Assessing the role of tax-benefit policies in mitigating the distributional effects of COVID-19 in the Andean region

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Introduction

- This paper assesses the role of tax-benefit policies in mitigating the effects of the COVID-19 crisis on the distribution of household disposable incomes in Colombia, Ecuador and Peru.

  - Before the crisis, these countries had low levels of social spending. Thus, when the crisis hit, it was likely that their benefit systems could not offer much protection.

- Projections from the Economic Commission for Latin America and the Caribbean (ECLAC), by the end of 2020 poverty and extreme poverty have increased in 22 million persons in poverty compared with 2019.

- The pandemic also brought a significant deterioration of labour market indicators in 2020: the unemployment climbed 2.5 pp on average, while the occupation and participation rates decreased by 10 and 9.5 pp respectively (ECLAC, 2021)

Earners relative to the working age population
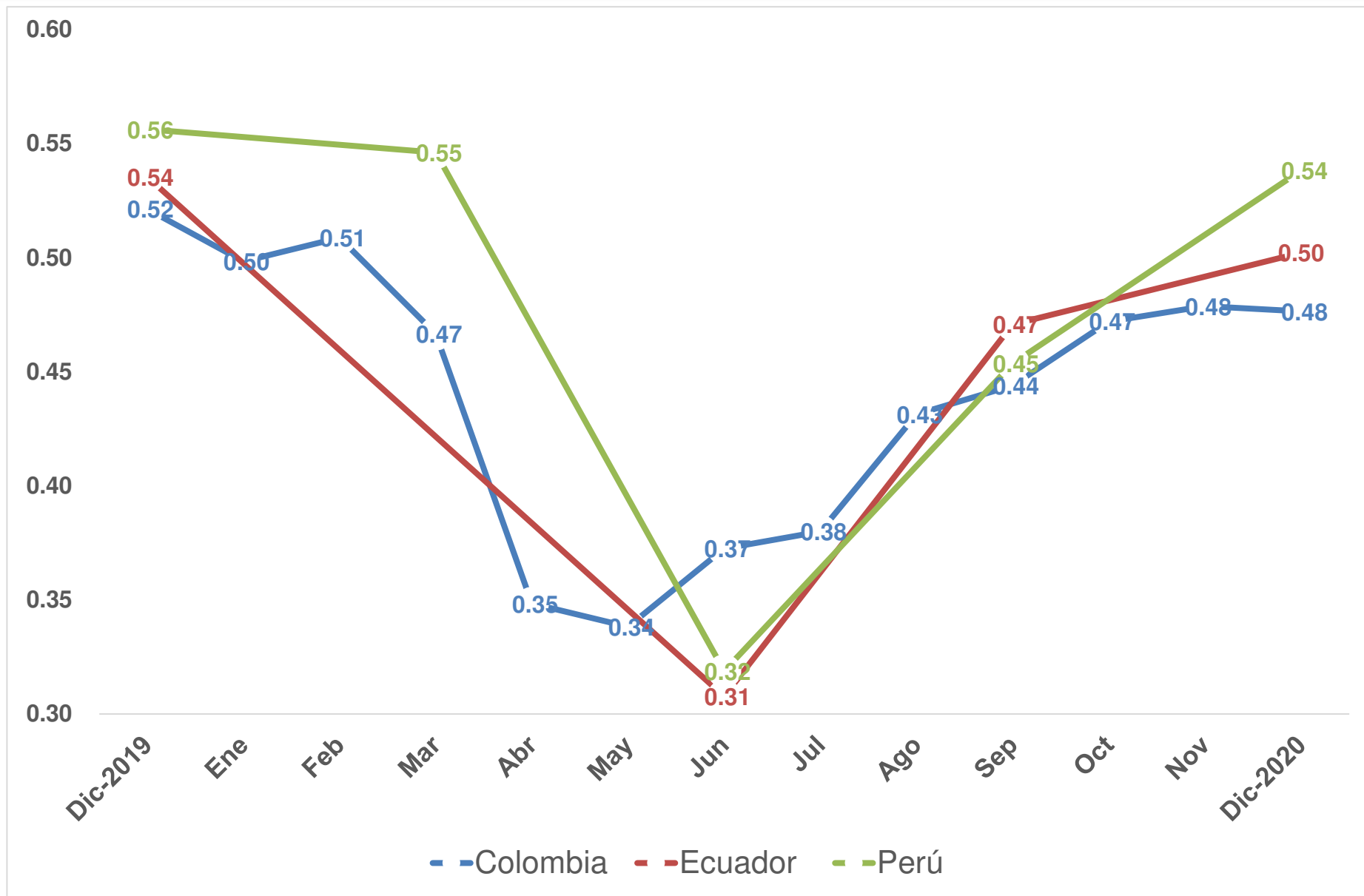
Models' description

