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# Simulations of policy responses and interventions to promote inclusive adaptation to and recovery from the COVID-19 crisis in Ecuador

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**PAGE**  
policy analysis on growth and employment



## Abstract

COVID19 has had a devastating effect on the economy and health of households around the world. In this study, we evaluate the economic impact of COVID19, as well as the effect of the government interventions aimed at alleviating it, on the welfare of Ecuadorian households in terms of income shocks, poverty rates, and inequality. The empirical strategy is to measure the mean income shock by gender and economic sector based on cross sectional data from December 2019, May 2020, and September 2020, and using these estimates to simulate individual income shocks from the December 2019 data. This allows us to disaggregate our analysis by demographics and employment profiles in order to identify groups at risk and help guide future government programs to recover from COVID. We find that by May 2019, poverty had more than double reaching 57%, and average income fell by more than 50%. Informal workers, rural populations, indigenous households, and households with young kids were among the most affected. Current Government interventions have a negligible effect in the aggregate, but they may have been crucial for the subsistence of household below the poverty line.

**Key words:** COVID19, economic impact, micro-simulations.

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# 1 Introduction

The sudden appearance and rapid spread of the COVID-19 virus pushed Governments around the world to partially shut down their economies in order to limit contact and suppress transmission. During the first trimester of the pandemic, Ecuador was among the countries hardest hit by the virus. Even though it was one of the first countries to impose lockdown measures, according to an analysis of mortality data by The New York Times, between March and October 2020, the overall number of deaths in Ecuador was 36,800 higher than usual compared to the same period in previous years –that is 2.97 times higher than the number of deaths officially reported.

The economic effects of the pandemic are being widely felt in the country, which by the time of the virus outbreak, was also dealing with one of its worst economic crises in decades. Most Ecuadorian households are economically vulnerable to income shocks, and the double impact of COVID-19 on supply and demand has exacerbated this vulnerability. Indeed, the social distancing and lockdown measures needed to reduce the spread of the virus have had important consequences in the labour market and private transfers, thus directly affecting household's economic well-being. In addition, a large share of workers are informal workers (66% of total employment in December 2019).<sup>1,2</sup> Economic shocks to employment or to labour income are particularly dangerous for these workers as they have a very limited savings capacity and they do not have access to unemployment protection.

So far the Ecuadorian Government has implemented two large-scale policy responses aiming to alleviate the economic impact of the crisis on household welfare:<sup>3</sup>

## 1. The Humanitarian Support Law introduces minor tax reliefs and labour reforms,

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<sup>1</sup>Socio-Economic Database for Latin America and the Caribbean

<sup>2</sup>Productive informality: an individual is considered an informal worker if (s)he belongs to any of the following categories: (i) unskilled self-employed, (ii) salaried worker in a small private firm, (iii) zero-income worker.

<sup>3</sup>[Diario el Comercio: Ley de Apoyo Humanitario se publicó en el Registro Oficial, ¿qué implica?](#) (last accessed 20 October 2020)

along with other minor amendments to renegotiate commercial debt.<sup>4</sup> In terms of labour reforms, it allows the modification of existing economic conditions in current labour contracts, in particular, the reduction of employees' working time up to 50 per cent of the normal working hours, thus reducing payments proportionally. In terms of social security coverage and unemployment protection, it allows salaried workers who had been laid off, to apply for unemployment insurance after 10 days of unemployment instead of 60 days, as it was before. The Government increased their expenditure on unemployment insurance by \$372 million.<sup>5</sup>

2. Family Protection Bond for Emergencies: is a temporary emergency program targeting families whose income is below the minimum wage and do not have access to social security (informal workers). The Government spent \$250 million on this program.

Yet, these policies seem quite modest compared to the economic impact of COVID 19. It is, therefore, key to evaluate the impact of COVID19 on the economic well-being of Ecuadorians, as well as the effectiveness of the current policies. These evaluations shall consider differences across key demographics and employment profiles including gender, age, ethnicity, education, rural/urban areas, formal/informal workers, income deciles, and firm size, in order to identify vulnerable groups and help policymakers direct future efforts to alleviate the economic impact of COVID19.

We divide this project in three parts: first, we use cross sectional data from household labour surveys to estimate the impact of COVID19 on labour income by gender and economic sector from December 2019 to May and September 2020, as well as the overall impact on non-labour income. Then, we use these estimates to simulate individual incomes and household per capita income post-COVID19; we analyse the average impact on income and poverty rates among key sub-populations, as well as the overall effect on inequality. Finally, we run simulations of the effect of existing alleviation policies.

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<sup>4</sup>See [Registro-Oficial \(2020\)](#)

<sup>5</sup>See the [IMF \(2020\)](#) report for the amount spent in different programmes

The remainder of this paper is organised as follows: Section 2 presents the economic context pre-COVID in Ecuador; Section 3 we discuss related studies; Section 4 describes the data and the empirical strategy; Section 5 presents our results and Section 6 concludes.

## 2 The Economic Context of Ecuador

Ecuador was already a fragile economy when it became one of the countries most affected by COVID19. Since 2015, the average GDP growth of the economy was almost zero and GDP per capita decreased every year, except 2017 when it grew marginally (see Table 1). Unemployment fell from 4.7 to 3.8% in 2019, but through a lower participation in the labour market and a growth in informal work from 58.4% to 66.07%. Part of this growth in informality is driven by a growth in self-employment from 34 to 38%. These are likely to be workers who could not find salaried work, thus they start low productivity subsistence activities. Labour income also fell and fiscal accounting deteriorated. The country has also high levels of income inequality (the Gini coefficient was 0.459 in 2017, 0.469 in 2018, and 0.473 in 2019). The incidence of poverty is also high with an increasing trend (21.5% in 2017, 23.2% in 2018, and 25% in 2019).

