THE IMPACT OF COVID-19 LOCKDOWNS AND EXPANDED SOCIAL ASSISTANCE ON INEQUALITY, POVERTY AND MOBILITY IN ARGENTINA, BRAZIL, COLOMBIA AND MEXICO

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CEQ Working Paper 92

AUGUST 2020

ABSTRACT

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The Impact of COVID-19 Lockdowns and Expanded Social Assistance on Inequality, Poverty and Mobility in Argentina, Brazil, Colombia and Mexico [‡]

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CEQ Working Paper 92
August 2020

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JEL Codes: C63, D31, I32, I38

Keywords: Covid-19, inequality, poverty, mobility, microsimulations, Latin America

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1. Introduction

The recent COVID-19 pandemic has come at overwhelming health and economic costs to Latin America. In August, Brazil, Mexico Peru, Colombia and Chile are among the top ten countries in terms of infections; Peru, Chile and Brazil are among the top ten in terms of deaths per hundred thousand inhabitants. [1]To contain the spread of the virus, governments implemented lockdown policies of various degrees.[2] Inevitably, these measures caused a sharp reduction of activity, a fall in employment and income, and a rise in poverty and inequality.[3] In this paper we analyze the impact of lockdown policies on poverty, inequality, and income mobility (before and after the shock) in the four largest countries in Latin America: Argentina, Brazil, Colombia and Mexico.[4] In addition to lockdowns to control infection rates, governments have introduced new or expanded social assistance measures to varying degrees. We assess the extent to which these measures offset the negative effects of the lockdowns.

We obtain our estimates by simulating potential income losses at the household level using microdata from household surveys. The simulations first identify individuals whose income is "at risk" because they work in sectors in which the lockdowns have reduced or eliminated activity. We aggregate this at-risk income to the household level and then simulate actual losses using a range of two key parameters: the share of households with at-risk income that actually lose income and, of those who lose income, the share of at-risk income lost. We allow both parameters to range from zero to one-hundred percent, yielding an equally wide range of possible outcomes. To narrow our focus to reasonable possibilities, we choose a combination of the two key parameters that yields a decline in per capita income that comes closest to the IMF World Economic Outlook forecast from June 2020.[5] Even here, there are multiple possibilities of which we present two extremes, one in which a smaller proportion of households lose a large share of their income and another in which a larger number of households lose less income. Other cases are available in the appendix.

To complete the analysis, we construct a simulated income distribution that incorporates the losses we estimate and compare it with the *ex ante* distribution. We also simulate a third distribution that incorporates the effects of the lockdown plus any new compensatory social assistance measures each

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[1] https://coronavirus.jhu.edu/data/mortality Also, projections by the Institute of Health Metrics and Evaluation released on June 25, 2020 estimated that by October 1, total deaths due to Covid-19 in LAC would reach near 440,000. http://www.healthdata.org/news-release/correction-new-ihme-covid-19-model-forecasts-latin-american-caribbean-nations-will-see

[2] For a description of lockdowns by country see, for example, Pages et al. (2020).

[3] According to IMF (2020) and ECLAC (2020), the region's GDP could contract in 2020 by 9.4 and 9.1 percent, respectively.

[4] Note that mobility here refers to *ex ante/ex post* comparisons and not to mobility over time or intergenerational mobility.

[5] We use the IMF predictions for 2020 adjusted to per capita growth rates using data on population growth for latest year available. Then, following the method suggested by Ravallion (2003) and applied by Lackner et al. (2020), we assume a "pass-through" of GDP growth to household (gross) income growth of 0.85.

government has taken. In addition to comparing standard distributional statistics for each income distribution, we find it especially useful to examine income losses conditional on one's position in the *ex ante* distribution.[6]

In addition to the obvious observation that the impact of the crisis is huge by any standard, our approach yields four important conclusions. First, increases in poverty are worse than if we had assumed that each household's income declines by an equal proportion as many other studies do.[7] This is a convenient assumption for the rapid analysis the crisis demands, and a necessary one for those working only with macroeconomic data, but it is inaccurate. Second, contrary to many people's priors, the non-anonymous growth incidence curves show that the losses are greatest in the middle (roughly) of the *ex ante* distribution rather than among the poorest. This is because the social assistance policies put in place in most Latin American countries over the past 25 years (Stampini and Tornarolli, 2012) put a "floor" under the incomes of the poorest. Third, the governments that have introduced substantial expansions of existing social assistance or entirely new programs (Argentina and Brazil) have been able to offset a significant share of the poverty caused by the crisis.

Fourth, in Brazil we find that poverty among afrodescendants and indigenous populations increases by more than for whites, but the offsetting effects of expanded social assistance also are larger for the former. In Mexico, the crisis induces significantly less poverty among the indigenous population. In all countries the increase in poverty induced by the lockdown is similar for male- and female-headed households but the offsetting effect of expanded social assistance is greater for female-headed households.

This paper makes several contributions. First, most existing exercises that predict the impact of Covid-19 on poverty assume that income losses are proportional across the income distribution.[8] Based on existing information, however, the distribution of income is changing—and changing fast--during the lockdowns. In particular, "real time" telephone surveys seem to show that it is the poorer and informal sector workers who lose employment and income in larger proportion due to the "Covid-19 effect."[9] Our use of microsimulation allows us to relax the equal loss assumption and so incorporate distributional changes in the analysis. In particular, we use techniques analogous to non-anonymous growth incidence curves to describe income losses across the *ex ante* income distribution. Second, ours is the first work to describe the distributional consequences of the expanded social assistance governments have implemented in response to the crisis and the extent to which that assistance offsets the crisis' effect on poverty. Some countries have expanded social assistance considerably in response

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[6] This is analogous to the non-anonymous growth incidence curves in Bourguignon (2011), albeit here describing a contraction.

[7] For example, CONEVAL (2020) (for Mexico), Gerszon Mahler et al. (2020), Sumner, Hoy and Ortiz-Juarez (2020), Valensisi (2020) and World Bank (2020a). Decerf et al. (2020) focus on a different question but they also assume no change in the distribution of income.

[8] ECLAC (2020), Universidad de los Andes (2020) (for Colombia) and Vos, Martin, and Laborde (2020) are exceptions.

[9] See, for example, Bottan, Vera-Cossio, and Hoffman, 2020; Brussevich, Dabla-Norris, and Khalid, 2020; Busso et al., 2020; INEGI, 2020; Universidad Iberoamericana, 2020).

to the crisis, so ignoring this exaggerates the recent increases in poverty. Third, we estimate the impact of lockdowns and social assistance by race and ethnicity, and gender.

Our exercise has some important caveats. The microsimulations do not take into account behavioral responses or general equilibrium effects, so they yield first-order effects only. The depth and duration of the crisis is still uncertain and the economies could end up contracting by more (or less) than the IMF June 2020 projections. Our results depend on the specific assumptions we make about income sources that are "at risk" (which we detail in Table A2 in appendix) and the extent to which losses are concentrated or dispersed across households.[10]

2. Data and Methodology

For our simulations, we use the most recent household survey available in each country: Argentina: Encuesta Permanente de Hogares (EPH, 2019), Brazil: Pesquisa Nacional por Amostra de Domicilios Continua (PNAD, 2019), Colombia: Gran Encuesta Integrada de Hogares (GEIH, 2019), Mexico: Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH, 2018). The household surveys for Brazil, Colombia and Mexico are representative at the national level. In Argentina the survey covers urban areas only that represent around 62 percent of the population. (For simplicity, in this paper we will refer to "Argentina" except in tables and figures where we shall add "urban").

We obtain our estimates by simulating potential income losses at the household level using microdata from household surveys. The simulations first identify individuals whose income is "at risk" because they work in sectors in which the lockdowns have reduced or eliminated activity (see more details below). We aggregate this at-risk income to the household level and then simulate potential losses using a range of two key parameters: the share of households with at-risk income that actually lose income and, of those who lose income, the share of at-risk income lost. Households who actually lose income (from the set of households with at-risk income) are randomly selected. We allow both parameters to range from zero to one-hundred percent (in 10 percent intervals), yielding a ten-by-ten matrix of possible income losses.[11]

We use gross income per capita as the welfare indicator. Gross income is defined as labor income plus rents, private transfers, pensions, and government cash transfers before any direct taxes. To maintain comparability across countries, we exclude own-consumption and the rental value of owner-occupied housing[12,13] We update gross incomes for Mexico to 2019 by the rate of growth of GDP per capita for

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[10] A minor caveat is that our simulation of social assistance programs includes most but not all of the emergency programs implemented.

[11] The results for this ten-by-ten matrix by country are shown in Table 2 in the next section.

[12] This may result in some discrepancies with poverty estimates published in national and international databases such as the World Bank's PovcalNet.

[13] For Mexico and Colombia we do have information on these two incomes. Including own-consumption has little effect on the results as this is a small amount even for the poorest. What effect there is, however, is concentrated among poorest. The rental value of OOH reduces the share of at-risk income roughly equally across the income distribution for both countries.

2019 multiplied by a so-called pass through of 0.85.[14] Also, for Mexico, we update gross incomes to take into account the significant reforms introduced to the cash transfers system in 2019.[15]

We base our determination of at-risk income on the economic sectors in which one works. We assume that income derived from work in sectors that are "essential" is not at risk, while any income earned in "nonessential" sectors is at risk. For Argentina and Colombia, the lockdown measures stated explicitly which sectors are essential. For Brazil and Mexico we use the ILO definition of essential sectors.[16]

At the household level, the at-risk incomes also include rental incomes and incomes of informal street vendors (regardless of the sector in which they work). For all other employment, we do not distinguish between formal and informal jobs. We assume that incomes from cash transfers programs, social security pensions, public employment and private transfers (e.g., remittances) are not affected by the lockdowns. Finally, we do not consider the income of white collar workers who are CEO's, managers and researchers with internet access at home to be at-risk even if they work in nonessential sectors.[17]

Our initial results for income losses provide a wide range of possibilities, too many to consider for further simulations. To narrow our focus, we choose outcomes that yield an overall loss of income per capita similar to the declines in GDP estimated in the June, 2020 World Economic Outlook predictions of the IMF.[18] In particular, we choose two scenarios that produce the income declines described: one in which a smaller proportion of households lose relatively large amounts of at-risk income; another in which many households lose a relatively smaller amount. We call these "concentrated losses" and "dispersed losses," respectively. We will say more on this below.

In addition to examining the ex ante and post-lockdown income distributions, we construct a third distribution that simulates most of the additional policies each government has put in place to cushion the impact of the crisis, including both expansions of existing social assistance and introduction of new programs. This yields a post-lockdown, post-policy response distribution. Table 1 gives a brief description of each government's policy responses that we can incorporate in our simulations of

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[14] The use of a pass through to convert GDP changes into changes in household disposable incomes was proposed by Ravallion (2003) and is applied by Lakner et al. (2020).

[15] The reforms are briefly described in Lustig and Scott (2019); details on how this update was carried out are available upon request.

[16] Decree 297/2020 (Argentina), Decree 457 of March 22nd of 2020 (Colombia), and ILO Monitor: COVID-19 and the world of work (Brazil and Mexico). Table A2 in the appendix shows the distribution of employment between at-risk and not-at-risk by sector.

[17] In the case of Argentina, the household survey does not allow us to identify internet access at home for white-collar workers.

