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Universal basic income: A feasible alternative to move people out of poverty in Mexico?

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Abstract

This paper evaluates the effectiveness of social policy to alleviate poverty in Mexico; where poverty is persistent, social programs are numerous and complex to monitor. Our analysis uses MEXMOD tax-benefit microsimulation. We simulate four scenarios that grant direct money transfers to individuals in multidimensional poverty, elderly people, families with children under 15 years old, and a universal basic income. The more generous and broader the coverage is, the costlier the policies. The first-best policy is the universal basic income, which can eradicate extreme poverty at the cost of 10.61 % of the gross domestic product. The least effective policy transfers only to older people.

JEL Classification: D31; D61; D73; H53; H68; O54

Keywords: Poverty; Universal basic income; Conditional transfers; Microsimulation

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1. Introduction

A fundamental objective over time has been to eradicate extreme poverty. It is the first of the sustainable development goals (SDGs). The challenge is to achieve this objective with a social policy based on conditional transfers. A less common social policy is to grant unconditional transfers. The Universal Basic Income (UBI) is an unconditional minimum monetary transfer granted to all individuals in a population. Universality provides the freedom to decide what and where to buy, and it promotes a more integrated society with a higher sense of community, which may lead to social justice (Sen, 2009).

The objective of this paper is to provide evidence of the effectiveness of social policy to alleviate poverty. To carry out the analysis, we base the analysis on the MEXMOD tax-benefit microsimulation model for Mexico developed under the EUROMOD framework. To the best of our knowledge, this is the first time that a simulated impact of UBI has been applied as an example of a long-term policy with conditional and unconditional cash transfers focused on the poor in a country with a high proportion of people in poverty and with a social policy mainly based on conditional transfers.

UBI is desirable under a social protection system with low coverage and low progressivity, where targeting difficulties, implementation bottlenecks, and resource constraints exist (Francese & Prady, 2018, p. 12, Fig. 6). One example of a UBI is the pension program for the older population. In Mexico, it started in 2007; initially, it was granted to people older than 65 years whose incomes were below a poverty cutoff. With a new federal government's arrival in 2019, the older pension program became universal, without conditioning on a low income (Gobierno de Mexico, 2021).

Conditional transfers have been the basis of social policy. However, problems arise when trying to find the eligible population among a dispersed population. The drawbacks of UBI are that the benefits are targeted to all populations, reducing inequality but raising questions about progressivity. Our contribution to the literature is to quantify different designs of this social policy and evaluate poverty reduction after hypothetically implementing conditional and unconditional transfers. Policy recommendations are the need to look for alternatives to make a better use of public resources to be more effective in reducing poverty. Our point is not to convince policymakers to implement UBI but to start an academic discussion of how to simplify social policy to maximize the coverage of the most vulnerable populations.

The structure of the paper is as follows: Section 1.1 explains the current poverty situation of Mexico and the social policies implemented; Section 1.2 discusses UBI definitions and estimated costs; Section 2 explains the assumptions to design UBI transfers; Section 3 describes the methodology and data used for the microsimulations; Section 4 provides the results of the microsimulations of UBI under four scenarios of conditional and unconditional criteria; and Section 5 shows the cost of each scenario of transfers and the distributional effects. Finally, Section 6 provides a discussion of the findings.

1.1. Chronic poverty and social programs in Mexico

Mexico has improved the measurement and evaluation of its social policy. The National Council for the Evaluation of Social Development Policy (CONEVAL, for its acronym in Spanish) officially calculates the poverty percentage. The multidimensional poor population increased in Mexico from 49.5 to 52.4 million persons, a relative reduction from 44.4 % to 41.9 % from 2008 to 2018; the latest number was 43.9 % in 2020. In contrast, there was a

reduction in extreme poverty, from 12.3 to 9.3 million, and from 11.0 % to 7.4 % in relative terms (CONEVAL, 2019). Multidimensional poverty combines nonmonetary and monetary eligibility criteria. Households who meet the nonmonetary criteria are deprived of at least one of the six social rights: food, health, education, social security, housing material quality, and housing services. Households who meet the monetary criteria earn a per capita income below the poverty line. Individuals are in extreme multidimensional poverty if they are deprived of at least three social rights and their per capita income is below the extreme poverty line, which includes only the value of a food basket. These percentages are high when compared to the international unidimensional poverty measurement of the percentage of people with income below $1.90 dollars daily; Mexico is estimated to be at 1.7 % in 2018, smaller than the estimate for Latin American countries of 3.7 % and more similar to the figure of 1.5 % for upper middle-income countries (The World Bank, 2019).

An early evaluation of CONEVAL (2013) showed evidence that an increasing supply of social programs to the municipalities and a coordinated plan reduces poverty. The poorest municipalities had a profound reduction in the number of school dropouts, a reduction in housing without sanitation, and fewer people uncovered by the health care system. The materialized effect on poverty might explain why by 2021, CONEVAL (2021) identified 8393 social programs and government actions to reduce poverty, and the majority are at the municipal level, 81.3 %.

During 2009–2019, the budgets of social programs and government actions increased, in real terms, by an average of 1.3 % annually. According to the social program inventory of CONEVAL (2020), there are 154 federal programs targeted at nine social rights, such as health, education, social security, wellbeing, employment, housing, food, environmental sustainability, and nondiscrimination. These nine social rights budgets add up to 1 billion Mexican pesos of 2019 and represent 5.58 % of the gross domestic product (GDP).[1] Mexico is at the bottom of social public spending among OECD states, amounting to 7.5 %; at the top is France, spending 31 %, while the OECD average was 20 % of the GDP (OECD, 2020b).

