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Unemployment insurance and income protection in Ecuador

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Abstract: This paper explores the role of the recently introduced unemployment insurance benefit (*seguro de desempleo*) in protecting incomes in case of unemployment in Ecuador. We use ECUAMOD, the tax-benefit microsimulation model for Ecuador, to simulate entitlement to the unemployment insurance benefit and calculate its effect on household disposable income in case individuals enter unemployment. Our results show that only around a quarter of the working age population would be covered in case of unemployment. Mean net replacement rates would increase from 51.44 to 54.5 per cent whereby protection by and large still rests on market income from other household members. Unemployment insurance would reduce the risk of falling into poverty in case of unemployment and would increase household income stabilization, although to a limited extent. Due to the high levels of informality (i.e. non-affiliation to social security) and the characteristics of the unemployment insurance scheme in Ecuador, the largest gains would be concentrated among middle-aged male employees at the top of the earnings distribution. Our analysis contributes to the recent debates about designing unemployment insurance schemes in Latin America and highlights the importance of considering the relevance of self-employment and informality in the design of such schemes.

Keywords: unemployment insurance, income protection, microsimulation
JEL classification: C81, H55, I3

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1 Introduction

Unemployment insurance (UI) schemes are the most common programs to provide protection in the event of unemployment in developed economies (Vodopivec 2013). The introduction of such schemes in developing countries has been a subject of wide discussions over the last decades (see Vodopivec and Raju 2002; Holzmann et al. 2012; Vodopivec 2013; Robalino 2014). The literature has in particular highlighted the need to tailor UI schemes to the circumstances of developing economies, characterized by large informality and weak administrative capacity (Vodopivec 2013; Robalino 2014).

In March 2016, Ecuador introduced a UI scheme (*seguro de desempleo*), which combines self-insurance with public insurance by providing a fixed payment, from a common pool of funds, to all unemployed workers fulfilling the eligibility conditions, and a variable top-up payment with funds from an individual account. The aim of this paper is to assess the income protection provided by the UI scheme in case of unemployment. Our analysis makes use of ECUAMOD, the tax-benefit microsimulation model for Ecuador, to simulate transitions into unemployment for all workers in the data in order to simulate entitlement to the UI and to compare their disposable income in work to the disposable income in unemployment with and without the introduction of UI.

Our analysis highlights several important findings. First, the Ecuadorian UI provides limited protection and would cover only around a quarter of the working age population in case of unemployment. The potential coverage of the scheme is mainly affected by the high level of informality in the economy, which we define as non-affiliation to any type of social security. Second, the main component contributing to income protection in case of unemployment in Ecuador is market income of other household members, whereas the role of the tax-benefit system is extremely modest. Third, net replacement rates would increase from 51.4 to 54.5 per cent on average following the introduction of the UI, reflecting the additional income protection provided by the scheme. The largest protection would, however, be provided to formal workers in the top earnings quintile, as the variable component of the benefit amount is proportional to previous earnings. Finally, the UI would reduce the risk of poverty for those entering unemployment and would have a positive effect on income stabilization.

In addition to assessing the protection provided by the current UI, tax-benefit microsimulation allows us to evaluate the effect of hypothetical reforms to the UI in order to highlight the factors influencing the results. Our analysis shows that relaxing the eligibility conditions to the benefit and increasing the duration of payment would increase the degree of income protection provided by the scheme. However, providing protection against unemployment for workers outside the formal economy would require implementing some type of unemployment assistance schemes or reforming current social assistance programs.

Our paper contributes to the literature on the effectiveness of UI schemes to provide income protection in developing countries in two main respects. First, we show that simulating transitions to unemployment represents a useful method to assess the protection offered by current and hypothetical unemployment benefit policies in developing countries. This approach originally proposed by Atkinson (2009) to 'stress-test' the performance of tax-benefit systems to provide an effective safety net in case of income loss has been used in a number of applications for EU countries (Figari et al. 2011; Fernandez Salgado et al. 2013; Jara and Sutherland 2014), and can now be exploited for developing countries thanks to the increasing availability of tax-benefit microsimulation models. Second, due to the large informal sector in developing economies, we

show that if the aim is to strengthen protection to workers in the event of unemployment, the introduction and design of UI schemes should not be considered independently from that of unemployment assistance or social assistance programs.

The remainder of this paper is structured as follows. Section 2 briefly discusses UI schemes in Latin America. Section 3 describes the characteristics of the UI scheme (*seguro de desempleo*) introduced in Ecuador in 2016. Section 4 presents the data and the tax-benefit microsimulation model for Ecuador. Section 5 assesses the effects of UI on income protection in Ecuador. Section 6 simulates the effect of two hypothetical reforms to the UI. Finally, section 7 concludes.

2 Unemployment insurance schemes in Latin America

Latin American countries have been traditionally characterized by systems of severance payments to protect workers in the event of unemployment. Severance payments constitute a lump sum payment received by employees upon involuntary separation from the firm.[1] The benefit amount usually depends on job tenure and previous earnings. Severance pay systems were designed to cover mainly workers in the formal private sector, as public sector employment is usually characterized by higher job security. In many developing countries this type if systems still represent an important benefit for formal workers due to the limited access to other forms of protection against unemployment (Holzmann and Vodopivec 2012; Vodopivec 2013). Velásquez Pinto (2014) shows that in all 19 Latin American countries considered in this study, severance pay systems are in place highlighting the relevance of such schemes in the region.[2]