[18] We use the IMF predictions for 2020 adjusted to per capita growth rates using data on population growth for latest year available. Then, following the method suggested by Ravallion (2003) and applied by Lackner et al. (2020), we assume a "pass-through" of GDP growth to household (gross) income growth of 0.85.

emergency social assistance programs.[19] Note that Mexico has provided no additional social assistance in the wake of the crisis.[20]

Table 1. Covid-19 New and Expanded Social Assistance Included in Simulations

Country	Program	Target population of new programs	Number of transfers	Amount of the transfers		Transfer as % of poverty line		Total beneficiaries (administrative data)	Fiscal cost in % of GDP
				LCU	USD	National	$5.50 PPP		
Argentina	AUH / AUE	-	1	ARG$3,100	US$46	34.7	77.5	4.3 million people	0.06%
	Ingreso Familiar de Emergencia*	Vulnerable, Informal workers	3	ARG$10,000	US$148	111.9	249.8	9 million people	1.14%
Brazil	Auxílio Emergencial*	Vulnerable, Informal workers	5	R$600	US$107	120.2	138.4	53 million people	1.95%
Colombia	Familias en Acción	-	3	COL$145,000	US$38	58.7	52.5	2.6 million households	0.10%
	Jóvenes en Acción	-	3	COL$356,000	US$92	144.1	128.9	204 thousand people	0.02%
	Colombia Mayor	-	3	COL$160,000	US$42	64.8	57.9	1.7 million people	0.07%
	Ingreso solidario*	Vulnerable, Informal workers	3	COL$160,000	US$42	64.8	57.9	3 million households	0.13%
	Bogotá solidaria*	Vulnerable, Informal workers	3	COL$233,000	US$60	94.3	84.4	300 thousand households	0.01%
Mexico	No additional social assistance								

Notes: * refers to new social assistance programs that were introduced in the first months of lockdowns. For a more detailed description (and sources) see Table A1 in appendix. Amount of the transfer in (local/USD) prices of May 2020. The number of beneficiaries in the simulations do not necessarily correspond exactly to those shown above because in Argentina the simulations apply to urban areas only. The numerator of the fiscal cost is obtained by multiplying the size of the transfers by the number of times it was given and the number of beneficiaries; the denominator equals GDP per IMF projections for 2020 (IMF, 2020).

3. Results

Composition of Pre-Crisis Income Across the Income Distribution

Figure 1 shows the composition of income by centile of the pre-crisis income (per capita) distribution across five categories: cash transfers, social security pensions, government salaries, other incomes not-at-risk, and incomes at-risk. There are two results to note. First, the share of income that is not at risk – everything but the dark blue area – is not equal across the income distribution as many studies assume, nor is it uniformly decreasing in income as it would be if the poorest were most at risk. Rather, it is U-shaped with the greatest risk in the middle of the income distribution rather than either extreme. The very poorest households have an income floor (albeit low) that protects an important share of their income. Second, while the richest households also have relatively low income at risk, in Colombia, Mexico, and perhaps Brazil, this is due to their receipt of social security pensions and employment in the public sector, not labor income from essential sectors or white-collar jobs that permit remote work.[21]

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[19] We do not include the employment support programs. Their impact is implicit in the projected aggregate contraction in the sense that the income of the beneficiary households of these programs is not at risk. In order to estimate the benefit of this policy, proper pre-policy counterfactuals need to be generated.

[20] Mexico neither expanded nor introduced new safety nets. There were really only two mitigation policies and neither involves an additional transfer: beneficiaries of the noncontributory pensions and scholarships were given two months in advance (with total payments for the year unchanged, at least for now) and access to "credito a la palabra" (a loan without any guarantees) to mainly small and medium enterprises (which could become a transfer in retrospect if they are not paid back).

[21] Here we should note that the Argentina survey is urban only which may explain its variance from the other countries.

Figure 1. Composition of Household Gross Income
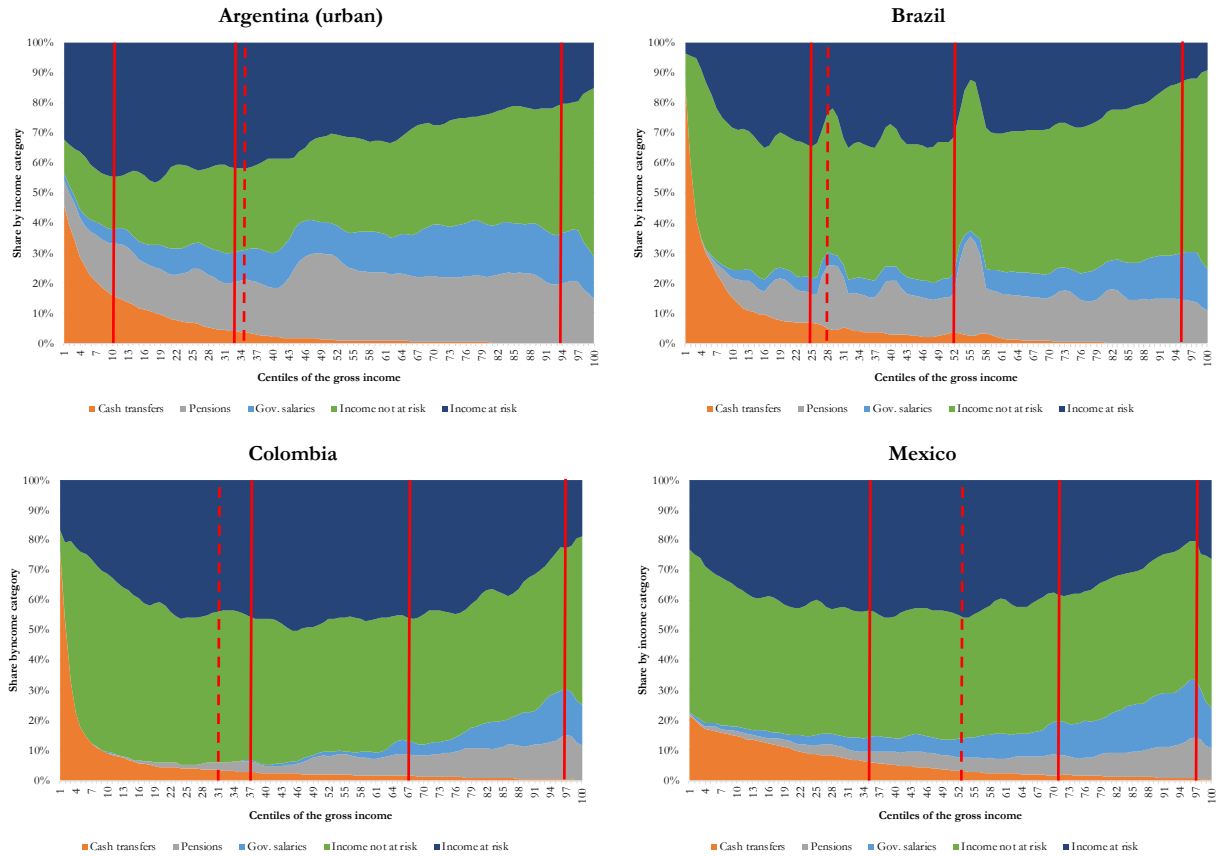
Notes: The dashed line is the national poverty line and the bold lines are—from left to right-- the $5.50 (moderate poor), $11.50 (lower-middle class) and $57.60 (middle class) per day international lines (in 2011 PPP), respectively.

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Cells in Table 2 show the range of possible households' gross income losses (as a proportion of ex ante gross income) for each country as we vary both the probability that a household loses at-risk income (down the rows) and the share of that at-risk income it loses (across the columns).[22] For example, in the 10 percent-10 percent cell of this matrix we show the fall in income in percent corresponding to the case in which 10 percent of the households (with at risk income) lose 10 percent of their income each (and so on). The possible losses are very wide indeed, ranging from near zero to 25-over 30 percent of pre-crisis income (depending on the country). To make the rest of the analysis manageable, we narrow our focus to outcomes that have income losses similar to the IMF's June 2020 World Economic Outlook projections for the decline in GDP per capita for each country, highlighted in yellow in Table 2. These form an "iso-loss" curve that runs through each table (see highlighted

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[22] See more details in the methodology section.

cells).[23] In particular, we choose the two such results closest to the corners of the table where either the smallest proportion of households lose much income (upper right) –"concentrated losses" scenario-- or the largest proportion of households lose smaller amounts of income (lower left) – "dispersed losses" scenario.

Table 2. Income Losses Matrix (as % of total household income)

Panel (a) Argentina (urban)

% of income lost ╱ % households losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
10%	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.7
20%	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2
30%	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0
40%	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.3	9.4	10.4
50%	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13.0
60%	1.6	3.1	4.7	6.2	7.8	9.3	10.9	12.4	14.0	15.5
70%	1.8	3.7	5.5	7.3	9.2	11.0	12.8	14.7	16.5	18.3
80%	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9	21.0
90%	2.4	4.8	7.1	9.5	11.9	14.3	16.7	19.0	21.4	23.8
100%	2.6	5.3	7.9	10.6	13.2	15.9	18.5	21.1	23.8	26.4

Panel (b) Brazil

% of income lost ╱ % households losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
10%	0.3	0.5	0.8	1.1	1.4	1.6	1.9	2.2	2.5	2.7
20%	0.5	1.1	1.6	2.2	2.7	3.3	3.8	4.4	4.9	5.4
30%	0.8	1.6	2.5	3.3	4.1	4.9	5.7	6.5	7.4	8.2
40%	1.1	2.2	3.3	4.4	5.5	6.6	7.6	8.7	9.8	10.9
50%	1.4	2.7	4.1	5.4	6.8	8.2	9.5	10.9	12.3	13.6
60%	1.6	3.3	4.9	6.5	8.1	9.8	11.4	13.0	14.6	16.3
70%	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1	19.0
80%	2.2	4.3	6.5	8.7	10.8	13.0	15.2	17.3	19.5	21.6
90%	2.4	4.9	7.3	9.7	12.1	14.6	17.0	19.4	21.8	24.3
100%	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3	27.0

Panel (c) Colombia

% of income lost ╱ % households losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
10%	0.3	0.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	3.4
20%	0.7	1.3	2.0	2.6	3.3	3.9	4.6	5.2	5.9	6.6
30%	1.0	2.0	2.9	3.9	4.9	5.9	6.9	7.8	8.8	9.8
40%	1.3	2.6	4.0	5.3	6.6	7.9	9.2	10.5	11.9	13.2
50%	1.7	3.3	5.0	6.6	8.3	9.9	11.6	13.3	14.9	16.6
60%	2.0	4.0	6.0	8.0	10.0	12.0	13.9	15.9	17.9	19.9
70%	2.3	4.7	7.0	9.4	11.7	14.0	16.4	18.7	21.1	23.4
80%	2.7	5.3	8.0	10.7	13.4	16.0	18.7	21.4	24.0	26.7
90%	3.0	6.0	9.0	12.0	15.0	18.0	21.1	24.1	27.1	30.1
100%	3.4	6.8	10.2	13.6	17.0	20.4	23.8	27.2	30.6	34.0

Panel (d) Mexico

% of income lost ╱ % households losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
10%	0.3	0.6	0.9	1.2	1.6	1.9	2.2	2.5	2.8	3.1
20%	0.6	1.3	1.9	2.5	3.1	3.8	4.4	5.0	5.7	6.3
30%	1.0	1.9	2.9	3.8	4.8	5.7	6.7	7.6	8.6	9.5
40%	1.3	2.5	3.8	5.1	6.4	7.6	8.9	10.2	11.4	12.7
50%	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.3	15.9
60%	2.0	3.9	5.9	7.8	9.8	11.7	13.7	15.6	17.6	19.6
70%	2.3	4.6	7.0	9.3	11.6	13.9	16.3	18.6	20.9	23.2
80%	2.6	5.3	7.9	10.6	13.2	15.8	18.5	21.1	23.8	26.4
90%	3.0	5.9	8.9	11.8	14.8	17.7	20.7	23.6	26.6	29.6
100%	3.3	6.6	9.9	13.1	16.4	19.7	23.0	26.3	29.6	32.8

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[23] We have also checked how poverty and inequality post-Covid vary as we move along the diagonal of the matrix shown in Table 2. The results can be seen for poverty in Figure A1 and for inequality in Figure A2 in the appendix. One can observe how the indicators accelerate in the negative direction (more poverty and more inequality, that is) as the order of magnitude of the two parameters is above 50-50 percent.