Social programs are monetary, nonmonetary, and mixed. The public spending budget of monetary support devotes 39 % to scholarships, subsidies, and stipends for productive projects; nonmonetary programs represent 53.7 % of the budget and includes consultancies, training, health care services, cultural activities, among others (CONEVAL, 2020). The rest is a mixture of monetary and nonmonetary programs. The majority of beneficiaries of social programs households and individuals such as women, children, students, teachers, youth, and the older population, 54 %. The remaining 46 % of the beneficiaries are schools, institutions, and non-governmental organizations that work with the poor population.

Monitoring social programs is a challenge in a country where only 43 % of the programs have a beneficiary list, of which only 30 % annually update their list (CONEVAL, 2020); lately these numbers have slightly improved, as 49 % have a beneficiary list (CONEVAL, 2022). The impossibility of tracking the beneficiaries reduces transparency in applying the budget and raises doubts about the social policy's actual incidence and effectiveness. Moreover, 21 new programs were in place in 2019, which, according to CONEVAL (2020), are not relevant to the six social rights established in the official poverty measurement.

[1] Average of quarterly GDP in 2019 is estimated in $18,517,060 million Mexican pesos 2019, INEGI (2021).

1.2. UBI as an alternative for poverty alleviation

Despite the increasing supply of social programs and improvements in evaluations, the poverty rate is persistent in Mexico. Then, we need to look for better alternatives or options for poverty alleviation. A radical change in social policy would be to implement a universal basic income policy. The Universal Basic Income (UBI) is a program to be delivered in cash, unconditionally, and to everyone (Gentilini et al., 2020; Ortiz et al., 2018; van Parijs & Vanderborght, 2017). This radical idea is not new; in 1526 Juan Vives proposed a minimum rent to all to reduce poverty and oriented toward social protection of the poor through decent jobs that guarantee subsistence and dignity (Solanes, 2018). Moreover, Thomas Paine, in 1779, proposed an unconditional lump-sum transfer for adults, pensions for older persons, and ground rents paid by landowners for persons with disabilities (Ortiz et al., 2018).

A proposal such as UBI is not as radical as it seems when accounting for the financing design (Gentilini et al., 2020). UBI is not a single policy but a family of closely related policies that guarantee a minimum income level to all persons (van Parijs & Vanderborght, 2017). A transfer scheme such as UBI provides freedom to choose better jobs (Wright, 2002) and increases fairness in social contracts, gender equity, and societal aspiration (Gentilini et al., 2020). The unconditionality in the benefits enhances real freedom (Calsamiglia & Flamand, 2019). Despite their need or willingness to work, basic income can be lifesaving for the most impoverished regions (Moseley, 2012). In developing countries where there is a high informality, it is difficult to target the poor and to locate them when eligibility depends on actual incomes, which can be predicted or self-reported by the individual (Hanna & Olken, 2018). Implementing a UBI is a straightforward way to redistribute to the poor if the transfers are financed through progressive taxation (Hanna & Olken, 2018). UBI benefits include reducing the information and administration costs from dealing with a massive amount of private information (Zwolinski, 2012). If the transfers are unconditional to work, they can increase bargaining power to prevent the expansion of low-paying jobs (van Parijs, 2005: p.14) or reduce precarious jobs because of pre-existing job insecurity (Standing, 2011).

The opponents of UBI argue about the high fiscal costs. The cost of UBI depends on how generous it is. Ortiz et al. (2018) estimated a global average of 32.7 % and 39.4 % of every country's GDP. Following International Labour Organization (ILO) recommendations, they assume two scenarios: a transfer of 100 % of the national poverty line for all adults and children and a transfer of 100 % to adults and 50 % to children up to 15 years old. However, the cost varies across regions; in low-income countries, it is 62.3 % and 79.1 % of the GDP, while in high-income countries, it is 27.4 % and 29.9 %, according to the ILO estimations presented in Ortiz et al. (2018). In Latin American countries, the average UBI cost is 27.6–32.3 % of the GDP in each scenario presented by Ortiz et al. (2018). Other proposals are above the poverty line; van Parijs and Vanderborght (2017) propose $14,000 per year per person in the United States, approximately 25 % of the GDP. Zwolinski (2012) argues that the cost depends on whether the UBI would substitute for other social programs or supplement them. Acemoglu (2019) underlined the high fiscal cost of a transfer of $1000 per month that would cost $4 trillion per year, approximately the entire U.S. federal budget in 2018. Additionally, Acemoglu (2019) argued about the distortionary costs on the economy, mainly because if UBI is financed with taxes, then investments and work are discouraged.

A progressive transfer such as a negative income tax (NIT) proposed by Friedman (1966) is a guaranteed minimum income that differs from the taxable income at which individuals pay taxes and receive subsidies. One advantage of NIT is that it enhances freedom to individuals

and "develops habits of independence and self-reliance" (Friedman, 1966, p.6). NIT would limit government intervention, making the program less susceptible to change, and it is more consistent with a free economy with limited government intervention (Friedman, 1966). NIT reduces political patronage, so it cannot be used as a political slush fund like other social programs (Friedman, 1966, p.11). Likewise, UBI also reduces bureaucracy and administrative costs (Gentilini et al., 2020). Unconditionality avoids permanent welfare beneficiaries, and universality allows us to obtain information at a lower cost, creating no poverty or unemployment traps (Casamiglia & Flamand, 2019; van Parijs & Vanderborght, 2017).