- EUROMOD is a static microsimulation model and software platform.

- It applies user-defined tax and benefit policy rules to specially prepared micro-data on individuals and households, calculates the effects of these rules on household income, and then outputs results – still at the micro level.

- COLMOD, PERUMOD, and ECUAMOD are models based on the EUROMOD framework

	COLMOD	PERUMOD	ECUAMOD
DATA	Gran encuesta integrada de hogares (GEIH)	Encuesta nacional de hogares (ENAHO)	Encuesta nacional de ingresos y gastos de hogares urbanos y rurales (ENIGHUR)

Covid-19 policies

Colombia	Perú	Ecuador
• *Familias en Acción* • *Jóvenes en Acción* • *Colombia Mayor* • *Ingreso Solidario* • *Devolución del IVA* • *Impuesto Solidario* • The Colombian government implemented a reduction of pension contribution going from 16% to 3% for independent workers, from 4% to 0.75% for employees and the rates for employers changed from 12% to 2.25%. • Unemployment subsidy adjustments	• *Bono independiente* • *Bono rural* • *Bono Yo me quedo en casa* • *Bono familiar universal* • Peru's government also gave an extension of the annual declaration and payment of income tax for 2019, and the automatic refund of payments in excess of 2019.	• *Bono de Protección Familiar*

Nowcasting

- The pandemic forced statistical agencies in the three countries to reduce the size of the typical survey questionnaire and, in some cases, to resort to telephonic interviews.
  - The data for 2019 contains detailed information on demographics, employment, earnings, income from capital and property, private transfers, pensions, and expenditures.
  - However, data for 2020 in most cases only contains demographics and earnings information.