For the vast majority of households in the country, labour income accounts for the main, if not the only, source of income. In December 2019, labour income accounted for 82% of total household income. Other sources of income include conditional cash transfers from the Government (CCT accounted for 15% of total income of program eligible households) and private transfers. In terms of social security coverage, the percentage of wage workers registered with the system's contributory scheme in 2019 was only 53.9%, that is 24.7% of the working population. If we take into account unpaid workers (16%) and self-employed (38%), the percentage of workers not covered by the social security system accounted, on average, for 75% of the working population. Given that these workers have a limited savings capacity to cope with economic shocks and they do not have access to unemployment protection, changes in labour income asso-

ciated to this group of workers are particularly important in terms of economic policy.

Table 1: Macroeconomic Statistics

Indicator	2015	2016	2017	2018	2019
GDP (real 2007 \$)	70,174	69,314	70,955	71,870	71,909
GDP growth (% annual)	0.1%	-1.23%	2.37%	1.29%	0.05%
GDP per capita (real 2007 \$)	4,310	4,193	4,229	4,221	4,164
GDP per capita growth (% annual)	-1.45%	-2.72%	0.85%	-0.18%	-1.36%
Public debt (% GDP)	33%	38.2%	44.6%	45.2%	44.9%
Primary fiscal deficit (% GDP)	-1.68%	-5.34%	-5.39%	-2.46%	-2.48%
Total population	16,278,844	16,528,730	16,776,977	17,023,408	17,267,986
Working age population	11,399,276	11,696,131	11,937,928	12,239,023	12,402,565
Active population	7,498,528	7,874,021	8,086,048	8,027,130	8,099,030
Activity rate (% working force)	65.78%	67.32%	67.73%	65.59%	65.3%
Unemployment rate (% labour force)	4.77%	5.21%	4.62%	3.69%	3.84%
Informal work* (% employed)	58.4%	62.2%	63%	64.7%	66.08%
Self-employed* (% employed)	34.1%	35.9%	35.6%	36.9%	38.5%
Mean labour income	355.6	337.1	341.2	333.5	325.8

Source: Central Bank of Ecuador; \*SEDLAC estimates

### 3 Related Literature

Several recent studies have focused in evaluating the impact of COVID19 on the world economy. For instance, the [ILO \(2021\)](#) has estimated that the COVID pandemic has resulted in 114 million lost jobs worldwide in 2020 compared to 2019. In Latin America and the Caribbean, using online surveys for 17 countries in the region, [Bottan et al. \(2020\)](#) found that 45% of respondents report that a household member lost their job and, among families who owned business, 58% report that a household member closed their business. More strikingly, they found that, among households with pre-COVID incomes below their national minimum wage, 71% report that a household member lost their job and 61% report that a household member closed their business; the authors

show that the crisis due to the pandemic has exacerbated economic inequality.

Regarding Ecuador, [Jara et al. \(2021\)](#) use a microsimulation model to study the role of tax-benefit policies in mitigating the immediate impact of the economic shock; they find that tax-benefit policies do little to mitigate the losses in household incomes due to the COVID19. They also report that inequality increased and poverty more than doubled –in line with our findings. Yet, their study considers aggregate measures. In contrast, our current paper analyses how COVID impacted subgroups such as different demographics and type of workers. This is important as there are large differences in the level of vulnerability of diverse groups.

For instance, gender and ethnic disparities in LAC countries are well documented, and Ecuador is not the exception. Using household surveys from Bolivia, Ecuador, and Guatemala, [Canelas and Salazar \(2014\)](#) show that, in the three countries, women are highly discriminated in the labour market and undertake most of the domestic activities in the household. Similarly, using data from eighteen Latin Americans countries, [Atal et al. \(2009\)](#) found that in most countries in the region, women are more likely than men to hold low-paid occupations and gender earnings gaps remain substantial. [Cunningham and Jacobsen \(2008\)](#) analyse data for Bolivia, Brazil, Guatemala, and Guyana and use simulations to show that there is significant income inequality across gender and ethnic groups in these countries.

## 4 Data and Empirical Strategy

### 4.1 Data

The data used in this paper is drawn from the National Survey of Employment and Unemployment 2019 and 2020 conducted by the Ecuadorian National Institute of Statistics (INEC).<sup>6</sup> The ENEMDU is a pooled cross-sectional survey representative of the Ecuadorian population. The survey collects detailed information on household de-

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<sup>6</sup>Encuesta Nacional de Empleo y Desempleo—ENEMDU

mographics, occupations and labour force participation, housing and asset ownership, and labour and non-labour income such as contributions from social assistance and private transfers. The data also allows us to identify formal workers affiliated to the national social security system. Workers registered with the public contributory pension scheme have access to health care services, unemployment and retirement benefits. They also have the right to earn at least the minimum wage, be paid for extra hours of work and to receive mandated benefits such as Christmas bonus salary and profit sharing at the end of the fiscal year (Canelas, 2014, 2019). In contrast, informal workers do not have any social security coverage.