2. How to quantify the effects of social policy

There is a significant debate on which policy better fits an economy. Some countries have implemented randomized controlled experiments of UBI implementation to evaluate the costs and the behavior related to the policy. Finland was an example of a compulsory experiment randomized designed to study the effects of basic income on employment and income; the goal was to simplify the current social security system, promote less bureaucracy, and analyze work incentives for the unemployed (Kangas et al., 2019). The results showed no effects on employment status during the first year of the experiment; however, there was an improvement in wellbeing, as the treatment group experienced fewer problems associated with health, stress, and the ability to concentrate (Kangas et al., 2019).

Only Mongolia and Iran implemented a UBI for a short period, and few countries are running pilot experiments on the feasibility of a program such as a UBI (Gentilini et al., 2020). In developed countries, there are in-progress experiments in Canada and Italy and developing countries such as Kenya and Uganda (Fleischer & Hemel, 2017). A randomized controlled experiment can provide a clear understanding of the behavioral effects of a basic income policy. However, it takes time to design and is expensive to implement, and identification issues arise if another policy takes place simultaneously. The World Bank, International Monetary Fund (IMF), Organisation for Economic Co-operation and Development (OECD), and International Labour Organisation (ILO) compared several scenarios of a UBI across countries. They mainly use microsimulation approaches to estimate fiscal costs, benefits, and poverty incidence and inequality. The OECD developed the TaxBen framework, a simple computational software available online that compares means-tested benefits from hypothetical families with a comparable basis (OECD, 2020a). The international comparisons are not clear when there is no standard microsimulation framework applied to any country. EUROMOD is a fiscal microsimulation framework using countries' household surveys to make comparisons across European countries. Other extensions included more countries with the same framework as EUROMOD, for example, SAMOD for South Africa, SRMOD for Serbia, and RUSMOD for Russia (Sutherland & Figari, 2013). Extending the framework comparability to Latin American countries, Bargain et al. (2017) examined a policy swap in the tax-benefit systems between Ecuador and Colombia ECUAMOD, COLMOD, both included in the LATINMOD jointly with Argentina, Bolivia, Uruguay, and Venezuela (Arancibia et al., 2019). MEXMOD is a new framework developed for Mexico, which is publicly available and has already been validated by the EUROMOD framework.

Other microsimulations with international comparison are presented in Lustig (2017), where there is a comparison of sixteen Latin American countries, Mexico included. Lustig (2017) found that countries with more extensive social spending tend to distribute more, although fiscal policy impoverishes the poor for some countries. The mentioned framework is comparable to

EUROMOD if the analysis is on direct taxes and transfers (Lustig, 2017). Unfortunately, it is difficult to compare because the framework models are not publicly available.

The IMF analysis of Francese and Prady (2018) defines six key features accounting for the different results of studies related to UBI, which are the following: 1) exclusivity: replace or complement the current social protection; 2) regularity: one-time endowment or regular income; 3) coverage: categorial or universal; 4) eligibility criteria: conditioned or unconditioned; 5) recipient unit: household or individual; and 6) form of distribution: tax credit or cash transfer. Accordingly, UBI and NIT differ because the first one complements the social security system and is given to the individual in the form of a cash transfer.

A budget-neutral policy implies that implementing a UBI will bring up no change in budgeting; it is a substitution for the social system. It is not recommended because it can harm the poor to a greater extent (Immervoll & Browne, 2017). This result is also not consistent with ILO standards (Ortiz et al., 2018). A budget-neutral transfer could generate more poverty and inequality. If the benefit level is below the poverty line, more severe issues in a country such as Mexico will follow, such as low or null impact on reducing poverty and the social policy may end up with low incidence or coverage over the population. Campos-Vázquez et al. (2020: 363) indicate that social policy covered only between 65 % and 69 % of people in poverty in the country in 2016. A benefit set to meet the poverty line could be expensive to finance (Ortiz et al., 2018).

The ILO recommendations to guarantee a basic level of social security are part of the 2030 Development Agenda, a mixture of child and family benefits, maternity protection, unemployment benefits, health protection, old-age benefits, disability benefits, among others (ILO, 2017).

To analyze the effects of a UBI in Mexico, we follow the IMF report by Francese and Prady (2018) to include the three dimensions to discuss the performance of social spending: 1) generosity, 2) coverage, and 3) progressivity. The three dimensions previously mentioned are used to define the assumptions to construct a UBI and analyze its effect on poverty.

1) Generosity: We calculated the per capita poverty gap by using the extreme poverty line estimated by CONEVAL (2019), which includes only monthly food expenses. We hypothesize that with this amount, it is likely that recipients would obtain access to social rights or monetary resources to reach the poverty line. This amount would be a minimum transfer to ensure a basic level of income security (Gentilini et al., 2020) to move people out of poverty.
2) Coverage: define the objective population who would receive a UBI. We estimated the cost according to the target population under four scenarios.
3) Progressivity: transfer program's distributional impact to reduce poverty. These are the changes in per capita income after receiving UBI.

3. Methodology and data

Targeting and searching for the objective population is costly and time-consuming. As an alternative to focalization, we test whether implementing a UBI is effective in reducing multidimensional poverty. We argue that fewer conditions to grant transfers simplify social policy, reducing the costs of searching and increasing population coverage. We use MEXMOD to estimate the impact of a UBI on poverty because it offers the advantages derived from EUROMOD, such as flexibility, simplicity, and transparency. In addition, the MEXMOD

programming code to estimate the policy effects is freely available, allowing for replication of the calculations.