- To overcome this restriction, we use nowcasting techniques: we modify the 2019 information on earnings and labour market status to match the available information for 2020.
  - More precisely, we estimate a probability model to determine if a working individual in the 2019 database is predicted to have positive earnings in 2020 (extensive margin). Conditional on having predicted positive earnings, we update the earnings to match those prevailing in 2020 (intensive margin).
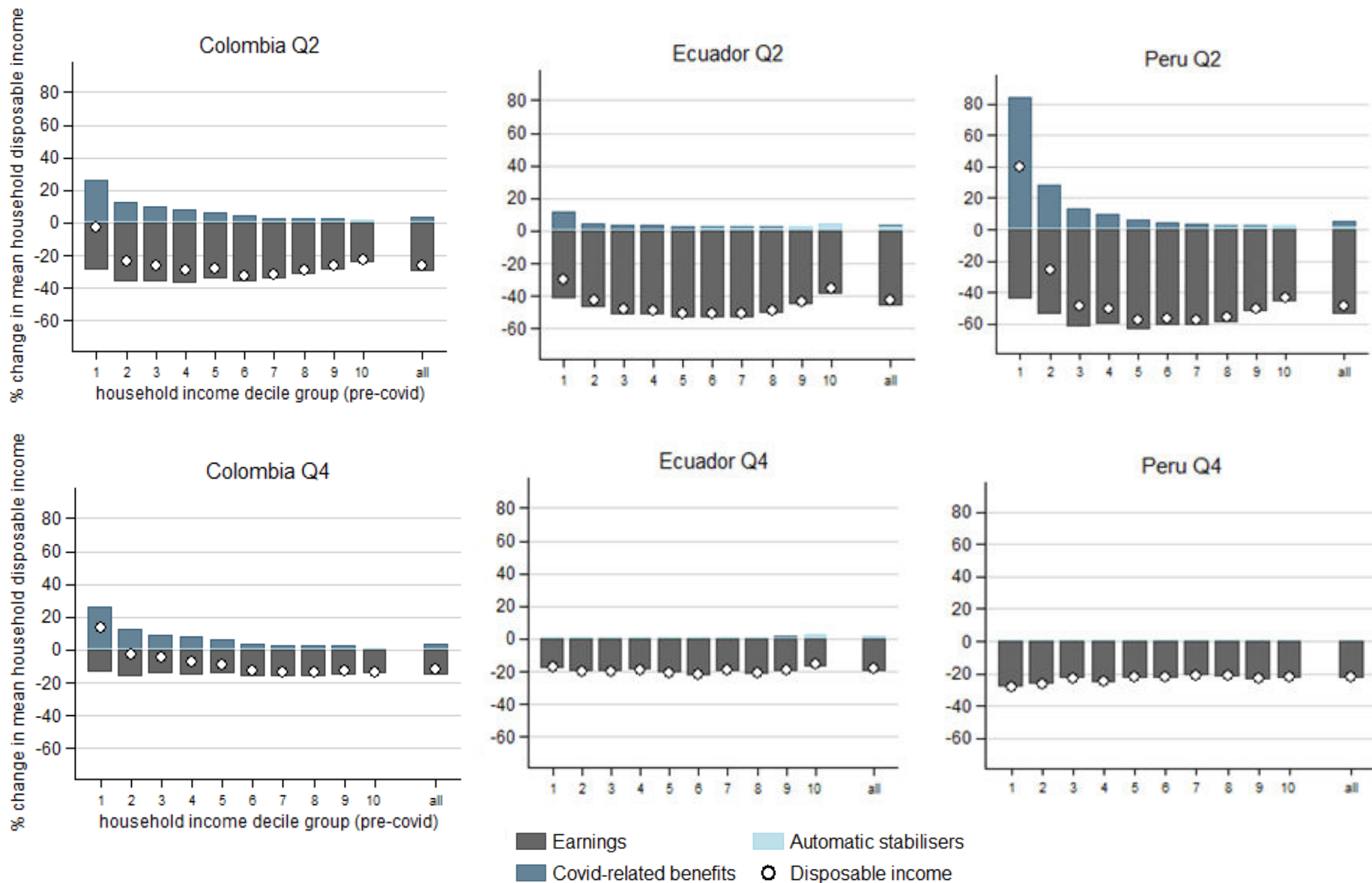
Extensive Margin:

$$P(\text{Earnings} = 1) = \Phi(\beta + \phi\text{Characteristics} + \theta d2020 + \delta\text{Characteristics} \cdot d2020)$$

- The model is used to predict the probability of being an earner in 2020 for individuals in the 2019 data. For this, the 2020 dummy is set to one for individuals in 2019 and the predictions are based on each person's characteristics multiplied by the coefficients plus a random component that accounts for unobserved factors that may tip people into being an earner or not.

  - The addition of the random term means that we do not completely exclude groups with low (deterministic) probability from being earners (Li and Donoghue 2014)