## 4.2 Empirical Strategy

This study is part of a broader research initiative on the ‘inclusive adaptation and recovery policies responding to the COVID-19 crisis in developing countries.’ In order to allow for some comparison among the different countries in the project, we follow a similar methodology to estimate the effects of the COVID19 on households’ welfare.

The aim is to estimate individual incomes post-COVID and use them to analyse changes for key demographic groups. We start by computing the actual changes in average income for each economic sector in May 2020 and September 2020 (the two post-COVID cross section data sets) with respect to December 2019 (the last pre-COVID cross sectional data; see Table 2). For this purpose, we compute the mean labour income,  $\bar{Y}_{t,g,s}$ , and total employment,  $N_{t,g,s}$ , by gender,  $g$ , and economic sector,  $s$ , for each cross-sectional period,  $t$ . We then compute the changes in labour income,  $\Delta Y_{t,g,s}$ , at time  $t$  (May and September 2020) with respect to pre-COVID levels,  $\bar{Y}_{0,g,s}$  (December 2019), while considering the change in total employment in a given sector as zero-income in order to capture the expected income post-COVID accounting for the probability of unemployment in each sector.

$$\Delta Y_{t,g,s} = \frac{\bar{Y}_{t,g,s} N_{t,g,s} / N_{0,g,s}}{\bar{Y}_{0,g,s}}$$

We also compute the change in the mean individual non-labour income,  $\Delta Z_t$ , also ac-

counting for zeros. This includes remittances, government transfers, and private transfers.<sup>7</sup>

We use these shocks to estimate the expected individual income post-COVID,  $w_{i,t,g,s}$ , based individual's gender and economic sector, as well as the projected change in individual non-labour income:

$$y_{i,t,g,s} = y_{i,0,g,s}(1 + \Delta Y_{t,g,s})$$

$$z_{i,t} = z_{i,0}(1 + \Delta Z_t)$$

$$w_{i,t,g,s} = y_{i,t,g,s} + z_{i,t}$$

Based on these estimates at the individual level, we also compute the change in total household income per capita, as well as the labour and non-labour household income per capita. We use household income per capita to compute poverty rates and inequality.

Finally, we also simulate the impact of the current Government cash transfers in response to the crisis, as well as the additional unemployment insurance expenditures. Our strategy to evaluate the Family Protection Bond for Emergencies consists of considering the total Government expenditure on transfers (\$250 million) and distribute it equally to the simulated post-COVID incomes of the qualifying individuals—individuals below the extreme poverty line. To simulate the effect of the additional unemployment coverage, we consider the total additional Government expenditure on unemployment (\$372 million) and distribute it equally among formal wage workers.<sup>8</sup> We then compare poverty rates of key populations with and without the transfers.

The advantage of this exercise is that we can then analyze income shocks and poverty rates for key demographics and employment profiles.

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<sup>7</sup>Unfortunately, there was a problem with the remittance variable in the 2019 data, thus we can only consider the total non-labour income.

<sup>8</sup>Since we do not know who lost their job, we give all of qualifying workers an equal share of the unemployment budget.

## 5 Evaluation of the Impact of COVID19

Table 2: Change in labour income and employment 2019/2020

Econ. Sector	Mean income among employed			%Δ employment		Expected %Δ mean inc	
	12/2019	06/2020	09/2020	12/19 - 6/20	12/19 - 9/20	12/19 - 6/20	12/19 - 9/20
<i>Female</i>							
Agriculture + Fishing + Mining	77.86	49.65	77.35	-26.46%	-8.49%	-53.11%	-9.10%
Industry + Electricity gas & water	324.77	221.35	278.52	-25.38%	-18.28%	-49.14%	-29.92%
Construction	422.16	432.41	426.62	-16.96%	-5.66%	-14.94%	-4.66%
Trade	277.39	165.63	236.39	-27.92%	1.39%	-56.96%	-13.59%
Restaurants & Hotels	305.56	76.37	215.01	-20.97%	-9.98%	-80.25%	-36.66%
Transportation & communication	579.35	423.97	408.56	-20.00%	12.19%	-41.46%	-20.88%
Real estate	408.75	297.41	398.92	-48.04%	-1.04%	-62.20%	-3.42%
Public administration and defence	1008.34	828.78	970.17	12.01%	37.44%	-7.94%	32.24%
Education	766.74	702.07	717.59	-13.69%	-0.07%	-20.97%	-6.48%
Health	736.98	677.06	864.37	-17.13%	-4.89%	-23.87%	11.56%
Personal services	300.79	151.94	278.81	-44.36%	-33.24%	-71.89%	-38.12%
Other services	882.85	851.41	890.39	28.84%	30.29%	-16.15%	31.41%
All female	309.97	227.62	295.71	-26.42%	-7.36%	-45.97%	-11.62%
<i>Male</i>							
Agriculture + Fishing + Mining	241.79	146.09	211.96	-12.89%	-7.57%	-47.37%	-18.97%
Industry + Electricity gas & water	521.88	315.27	438.02	-30.51%	-3.19%	-58.02%	-18.75%
Construction	425.92	100.86	356.34	-42.16%	-11.64%	-86.30%	-26.07%
Trade	451.57	228.04	525.78	-17.90%	-2.71%	-58.54%	13.28%
Restaurants & Hotels	414.94	145.06	274.95	-17.63%	5.02%	-71.20%	-30.41%
Transportation & communication	494.78	211.28	408.98	-21.47%	-19.50%	-66.47%	-33.46%
Real estate	619.63	338.42	520.18	-24.85%	-10.52%	-58.96%	-24.88%
Public administration and defence	1016.79	925.27	1067.36	-11.51%	-9.65%	-19.48%	-5.16%
Education	819.99	695.47	926.78	-12.55%	11.28%	-25.83%	25.77%
Health	956.67	885.62	919.35	-8.14%	1.57%	-14.96%	-2.40%
Personal services	459.19	198.90	388.30	-23.87%	-16.23%	-67.02%	-29.16%
Other services	975.77	717.17	1017.63	18.44%	10.97%	-12.95%	15.73%
All male	437.45	251.64	410.99	-19.96%	-7.02%	-53.96%	-12.64%
All	384.41	242.08	363.17	-22.65%	-7.16%	-51.29%	-12.29%