Many Latin American countries have, in turn, shifted to a system of Unemployment Insurance Savings Accounts (UISAs), where employers and employees are required by law to contribute regularly a share of the worker's salary to an individual savings account (Ferrer and Riddell 2012). In case of unemployment, individuals can then draw unemployment compensation from their individual fund. UISAs have the advantage of guaranteeing compensation in the event of unemployment because regular payments are made to the individual accounts, whereas severance pay systems do not require firms to create specific reserve funds which could therefore create incentives for firms to avoid payments (Kugler 2001). UISAs also present advantages compared to traditional Unemployment Insurance (UI) schemes, characterized by a shared funding mechanism. UISAs avoid moral hazard problems by internalizing the cost of remaining in unemployment because compensation comes from an individual account rather than a common fund. This aspect of UISAs also reduces administrative costs compared to UI because they do not require extensive monitoring to control the risk of moral hazard which represents a great advantage for countries with limited administrative capacity (Ferrer and Riddell 2012). Systems of UISAs currently exist in Argentina, Brazil, Chile, Colombia, Ecuador, Panama, Peru, and Venezuela, and in some of these countries they already have a long history. In Panama, UISAs were introduced in 1972. In Argentina, UISAs were introduced in 1975 but they apply only to workers in the construction sector.[3]

[1] Holzmann et al. (2012) provide a collection of studies analysing the origins, rationale, characteristics and problems related to systems of severance pay within an international perspective.

[2] Velásquez Pinto (2014) provides a recent account of the state of protection against unemployment in Latin America.

[3] For a detailed description of the characteristics of different systems of severance pay in Latin America see Velásquez Pinto (2014).

More recently, some countries have moved to a system combining UISA with more traditional systems of unemployment insurance.[4] This is the case of UI systems in Chile and Ecuador. The combination of self-insurance and public insurance would allow providing more adequate protection in the event of unemployment. In fact, a problem associated with systems based purely on self-insurance is that it cannot be ensured that workers would have sufficient funds in their individual accounts to be compensated in case of unemployment. The Chilean UI system, *Fondo Solidario*, introduced in 2002, represents a pioneering example of UISAs combined with UI (Berstein et al. 2012, Sehnbruch and Carranza 2015). In 2016, Ecuador also adopted this model and introduced *Seguro de Desempleo*, which combines traditional UISAs with a shared funding mechanism, and is the object of this study.

Finally, contrary to developed countries, contributory UI systems characterized purely by common insurance are limited in Latin America, and currently exist only in Argentina, Brazil, Uruguay, and Venezuela.[5] Examples of unemployment assistance schemes, i.e. non-contributory unemployment benefits subject to means-testing and targeting workers not eligible to UI, are also scarce in the region. Argentina's *Plan Jefas y Jefes de Hogar Desocupados* represents one of the only examples of such type of programs in Latin America.[6]

3 The unemployment insurance benefit (*Seguro de desempleo*) in Ecuador

The UI benefit (*seguro de desempleo*) was introduced by the Organic Law for the Promotion of Juvenile Labour, Exceptional Regulation of the Working Day, Severance Pay and Unemployment Insurance (*Ley Orgánica para la Promoción del Trabajo Juvenil, Regulación Excepcional de la Jornada de Trabajo, Cesantía y Seguro de Desempleo*) in March 2016. The scheme is financed through compulsory employer and employee social insurance contributions and aims to protect workers affiliated to social security in the event of involuntary unemployment.[7]

In order to be eligible to UI, the following conditions need to be fulfilled: (a) be affiliated to the general social security regime of the IESS; (b) work as an employee; (c) have contributed to the social security system through an employer for at least 24 months, out of which 6 contributions need to have been made consecutively before entering unemployment; (d) be unemployed for a period of at least 60 days; (e) be unemployed involuntarily; (f) not be retired; and (e) apply for UI from the 61st day of unemployment up to 45 days after.

The UI benefit amount is based on the average earnings received over the last 12 months of employment. UI benefits are composed of a fixed and a variable part. The fixed part is financed through the employer social insurance contribution and is equal to 70 per cent of the national minimum wage (USD366 in 2016) per month. The variable part is financed through employee social insurance contributions and tops up the fixed component (if the employee contributory

[4] The Chilean Fondo Solidario, introduced in 2002, represents a pioneering example of Unemployment Insurance combined with UISA.

[5] In Brazil, the scheme is not financed through employee and employer contributions but through the Worker Protection Fund (Fundo de Amparo ao Trabalhador – FAT). In order to be eligible, individuals are required to have been employed in the formal sector for six months over the last three years (Hijzen 2011, Velásquez Pinto 2014).

[6] For more information about Plan Jefas y Jefes de Hogar Desocupados in Argentina and its effects on long term employment see Iturriza et al. (2008).

[7] Employers are required by law to make a 1 per cent contribution to the common UI fund. Employees are required by law to make a 2 per cent contribution to their individual account.

unemployment funds are sufficient) up to a maximum benefit amount of 70 per cent of average earnings received over the last 12 months. The first UI benefit payment is made on month 4 of unemployment at the level of the maximum benefit. The benefit amount is then reduced 5 per cent every month until month 8 (50 per cent of average earnings received over the last 12 months) after which entitlement to UI benefits stops.

As previously mentioned, the maximum duration of payment is thus 5 months. At the end of the 5 months unemployment period, the employee can decide to withdraw the remainder of his/her unemployment fund as a lump sum or keep it in his/her individual account. For the purpose of our simulations, we assume that once the 5 months' payments have been exhausted, individuals keep their remaining contributions in their individual accounts.

4 Data and methodology

Our study makes use of ECUAMOD, the tax-benefit microsimulation model for Ecuador, based on household representative microdata, to assess the role of the UI in protecting incomes in unemployment. Our strategy consists of simulating transitions from work into unemployment for all working age individuals with positive earnings, and comparing a scenario in which the UI is not in place with another in which the UI has been introduced. The remainder of the section describes ECUAMOD and the data used for the simulations and provides a description of the methodology used to model transitions into unemployment.

4.1 ECUAMOD and the data

ECUAMOD is the tax-benefit microsimulation model for Ecuador, which is based on microdata from the National Survey of Income and Expenditures of Urban and Rural Households (*Encuesta Nacional de Ingresos y Gastos de Hogares Urbanos y Rurales*, ENIGHUR) 2011–12.[8] ECUAMOD combines detailed country-specific coded policy rules with micro-data from ENIGHUR 2011–12 to simulate direct and indirect taxes, social insurance contributions and cash transfers for the household population of Ecuador.