Notes: Cells in yellow correspond to losses similar to the loss projections by IMF (2020); cells in dark yellow correspond to the "concentrated losses" and "dispersed losses" scenarios described in the text.
Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Impact on poverty and inequality

For poverty, we estimate the incidence of poverty using two poverty thresholds: the national poverty lines and the US$5.50 a day international poverty line (in 2011 purchasing power parity).[24,25] We use the Gini coefficient to measure the impact on inequality.

Table 3 shows the change in poverty from *ex ante* income to post-lockdown income and from *ex ante* income to post-lockdown, post-policy response income. It is not surprising that the increases in poverty due to the lockdowns are very large for all countries, poverty lines, and scenarios (column 4). At national poverty lines, the results are quite similar across scenarios, suggesting that our results are robust to any particular pair of loss probability and loss share chosen from Table 2 so long as they produce a national decline in income per capita similar to the IMF's projections for GDP. At the $5.50 poverty line, poverty increases do differ somewhat across scenarios for Argentina and Brazil, but remain large. Note also that at the $5.50 line the poverty increases are considerably smaller in the "dispersed losses" scenario than the "concentrated losses" scenario for Argentina and Brazil.[26]

Column 7 of Table 3 gives a second key set of results: in Argentina and Brazil, where governments have committed significant resources to new or expanded social assistance, those policies have offset a considerable amount of the lockdown-induced increase in poverty. Indeed, in Brazil the offset is almost complete at the national poverty line and more than complete at the $5.50 line. In Colombia and Mexico, where governments have dedicated much less (or nothing) to new social assistance spending, the effect is much smaller or nil.

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[24] The national poverty line in 2011 PPP a day is equivalent to $12.3 in Argentina, $6.3 in Brazil, $4.9 in Colombia, and $7.8 in Mexico.

[25] For Argentina, the conversion to 2011 PPP uses Buenos Aires city's CPI because the one produced by the National Statistics Institute (INDEC) went through a series of methodological changes that weakened its credibility. See, for example, Cavallo (2013).

[26] As a check on the importance of the assumptions we have made about which income is at-risk, we repeated our analysis assuming that *all* income (except for income from cash transfers, pensions and government salaries) is at-risk. We find the results to be broadly similar, though the increases in poverty and inequality are slightly less when we restrict our attention to outcomes with income losses similar in scale to the IMF's predictions for declines in GDP.

Table 3. Incidence of Poverty
Panel (a) "Concentrated losses"

Country	*Ex ante*	*Ex post*	Change	New poor (in millions)	*Ex post +* Social Assistance	Change	New poor (in millions)
Panel (a) Headcount (National Poverty Line)							
Argentina (urban)	35.5	42.8	7.2	2.0	40.3	4.8	1.4
Brazil	28.2	34.6	6.4	13.5	31.5	3.4	7.1
Colombia	31.8	37.9	6.1	3.0	37.3	5.6	2.7
Mexico	53.8	60.1	6.4	8.0			
Panel (b) Headcount ($5.5 PPP Poverty Line)							
Argentina (urban)	10.9	19.1	8.2	2.3	16.8	5.9	1.7
Brazil	25.4	32.0	6.6	13.9	27.9	2.5	5.3
Colombia	37.6	43.6	6.0	2.9	43.0	5.4	2.7
Mexico	34.9	43.8	9.0	11.2			

Panel (b) "Dispersed losses"

Country	*Ex ante*	*Ex post*	Change	New poor (in millions)	*Ex post +* Social Assistance	Change	New poor (in millions)
Panel (a) Headcount (National Poverty Line)							
Argentina (urban)	35.5	43.1	7.6	2.1	40.7	5.1	1.4
Brazil	28.2	33.6	5.4	11.4	29.5	1.3	2.8
Colombia	31.8	36.9	5.2	2.5	36.4	4.6	2.3
Mexico	53.8	60.8	7.0	8.8			
Panel (b) Headcount ($5.5 PPP Poverty Line)							
Argentina (urban)	10.9	15.8	4.9	1.4	12.8	1.9	0.5
Brazil	25.4	29.8	4.5	9.3	25.2	-0.2	-0.4
Colombia	37.6	42.6	5.1	2.5	42.1	4.5	2.2
Mexico	34.9	42.9	8.1	10.1			

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table 4 gives similar results for inequality. Column 4 has the difference between *ex ante* and post-lockdown income. Under the "concentrated losses" scenario, the increase in inequality is large in all countries, but it is less so in the "dispersed losses" scenario. In the former, a smaller proportion of households are losing almost all their at-risk income which shifts them far to the lower end of the income distribution, necessarily increasing inequality almost regardless of where they started. In the latter, each losing household's loss is smaller and so less likely to move a large number of households to the low end of the distribution.[27] As with poverty, the new social assistance measures implemented in Argentina and Brazil succeed in reducing or eliminating the lockdown-induced increase in inequality.

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[27] As expected, the Gini coefficient is in all cases lower for the "dispersed losses" than for the "concentrated losses" scenarios, but this is not true for the headcount because it depends on the density of the population around the poverty line. The squared poverty gap (FGT(2))—which is distribution-sensitive among the poor--follows the same pattern as the Gini coefficient (see Table A5 in appendix).

Table 4. Gini Coefficient
Panel (a) "Concentrated losses"

Country	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Argentina (urban)	0.444	0.486	0.042	0.469	0.025
Brazil	0.554	0.591	0.037	0.565	0.011
Colombia	0.550	0.578	0.028	0.574	0.024
Mexico	0.464	0.503	0.039		

Panel (b) "Dispersed losses"

Country	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Argentina (urban)	0.444	0.467	0.022	0.451	0.007
Brazil	0.554	0.570	0.016	0.545	-0.009
Colombia	0.550	0.564	0.014	0.560	0.010
Mexico	0.464	0.479	0.015		

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Differential Impact by Ethnicity and Gender

Table 5 presents results for the change in poverty across distributions by race in Brazil and ethnicity in Mexico.[28] In Brazil, the impact of the lockdown (column 4) on afrodescendants and indigenous populations is more severe for both poverty lines and both scenarios. At the same time, the newly introduced social assistance offsets more of the poverty increase for afrodescendants and indigenous populations, leaving the overall increase in poverty roughly the same for both groups. In Mexico, the impact of the lockdown is much less for indigenous people than for whites.[29]

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[28] These distinctions are not possible in the data from Colombia and Argentina.

[29] In Brazil, the afrodescendants and indigenous populations category includes individuals who self-reported as "black" and "indigenous." In Mexico, the indigenous population is identified by those individuals who responded that they speak an indigenous language.

Table 5. Headcount Estimates by Race of the Household Head
Panel (a) "Concentrated losses"

Country	White					Afrodescendants and indigenous				
	Ex ante	Ex post	Change	Ex post + Social Assistance	Change	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Panel (a) Headcount (National Poverty Line)										
Brazil	27.2	33.5	6.3	30.6	3.4	35.2	42.5	7.2	38.5	3.2
Mexico	51.7	58.3	6.6			77.2	80.9	3.6		
Panel (b) Headcount ($5.5 PPP Poverty Line)										
Brazil	24.6	31.0	6.4	27.1	2.5	31.1	38.8	7.7	33.9	2.8
Mexico	32.1	41.4	9.3			66.0	71.4	5.4		

Panel (b) "Dispersed losses"

Country	White					Afrodescendants and indigenous				
	Ex ante	Ex post	Change	Ex post + Social Assistance	Change	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Panel (a) Headcount (National Poverty Line)										
Brazil	27.2	32.5	5.3	28.5	1.3	35.2	42.1	6.8	36.7	1.4
Mexico	51.7	58.9	7.2			77.2	81.7	4.5		
Panel (b) Headcount ($5.5 PPP Poverty Line)										
Brazil	24.6	28.9	4.3	24.3	-0.2	31.1	37.1	6.0	31.5	0.3
Mexico	32.1	40.4	8.3			66.0	71.7	5.7		

Notes: In Brazil, the afrodescendants and indigenous populations category includes individuals who self-reported as "black" and "indigenous." In Mexico, the category only includes those individuals who responded that they speak an indigenous language.
Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table 6 presents results for male- and female-headed households. The increase in poverty caused by the lockdowns (column 4) is broadly similar. Only in Argentina is the difference greater than one percentage point, and that only in the "concentrated losses" scenario. In Argentina and Brazil, the poverty increases from the *ex ante* to the post-lockdown, post-policy response distribution is less in female-headed households, indicating that the new social assistance introduced in response to the crisis has favored female-headed households. This reflects the emphasis these countries have placed on targeting them.

Table 6. Headcount Estimates by Sex of the Household Head
Panel (a) "Concentrated losses"

	Men					Women				
Country	Ex ante	Ex post	Change	Ex post + Social Assistance	Change	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Panel (a) Headcount (National Poverty Line)										
Argentina (urban)	33.6	41.0	7.4	39.0	5.4	38.7	45.0	6.3	42.5	3.8
Brazil	25.2	31.8	6.5	29.3	4.1	31.4	37.6	6.2	34.0	2.6
Colombia	30.1	35.9	5.9	35.5	5.5	34.9	41.5	6.6	40.6	5.8
Mexico	54.1	60.6	6.5			52.7	58.7	6.0		
Panel (b) Headcount ($5.5 PPP Poverty Line)										
Argentina (urban)	9.2	18.6	9.4	16.4	7.2	13.7	20.6	7.0	17.6	3.9
Brazil	22.7	29.3	6.6	26.2	3.4	28.2	34.8	6.5	29.8	1.5
Colombia	37.0	42.7	5.7	42.2	5.2	38.7	45.2	6.5	44.6	5.9
Mexico	35.6	44.8	9.2			32.6	40.9	8.3		

Panel (b) "Dispersed losses"

|	Men					Women				
Country	Ex ante	Ex post	Change	Ex post + Social Assistance	Change	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Panel (a) Headcount (National Poverty Line)										
Argentina (urban)	33.6	41.5	7.9	39.0	5.4	38.7	46.0	7.3	43.3	4.6
Brazil	25.2	30.3	5.1	27.0	1.7	31.4	37.2	5.8	32.3	0.9
Colombia	30.1	35.3	5.2	34.7	4.7	34.9	40.1	5.2	39.4	4.5
Mexico	54.1	61.3	7.2			52.7	59.2	6.5		
Panel (b) Headcount ($5.5 PPP Poverty Line)										
Argentina (urban)	9.2	14.1	4.9	11.2	2.0	13.7	18.7	5.0	15.3	1.7
Brazil	22.7	26.8	4.1	23.1	0.3	28.2	33.2	4.9	27.5	-0.7
Colombia	37.0	41.8	4.9	41.3	4.4	38.7	44.1	5.4	43.5	4.8
Mexico	35.6	43.7	8.1			32.6	40.5	7.9		

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Coverage of Social Assistance

Figure 2 shows the coverage of social assistance transfers that existed before the crisis (on the left of each figure) and those measures plus any new or expanded social assistance implemented in response (on the right) for those who were poor before the crisis (in gray) and for those who became poor after the lockdown (in red). In both the "concentrated losses" and "dispersed losses" scenarios the two countries that have expanded social assistance significantly in response to the crisis show impressive increases in coverage for both the *ex ante* poor and the new poor which helps to explain their success at offsetting the poverty increase that lockdowns caused. It is also interesting that in these two countries the coverage of the *ex ante* social assistance measures is much higher for the *ex ante* poor, as it should be, but the difference narrows once the new policies are added to the mix, also as it should. These results suggest good targeting of both *ex ante* and new social assistance measures in Argentina and Brazil. Colombia also has a substantial increase in coverage for both the *ex ante* and the new poor, despite the limited budget it has dedicated to new social assistance measures.