Source: ENEMDU December 2019, June/May 2020, and September 2020

Note: The last two columns take into account the change in employment as zero incomes.

We start by reporting the impact of COVID19 on the mean labour income and on employment by gender and economic sector (see Table 2). Compared to December 2019, in May 2020 the aggregate mean income dropped by -51% and employment dropped by -21%. Among females, the most affected economic sectors during this period were restaurants/hotels, personal services, and real estate with drops in average income of -80%, -72%, -62%, respectively; among males, the most affected sectors were construction, restaurants/ hotels, and personal services with drops in average income of -86%, -71%, -67%, respectively. By September 2020, the drop in mean income across sectors improved (-12% compared with December 2019) and the average income recovered in several sectors such as education, health, and services.

There are gender differences regarding changes in employment. During the first trimester of the pandemic, female employment dropped by -26%, while male's employment dropped by -20%. By September 2020, the drop in employment across gender and sectors improved, although it remained 7% lower than in December 2019 for both male and female workers.

Individual non-labour income, dropped by -13% in May 2020 –despite an increase of 34% in Government transfer, albeit, from a very low base– but recovered to its pre-COVID level by September 2020 (see Table 3).

Table 3: Change in non-labour income 2019/2020

	Income			Change	
	Dec. 2019	May 2020	Sept. 2020	%Δ Dec-May	%Δ Dec-Sep
Non-labour income	44.34	38.37	44.30	-13.46%	-0.09%
Government transfers	4.44	5.94	4.80	33.75%	8.06%

Source: ENEMDU Dec 2019 and authors' calculations

Note: Changes in May and in September 2020 are both computed with respect to December 2019.

We use the estimates from Table 2 to simulate the change in individual labour income, and we use the last two columns of Table 3 to simulate the change in individual non-labour income as explained in the methodology. We then constructed household

income per capita, for which we estimate a drop of -44% in May 2019 and of -10% by September 2019 (see Table 4). As expected, we can see that the drop in household income per capita was mainly driven by the drop in labour income.

Table 4: Change in household per capita income 2019/2020

	December 2019	May/June 2020		September 2020	
	Income	Income	Change	Income	Change
HH inc pc	214.49	120.21	-43.95%	193.18	-9.93%
HH lab inc pc	170.14	81.83	-51.90%	148.83	-12.52%
HH nonlab inc pc	44.35	38.38	-13.46%	44.30	-0.13%

Source: ENEMDU Dec 2019 and authors' calculations

## 5.1 Heterogeneity on Individual Labour Income Shocks

In Table 5 we analyse shocks to labour income for key subgroups. We find that the labour income for informal workers<sup>9</sup> was considerably more affected than for formal workers' (-60% vs -42% in May 2020 and -17% vs -8% in September 2020). This is particularly severe considering that 75% of workers are in the informal sector. Workers in urban and rural areas experienced a similar shock in labour income (-52%), but income in urban areas recovered more by September (-12% vs. -16%). Also, rural workers earn considerably less than urban workers in all periods. Regarding private firm size and workers in the public sector, the income of workers at small firms was more affected than at big firms (-60% vs. -53% in May and -17% vs. -14% in September) and public workers were less affected (-23% in May and +3% in September). Note that 69% of workers are in small firms, and 7% are public workers.

There are striking difference by education level. Workers with higher education were much less affected (-39% in May and -4% in September) than high school graduates (-

<sup>9</sup>Informal worker: an individual is considered an informal worker if (s)he lacks social insurance coverage.

