	1.2	3,147	3,586	2,452	1,234	1,891	947	0.0
10	44.9	11.2	3.3	43.4	7.6	5.1	19.2	2.0	7,183	7,912	4,435	1,773	7,376	2,054	0.0
d10/d1	1.0	3.7	0.5	0.1	1.3	0.2	0.6	6.5	15.3	12.9	10.8	7.7	28.4	13.9	0.0
Total	44.0	6.4	4.7	46.9	7.5	11.2	19.5	0.9	2,348	2,661	1,714	805	1,514	666	12.7

Deciles	1994														
	Age	Educ- ation	Size	Wage Share	Transfer Share	Self- Employed Share	Business share	Property share	Average Expend- iture	Average Income	Average Wage	Average Transf.	Average Profit	Average Other Income	Poverty
1	44.2	3.3	6.5	40.6	6.1	16.0	21.0	0.2	541	651	464	296	217	179	100.0
2	45.8	3.7	6.0	43.0	7.3	15.7	20.3	0.7	817	979	714	378	387	249	29.7
3	44.9	4.4	5.5	47.9	7.1	13.2	18.2	0.5	1,032	1,257	928	510	490	294	1.8
4	45.3	4.6	5.3	47.5	7.8	11.9	18.4	0.3	1,262	1,534	1,154	525	682	372	0.0
5	43.4	5.5	4.8	47.4	7.7	12.5	18.6	0.2	1,432	1,670	1,165	596	777	429	0.0
6	44.5	6.0	4.5	44.2	7.3	12.0	17.9	0.5	1,663	1,924	1,322	561	938	528	0.0
7	44.2	6.7	4.3	45.7	6.3	13.0	18.6	0.5	1,965	2,301	1,625	583	1,079	630	0.0
8	44.6	7.7	3.9	45.5	8.1	11.1	16.5	1.0	2,368	2,807	1,860	882	1,438	809	0.0
9	44.0	8.6	3.5	48.2	7.8	8.3	13.9	1.6	3,155	3,645	2,521	914	1,701	1,056	0.0
10	46.7	11.3	3.1	46.0	8.9	7.5	15.3	1.8	7,017	8,317	5,798	2,314	4,724	2,258	0.0
d10/d1	1.1	3.5	0.5	1.1	1.4	0.5	0.7	10.3	13.0	12.8	12.5	7.8	21.8	12.6	0.0
Total	44.8	6.5	4.6	45.7	7.5	11.8	17.6	0.8	2,349.4	2,771.8	1,969.0	896.7	1,193.5	752.2	10.6

Deciles	1996														
	Age	Educ- ation	Size	Wage Share	Transfer Share	Self- Employed Share	Business Share	Property Share	Average Expend- iture	Average Income	Average Wage	Average Transfer	Average Profit	Av Other Income	Poverty
1	44.1	3.7	6.8	35.8	7.7	18.5	25.7	0.2	471	539	350	259	216	145	100.0
2	44.5	4.4	6.0	43.0	10.4	16.7	22.0	0.3	709	807	546	383	312	177	72.3
3	44.7	4.9	5.3	47.7	10.3	12.7	18.5	0.5	837	930	645	428	364	198	28.9
4	43.9	5.4	5.1	47.7	8.6	13.0	18.3	0.3	989	1,089	760	427	455	252	0.0
5	44.5	6.0	4.6	50.8	8.1	11.5	17.3	0.7	1,105	1,202	853	443	511	276	0.0
6	43.6	6.6	4.5	48.1	10.0	9.9	17.0	0.5	1,318	1,441	1,002	566	639	341	0.0
7	45.0	7.0	4.1	47.6	10.0	9.8	16.5	0.6	1,520	1,650	1,111	612	806	401	0.0
8	45.2	7.6	3.8	48.6	10.8	8.4	15.2	0.7	1,822	2,043	1,404	685	1,108	460	0.0
9	44.7	9.1	3.4	47.8	10.7	8.1	15.5	1.3	2,356	2,613	1,809	1,044	1,351	629	0.0
10	45.5	11.4	3.0	46.6	9.1	5.7	15.9	1.8	5,056	5,309	3,452	1,463	3,545	1,398	0.0
d10/d1	1.0	3.1	0.4	1.3	1.2	0.3	0.6	8.7	10.7	9.9	9.8	5.7	16.4	9.7	0.0
Total	44.6	6.9	4.5	46.6	9.6	11.0	17.9	0.8	1,762.3	1,913.7	1,304.0	690.1	892.3	467.7	16.9

Source: IMF staff estimates based on 1992, 1994 and 1996 ENIGH.