Figure 2. Coverage of Existing and New or Expanded Social Assistance
Panel (a) "Concentrated losses"

Argentina (urban)

Brazil

Colombia

Mexico

Panel (b) "Dispersed losses"

Argentina (urban)

Brazil

Colombia

Mexico
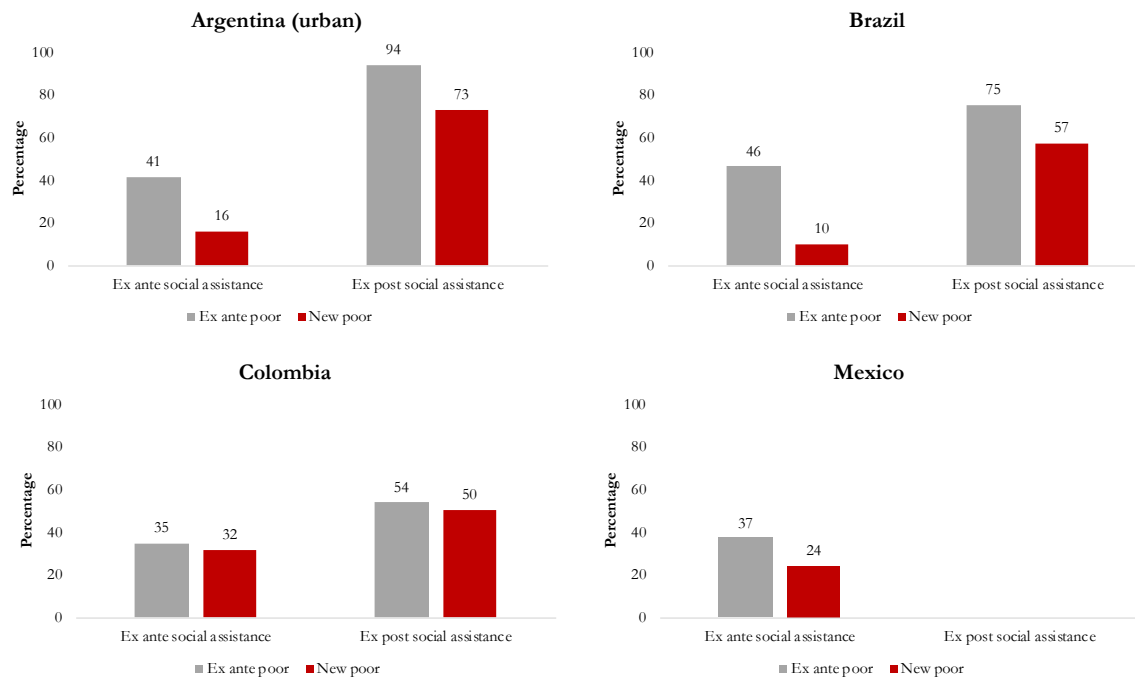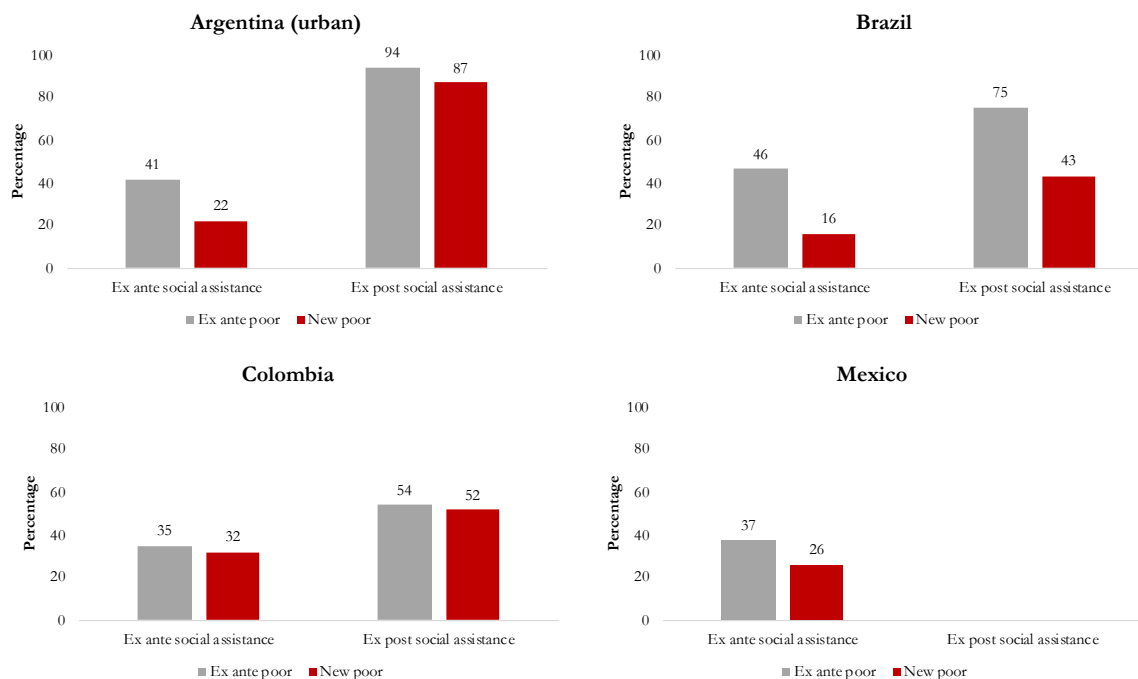
Notes: Poverty measured using the national poverty line.

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Impact on income mobility

The poverty and inequality comparisons above are anonymous. By (re-)ranking households from poorest to richest in each distribution, they do not consider the income trajectories of individual households. But those income trajectories are of considerable interest when income losses (or gains) differ, perhaps greatly, among households as they do here. To describe those trajectories, we use two non-anonymous distributional comparisons: non-anonymous growth incidence curves (GIC)—in this case, "contraction incidence curves"-- and mobility across broad income classes with income transition matrices.[30] These income classes are: extreme poor -- less than $3.20 per day; moderate poor -- between $3.20 and $5.50 per day; lower-middle class -- between $5.50 and $11.50 per day; middle class -- between $11.50 and $57.60 per day; and rich -- more than $57.60 per day.[31]

Figure 3 shows the change in income at each percentile of the *ex ante* income distribution.[32] Households across the entire income distribution are worse off on average (regardless of the scenario) after the lockdowns, which is not surprising, but the losses tend to be higher for the middle deciles rather than the poorest, which perhaps is surprising. The latter reflects the fact that poorer households have a cushion given by the existing social assistance programs (the yellow "band" in Figure 1); it also reflects the fact that three types of income are both not at risk and concentrated at the top end of the ex ante income distribution: social security pensions, salaries earned in the public sector, and labor earnings of white collar workers who are CEO's, managers and researchers with internet access at home. The dotted lines show the GIC after considering the effect of the expanded social assistance. As expected, social assistance cuts the losses and, indeed, increases the income of poor households by significantly more in Argentina and Brazil where the mitigation policies have been much more

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[30] Bourguignon (2011) discusses the theoretical and practical differences between the standard anonymous comparisons and non-anonymous methods, including the ones we use here.

[31] All cut-off values are in 2011 purchasing power parity (PPP) dollars. The default cut-off values $3.20 and $5.50 correspond to the income-category-specific poverty lines suggested in Jolliffe & Prydz (2016). The US$3.20 and US$5.50 PPP per day poverty lines are commonly used as extreme and moderate poverty lines for Latin America and roughly correspond to the median official extreme and moderate poverty lines in those countries. The $11.50 and $57.60 cutoffs correspond to cutoffs for the vulnerable and middle-class populations suggested for the 2005-era PPP conversion factors by López-Calva and Ortiz-Juarez (2014); $11.50 and $57.60 represent a United States CPI-inflation adjustment of the 2005-era $10 and $50 cutoffs. The US$10 PPP per day line is the upper bound of those vulnerable to falling into poverty (and thus the lower bound of the middle class) in three Latin American countries, calculated by López-Calva and Ortiz-Juarez (2014). Ferreira and others (2013) find that an income of around US$10 PPP also represents the income at which individuals in various Latin American countries tend to self-identify as belonging to the middle class and consider this a further justification for using it as the lower bound of the middle class. The US$10 PPP per day line was also used as the lower bound of the middle class in Latin America in Birdsall (2010) and in developing countries in all regions of the world in Kharas (2010). The US$50 PPP per day line is the upper bound of the middle class proposed by Ferreira and others (2013).

[32] In other words, each point on the curves shows the loss for the households that are, ex ante, in the shown centile in the x-axis. The y-axis shows the average change in per capita income. For example, the households in the first centile in Argentina could potentially lose about 13 percent of their pre-Covid per capita income before the expanded social assistance; that loss becomes a gain of roughly 30 percent once we consider expanded social assistance.

ambitious.[33] In all three countries that have new social assistance transfers those transfers favor the *ex ante* poor.