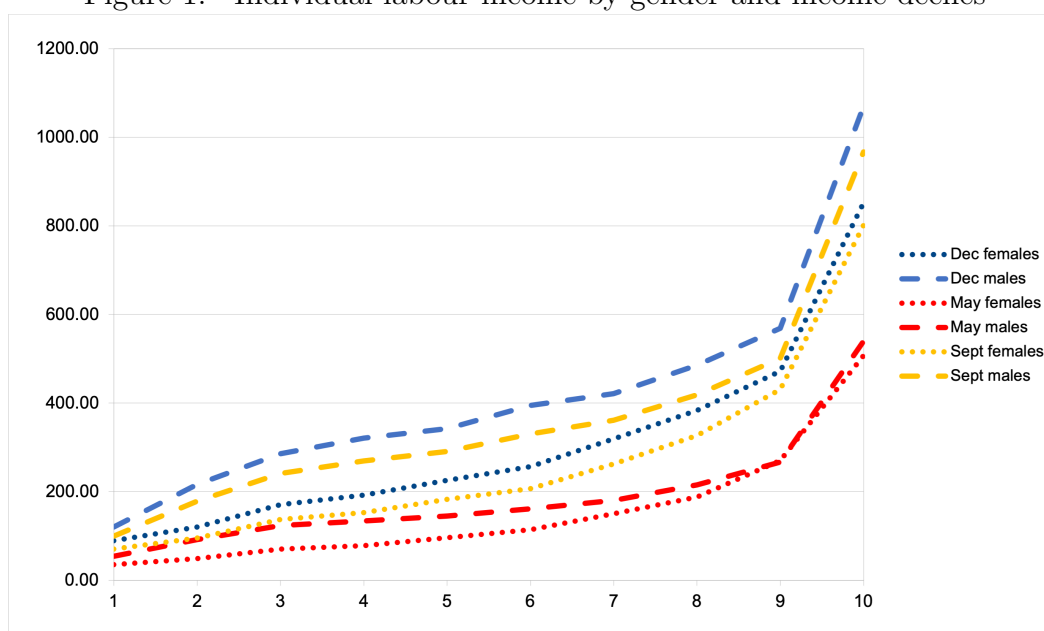
Table 5: Monthly individual labour income pre- and post-COVID

Group	% of workers	December 2019	May/June 2020		September 2020	
		Income	Income	Change	Income	Change
<i>By gender</i>						
Female	37.33%	389.26	205.62	-47.18%	343.53	-11.75%
Male	62.67%	474.01	216.82	-54.26%	412.6	-12.96%
<i>By age</i>						
<26	11.11%	309.61	137.88	-55.47%	265.76	-14.16%
26-65	80.64%	476.93	231.60	-51.44%	418.23	-12.31%
>65	8.25%	282.97	127.95	-54.78%	242.50	-14.30%
<i>By ethnicity</i>						
Indigenous	13.72%	300.51	134.19	-55.34%	256.10	-14.78%
Afro	5.03%	379.83	181.32	-52.26%	321.26	-15.42%
Mestizo	73.95%	470.54	227.53	-51.65%	414.01	-12.02%
Other	7.31%	344.86	163.54	-52.58%	290.20	-15.85%
<i>By education level</i>						
No high school	50.73%	320.6946	130.5171	-59.30%	262.7539	-18.07%
High school	33.29%	445.1933	201.1437	-54.82%	383.0887	-13.95%
Higher education	15.98%	835.7534	506.4722	-39.40%	801.7644	-4.07%
<i>By type of employment</i>						
Informal	75.19%	346.88	139.44	-59.80%	289.17	-16.64%
Formal	24.81%	669.88	387.09	-42.22%	619.47	-7.53%
<i>By area</i>						
Rural	28.92 %	343.81	164.66	-52.11%	287.72	-16.31%
Urban	71.08%	483.09	232.47	-51.88%	427.76	-11.45%
<i>By firm size</i>						
Big (> 5 employees)	23.8%	576.07	268.50	-53.39%	497.93	-13.56%
Small	68.99%	339.61	135.30	-60.16%	282.72	-16.75%
Public	7.21%	843.22	646.44	-23.34%	864.64	2.54%
<i>By income deciles</i>						
1	10%	111.88	49.19	-56.03%	92.11	-17.67%
2	10%	185.98	78.47	-57.81%	152.43	-18.04%
3	10%	248.93	106.49	-57.22%	207.91	-16.48%
4	10%	274.42	113.7	-58.57%	227.43	-17.12%
5	10%	304.21	128.83	-57.65%	255.47	-16.02%
6	10%	344.37	143.86	-58.23%	285.62	-17.06%
7	10%	382.19	168.71	-55.86%	323.78	-15.28%
8	10%	444.31	204.22	-54.04%	381.42	-14.15%
9	10%	529.2	268.01	-49.36%	471.92	-10.82%
10	10%	976.74	525.97	-46.15%	896.08	-8.26%

Source: ENEMDU Dec 2019 and authors' calculations

55% in May and -14% in September) and those without a high school diploma (-59% in May and -18% in September). In terms of age, the income shock was slightly worse for the youth and the seniors than for adults in May (-55%, -55%, -51% respectively) and in September (-14%, -14%, -12% respectively). Regarding ethnicity, the income shock was slightly worse for indigenous people (-55%) than for other ethnicities (-52%) in May, and mestizos/whites recovered more than other ethnicities by September (-12% vs. -15%).

Figure 1: Individual labour income by gender and income deciles



Source: ENEMDU Dec 2019 and authors' calculations.

Males' labour income was slightly more affected than females' (-54% vs -47% in May and -13% vs -12% in September), yet females still earn less than males in all periods. In Figure 1, we can see the gender gap in each decile: income distributions for both, male and female, dropped severely in May pushing the gender gap down; yet, males recovered considerably more by September. It is also worth noting that, in December 2019, 17% of the labour force corresponded to unpaid workers, among whom 62% are female workers with zero income.

Lastly, in the bottom panel of Table 5 we can see that shock to labour income was considerable in all income deciles in May (around -57%), with deciles nine and ten experiencing the smallest drop (-49% and -46% respectively). By September the drop in income was around -16% for the lowest eight deciles and -11% and -8% for the top two deciles.

## 5.2 Government Interventions

Next, we consider the effect of the Government interventions –the direct cash transfers from the Family Protection Bond for Emergencies, and the additional expending on unemployment insurance. We add the corresponding share of these transfers to the simulated income of the qualifying individuals as described in the methodology and we use these to compute the household income per capita with transfers.