ENIGHUR 2011–12 contains very detailed information on labour and non-labour income, taxes and social insurance contributions, public pensions, cash transfers, private transfers, expenditures, as well as personal and household characteristics. The data used in our analysis contains information for 39,617 households and 153,341 individuals.

ECUAMOD is used to simulate the main tax and benefit components of household disposable income in Ecuador, where household disposable income is defined as the sum of market income plus social cash transfers minus income tax and social insurance contributions. Simulation results for ECUAMOD have been validated both at the micro and macro level (see Jara et al. 2017) and

[8] ECUAMOD has been developed as part of UNU-WIDER's project on 'SOUTHMOD—simulating tax and benefit policies for development' in which tax–benefit microsimulation models have been built for selected developing countries. ECUAMOD and other country models from the SOUTHMOD project are openly accessible, and run on the EUROMOD software, which enables users to analyse the effect of tax-benefit policies on the income distribution in a comparable manner. For more information about SOUTHMOD see: https://www.wider.unu.edu/project/southmod-simulating-tax-and-benefit-policies-development. For more information about EUROMOD see Sutherland and Figari (2013).

the model has been used in recent empirical studies by Bargain et al. (2017), Jara and Varela (2018), Jouste and Rattenhuber (2018).

Our analysis takes 2016 policies (as on June 30th) in Ecuador as the starting point. Market incomes and non-simulated tax-benefit variables in ENIGHUR 2011–12 are adjusted to 2016 levels using source-specific updating factors (see Jara et al. 2017). More precisely, we simulate transitions from work into unemployment for all working-age individuals in the data and calculate their household disposable income in unemployment with and without the introduction of the UI. The simulations in our analysis are static, in the sense that the behaviour of the agents and of the other members of their households is assumed not to be affected by the introduction of the UI.

4.2 Transitions to unemployment

This paper evaluates the effects of the newly introduced UI policy by comparing how moving from work (employment or self-employment) into unemployment with and without introducing UI would affect people's disposable income. Disposable incomes under both scenarios (with and without introducing UI) are calculated by means of the microsimulation model ECUAMOD, hence capturing the implications of the tax-benefit system for people's income position while employed versus unemployed. The effects of a transition to unemployment are simulated for all those currently in work in the data, aged between 15 and 64, not in full-time education or in retirement. This sub-section focuses on the assumptions that have been made in simulating transitions into unemployment and how these are implemented in the simulations.

The effects of transitions into unemployment in our analysis are simulated as follows. First, household disposable income is calculated before transition to unemployment takes place. Then, for each earner in the household, individual earnings are set to zero and all benefits for which they would become eligible (including UI) are simulated with ECUAMOD, as well as their corresponding household disposable income under unemployment.[9] This is done separately for each earner in the household, making the assumption that the earnings of other household members are not affected by the individual's change in labour market status and income. Table A1 in the appendix shows the characteristics of the sample in our analysis.

Simulating transitions to unemployment is particularly practical in order to simulate the policy rules determining entitlement to unemployment benefits for several reasons (Jara and Sutherland 2014). First, eligibility to UI can be assessed using work history reported in the data by individuals currently in work. Second, employment status (employee or self-employed), which is needed to assess eligibility, is available for those currently employed. Third, current earnings can be used to simulate the UI amount in entry to unemployment. Finally, in our case the data reports whether individuals currently in work are affiliated to social security, differentiating between the general, voluntary or other regimes. This information allows us to simulate entitlement to the UI only for those affiliated to the general social security regime.

Despite the advantages of simulating transitions to unemployment, some assumptions are necessary to simulate UI benefits. First, the number of months of contributions to social security is assumed to be equal to the months of work experience reported in the data. Note that this might result in an overestimation of UI entitlement, because individuals currently affiliated with social security were not necessarily affiliated since the beginning of their work career. Second, the eligibility conditions of the Ecuadorean UI require individuals to have at least six consecutive

[9] Other relevant labour market variables entering the simulations are adjusted to reflect the corresponding change in their labour market situation e.g. labour market status set to unemployment, hours of work set to zero.

contributions before entering unemployment. This information is not available in the data and our simulations assume that individuals with the required overall 24 contributions (i.e. 24 months of work experience) fulfil this eligibility conditions. Third, the benefit amount needs to be calculated based on the average monthly earnings of the last 12 months before unemployment. The survey records employment income over the last month only. Our simulations take these earnings as a proxy of the earnings base for the calculation of the UI benefit amount. Finally, an important assumption needed for the calculation of unemployment benefits for the new unemployed involves determining the duration of their unemployment spell. Here, we use a simplifying assumption of 12 months to focus on the effect of the UI over the first year of unemployment. Due to these data limitations, our results should be considered as an upper bound of income protection provided by the Ecuadorian UI in case of unemployment.

5 Assessing the effects of the UI scheme in Ecuador

This section presents an empirical assessment of the potential effect of the UI on various outcomes of interest. We first analyse the potential coverage provided by the UI in case individuals would enter unemployment. Then, we study the effect of the UI on net replacement rates. Finally, the effect of the UI on poverty risk and household income stabilization is analysed.

Our results exploit the heterogeneity in the microdata to provide findings not only at the population level but also across particular population subgroups (by gender, age, education, employment status and sector, and earning quintile groups). This subgroup analysis is particularly relevant as the degree of income protection provided by the UI most likely varies depending on the characteristics of the population entering unemployment.

5.1 Potential coverage

Our analysis refers to potential coverage as the proportion of the new unemployed who would be entitled to UI, in the first 12 months of unemployment based on their previous work history (Jara and Sutherland 2014). The potential coverage provided by the UI in case of unemployment is presented in Figure 1 for the whole population and specific subgroups.