Figure 3. Non-anonymous Growth Incidence Curves
Panel (a) "Concentrated losses"
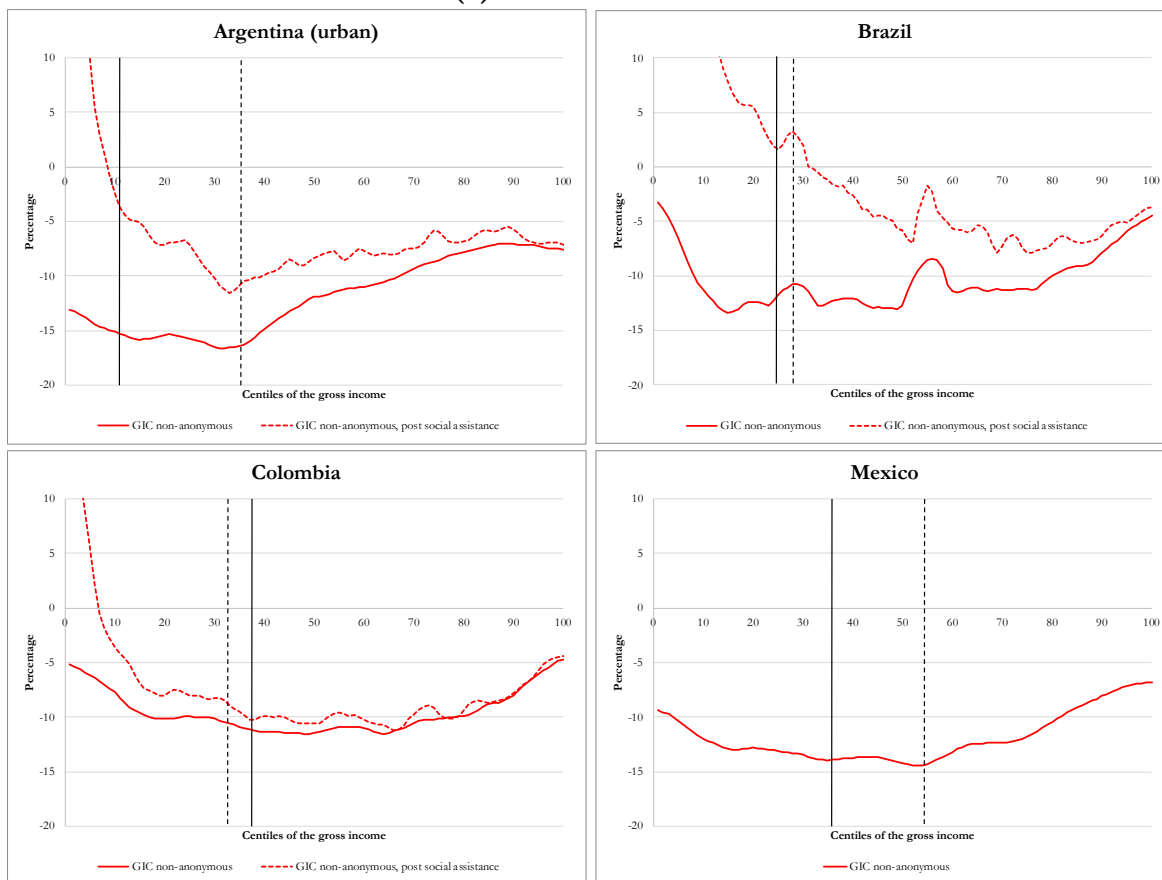
Panel (b) "Dispersed losses"
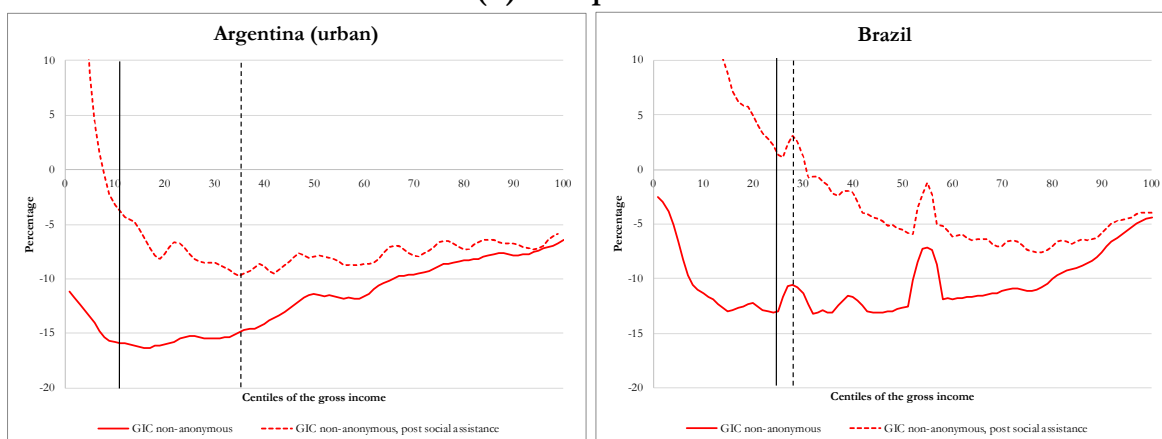
[33] Figure A3 in the appendix shows both the anonymous and non-anonymous GICs. The anonymous GIC tend to be upward sloping (except for the very poorest) and lie below the nonanonymous ones. In fact, the decline of incomes at the bottom before the expanded social assistance is much larger especially for the "concentrated scenario" because some of the households that were not among the poorest ex ante end up with almost zero income.
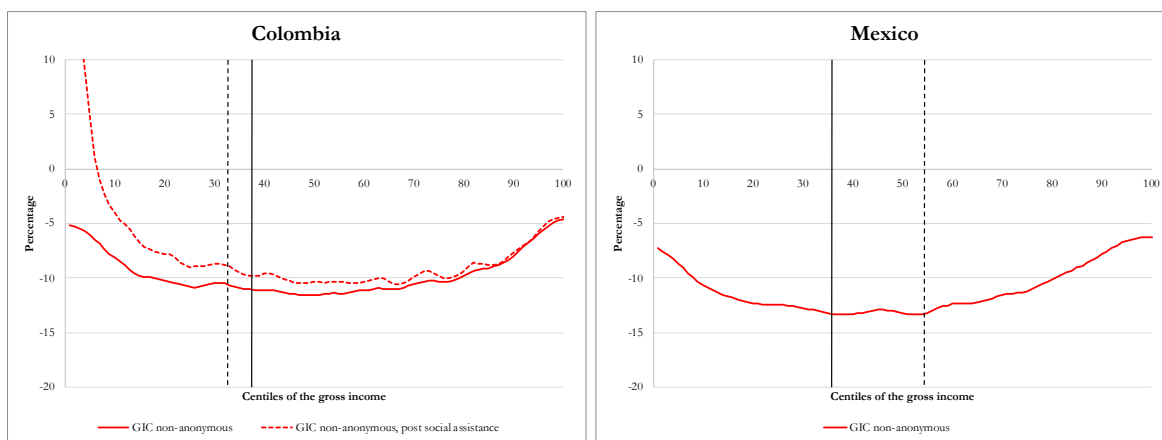
Colombia

Mexico

Notes: The dashed line is the national poverty line and the bold line is the $5.50 (moderate poor) per day international line (in 2011 PPP). Poverty lines based on the ex ante distribution of income.

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table 7 shows the downward mobility of the lower middle class and middle class caused by the crisis. Large shares of the *ex ante* poor fall into extreme poverty in both scenarios, and large shares of the *ex ante* lower-middle class fall into poverty. In the "concentrated losses" scenario, even some previously middle class households fall into poverty, though this does not occur in the "dispersed losses" scenario as the losses to any individual household are smaller and thus not sufficient to drive a previously middle-class household into poverty. The difference across scenarios in the impact of the newly introduced social assistance is much more striking in Argentina and Brazil, the two countries with substantial new programs. In the "concentrated losses" scenario, the new transfers offer only very small reductions in those who fall into extreme poverty or poverty. In this scenario, households are losing substantial amounts of income which the new social assistance is too small to replace. In the "dispersed losses" scenario, though, each losing household loses less income and the new transfers more often are sufficient to offset those losses and thus prevent households from falling into (extreme) poverty.[34]

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[34] The full set of income transition matrices can be found in the appendix (Tables A6 and A7).

Table 7. Inter-Income Group Mobility

Country	Without social assistance			With social assistance		
	% of moderate poor who fall to extreme poor	% of the lower-middle class who fall to poor	% of the middle class who fall to poor	% of moderate poor who fall to extreme poor	% of the lower-middle class who fall to poor	% of the middle class who fall to poor
	Panel (a) "Concentrated losses"					
Argentina (urban)	22.6	20.8	6.2	19.2	19.0	5.8
Brazil	16.2	14.8	6.0	13.9	12.9	5.4
Colombia	14.4	15.2	4.9	14.0	15.0	4.9
Mexico	20.1	20.3	4.8			
	Panel (b) "Dispersed losses"					
Argentina (urban)	27.5	21.9	0.0	7.8	13.0	0.0
Brazil	24.1	16.8	0.0	7.5	8.0	0.0
Colombia	20.0	17.0	0.0	18.3	16.2	0.0
Mexico	22.1	21.2	0.0			

Note: Income groups in terms of 2011 PPP are: moderate poor: between $3.20 and $5.50 per day; lower-middle class: between $5.50 and $11.50 per day; and middle class: between $11.50 and $57.60 per day.
Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Comparison to Other Studies

We have not found studies with non-anonymous analysis of income losses (income transitions or losses across the income distribution). Nor have we found any work on the distributional consequences of expanded social assistance. There is, however, a growing literature on the poverty impact of the crisis. Several studies assume that losses are proportional across the income distribution. For example, see Gerszon Mahler et al. (2020), Sumner, Hoy and Ortiz-Juarez (2020) and Valensisi (2020). Valensisi (2020) and Gerszon Mahler et al. (2020) do not present results for individual countries so we do not include them here.

Sumner, Hoy and Ortiz-Juarez (2020) use the World Bank's Povcal.Net platform and generate new poverty estimates by assuming that the poverty line increases by the same amount as their assumed contractions in income. For an aggregate contraction of 10 percent (which is the closest to our scenarios) and the $5.50 poverty line, their estimates predict an increase in the number of poor for Latin America and the Caribbean (LAC) of 23.5 million. For the four countries included here the increase is 15.8 million. In our analysis, the rise in the number of poor for these four countries before social assistance is 23.3 ("dispersed losses") and 30.4 ("concentrated losses") million. Their estimates are lower than ours because their study assumes proportional contractions across the income distribution.[35]

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[35] As a check on the importance of including the change in the distribution of income on our poverty estimates, we repeated our analysis assuming that everybody's income declines by the same per capita fall projected by the IMF for each country. In this case, the increase in the number of poor in the four countries taken together would equal 12.5 million

In ECLAC (United Nations Economic Commission for Latin America and the Caribbean, July 2020) incomes do not contract proportionally. For the four countries included here, ECLAC projects an increase of 31.2 million poor people using national poverty lines. Our estimate is an increase of between 24.9 ("dispersed losses") and 26.5 ("concentrated losses") millions, considerably lower. This is due to the fact that our estimates take into account the cushion that existing social assistance programs provide to the poorest while ECLAC's projections use labor income before transfers. A further difference in our results is that we take account of the offsetting effects of expanded social assistance. Do so reduces our estimates to an increase of between 15.3 (dispersed losses) and 19.1 (concentrated losses) poor people.

4. Conclusions

To contain the spread of the novel coronavirus, governments implemented lockdown policies of various degrees that, together with the global crisis, inevitably caused a sharp reduction in activity, a fall in employment and income, and a rise in poverty and inequality. Our microsimulations show that increases in poverty are worse than if we had assumed that each household's income declines by an equal proportion as many other studies of the crisis do. Contrary to prior expectations, we find that the worst effects are not on the poorest, but those (roughly) in the middle of the *ex ante* income distribution. We also find that the expanded social assistance governments have introduced in response to the crisis have a large offsetting effect in Brazil and Argentina, much less in Colombia (and nil in Mexico, a country where no expansion of social assistance took place). In Brazil, the lockdowns caused larger increases in poverty in the afrodescendant and indigenous populations than for others. But we also find that in Brazil the offsetting effects of expanded social assistance are larger for households whose head is afrodescendant or indigenous. In all countries the increase in poverty induced by the lockdown is similar for male- and female-headed households but the offsetting effect of expanded social assistance is greater for female-headed households.