The UBI's design in Mexico follows the same purpose as other similar programs implemented in Europe. In a twofold scheme, granting a universal basic income for the entire population would be useful for protection and helpful—of a pro-poor nature—to fight against poverty. Thus, we define the poor as those suffering from poverty in 2019 by using CONEVAL's multidimensional measure through the Alkire-Foster standard estimation technique (Alkire & Foster, 2011). Then, we merged these official estimates with the microdata from the MEXMOD microsimulations of UBI.

The microsimulation model allows for assessing impacts on the income distribution. First, we assume a UBI transfer equal to the per capita extreme poverty line from CONEVAL (2019), equivalent to $1668 per month (current prices in 2019). We then calculate the poverty gap as the difference between the per capita income of every person relative to the extreme poverty line, with the intention of building a relative measure of poverty to assess income distribution. We then let the level of taxes be fixed, both direct and indirect, including excise consumption taxes as well. This assumption is of great relevance, as it will tell by how much the cost of the UBI programs would be.

Second, we define the groups that will receive the benefit; in particular, we choose four scenarios to calculate the conditional and unconditional transfers, that is, we define different UBI simulations. *Scenario 1*: target only those suffering multidimensional poverty conditions. *Scenario 2*: target those aged 65 years and over. *Scenario 3*: Target the transfer to families with at least one child up to 15 years old and provide to each family member according to the eligibility criteria. *Scenario 4*: Target the transfer to all populations regardless of their poverty condition. This last scenario is the unconditional transfer, usually known as the UBI; however, the other scenarios can also be considered to a certain degree a UBI.

According to the eligibility criteria defined in each scenario, the selected UBI transfer is added to the set of benefits simulated in the MEXMOD. Once changes in disposable household incomes were estimated, we obtained per capita income according to CONEVAL's measure of poverty in Mexico (which accounts for monetary and nonmonetary income), including an equivalence scale unit. Afterward, we estimate poverty indices and poverty curves for each UBI scenario to determine to what extent it can reduce initial poverty levels.

To broaden the impact and check for poverty dominance of a UBI beyond the usage of FGT indices, which takes values between 0 and 1 ($P^{\alpha=0,1}$), we estimate in the empirical Section a set of poverty curves for any value of the poverty line in the interval [0, z +] and see the complete distributional changes in incomes, as follows:

$$P^{\alpha=0,1}(y) = \int_0^z p(y, z)dF(y) \tag{1}$$

$$P^{\alpha=0,1}(y_s) = \int_0^z p(y_s, z)dF(y_s) \tag{2}$$

where y is the per capita income in Eq. (1) used as a base scenario; y_s is the per capita income including the UBI transfer in Eq. (2) for scenarios $S \in \{1, 2, 3, 4\}$; z stands for the poverty line in both urban and rural areas; and $F(.)$ is the cumulative distribution function of the corresponding per capita incomes for the poor in the income space for y and y_s.

4. UBI estimation and social policy in Mexico

To answer the question of how much budget is needed to finance a UBI in Mexico, we start by estimating the value of the average transfers that individuals receive using the simulated microdata. MEXMOD uses the microdata from the National Survey of Income and Expenditures in the Households (ENIGH, for its acronym in Spanish) (Huesca & Llamas, 2020). By using 2018 ENIGH data, MEXMOD simulates direct and indirect taxes, social insurance contributions and the main means-tested transfers in 2019, such as old-age benefit, *Benito Juárez* scholarships, Youth building the future (*Jóvenes Construyendo el Futuro) program, disability benefit,* and Welfare savings program (*Tandas para el Bienestar)*. All monetary variables are in Mexican pesos at current prices on a monthly basis.[2] Additionally, other personal and household sociodemographic information is provided by the survey. Table 1 shows the social policy transfers in monetary terms and according to the target population. Only Old-age benefits *(pension de adultos mayores)* are universal, as they do not depend on the poverty condition but are conditional on age; the coverage reaches approximately 6.9 million people aged 68 years and older. The monthly stipend of $1275 Mexican pesos.

Scholarships *Benito Juárez* are distributed in three education levels. By ranking them on the coverage order, the two most relevant are directed to basic and upper secondary education, with the same amount of money of $666 pesos per month. The third scholarship is known as *Youth writing the future,* granting an amount of $1885 pesos for those enrolled in high-school and college technical studies, reaching nearly 300 thousand individuals in 2019.

Youth building the future program grants $3600 pesos conditional to be enrolled in a training program either in private or public sectors with the expectation of being hired after 10–12 months. According to the MEXMOD microsimulated database, 559,290 workers are covered. The last two cash transfers, named Disability Benefit (*Apoyo para discapacidad*) and Welfare savings (*Tandas para el Bienestar*), are no less important in budgetary terms, with corresponding transfers of $1396 and $500 pesos both reaching 1.1 million people. The current structure of cash transfers provides a reference based on social policy generosity. However, these estimations do not account for the operation costs of the program, for which the accumulated amount can be approximately thirty percent. These costs arise because the government needs to find the beneficiaries, monitor beneficiary care, and evaluate each of the programs independently.