Our results show that only 24.5 per cent of the working age population would be covered by the UI in case of unemployment. Potential coverage is slightly larger for men (25.04 per cent) than for women (23.7 per cent). In terms of age, coverage would be larger among those aged 30 to 50. The smaller coverage for young workers is related to fewer months of work experience, which is used to assess eligibility, whereas the smaller coverage among older age groups is related to lower affiliation to social security.

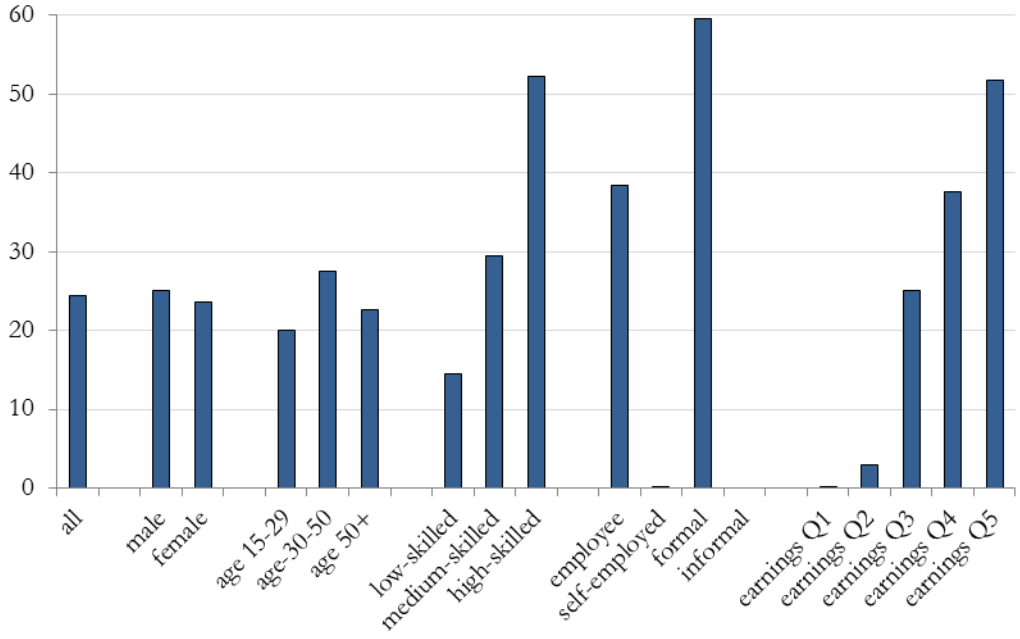
Noticeable differences in potential coverage are observed across education subgroups. Only 14.5 per cent of low-skilled workers would be covered by the UI in case of unemployment. Potential coverage increases with the level of education, with 29.5 per cent of coverage among medium-skilled workers and up to 52.2 per cent for the high-skilled. Differences in coverage across education subgroups reflect the fact that informality (lack of affiliation to social security) is concentrated among low-skilled workers.

Labour market characteristics play an important role for potential coverage. By design, eligibility to the UI is restricted to employees affiliated to the general social security regime. The self-employed are not entitled to UI and would therefore not be covered in case of unemployment, whereas potential coverage is 38.5 per cent among employees. Informal workers, defined as those

not affiliated to any type of social security, would also be unprotected in case of unemployment, whereas 59.6 per cent of formal workers would be covered by the UI.

Finally, there is a clear pattern in terms of earning quintile groups, with potential coverage increasing with the level of earnings. Potential coverage is only 0.20 per cent for the bottom earnings quintile, whereas coverage increases up to 51.8 per cent for the top quintile group. Differences across earning quintile groups are most likely related to a lower rate of affiliation to social security among low earners.

Figure 1: Potential coverage of the UI benefit in Ecuador



Source: Author's elaboration based on ECUAMOD v1.4.

5.2 Net replacement rates

Net replacement rates measure the proportion of household disposable income that would be maintained in case a member of the household falls into unemployment. As such net replacement rates capture, the degree of income protection provided by the tax-benefit system and incomes of other household members in case an individual in the household becomes unemployed. More formally, the net replacement rate (NRR) of individual *i* is defined as

$$NRR_i = \frac{Y^{U_i}}{Y^{W_i}} ,$$

where Y^{Ui} represents household disposable income when individual *i* is unemployed (U) and Y^{Wi} represent household disposable income when individual *i* is in work (W). In case the household has multiple earners, net replacement rates are calculated for each earner in the household separately, assuming that behaviour of other household members does not change when a person becomes unemployed.

Net replacement rates would normally range between 0 and 100 per cent. However, specific features of tax-benefit systems could result in net replacement rates taking values above 100

percent or below zero.[10] In our analysis we exclude the top percentile of the net replacement rates distribution if the net replacement rate is above 150 per cent and the lowest percentile if the net replacement rate is negative. This restriction is chosen in order to reduce the risk of our calculations being biased by 'outliers', especially when we consider net replacement rates by population subgroups.[11]

The effect of the UI on net replacement rates is presented in Figure 2, where mean net replacement rates with and without UI are depicted. Our results show that net replacement rates would increase from 51.4 to 54.5 on average for the whole working age population. Figure 2 further shows that there is an important degree of heterogeneity in net replacement rates across the population and that the additional protection provided by the UI varies widely across subgroups.