It should be noted that our simulations do not include all the mitigation measures that have been implemented by governments. However, it covers the most important ones. Still, the impact of expanded social assistance on poverty, inequality and income mobility shown here is probably a lower bound. On the other hand, the decline in economic activity and employment may be higher than what the IMF (2020) forecasted. Thus, the impact of the coronavirus crisis on poverty and inequality may also be higher than our results show.

(using the $5.50 poverty line). This has to be compared with our distribution-sensitive simulations. As shown in Table 3, the increase in number of poor from the lockdowns is estimated to be between 23.3 ("dispersed losses) and 30.4 ("concentrated losses") million individuals. When we compare our results for the case without changes in the distribution to Sumner, Hoy and Ortiz-Juarez (2020), there is a difference of roughly three million more new poor in their estimates compared to ours: 12.5 m (ours) vs. 15.8 (theirs). We think that our estimates are lower because the IMF projections indicate lower than 10 percent contractions for Argentina, Brazil and Colombia.

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Appendix

Table A1. Description of Existing and New Social Assistance Programs by Country

ARGENTINA
INCREASED *Asignación Universal por Hijo* is a conditional cash transfer program for children and adolescents (younger than 18 years old) living in poverty or vulnerability situation. The program includes conditions related to health and education obligations. The beneficiaries are individuals and a household can receive of up to 5 allowances. During March 2020, the federal government has announced a unique increase of $3,100 ARS. The program represents around 35% and 77% of the national and $5.5 PPP per day poverty lines, respectively. https://www.unicef.org/argentina/media/4186/file/Universal%20Child%20Allowance%20(AUH).pdf
INCREASED (not included in simulation) *Pensión Universal para el Adulto Mayor* is an unconditional cash transfer aid to elderly than 65 years old that are not receiving any pension from the contributory system. The beneficiaries are individuals and there are no restrictions in the number of allowances per household. During March 2020, the federal government has announced a unique increase of $3,000 ARS. The program represents around 34% and 75% of the national and $5.5 PPP per day poverty line respectively. https://www.anses.gob.ar/pension-universal-para-el-adulto-mayor
NEW *Ingreso Familiar de Emergencia* is an unconditional transitory cash transfer aid to informal and vulnerable workers between 18 and 65 years old during the COVID-19 pandemic. The beneficiaries are individuals and only one allowance could be received per household. It is a monthly payment of $10,000 and it was delivered to beneficiaries during May, June and July. The program represents around 112% and 250% of the national and $5.5 PPP per day poverty line respectively. https://www.anses.gob.ar/ingreso-familiar-de-emergencia
BRAZIL
INCREASED NUMBER OF BENEFICIARIES (not included in simulation) *Bolsa Família* is a conditional cash transfer program for families living in poverty. The program includes variable benefits depending on the characteristic of the household. The beneficiaries are individuals and there are no restrictions in the number of allowances per household. The program includes conditions related to health and education obligations. https://publications.iadb.org/publications/english/document/How-Does-Bolsa-Familia-Work-Best-Practices-in-the-Implementation-of-Conditional-Cash-Transfer-Programs-in-Latin-America-and-the-Caribbean.pdf

NEW Auxílio Emergencial is a financial benefit for informal workers, individual microentrepreneurs, self-employed and unemployed and its purpose is to provide emergency protection in the period of coping with the crisis caused by the COVID 19 pandemic. The beneficiaries are individuals and there are no restrictions in the number of allowances per household. During April 2020, the federal government has announced the program that consists in five payments of $600 R. The program represents around 120% and 138% of the national and $5.5 PPP per day poverty line respectively. https://auxilio.caixa.gov.br/#/inicio

NEW *Benefício Emergencial de Manutenção do Emprego e Renda* is a program that helps companies and employees agree a proportional reduction of working hours and wages; or the temporary suspension of the employment contract. In compensation to that reduction, the government will cover the original wage of the worker. The beneficiaries are individuals and there are no restrictions in the number of allowances per household. During April 2020, the federal government has announced the program. The program represents around 160% and 184% of the national and $5.5 PPP per day poverty line respectively.https://servicos.mte.gov.br/bem/

COLOMBIA

INCREASED *Familias en Acción* is a conditional cash transfer program for children and adolescents (younger than 18 years old) living under food insecurity conditions. The beneficiaries are individuals and a household can receive of up to 3 allowances. The program includes conditions related to health and education obligations. The program represents around 59% and 53% of the national and $5.5 PPP per day poverty lines, respectively. https://plataformacelac.org/programa/481#:~:text=Familias%20en%20Acci%C3%B3n%20es%20un,permanencia%20en%20el%20sistema%20escolar.

INCREASED *Jóvenes en Acción* is a conditional cash transfer program for young adults (between 16 to 24 years old) facing economic difficulties to continue or finish their studies. The program includes conditions related to eligibility criteria on other programs such as Familias en Accion, Red de la superacion de la pobreza extrema, etc. The beneficiaries are individuals and there are no restrictions in the number of allowances per household. During August 2020, the federal government increased the number of beneficiaries in 140 thousand. The program represents around 144% and 129% of the national and $5.5 PPP per day poverty lines, respectively. https://prosperidadsocial.gov.co/sgpp/transferencias/jovenes-en-accion/cupos/

INCREASED *Colombia Mayor* is an unconditional cash transfer program that aims to increase protection for older adults who do not have a pension, or live in extreme poverty or indigence, through the delivery of a monthly economic subsidy. The beneficiaries are individuals and there are no restrictions in the number of allowances per household. During June 2020, the federal government has announced a payment increase of $160,000 Col for three months. The program represents around 65% and 58% of the national and $5.5 PPP per day poverty lines, respectively. https://www.fondodesolidaridadpensional.gov.co/fondo-de-solidaridad/que-es-el-fondo-de-

solidaridad-pensional/programas/programa-colombia-mayor.html#:~:text=El%20Programa%20de%20Protecci%C3%B3n%20Social,de%20un%20subsidio%20econ%C3%B3mico%20mensual.

NEW *Ingreso solidario* is an unconditional cash transfer program that aims to mitigate the situation of households facing economic difficulties due to COVID-19 crisis. The beneficiaries of Ingreso Solidario are not obligated to any condition but they must not being receiving any other social programs. The beneficiaries are households and only one allowance per household is permitted. The program represents around 65% and 58% of the national and $5.5 PPP per day poverty line respectively. https://ingresosolidario.dnp.gov.co/

NEW *Bogotá solidaria* is a unconditional cash transfer program (from Mayor's Office of Bogotá) that aims help vulnerable or poor families in the city of Bogotá so that they have a basic income during the COVID-19 quarantine. The beneficiaries of Bogotá Solidario must not have any intra-household violence record. The beneficiaries are households and only one allowance per household is permitted. During March 2020, the federal government has announced the program $233,000 Col for five months. The program represents around 94% and 84% of the national and $5.5 PPP per day poverty line respectively. https://rentabasicabogota.gov.co/

NEW (not included in simulation) *Subsidio de Nómina* is a subsidy received by the employers as a contribution of up to 40% of the value of the current legal monthly minimum wage for each employee. The beneficiaries are the formal workers and there are no restrictions in the number of allowances per household. The maximum value of the program represents approximately 142% and 127% of the national and $5.5 PPP per day poverty line respectively. https://www.grupobancolombia.com/personas/alivios-financieros/subsidio-pago-nomina#:~:text=Consiste%20en%20un%20subsidio%20creado,julio%20y%20agosto%20de%202020%2020.

Table A2. Employment by sector

Panel (a) Argentina (urban)

Sector	Not at risk	At risk	Total
Agriculture	65,109	0	65,109
Mining	36,897	12,281	49,178
Manufacturing	736,190	663,709	1,399,899
Electricity, gas and water supply	52,041	37,702	89,743
Construction	119,479	984,050	1,103,529
Retail and wholesale	593,180	1,584,484	2,177,664
Accommodation and food service	112,358	344,128	456,486
Transport	150,331	490,213	640,544
Information and communication	86,118	170,555	256,673
Financial services	178,675	88,681	267,356
Real estate	36,809	30,604	67,413
Professional activities	695,307	251,581	946,888
Public administration	1,016,020	0	1,016,020
Education	1,012,903	0	1,012,903
Health	793,233	0	793,233
Other sectors	349,785	1,404,260	1,754,045
Total	6,034,435	6,062,248	12,096,683
%	49.9%	50.1%	

Panel (b) Brazil

Sector	Not at risk	At risk	Total
Agriculture	8,636,764	0	8,636,764
Mining	384,819	28,358	413,177
Manufacturing	3,996,924	6,910,053	10,906,977
Electricity, gas and water supply	744,746	153,773	898,519
Construction	321,999	6,493,117	6,815,116
Retail and wholesale	8,352,357	9,543,628	17,895,985
Accommodation and food service	385,260	5,236,263	5,621,523
Transport	2,641,323	2,194,322	4,835,645
Information and communication	1,241,353	102,909	1,344,262
Financial services	1,103,351	168,406	1,271,757
Real estate	70,257	476,066	546,323
Professional activities	4,062,780	3,481,562	7,544,342
Public administration	5,111,266	0	5,111,266
Education	6,588,520	0	6,588,520
Health	4,747,906	0	4,747,906
Other sectors	698,142	10,602,821	11,300,963
Total	49,087,767	45,391,278	94,479,045
%	52.0%	48.0%	

Panel (c) Colombia

Sector	Not at risk	At risk	Total
Agriculture	3,515,167	0	3,515,167
Mining	195,612	1,222	196,834
Manufacturing	1,450,032	1,089,303	2,539,335
Electricity, gas and water supply	113,037	38,081	151,118
Construction	120,927	1,392,706	1,513,633
Retail and wholesale	1,632,476	2,815,331	4,447,807
Accommodation and food service	26,771	1,492,637	1,519,408
Transport	518,790	946,252	1,465,042
Information and communication	213,505	46,873	260,378
Financial services	305,304	26,567	331,871
Real estate	40,836	311,224	352,060
Professional activities	792,673	554,786	1,347,459
Public administration	711,302	0	711,302
Education	959,010	0	959,010
Health	956,935	0	956,935
Other sectors	205,906	1,688,689	1,894,595
Total	11,758,283	10,403,671	22,161,954
%	53.1%	46.9%	

Panel (d) Mexico

Sector	Not at risk	At risk	Total
Agriculture	8,953,313	0	8,953,313
Mining	198,514	0	198,514
Manufacturing	4,098,366	5,470,030	9,568,396
Electricity, gas and water supply	220,675	655	221,330
Construction	348,183	4,477,639	4,825,822
Retail and wholesale	5,893,101	5,145,482	11,038,583
Accommodation and food service	181,228	4,754,290	4,935,518
Transport	813,780	1,628,415	2,442,195
Information and communication	470,479	0	470,479
Financial services	558,741	557	559,298
Real estate	377,231	108	377,339
Professional activities	1,351,674	31,126	1,382,800
Public administration	2,172,350	0	2,172,350
Education	2,818,952	0	2,818,952
Health	1,670,654	0	1,670,654
Other sectors	6,208,673	5,566,657	11,775,330
Total	36,335,914	27,074,959	63,410,873
%	57.3%	42.7%	

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Figure A1. Sensitivity analysis of poverty

Panel (a) Argentina (urban)