Appendix Table 13. Distribution by Average Equivalent Expenditure Deciles—Subsample of Poor Households

Deciles	1992														
	Age	Education	Size	Wage Share	Transfer Share	Self-Employed Share	Business Share	Property Share	Average Expenditure	Average Income	Average Wage	Average Transfer	Average Profit	Average Other Income	Poverty
1	43.3	2.6	6.7	26.3	4.1	31.1	41.3	0.0	249	396	255	149	185	97	100
2	44.6	1.9	7.0	28.9	8.5	21.3	33.7	0.6	392	540	305	236	254	134	100
3	42.4	3.2	6.8	38.2	3.9	20.7	29.5	0.4	455	613	416	225	277	147	100
4	43.2	3.6	6.7	39.7	4.8	16.1	25.6	0.8	517	620	402	188	222	167	100
5	43.5	3.3	6.1	35.7	5.5	22.8	35.1	0.0	536	744	579	170	334	154	100
6	42.3	3.2	6.1	33.2	7.6	24.0	30.1	0.0	586	678	392	261	312	180	100
7	45.9	3.8	6.5	41.4	6.6	19.1	27.8	0.0	671	863	492	386	329	188	100
8	43.9	3.7	6.8	39.4	5.9	16.6	26.9	0.2	750	926	587	314	417	212	100
9	44.7	4.2	6.4	45.6	8.0	20.8	26.1	0.0	778	941	674	424	518	198	100
10	40.5	5.3	6.4	60.1	6.6	8.0	12.5	2.5	944	1,193	915	342	465	221	100
d10/d1	0.9	2.0	1.0	2.3	1.6	0.3	0.3		3.8	3.0	3.6	2.3	2.5	2.3	1.0
Total	43.3	3.6	6.5	39.8	6.1	19.5	28.1	0.6	601	768	546	277	316	171	100
Deciles	1994														
	Age	Education	Size	Wage Share	Transfer Share	Self-Employed Share	Business Share	Property Share	Average Expenditure	Average Income	Average Wage	Average Transfer	Average Profit	Average Other Income	Poverty
1	43.5	2.3	7.7	30.4	5.1	24.4	29.0	0.0	365	463	289	196	164	145	100
2	45.5	3.2	7.0	43.6	4.4	15.8	21.7	0.0	459	546	438	152	172	145	100
3	42.7	3.5	6.5	36.9	6.5	16.3	19.6	0.4	500	606	401	295	218	186	100
4	43.8	3.0	6.1	33.6	7.7	13.3	18.1	0.0	525	587	465	228	184	182	100
5	42.4	3.0	6.2	40.7	3.6	22.2	26.4	0.1	576	670	431	206	267	184	100
6	44.9	3.3	6.2	47.9	4.3	10.2	16.3	0.8	626	739	502	262	217	220	100
7	45.0	3.4	6.1	46.4	7.7	12.1	18.9	0.0	654	818	542	354	295	188	100
8	47.9	4.8	6.3	48.4	9.5	11.9	16.4	0.7	707	889	732	583	245	213	100
9	46.9	3.1	6.5	41.4	5.5	17.5	21.6	0.0	785	942	763	282	409	237	100
10	42.9	4.9	6.1	54.9	5.8	11.8	14.6	0.1	912	1,086	826	339	551	290	100
d10/d1	1.0	2.2	0.8	1.8	1.1	0.5	0.5		2.5	2.3	2.9	1.7	3.4	2.0	1.0
Total	44.5	3.5	6.4	42.6	6.0	15.5	20.1	0.2	619	744	556	300	258	200	100
Deciles	1996														
	Age	Education	Size	Wage Share	Transfer Share	Self-Employed Share	Business Share	Property Share	Average Expenditure	Average Income	Average Wage	Average Transfer	Average Profit	Average Other Income	Poverty
1	44.8	3.0	7.9	24.8	5.8	21.6	30.6	0.0	322	363	220	155	140	122	100
2	43.4	3.4	7.0	33.3	10.3	19.3	25.3	0.1	435	517	319	340	185	140	100
3	45.9	3.3	6.4	37.9	8.0	15.3	24.8	0.1	477	542	330	258	224	146	100
4	42.0	4.6	6.1	42.9	5.8	19.0	24.4	0.1	520	594	404	179	263	146	100
5	44.3	4.3	6.4	39.6	8.3	17.7	24.1	0.6	600	677	440	325	310	170	100
6	43.4	4.5	6.2	45.0	9.5	13.3	19.9	0.5	629	677	478	318	256	158	100
7	44.5	4.1	6.1	45.0	7.7	17.6	24.3	0.2	669	759	477	370	326	163	100
8	45.0	4.4	6.2	45.2	10.7	16.1	21.1	0.4	720	826	558	379	323	177	100
9	42.6	5.4	6.2	53.6	7.9	15.0	19.5	0.1	818	945	704	337	425	193	100
10	43.2	6.1	5.4	56.5	5.4	11.7	17.1	0.6	831	930	678	290	445	191	100
d10/d1	1.0	2.0	0.7	2.3	0.9	0.5	0.6		2.6	2.6	3.1	1.9	3.2	1.6	1.0
Total	43.9	4.4	6.4	42.8	7.9	16.6	23.0	0.3	609	692	489	300	275	161	100

Source: IMF staff estimates based on 1992, 1994, and 1996 ENIGH.

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