Table 6: Average household per capita income with and without public transfers

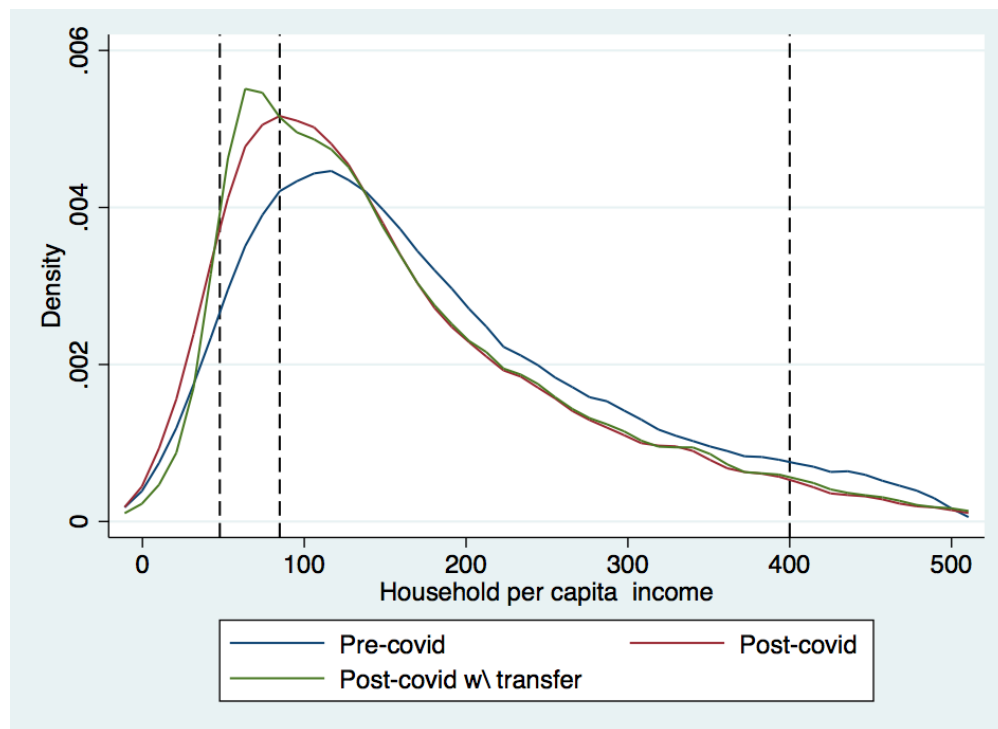
	Dec. 2019	Sep 2020 simulated income	
	Income	without transfers	with transfer
All	214.49	193.19	197.99
Poor	54.24	47.53	53.36

Source: ENEMDU Dec 2019 and authors' calculations

Table 6 compares the mean household per capita income in December 2020 with the simulated income in September 2020, with and without transfers. We see that, in the aggregate, these transfers had very little effect, with the average monthly income increasing by only \$4 per month. Yet, considering only individuals below the poverty line, the average increase was \$6 per month, representing about 11% of their pre-COVID average income and a recovery of 87% of the average loss in their household per capita income. Figure 2 shows the income distribution below the minimum wage in December 2019, as well as the distribution of the simulated incomes in September 2020, with and without transfers. We can see how the COVID19 crisis increased the density of the

distribution below the minimum wage; we can also see that the transfers had some small effect around the poverty line. Indeed, the transfer compressed the left tail of the distribution helping some household to get out of extreme poverty. This can also be seen on the small bump between the extreme poverty line and the poverty line.

Figure 2: Income distribution pre- and post-COVID (September) with and without transfer 2020



Source: ENEMDU Dec 2019 and authors' calculations. Dash lines represent, from left to right, the extreme poverty line (\$47.80), the moderate poverty line (\$84.81) and the minimum wage (\$400).

### 5.3 Poverty and Inequality

Table 7 shows the poverty rates in December 2019 and the rates with the simulated household per capita income in May and September 2020. Overall, the poverty rate more than doubled, from 24% in December 2019 to 57% in May 2020; in September the poverty rate decreased to 30%, still six percentage points higher than pre-COVID. In the

aggregate, the current Government interventions had almost no effect on the poverty rate –around one percentage point.

Poverty is particularly severe in rural areas where it reached 68% in May and 44% in September –that is over 20 percentage points higher than in urban areas in all periods. In terms of geographical region, poverty is very severe in the Amazon where it reached 68% in May and remained at 50% in September. Poverty is also particularly severe for informal workers for whom it reached 62% in May and 33% in September; in sharp contrast, the corresponding numbers for formal workers are 22% and 4%. Also note that, the government interventions in May had 4.38 percentage points drop in the poverty rate of formal workers, the largest impact of the Government interventions among the categories of the table –mostly from unemployment benefits.

There are again big differences by education level. Those without a high school diploma reached a poverty rate of 65% in May and remained at 37% in September. High school graduates are also vulnerable, with poverty rates of 44% in May and 17% in September. In contrast, the corresponding figures for individuals with higher studies are 12% and 5%. In terms of age, sadly kids fourteen and younger are the most vulnerable group with a poverty rate of 79% in May and 42% in September. Poverty rates drop steadily for each consecutive age group, with the oldest groups (+65 and older) having had a 31% poverty rate in May and 16% in September. In terms of ethnicity, indigenous populations are the poorest group reaching a poverty rate of 80% in May, and still 57% by September. In contrast, the corresponding numbers for mestizos/whites are 51% and 25%.