Panel (b) Brazil

Panel (c) Colombia

Panel (d) Mexico
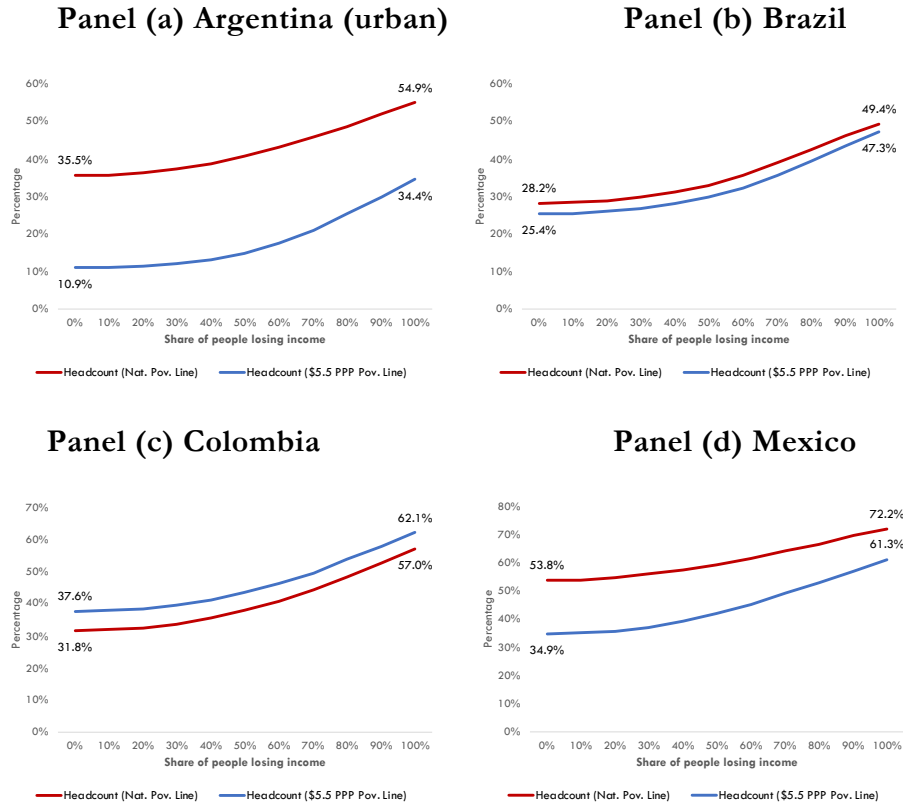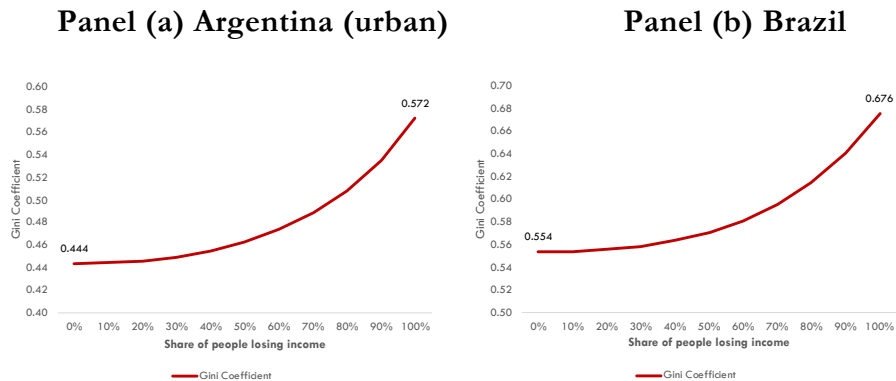

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Figure A2. Sensitivity analysis of inequality

Panel (a) Argentina (urban)

Panel (b) Brazil

Panel (c) Colombia

Panel (d) Mexico
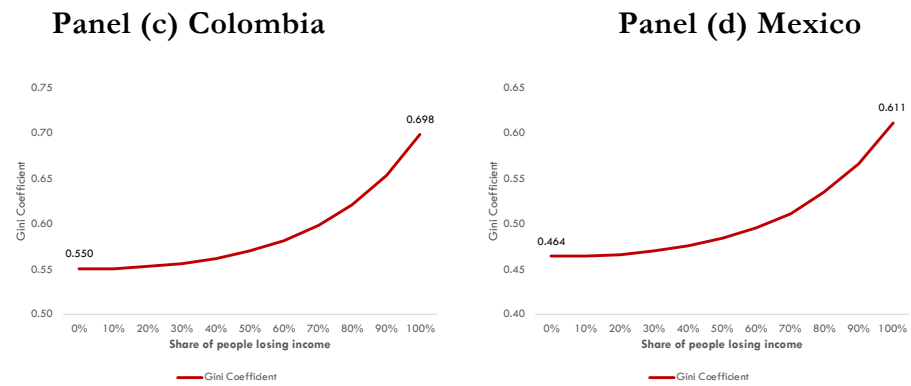
Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table A3. Incidence of Poverty for All Scenarios

Country	Scenario	*Ex ante*	*Ex post*	Change	New poor (in millions)	*Ex post* + Social Assistance	Change	New poor (in millions)
Panel (a) Headcount (National Poverty Line)								
Argentina (urban)	40% lose 90%	35.5	42.8	7.2	2.0	40.3	4.8	1.4
Argentina (urban)	50% lose 70%	35.5	42.9	7.4	2.1	40.3	4.7	1.3
Argentina (urban)	60% lose 60%	35.5	43.1	7.6	2.1	40.6	5.1	1.4
Argentina (urban)	70% lose 50%	35.5	43.0	7.4	2.1	40.7	5.2	1.5
Argentina (urban)	90% lose 40%	35.5	43.1	7.6	2.1	40.7	5.1	1.4
Brazil	30% lose 100%	28.2	34.6	6.4	13.5	31.5	3.4	7.1
Brazil	50% lose 60%	28.2	34.5	6.3	13.2	30.6	2.4	5.1
Brazil	60% lose 50%	28.2	33.7	5.6	11.6	30.1	1.9	4.0
Brazil	100% lose 30%	28.2	33.6	5.4	11.4	29.5	1.3	2.8
Colombia	30% lose 80%	31.8	37.9	6.1	3.0	37.3	5.6	2.7
Colombia	40% lose 60%	31.8	37.8	6.1	3.0	37.1	5.4	2.6
Colombia	60% lose 40%	31.8	37.4	5.7	2.8	36.8	5.1	2.5
Colombia	80% lose 30%	31.8	36.9	5.2	2.5	36.4	4.6	2.3
Mexico	40% lose 80%	53.8	60.1	6.4	8.0			
Mexico	60% lose 50%	53.8	60.4	6.7	8.3			
Mexico	100% lose 30%	53.8	60.8	7.0	8.8			
Panel (b) Headcount ($5.5 PPP Poverty Line)								
Argentina (urban)	40% lose 90%	10.9	19.1	8.2	2.3	16.8	5.9	1.7
Argentina (urban)	50% lose 70%	10.9	18.0	7.1	2.0	14.9	4.0	1.1
Argentina (urban)	60% lose 60%	10.9	17.5	6.6	1.9	13.9	3.0	0.9
Argentina (urban)	70% lose 50%	10.9	16.5	5.6	1.6	13.0	2.1	0.6
Argentina (urban)	90% lose 40%	10.9	15.8	4.9	1.4	12.8	1.9	0.5
Brazil	30% lose 100%	25.4	32.0	6.6	13.9	27.9	2.5	5.3
Brazil	50% lose 60%	25.4	31.1	5.8	12.0	26.4	1.1	2.3
Brazil	60% lose 50%	25.4	30.6	5.2	11.0	25.9	0.5	1.1
Brazil	100% lose 30%	25.4	29.8	4.5	9.3	25.2	-0.2	-0.4
Colombia	30% lose 80%	37.6	43.6	6.0	2.9	43.0	5.4	2.7
Colombia	40% lose 60%	37.6	43.5	6.0	2.9	42.9	5.4	2.6
Colombia	60% lose 40%	37.6	43.2	5.6	2.7	42.6	5.0	2.5
Colombia	80% lose 30%	37.6	42.6	5.1	2.5	42.1	4.5	2.2
Mexico	40% lose 80%	34.9	43.8	9.0	11.2			
Mexico	60% lose 50%	34.9	43.4	8.5	10.7			
Mexico	100% lose 30%	34.9	42.9	8.1	10.1			

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table A4. Gini Coefficient for All Scenarios

Country	Scenario	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Argentina (urban)	40% lose 90%	0.444	0.486	0.042	0.469	0.025
Argentina (urban)	50% lose 70%	0.444	0.477	0.033	0.460	0.016
Argentina (urban)	60% lose 60%	0.444	0.475	0.030	0.457	0.013
Argentina (urban)	70% lose 50%	0.444	0.470	0.026	0.453	0.009
Argentina (urban)	90% lose 40%	0.444	0.467	0.022	0.451	0.007
Brazil	30% lose 100%	0.554	0.591	0.037	0.565	0.011
Brazil	50% lose 60%	0.554	0.577	0.023	0.551	-0.002
Brazil	60% lose 50%	0.554	0.574	0.020	0.549	-0.005
Brazil	100% lose 30%	0.554	0.570	0.016	0.545	-0.009
Colombia	30% lose 80%	0.550	0.578	0.028	0.574	0.024
Colombia	40% lose 60%	0.550	0.572	0.022	0.568	0.018
Colombia	60% lose 40%	0.550	0.566	0.016	0.563	0.012
Colombia	80% lose 30%	0.550	0.564	0.014	0.560	0.010
Mexico	40% lose 80%	0.464	0.503	0.039		
Mexico	60% lose 50%	0.464	0.487	0.023		
Mexico	100% lose 30%	0.464	0.479	0.015		

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table A5. Squared Poverty Gap

Panel (a) "Concentrated losses"

Country	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Panel (a) Squared Poverty Gap (National Poverty Line)					
Argentina (urban)	7.8	13.9	6.1	11.6	3.8
Brazil	9.0	15.1	6.1	10.9	1.9
Colombia	8.9	12.6	3.7	12.0	3.0
Mexico	10.7	16.7	6.0		
Panel (b) Squared Poverty Gap ($5.5 PPP Poverty Line)					
Argentina (urban)	2.2	6.1	3.9	3.9	1.8
Brazil	7.7	13.7	6.0	9.6	1.9
Colombia	11.1	15.0	3.8	14.4	3.2
Mexico	6.0	11.0	5.0		

Panel (b) "Dispersed losses"

Country	Ex ante	Ex post	Change	Ex post + Social Assistance	Change
Panel (a) Squared Poverty Gap (National Poverty Line)					
Argentina (urban)	7.8	10.8	3.0	8.7	1.0
Brazil	9.0	10.5	1.6	7.4	-1.6
Colombia	8.9	10.4	1.5	9.9	1.0
Mexico	10.7	14.0	3.3		
Panel (b) Squared Poverty Gap ($5.5 PPP Poverty Line)					
Argentina (urban)	2.2	3.0	0.8	1.8	-0.4
Brazil	7.7	9.0	1.3	6.0	-1.7
Colombia	11.1	12.8	1.7	12.3	1.1
Mexico	6.0	8.0	2.0		