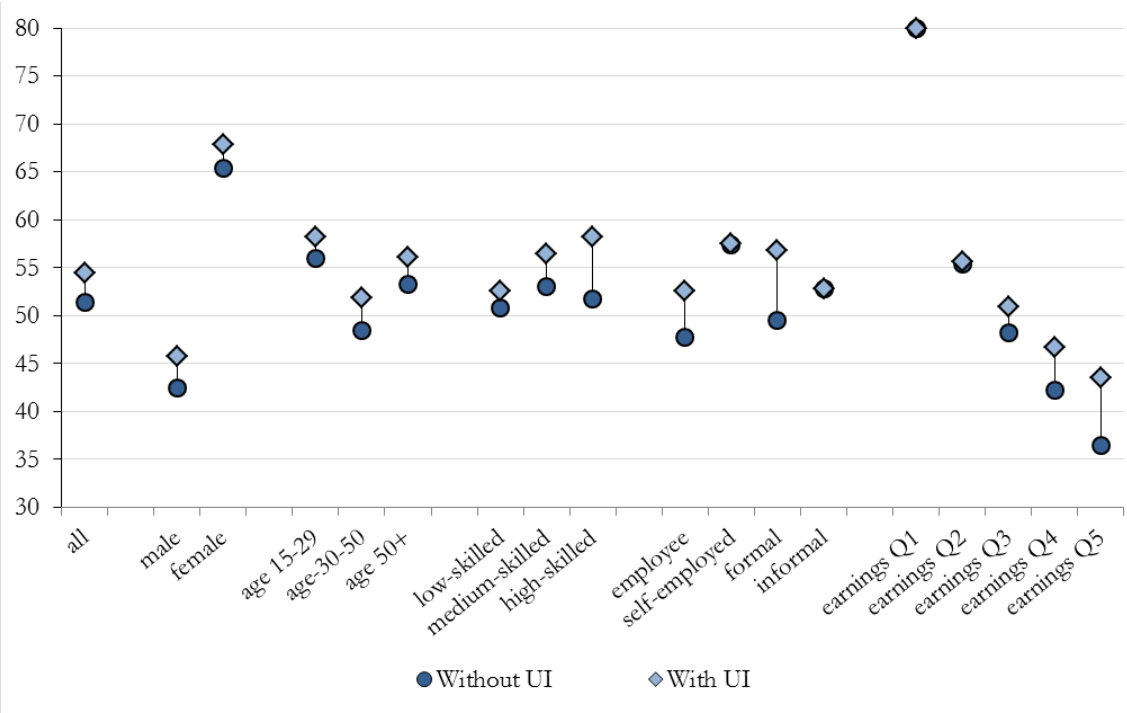
Male workers and those aged 30 to 50 present lower net replacement rates on average, and these groups would benefit the most from the introduction of the UI. The difference in net replacement rates between male and female workers is driven by the fact that men have on average higher earnings than women, in which case the entry to unemployment of a male worker would represent a larger loss in household disposable income (lower net replacement rate). Net replacement rates for male (female) workers would increase from 42.4 per cent (65.4) to 45.8 per cent (67.9 per cent). Net replacement rates increase by 3.5 points for individuals aged 30 to 50, compared to 2.2 point for younger age groups and 2.9 points for older workers.

The additional protection provided by the UI increases with the level of education. Net replacement rates would increase by 1.8 points, 3.4 points and 6.5 points for low-skilled, middle-skilled and high-skilled workers, respectively. A similar increasing pattern is observed across earning quintile groups, with a negligible effect in net replacement rates for the bottom quintile to up to a 7 point increase in the top quintile group. Finally, as we would expect the largest increase is observed for workers in the formal sector (7.3 points), which is the groups targeted by the UI.

[10] For instance, the presence of lower limits of unemployment insurance schemes could result in disposable income in unemployment being higher than disposable income in work for low earners.

[11] A similar procedure is suggested by Jara and Tumino (2013) in their analysis of marginal effective tax rates.

Figure 2: Mean net replacement rates to unemployment (%)



Source: Authors' elaboration based on ECUAMOD v1.4.

As previously mentioned, Figure 2 shows important differences in net replacement rates across population subgroups. These differences might be related to the role of different sources of income in protecting household income in case of unemployment. For this reason, we provide a picture of the composition of mean net replacement rates by income component. More formally, household disposable income in unemployment can be decomposed as the sum of market incomes (O) (incomes before any tax and transfer), benefits and pensions (B) minus taxes and social insurance contributions (T). Net replacement rates can therefore be expressed as follows:

$$NRR_i = \frac{O^{U_i} + B^{U_i} + T^{U_i}}{Y^{W_i}} \ .$$

Market income when individual *i* is unemployed includes earnings of other household members, as well as other sources of personal income such as investment and property income, private inter-household transfers and alimonies.