4.1. UBI estimated effect to move people out of poverty

Table 2 shows the microsimulated results of the transfers under several scenarios. The first column presents the baseline situation obtained from the dataset at 2019 prices; these numbers may differ from the official poverty percentages of 2018. The following columns show the four scenarios S1, S2, S3, and S4, assuming that every family obtains a per capita amount of $1668 per month, equivalent to the poverty line, this amount would move poor people above the poverty line. The columns account for the transfers targeted to specific populations under the different scenarios; only the last scenario is unconditional transfer, most commonly known as UBI. Then, we calculate how many people would remain in extreme poverty, poverty, and the

[2] Because household database is from 2018, all monetary variables were uprated to 2019 using consumer price index and minimum wage changes as deflators.

Table 1
Microsimulated benefits received from mean-tested programs: Mexico, 2019.
Source: Authors' estimations using MEXMOD.

Variable	Sample weighted	Mean	Std. Dev.	Min	Max
Old-age Benefit	6,982,692	1275.00	0	1275.00	1275.00
Scholarships Benito Juárez					
Basic-level education	3,227,299	666.67	0	666.67	666.67
Upper secondary education	3,698,967	667.31	20.68	666.67	1333.34
*Youth writing the future**	298,805	1885.03	386.60	666.67	2666.67
Youth building the future**	559,290	3600.00	0	3600.00	3600.00
Disability Benefit	773,446	1396.45	374.30	1275.00	2550.00
Welfare savings***	348,316	500.00	0	500.00	500.00

*Jóvenes Escribiendo el Futuro, ** Jóvenes Construyendo Futuro, *** Tandas para el bienestar.

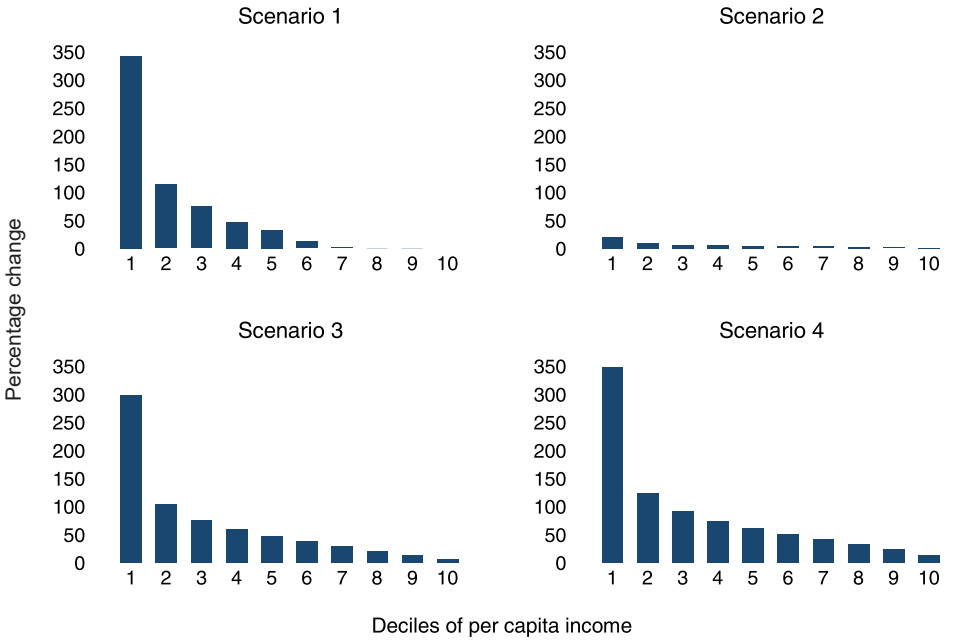
Table 2
Transfers effectivity to reduce poverty, Mexico 2019.
Source: Authors' estimations using MEXMOD.

Indicator	2019	S1	S2	S3	S4
Extreme Poverty (%)	11.63	0.25	10.20	1.87	0.03
Poverty (%)	39.63	7.11	36.74	9.59	3.00
Poverty gap (%)	14.00	1.12	12.57	2.64	0.34
Per capita poverty gap	378.22	34.08	339.51	73.25	10.24
Urban					
Headcount ratio (%)	37.21	8.98	34.68	10.08	3.81
Poverty gap ratio (%)	12.06	1.43	10.82	2.52	0.43
Per capita poverty gap	371.55	44.17	333.26	77.68	13.34
Rural					
Headcount ratio (%)	47.09	1.36	43.09	8.11	0.50
Poverty gap ratio (%)	19.98	0.15	17.98	2.99	0.04
Per capita poverty gap	398.78	3.00	358.76	59.58	0.69

average poverty gap. We also provide head count ratios and the average per capita poverty gap for urban and rural populations for each scenario.

These comparisons show to what extent a conditional transfer and unconditional UBI are effective in reducing poverty levels. The baseline situation is that 11.63 % of the population in Mexico is in extreme income poverty, 39.63 % is in income poverty, and the average per capita gap is $371.55, which represents 14 % of the poverty line; in rural areas, the headcount ratio of poverty is higher than that in urban areas, 47.09 % relative to 37.21 %. By all measures, the most effective policy to reduce poverty is the unconditional transfer (S4), and then, the UBI is the first-best policy. The second-best is scenario S1, which gives the transfer to the multidimensional poor population, and the third-best is scenario S3, which grants the transfer to each member of the family with children younger than 15 years old. The least effective policy to reduce poverty is scenario S2, which targets only the older population; this is a universal program currently implemented in Mexico. Nevertheless, in practice, Old-age Benefit do not yet cover the whole objective population.