- Based on these predicted probabilities, we move individuals from being earners in 2019 to having zero earnings in 2020 matching the number earners by industry and formality status (formal or informal) observed in the 2020 data.
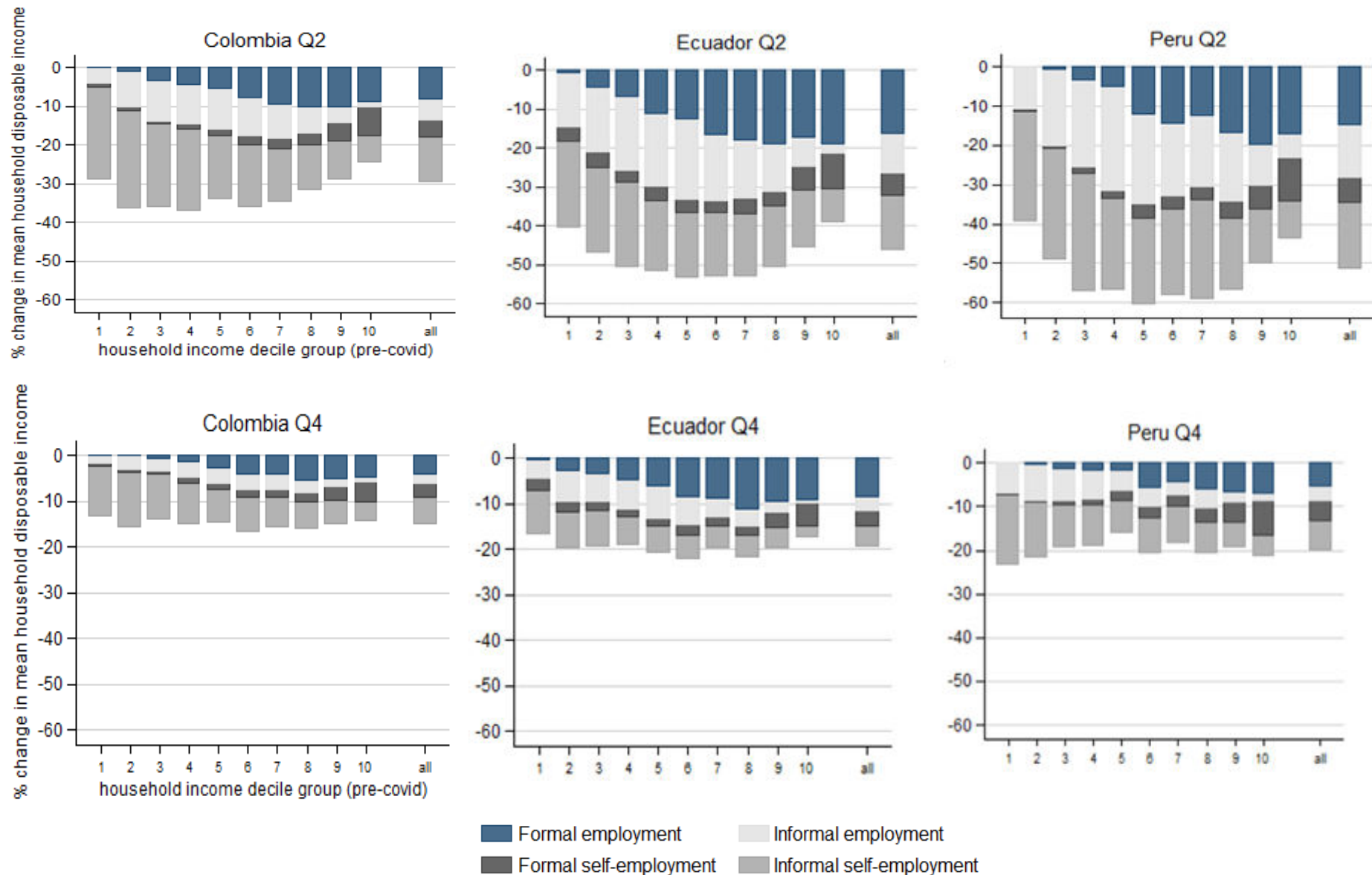
Intensive Margin:

- Once a worker in 2019 is determined to have positive earnings in 2020, we adjust the 2019 earnings to 2020 earnings using the percent change in earnings rate between 2019 and 2020.

  - We carry out this process for employees and self-employed workers independently.

  - We calculate percent changes by industry and formality status

The effect of the COVID-19 pandemic on income inequality and poverty

	Colombia			Ecuador			Peru		
	Pre-COVID scenario	Total change Q2	Total change Q4	Pre-COVID scenario	Total change Q2	Total change Q4	Pre-COVID scenario	Total change Q2	Total change Q4
Inequality									
Gini	0.497	0.070	0.010	0.461	0.133	0.038	0.460	0.126	0.042
Theil	0.481	0.115	0.013	0.395	0.225	0.058	0.379	0.241	0.069
Poverty									
FGT0 (%)	26.6	19.3	5.8	25.7	34.5	12.3	28.2	36.5	11.9
FGT1 (%)	10.0	13.2	3.1	9.6	25.5	7.2	13.1	25.6	8.9
Extreme poverty									
FGT0 (%)	6.9	14.1	2.7	9.2	31.3	8.5	13.6	29.6	9.9
FGT1 (%)	2.4	7.9	1.5	3.6	19.1	4.5	6.4	17.9	6.8

Note: poverty and inequality indicators are based on per capita household disposable income. The 2019 national poverty and extreme poverty lines are used in each country.