We do not find much difference between male and female poverty rates in any subcategory (See Table 9 in the Appendix for poverty rates by gender for each subcategories). However, since poverty is measured at household level (using household per capita income) the gender gap of poverty may be underestimated. Indeed, it implicitly assumes that all household members enjoy the same standard of living, which may not necessarily be true (see [Munoz Boudet et al., 2018](#), for a discussion of gender differences in poverty).

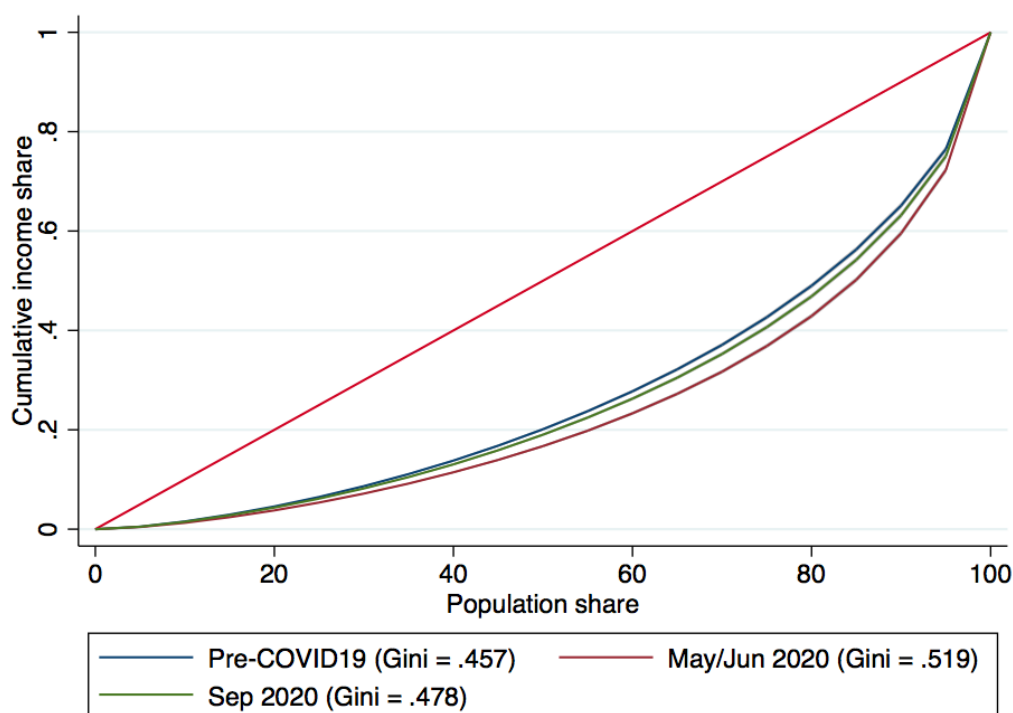
Table 7: Poverty rates pre- and post-COVID

	December 2019	May/June 2020		September 2020	
	Income	w/out transfers	w/ transfers	w/out transfers	w/ transfers
All	23.86%	58.11%	56.51%	30.82%	30.27%
<i>By gender</i>					
Female	24.05%	58.24%	56.60%	31.28%	30.69%
Male	23.66%	57.97%	56.40%	30.34%	29.84%
<i>By age groups</i>					
[0, 14]	34.13%	71.48%	69.93%	42.69%	42.10%
[15, 24]	24.73%	63.74%	61.74%	32.68%	32.01%
[25, 40]	20.62%	56.16%	54.31%	27.66%	27.12%
[41, 64]	17.61%	49.77%	48.20%	23.27%	22.72%
[65+]	13.30%	31.34%	30.77%	16.54%	16.35%
<i>By ethnicity</i>					
Indigenous	49.27%	80.06%	79.84%	57.45%	57.41%
Afro American	38.05%	67.69%	66.42%	42.50%	42.16%
White & mestizo	18.57%	52.78%	51.03%	25.39%	24.74%
Other	24.83%	62.14%	60.56%	32.26%	31.96%
<i>By education level</i>					
No high school	29.20%	66.40%	65.06%	37.55%	37.07%
High school	12.90%	46.44%	44.03%	17.84%	17.05%
Higher studies	4.01%	13.15%	12.35%	5.18%	4.96%
<i>By employment type</i>					
Informal	25.56%	62.23%	61.54%	32.67%	32.55%
Formal	3.38%	26.18%	21.87%	5.64%	4.48%
<i>By area</i>					
Rural	35.65%	69.28%	68.46%	43.73%	43.64%
Urban	18.36%	52.90%	50.93%	24.80%	24.04%
<i>By geographical region</i>					
Sierra	21.07%	53.83%	52.16%	27.16%	26.66%
Costa	24.61%	61.04%	59.42%	32.17%	31.57%
Amazonia	40.82%	68.42%	67.53%	49.71%	49.31%

Source: ENEMDU Dec 2019 and authors' calculations

Regarding inequality, Figure 3 shows the Lorenz curve and the Gini coefficient before and after the COVID crises. In December 2019, Ecuador had a Gini coefficient of 0.457; this was higher than the average Gini of the other Andean countries (Bolivia, Colombia, and Peru average 0.448) and lower than the average for the LAC region (0.51).<sup>10,11</sup> Ecuador's Gini reached 0.52 in May 2020 (comparable to Brazil's Gini in 2019, the most unequal country in the region), and went back down to 0.48 in September.