Microsimulation results provide evidence that the unconditional transfer UBI eradicates extreme poverty, while an effective social policy that transfers cash to multidimensional poor people reduces extreme poverty to 0.25 %, and the policy that transfers cash to households with children reduces extreme poverty to 1.87 %, significantly lower than the actual situation and the



Graph 1. UBI impact on per capita income by decile (percentage change).

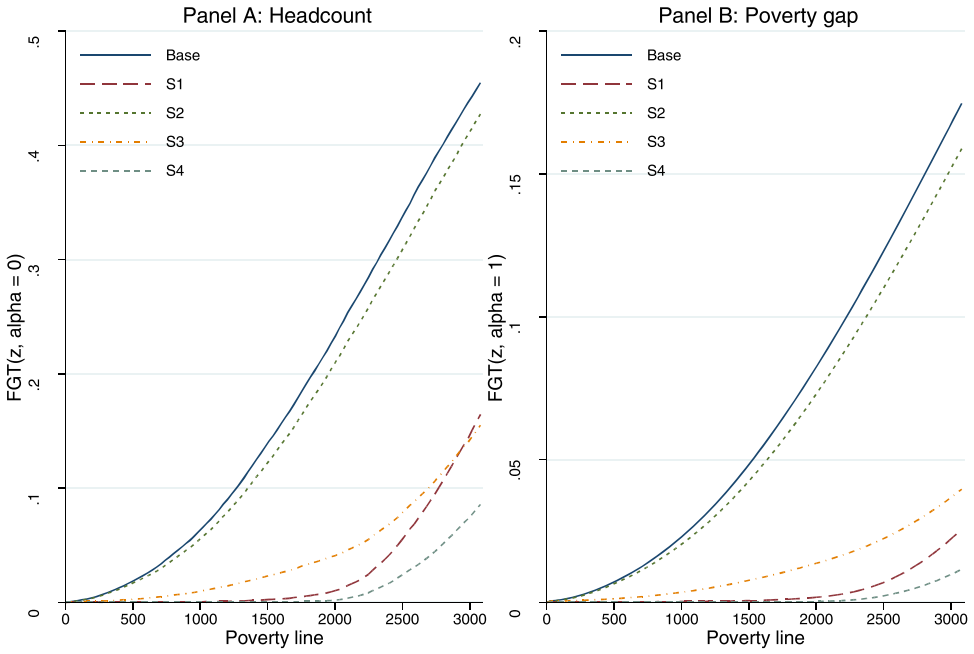
second scenario. Scenarios one and four present the broadest poverty-reducing effects, with 7.11 % and 3 %, respectively. Contrary to these scenarios, the second scenario only marginally reduces poverty from 39.63 % to 36.74 %, whereas the third scenario reduces it to 9.59 %.

In distributional terms, Graph 1 displays the impact by decile of per capita income, with the highest effect over the lowest deciles. Because of the income transfers, the mean per capita income for decile 1 increases almost 350 % under scenarios S1 and S4 and up to 300 % under scenario S3, while decile 2 doubles its initial levels. Since scenario S1 targets people under poverty conditions, the transfer favors only those in deciles 1–6. To a lesser extent, scenario S2 also increases the mean per capita income of the poor, with a major impact on deciles 1 and 2 (of 20 % and 9.5 %, respectively). Meanwhile, a transfer under scenarios S3 and S4 improves per capita incomes along all deciles.

Last, the scenario of a conditional transfer to individuals aged 65 years and up has only a marginal reduction. The same happens in the case of extreme poverty as long as the transfer closes the gap to make ends meet for a basket of food until the minimum level of 0.03 % in the fourth scenario; meanwhile, scenarios one and two close the gap, and extreme poverty declines from 11.63 to 0.25 and 1.87 correspondingly.

To validate the previous findings with greater formal inference, we show poverty curves considering the four conditional and unconditional UBI scenarios. We compute the total effect for each scenario by using the total poverty line (well-known as welfare poverty), and the results are displayed in Graph 2.

It can be seen that any UBI policy decreases the initial poverty level for any value of the poverty line, as all curves lie below the initial or base scenario. Scenario S4 displays the strongest impact, followed by scenarios S1 and S3, even though these two strategies do not