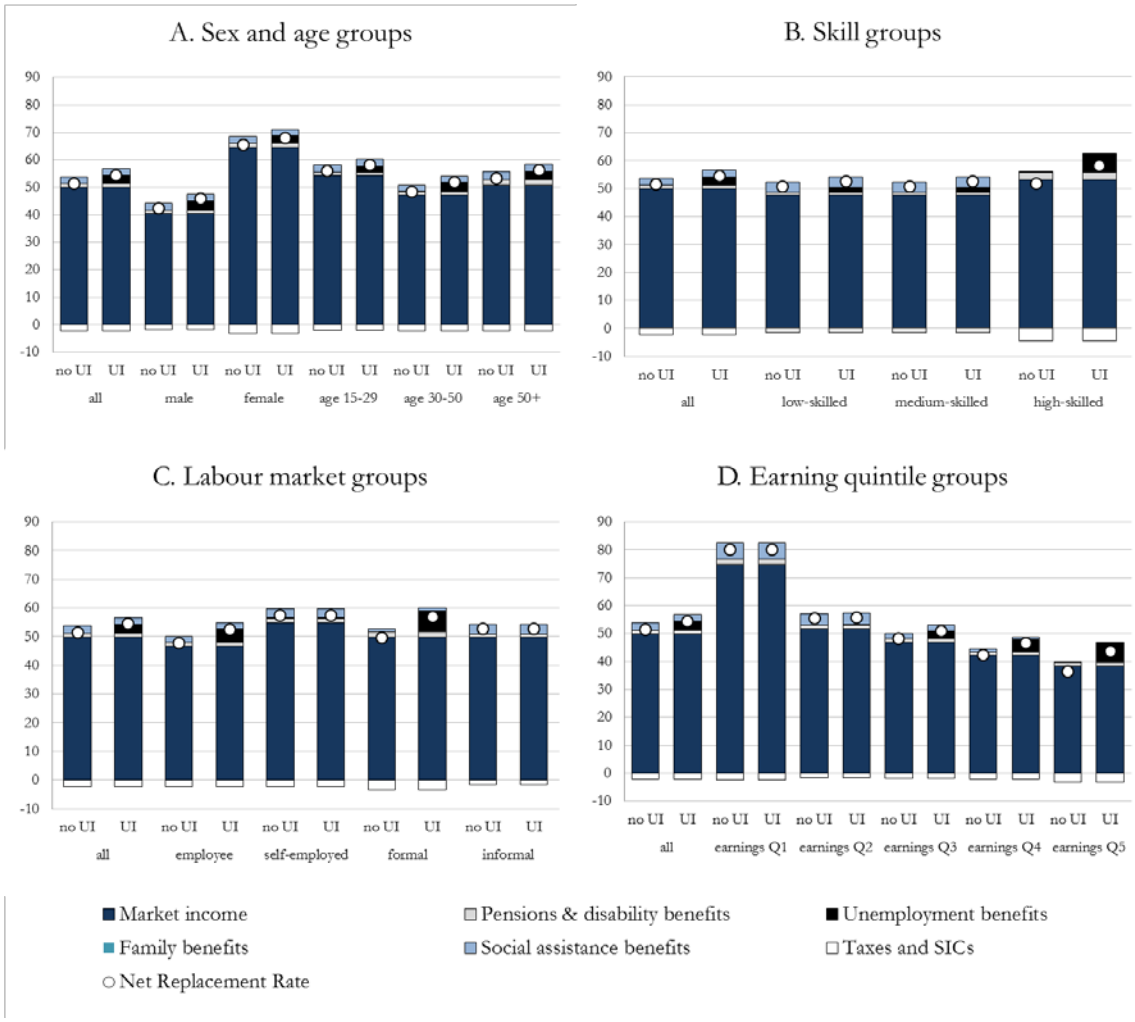
We follow Fernandez Salgado et al. (2013) and further decompose benefits into four components: (i) unemployment benefits; (ii) social assistance benefits, including the Human Development Transfer (*Bono de Desarrollo Humano*) and housing grants, etc.; (iii) family benefits, which mainly include scholarships; and (iv) pension and disability benefits, which include contributory old-age, survivors and disability pensions, as well as sickness benefits and the disability carer transfer Joaquín Gallegos Lara.

Figure 3 present the decomposition of mean net replacement rates for the whole population and for each population subgroup. Two main findings can be highlighted from our results. First, market income and in particular earnings of other household members play a major role in protecting against negative income shocks due to unemployment. Second, the tax-benefit system provides only very limited income protection in case of unemployment.

Market income (dark blue bars) represents the largest income component of net replacement rates, accounting for 50 per cent of in-work disposable income on average for the whole population. Earnings of other household members are a substantial part of market income and therefore highlight the importance of family income as a mean of protecting individuals in case of unemployment. Looking across population subgroups, our results show that the large differences in net replacement rates are driven by differences in market incomes, which is related to the relative importance of earnings of the person who becomes unemployed, with respect to earnings in the household. Consider, for instance, panel A in Figure 3. Net replacement rates without UI are 42.4 per cent for males compared to 65.4 per cent for females. The main driver of this difference is market income, which accounts on average for 40.4 per cent of in-work disposable income when male workers become unemployed, compared to 64.4 per cent when female workers become unemployed. As such, this result reflects the fact that in Ecuador earnings of female workers account for a smaller fraction of household earnings. Thus, when female workers become unemployed, the remaining share of household market income is larger than when male workers become unemployed. The effect of the relative importance of earnings of the new unemployed on net replacement rates is even more evident when the decomposition across earning quintile groups is considered (panel D in Figure 3).

The tax-benefit system plays only a minor role in protecting incomes in unemployment. On average, social assistance benefits account for only 2.5 per cent of in-work disposable income for the whole working age population. The small role of social assistance is due to the fact that the Human Development Transfer, the main cash transfer in Ecuador, is proxy means-tested, meaning that the eligibility conditions depend on a multidimensional index. The index is based on characteristics of the household and the head of the household, characteristics of the dwelling, the area of residence, etc. Household income does not enter directly the composite index and a loss of income due to unemployment has therefore no effect on the eligibility status of the household. Pensions and disability benefits account for 1.4 per cent of in-work disposable income, whereas all other benefits, before the introduction of the UI, have a negligible role in net replacement rates. The overall effect of income taxes and social insurance contributions on net replacement rates is small and negative because incomes of other household members are subject to income taxes and social insurance contributions.

Figure 3: Decomposition of net replacement rates by socio-economic groups



Source: Author's elaboration based on ECUAMOD v1.4.

Following its introduction, UI becomes the most relevant tax-benefit instrument in terms of income protection in unemployment but still represents only 3 per cent of in-work disposable income on average for the whole population. The effect of UI varies across the population, being the largest for males (3.3 per cent of in-work disposable income), those aged 30 to 50 (3.5 per cent), the highly skilled (6.6 per cent), employees (4.7 per cent), formal workers (7.3 per cent) and individuals in the highest earning quintile (7 per cent).

5.3 Risk of poverty

Unemployment is an important factor affecting the risk of households falling into poverty. Table 1 presents the proportion of people who would fall below the poverty line and extreme poverty line following their transition into unemployment and the difference made by the introduction of the UI in Ecuador. The table also shows the proportion of the sample who have incomes below the poverty and extreme poverty lines while in work (poor in work). The results are calculated based on household disposable income per capita using the national poverty (USD84.68 per month) and extreme poverty lines (USD47.72 per month) in 2016.