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Figure A3. Anonymous and Non-anonymous Growth Incidence Curves
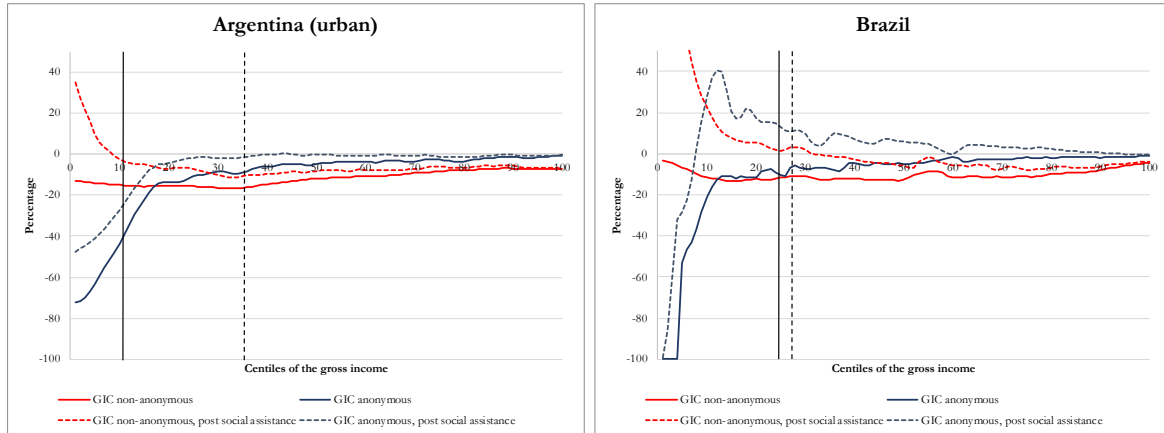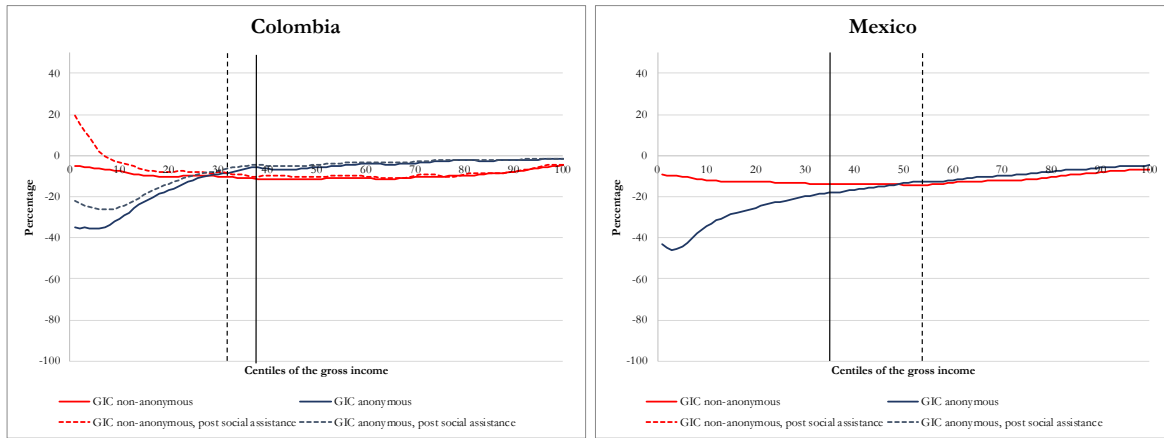
Panel (a) "Concentrated losses"

Colombia (chart)

Mexico (chart)

Panel (b) "Dispersed losses"

Argentina (urban) (chart)

Brazil (chart)

Colombia (chart)

Mexico (chart)
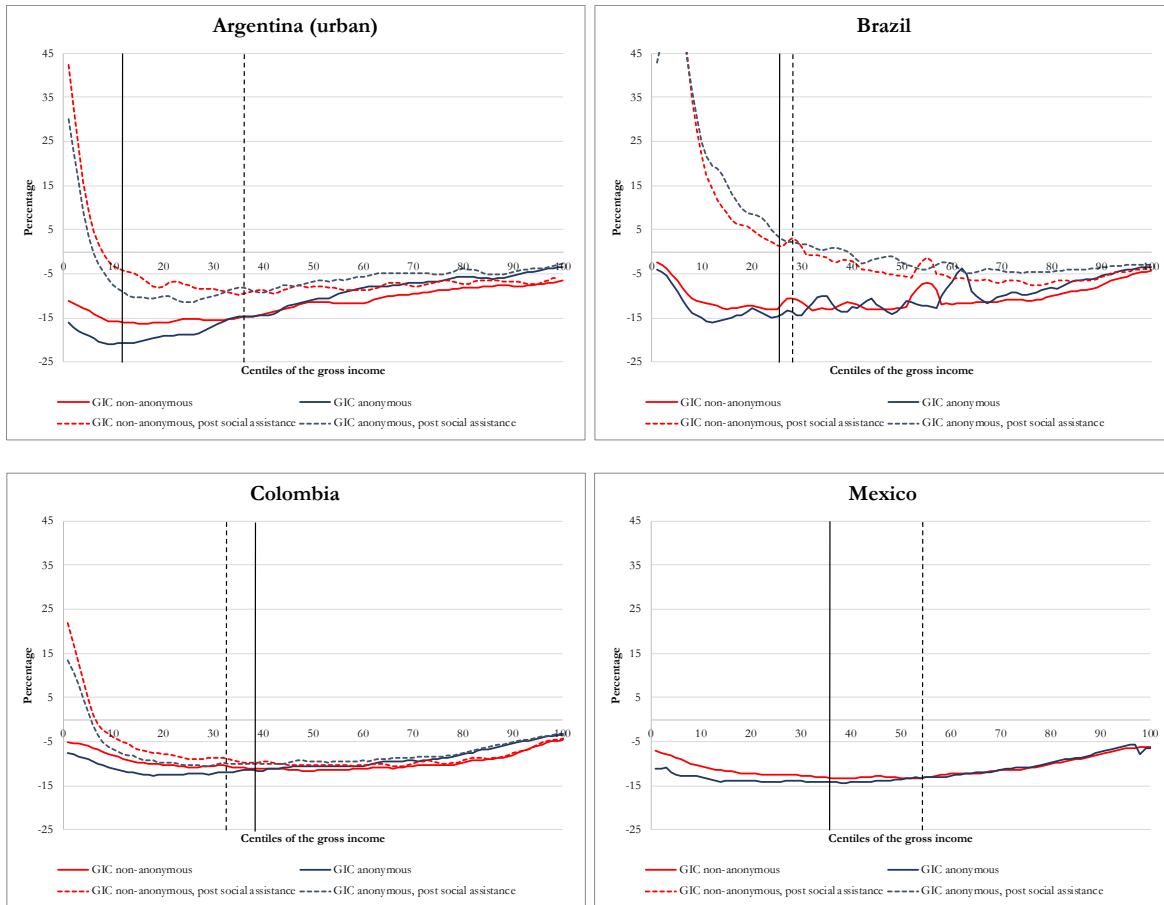
Notes: The dashed line is the national poverty line and the bold line is the $5.50 (moderate poor) per day international line (in 2011 PPP). Poverty lines based on the ex ante distribution of income.
Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table A6. Transition Matrices, "Concentrated losses"

Panel (a) Argentina (urban)

	Income group	Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	78.4%	21.5%	0.1%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	19.2%	53.8%	26.9%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	11.6%	7.3%	72.9%	8.1%	0.0%	100.0%
	11.50 <= y < 57.60	3.3%	2.5%	5.1%	88.9%	0.2%	100.0%
	57.60 <= y	0.0%	0.0%	1.8%	10.6%	87.6%	100.0%
Change wrt. the same group		131.9%	11.4%	-4.6%	-7.1%	-10.6%	

Panel (b) Brazil

	Income group	Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	76.2%	22.6%	1.3%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	13.9%	60.0%	26.1%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	8.7%	4.2%	78.5%	8.6%	0.0%	100.0%
	11.50 <= y < 57.60	4.4%	1.1%	5.1%	89.3%	0.2%	100.0%
	57.60 <= y	1.2%	0.0%	0.2%	4.5%	94.1%	100.0%
Change wrt. the same group		20.5%	-1.8%	-0.7%	-4.9%	-4.5%	

Panel (c) Colombia

	Income group	Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	97.2%	2.8%	0.0%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	14.0%	83.3%	2.7%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	10.5%	4.4%	84.5%	0.5%	0.0%	100.0%
	11.50 <= y < 57.60	2.0%	2.9%	7.0%	88.1%	0.0%	100.0%
	57.60 <= y	0.0%	0.0%	0.0%	6.6%	93.4%	100.0%
Change wrt. the same group		28.1%	-1.1%	-6.8%	-10.8%	-6.6%	

Panel (d) Mexico

	Income group	Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	20.1%	79.9%	0.0%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	11.6%	8.7%	79.7%	0.0%	0.0%	100.0%
	11.50 <= y < 57.60	1.6%	3.2%	8.2%	86.9%	0.0%	100.0%
	57.60 <= y	0.0%	0.0%	0.0%	8.5%	91.5%	100.0%
Change wrt. the same group		73.4%	-1.6%	-14.6%	-12.7%	-8.5%	

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).

Table A7. Transition Matrices, "Dispersed losses"

Panel (a) Argentina (urban)

Income group		Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	81.6%	18.4%	0.0%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	7.8%	76.9%	15.2%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	0.0%	13.0%	82.1%	4.9%	0.0%	100.0%
	11.50 <= y < 57.60	0.0%	0.0%	9.6%	90.3%	0.2%	100.0%
	57.60 <= y	0.0%	0.0%	0.0%	15.5%	84.5%	100.0%
Change wrt. the same group		-4.3%	29.3%	12.3%	-6.4%	-13.7%	

Panel (b) Brazil

Income group		Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	78.8%	20.3%	0.9%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	7.5%	74.3%	18.2%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	0.0%	8.0%	88.0%	4.0%	0.0%	100.0%
	11.50 <= y < 57.60	0.0%	0.0%	8.3%	91.6%	0.1%	100.0%
	57.60 <= y	0.0%	0.0%	0.0%	6.7%	93.3%	100.0%
Change wrt. the same group		-14.4%	14.5%	10.1%	-5.2%	-5.9%	

Panel (c) Colombia

Income group		Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	97.9%	2.1%	0.0%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	18.3%	80.0%	1.6%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	0.0%	16.2%	83.5%	0.3%	0.0%	100.0%
	11.50 <= y < 57.60	0.0%	0.0%	13.5%	86.5%	0.0%	100.0%
	57.60 <= y	0.0%	0.0%	0.0%	7.8%	92.2%	100.0%
Change wrt. the same group		13.9%	9.9%	-1.9%	-12.5%	-7.8%	

Panel (d) Mexico

Income group		Post					% Population
		Extreme poor y < 3.20	Moderate poor 3.20 <= y < 5.50	Lower-Middle Class 5.50 <= y < 11.50	Middle Class 11.50 <= y < 57.60	Rich 57.60 <= y	
Pre	y < 3.20	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3.20 <= y < 5.50	22.1%	77.9%	0.0%	0.0%	0.0%	100.0%
	5.50 <= y < 11.50	0.0%	21.2%	78.8%	0.0%	0.0%	100.0%
	11.50 <= y < 57.60	0.0%	0.0%	16.2%	83.8%	0.0%	100.0%
	57.60 <= y	0.0%	0.0%	0.0%	11.8%	88.2%	100.0%
Change wrt. the same group		38.7%	14.2%	-10.1%	-15.7%	-11.8%	

Source: Authors' calculations based on ENIGH (2018), EPH (2019), GEIH (2019), PNADC (2019).