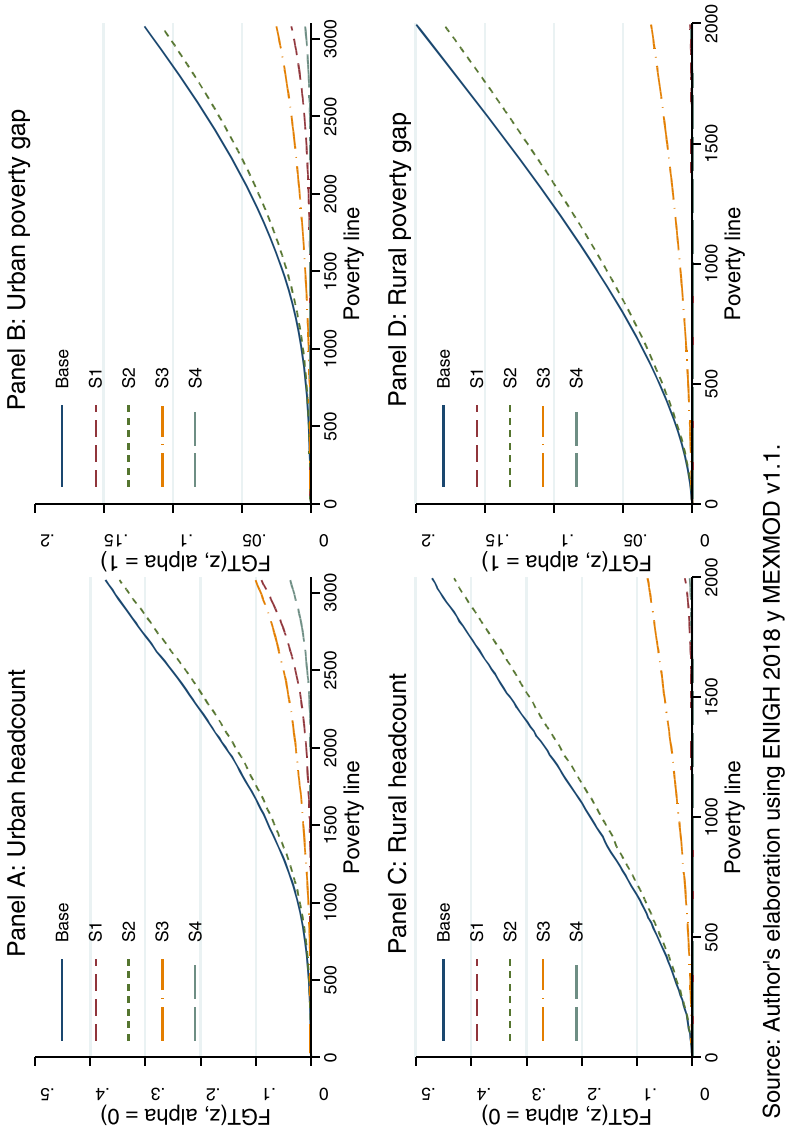
Graph 2. Effect of Universal Basic Income on poverty Mexico 2019.

show a clear pattern as they crossed at the top tail of the poverty line. Finally, scenario S2 causes few changes with respect to the base scenario as the curve remains closer to it. The microsimulation shows that the same happens when considering the poverty gap for all values of the poverty threshold.

We calculate the effects for each zone (rural and urban) on Graph 3. The rural population has a lower population density, and poverty is reduced more than in urban areas. This finding allows us to infer that poverty declines faster in rural areas for scenario S4 and that both measures poverty and the poverty gap. This is because distribution is more sensitive and the gap is smaller in rural rather than in urban zones. This technique is much better than displaying only poverty indices, since it is possible to observe each level of poverty along a curve and for all the thresholds of the poverty line.

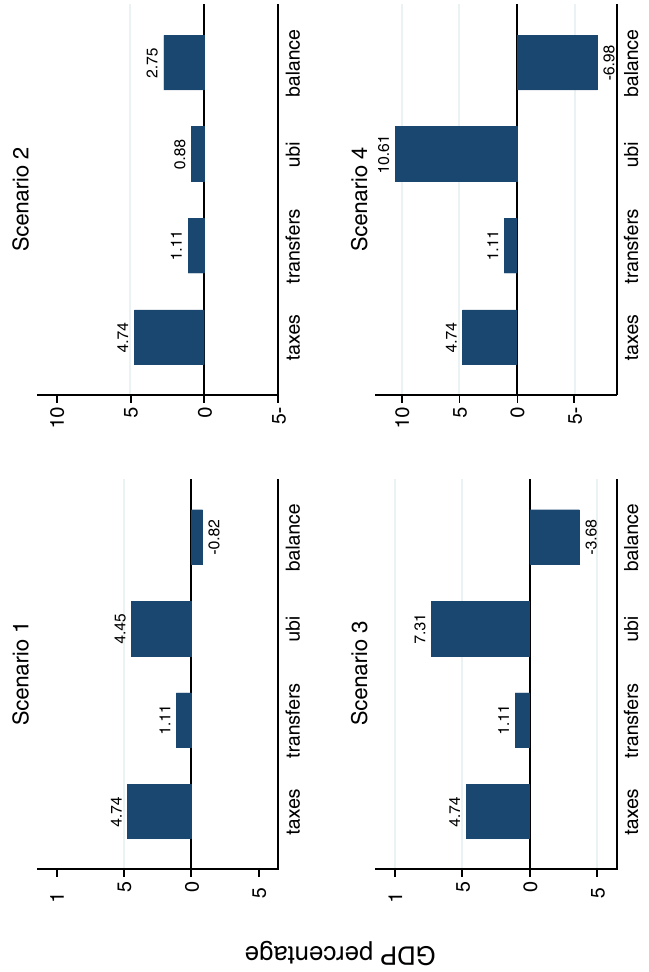
5. Feasibility of UBI financing from taxes

Microsimulation from MEXMOD also allows us to obtain the estimate on the tax burden and, more precisely, where in the population the money would come from in distributional terms. First, we need to assume no change in the tax revenue of 4.4 % and other transfers, 1.1 %, of the GDP. Second, we include an operating cost of 3.6 % (which is equivalent to the operating cost incurred for the old-age benefit in 2019). Third, we calculate the cost of each transfer under each of the four scenarios as a proportion of the GDP, including the operating cost. The microsimulated results show that the cost is directly related to the impact on poverty reduction. The first-best scenario is the most expensive, and the unconditional UBI would cost 10.61 % of