Table 1. At risk of poverty (per cent)

	Poverty	Extreme poverty
Poor in work	8.93	1.93
At risk without UI	31.68	24.18
At risk with UI	28.80	21.49

Notes: Poverty is computed for individuals according to their household disposable income per capita. Household disposable income is calculated as the sum of all income sources of all household members net of income tax and SICs.

Source: Author's elaboration based on ECUAMOD v1.4.

Our results show that 8.93 per cent and 1.93 per cent of those currently in work have incomes below the poverty and extreme poverty lines, respectively. In case of unemployment, 31.68 per cent of workers would fall below the poverty line, whereas 24.18 per cent would fall below the extreme poverty line in the absence of UI. The introduction of the UI benefit would decrease the risk of poverty by 2.88 percentage points and the risk of extreme poverty by 2.68 points. The limited effect of the UI in terms of protection against poverty might be driven by two factors. First, only workers affiliated to the general social security regime are entitled to UI. The scheme has therefore no effect on protection against poverty in case of unemployment for informal workers. Second, the duration of payment is 5 months. Therefore, over the period of one year (assessed in this study) the effect of the UI to protect individuals against falling into poverty is reduced.

5.4 Household income stabilization

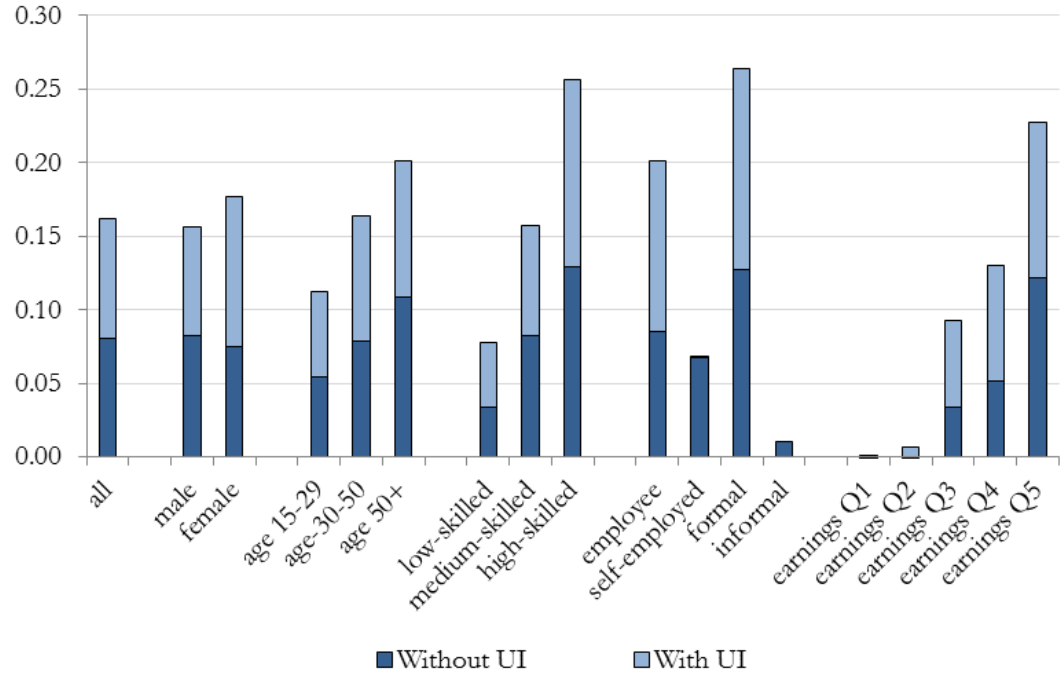
The introduction of the UI benefit could add to the income stabilization provided by the tax-benefit system in Ecuador. This section presents a picture of income stabilization before and after the introduction of the UI for the whole population and for particular population subgroups. More formally, we use the income stabilization coefficient as defined in Bargain et al. (2013; equation 12):

$$\tau = 1 - \frac{\sum_i (Y_{ih}^B - Y_{ih}^S)}{\sum_i (X_{ih}^B - X_{ih}^S)} \ ,$$

where Y^B_{ih} represents household disposable income before transitions into unemployment are simulated; Y^S_{ih} (S=N,UI) represents the disposable income of household h when worker *i* enters unemployment in the absence of UI (Y^N_{ih}) or when the UI is taken into account (Y^{UI}_{ih}); X^B_{ih} and Y^S_{ih} stand for market income of household h before and after transition to unemployment, respectively. As such, the income stabilization coefficient represents the proportion of gross income from work lost on becoming unemployed that is retained in the form of reduced taxes and increased benefits (i.e. unemployment insurance).

Figure 4 presents the coefficients of income stabilization for the whole population and particular subgroups and the difference made by the UI. The dark blue parts of the bars show the level of income stabilization in the absence of the UI. The light blue parts of the bars depict the additional stabilization provided by the introduction of the UI. The total length of the bars, therefore, shows the level of income stabilization in the presence of the UI. Our results show that automatic income stabilization is very low in Ecuador, with a coefficient of 0.08 before the introduction of the UI. The very limited degree of automatic stabilization is not surprising given the small role of taxes and social insurance contributions, and the rigidity of social assistance, which does not automatically protect individuals after an income loss.

Figure 4: Income stabilisation coefficient



Source: Authors' elaboration based on EUROMOD v1.4.

The introduction of UI would double the coefficient of income stabilization (0.16) although automatic stabilization remains very low. Figure 4 shows that the additional income stabilization provided by the UI varies with the characteristics of the potentially unemployed person. The additional income stabilization from the UI would be the largest for formal workers, employees, the high-skilled and high earners (top quintile) compared to other groups. As expected, no effect is observed for workers not covered by the UI (informal and the self-employed) and very little additional stabilization is provided for those with low earnings (first and second quintiles).