Source: own calculations

Decomposing the change in income inequality and poverty

	Colombia Q2			Ecuador Q2			Peru Q2			Colombia Q4		
	Total change	COVID-related policies effects	Other effects	Total change	COVID-related policies effects	Other effects	Total change	COVID-related policies effects	Other effects	Total change	COVID-related policies effects	Other effects
Inequality												
Gini	0.070	-0.023	0.092	0.133	-0.012	0.144	0.126	-0.046	0.172	0.010	-0.019	0.029
Theil	0.115	-0.034	0.149	0.225	-0.013	0.238	0.241	-0.070	0.311	0.013	-0.036	0.049
Poverty												
FGT0 (%)	19.3	-3.0	22.3	34.5	-0.7	35.2	36.5	-3.4	39.9	5.8	-3.4	9.2
FGT1 (%)	13.2	-3.5	16.7	25.5	-1.6	27.1	25.6	-6.3	31.9	3.1	-2.7	5.7
Extreme poverty												
FGT0 (%)	14.1	-3.9	18.0	31.3	-1.2	32.5	29.6	-7.0	36.6	2.7	-3.0	5.7
FGT1 (%)	7.9	-3.4	11.3	19.1	-2.0	21.2	17.9	-7.4	25.4	1.5	-1.7	3.2

Note: poverty and inequality indicators are based on per capita household disposable income. The 2019 national poverty and extreme poverty lines are used in each country.

Source: own calculations

Conclusions

- The tax-benefit models COLMOD, ECUAMOD, and PERUMOD were used to decompose changes in the distribution of disposable household income into the effects of (i) earning loses, (ii) COVID-related policies and (iii) automatic stabilizers.

- Our results show that average household disposable income fell dramatically in the second quarter of 2020 compared to December 2019: 25.7% in Colombia, 43% in Ecuador and 49.3% in Peru.
  - However, as lockdowns were relaxed household income adjusted, which resulted in smaller drops of 11.8% in Colombia, 18.2% in Ecuador and 21.9% in Peru.
  - In this way, the fastest recovery occurred in Peru regaining 27.11 percentage points (pp) from the second to the fourth quarter.

- Our results also show that the shock was larger at the middle of the income distribution, with a U-shaped pattern in the change of disposable income

- Decomposition results show that COVID-related policies helped to mitigate the impact of the pandemic at the bottom of the distribution, although to different extents across countries depend on the generosity of the emergency cash transfers

- COVID-related policies increase mean disposable income of the first income decile group by 26.1% in Colombia, 11.3% in Ecuador and 83% in Peru, during the second quarter of 2020.
  - By contrast, automatic stabilizers cushion the income shock at the top of the distribution due to automatic reductions in social insurance contributions and income tax payments.

- This meant that policies had a considerable effect only in reducing extreme poverty and inequality in Colombia and Peru, and that higher in the distribution, disposable incomes dropped well below their pre-crisis levels.

- During the second quarter of 2020 poverty increased from 26.6% to 45.9% in Colombia, from 25% to 60% in Ecuador and from 28.2% to 64.8% in Peru; whereas the Gini index increased from 0.49 to 0.56 in Colombia, from 0.46 to 0.59 in Ecuador, and from 0.46 to 0.58 in Peru.

- Although COVID-related policies helped to mitigate the drop in earnings at the very bottom in Colombia and Peru, they did not do so in Ecuador, nor did they go higher in the income distribution.

- This meant that at the peak of the crisis poverty dramatically rose, inequality did so too importantly, while the middle of the distribution was squeezed between receiving the largest shock and not having government support.

- These results highlight the unpreparedness of current tax-benefit systems, the partial success of some countries and the lack of fiscal capacity of others