Figure 3: Lorenz curves pre- and post-COVID



We also look at percentile ratios of the distribution of household per capita income pre- and post-COVID with and without transfers in order to differentiate changes among the poorest, the middle class, and the riches (see Table 8). The first column of the table ( $p90/p10$ ) shows that by December 2019 average household per capita income was around eight times higher for individuals in the upper decile of the distribution ( $p90$ ) compared to those in the lower decile ( $p10$ ). Without accounting for Government in-

<sup>10</sup>There is not data available for Venezuela.

<sup>11</sup>World Bank Development Indicators.

terventions, the difference between these two deciles reached tenfold during the first trimester of the crises, but the public transfers seem to have had a small equalising effect by reducing this ratio to 8.77. By September, the  $p_{90}/p_{10}$ , without considering public transfers, went down to 8.42, and the Government transfers reduced it to 7.59. We see similar patterns when looking at the income ratios between closer deciles, albeit with less variation.

Table 8: Inequality measures pre- and post-COVID

	Percentile ratios				Gini
	$p_{90}/p_{10}$	$p_{90}/p_{50}$	$p_{50}/p_{10}$	$p_{75}/p_{25}$	
December 2019	7.65	2.81	2.72	2.88	0.46
May/June 2020 without transfers	10.43	3.63	2.87	3.28	0.52
May/June 2020 with transfers	8.77	3.61	2.43	3.14	0.50
September 2020 without transfers	8.42	3.05	2.76	2.97	0.48
September2020 with transfers	7.59	3.05	2.49	3.01	0.47

Source: ENEMDU Dec 2019 and authors' calculations

## 6 Conclusions

This study shows the delicate economic situation in Ecuador. Mean labour income dropped by more than half in May 2020, while poverty rate more than doubled compared to pre-COVID levels (i.e., December 2019). The economic situation improved by September 2020 when the drop of income represented 10% of pre-COVID levels, and the poverty was 6 pp above the pre-COVID rate. Income inequality increased considerably in May 2020, and partially improved by September 2020. When evaluating the Government transfers in response to the crisis, we see that they had very limited effects in the aggregate average income. Yet, they may have been crucial for the subsistence of individuals below the poverty line.

The crisis affected individuals across the income distribution; only the top two deciles

experienced a somewhat smaller initial shock and faster recovery. The populations most affected were the informal workers, workers in small firms, workers in rural areas, indigenous populations, households with young children, and households in the Amazon region. In terms of gender, males' labour income was slightly more affected than females', yet females still earn considerably less than males across the income distribution in all periods. Furthermore, during the first trimester of the crises, female employment dropped by -26% vs. -20% for males.

Regarding future Government interventions, the best investment for now may be on vaccines as Ecuador still struggles to provide them to a large share of the population in order to normalise the economic activity (only 15% of the population has had the first doses). Beyond that, future relief efforts should pay particular attention to informal workers, rural workers, and poor household with young children. Since 75% of the working force is in the informal sector with no access to social security benefits, investment in direct cash transfers is likely to be more effective than wage subsidies and unemployment benefits.

By evaluating the impact of COVID19 among different groups of the population and by simulating the effectiveness of Government interventions, we hope to guide policy makers in aiming interventions more efficiently to alleviating the economic impact of the pandemic.

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# Appendices

Table 9: Share of poors by gender pre and post Covid

	Females			Males		
	Dec. 2019	May2020	Sept. 2020	Dec. 2019	May2020	Sept. 2020
All	0.24	0.58	0.31	0.24	0.58	0.30
<i>By area</i>						
Rural	0.36	0.70	0.44	0.35	0.68	0.43
Urban	0.19	0.53	0.25	0.18	0.53	0.24
<i>By employment type</i>						
Informal	0.26	0.61	0.33	0.25	0.63	0.32
Formal	0.02	0.18	0.03	0.04	0.32	0.07
<i>By age groups</i>						
[0, 14]	0.33	0.72	0.42	0.35	0.71	0.43
[15, 24]	0.26	0.65	0.34	0.23	0.63	0.31
[25, 40]	0.23	0.59	0.30	0.18	0.54	0.25
[41, 64]	0.17	0.48	0.23	0.18	0.51	0.24
[65+]	0.12	0.30	0.16	0.14	0.33	0.18
<i>By race/ethnicity</i>						
Indigenous	0.50	0.80	0.57	0.49	0.80	0.57
Afro American	0.37	0.68	0.42	0.39	0.67	0.43
White & Mestizo	0.19	0.53	0.26	0.18	0.53	0.25
Other	0.26	0.63	0.34	0.24	0.61	0.31
<i>By education level</i>						
No high school	0.30	0.67	0.38	0.29	0.66	0.37
High school	0.14	0.48	0.20	0.12	0.45	0.16
Higher studies	0.03	0.12	0.05	0.05	0.14	0.06
<i>By region</i>						
1 - Sierra	0.21	0.54	0.27	0.21	0.54	0.27
2 - Costa	0.25	0.61	0.33	0.24	0.61	0.31
3 - Amazonia	0.41	0.69	0.50	0.41	0.68	0.49

Source: ENEMDU Dec 2019 and authors' calculations