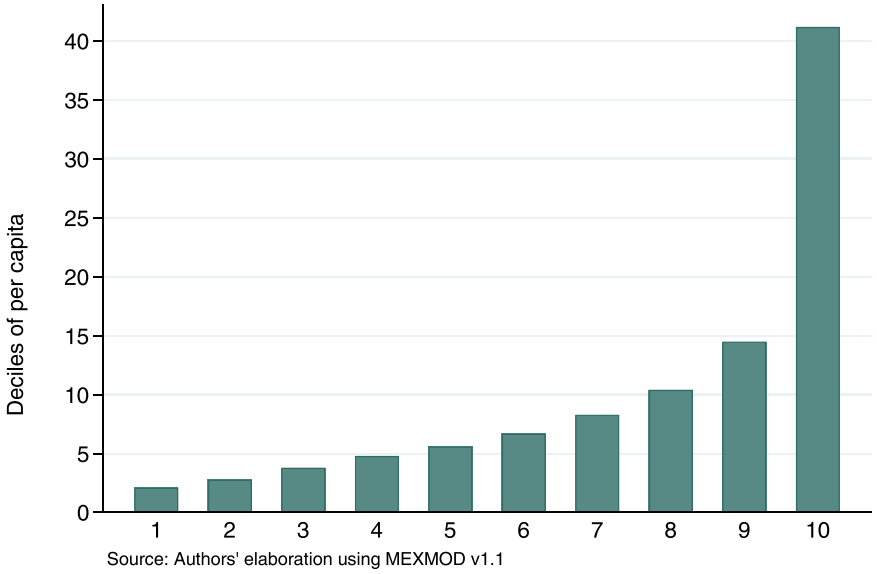
Source: Author's elaboration using ENIGH 2018 y MEXMOD v1.1.

Graph 3. Effect of Universal Basic Income on urban-rural poverty Mexico 2019.



Source: Authors' elaboration using MEXMOD v1.1

Graph 4. Cost of UBI as GDP percentage, Mexico 2019.



Graph 5. Tax revenue percentage contribution by decile, Mexico 2019 (deciles of per capita income).

the GDP (see Graph 4, scenario S4). Despite the negative balance, this policy is the only one that can eradicate extreme poverty and achieve the lowest level of income poverty, 3 %.

The second-best policy to reduce poverty (i.e., scenario S1) is less costly than the unconditional UBI transfer; the microsimulated cost is 4.4 %. The third-best policy would cost 7.31 % of GDP. The cheapest policy is the policy that provides the universal grant to the older population, and the cost is 0.88 % of the GDP.

As expected, lower income groups improve their position, and the distributional impact is positive as we move to the universal UBI scheme in scenario S4. Conclusively, the first and fourth scenarios are totally beneficial in the sense of their distributive impacts and for a whole range of poverty lines. These scenarios would clearly induce greater levels of improvements in terms of welfare dominance, as both do not cross for any level of income and across any poverty line considered.

The fundamentals of any microsimulation exercise in a tax-benefit model is to present both sides of the coin: on the one hand, to check the budgetary effects for the transfer policies simulated, and on the other hand, examine the distributional impacts for each scenario of the transfer.

Graph 5 displays the burden of both direct and indirect taxes according to MEXMOD microsimulation. It is of interest to see how the burden relies on the nonpoor, mainly by the richest decile; as a result, the measure could be progressive, as these revenues would be used in part to finance the UBI in the fourth case and explained lines above.

6. Discussion

This is the first time that a microsimulation using the tax-benefit MEXMOD model for Mexico has provided a formal comparison of the poverty situation given four different scenarios

under the design of a UBI transfer; three transfers are conditional on certain criteria, such as poverty condition, old age, and families with children. The last scenario proposes an unconditional approach of the universal basic income (UBI), as it is usually defined worldwide. As expected, lower income groups improved their position, and the distributional impact was positive as we moved to the universal UBI scheme in the fourth scenario. Conclusively, the first scenario, based on multidimensional poverty conditions, and the fourth scenario, the unconditional UBI, are totally beneficial in the sense of their distributive impacts and for a whole range of poverty lines.

These scenarios would clearly induce greater levels of improvements in terms of welfare dominance, as both do not cross for any level of income and across any poverty line considered. However, the cost of the first-best policy is twice the cost of providing the grant only to the poor population. In practice, even if the second-best policy seems relatively costless, there are some facts that could underestimate the cost. For example, the operating costs of finding the target population have not produced the expected results of alleviating poverty; after ten years of the definition and measuring multidimensional poverty, the objective population coverage is not complete.

According to the analytical framework of Francese and Prady (2018, p. 12, Fig. 6), a UBI is desirable in a situation where there is low progressivity and revenues are high enough to pay for it; if the coverage is high, UBI can reduce the leakages on the social programs, i.e., current benefits are regressive. The advantages of a UBI are the lower operating costs because the number of transactions and the bureaucracy are reduced; it could facilitate the information about the families to generate administrative data; and it increases financial inclusion. In addition to the cost, the disadvantages of a UBI are the low local revenues to finance the programs. However, the effect of improving income at the bottom is visible to be higher than any other benefit social program currently applied.

However, it is costly; the fourth scenario of the UBI transfer to all citizens would produce a deficit of approximately − 6.98% GDP points. This policy would improve well-being for the whole distribution of income, simultaneously decreasing poverty and inequality at minimum levels, and its results are worth the costs on revenues. Nevertheless, an increase in efficiency in revenues from direct taxation is needed in Mexico, a subject outside the scope of this research, which provides an interesting story to be told in the future.

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