6 Improving income protection in case of unemployment: simulating counterfactual policy scenarios

The analysis presented in the previous sections highlights the small protective role of the UI benefit in Ecuador. The degree of income protection provided by the scheme is driven by two factors. The first factor concerns the design of the UI scheme, e.g. eligibility conditions, benefit amount, duration. The second factor relates to the characteristics of the Ecuadorian labour market, namely the presence of a large informal sector. In this section, we simulate two hypothetical reform scenarios to illustrate how the degree of income protection provided by the scheme could be enhanced. The aim of this section is not to propose particular reforms to the UI scheme but to show how changes in its design would affect the protection provided by the scheme in case of unemployment.

6.1 Description of counterfactual scenarios

Counterfactual scenario A: Increasing the generosity if unemployment insurance

The first counterfactual scenario (Scenario A) aims at making the benefit more generous in all its dimensions. More formally, scenario A involves the following changes with respect to the baseline

UI scheme: (i) the number of months of contributions to social security in order to be eligible for the benefit is reduced from 24 months to 12 months; (ii) the (maximum) benefit amount is kept fixed at 70 per cent of previous earnings during months 4 to 8 of unemployment; (iii) the maximum duration of payment is increased to 9 months with a benefit amount equal to 50 per cent of previous earnings during months 9 to 12 of unemployment. All other characteristics of the baseline UI scheme remain the same.

Counterfactual scenario B: Implementing an unemployment assistance program

Note that under Scenario A, the scheme still targets only workers affiliated with the general social security regime and would therefore provide no protection to most self-employed workers or workers in the informal sector. For this reason, we simulate a second counterfactual scenario (Scenario B), which aims at dealing with the specificities of the Ecuadorian labour market.

Under scenario B, rather than reforming the current UI scheme, we introduce an unemployment assistance (UA) program designed as follows. Individuals eligible to UA are those involuntary unemployed, not affiliated with the general social security regime, not in receipt of UI, between ages 18 to 65, who live in households considered vulnerable according to the index of the social registry.[12] Individuals fulfilling the eligibility conditions for UA would be entitled to a benefit equal to 70 per cent of the national minimum wage (equivalent to the fixed part of UI) from month 4 to month 8 of unemployment.

6.2 Evaluation of counterfactual policy scenarios

The remainder of this section compares the baseline UI with the two counterfactual scenarios in terms of potential coverage rates, mean net replacement rates, poverty risk and household income stabilization. As it was the case for the previous section, we provide results at the population level but also across particular population subgroups in order to analyse which groups would gain the most from the counterfactual reforms.

Table 2 shows potential coverage rates under the baseline UI and scenarios A and B. Our results show that under scenario A, potential coverage would increase by around 3 points on average for the whole working age population. This increase is driven by the less stringent contribution conditions under scenario A (12 months of contributions instead of 24). The group that would benefit the most are individuals aged 15 to 29. This is expected as young workers would in general have made fewer contributions than workers who have been longer in the labour market. Note that under scenario A, coverage of self-employed workers only marginally increases, whereas informal workers are not protected by the counterfactual scheme. On the other hand, under scenario B, around 13.56 per cent self-employed workers and 22.1 per cent informal workers would be covered by unemployment assistance. Moreover, under scenario B, potential coverage of unemployment benefits (UI and UA) would increase by 60 per cent, from 24.5 to 39.2 per cent. The introduction of a UA scheme would also provide protection to low earners in the event of unemployment (quintiles 1 and 2), which is not the case under the current UI scheme due to the fact that most workers affiliated with the general social security scheme have higher earnings.

[12] The index of the social registry is a composite index used to assess eligibility to the main social assistance program in Ecuador, the Human Development Transfer (HDT). The HDT is a proxy means-tested conditional cash transfer. Three population subgroups are eligible for HDT: (i) poor families with children younger than 18 years, (ii) vulnerable elderly adults who do not receive any pension, and (iii) vulnerable disabled persons. In 2017, the benefit amount was fixed at USD50 per month.

Table 2: Potential coverage under baseline and counterfactual scenarios (%)

	Baseline	Scenario A	Scenario B
all	24.50	27.85	39.24
male	25.04	28.62	41.94
female	23.66	26.67	35.07
age 15-29	20.10	26.76	36.75
age-30-50	27.47	30.14	41.00
age 50+	22.58	23.39	37.97
low-skilled	14.47	16.38	36.45
medium-skilled	29.47	34.81	35.23
high-skilled	52.20	58.09	53.04
employee	38.46	43.73	53.94
self-employed	0.25	0.29	13.56
formal	59.64	67.81	63.85
informal	0.00	0.00	22.11
earnings Q1	0.20	0.23	19.68
earnings Q2	2.90	3.33	31.23
earnings Q3	25.09	30.21	41.94
earnings Q4	37.60	43.07	46.12
earnings Q5	51.83	56.82	53.60

Source: Authors' elaboration based on EUROMOD v1.4.

We now turn to the effect of our counterfactual scenarios on mean net replacement rates, shown in Table 3. Under scenario A, mean net replacement rates would increase by 3 percentage points on average for the whole working age population. The main driver of the improvement in net replacement rates is the extension of payment duration to months 9 to 12 of unemployment und to a lesser extent, the increase of benefit amounts for months 5 to 8 of unemployment (70 per cent of previous earnings rather than 50 per cent). The largest gains from this counterfactual reform would be concentrated among male, high-skilled, high earners. Under scenario B, mean net replacement rates for the whole working age population are only marginally higher than those under scenario A (58.02 per cent compared to 57.43 per cent). However, the distribution of gainers is substantially different. Contrary to scenario A, under the introduction of a UA scheme the largest gains would be concentrated among low-skilled workers, the self-employed, workers in the informal sector and low earners (quintiles 1 and 2). Despite the increase in net replacement rates under both scenarios, the contribution of the tax-benefit system to income protection in Ecuador would remain low, with market income from other household members representing by large the most important source of income protection in the event of unemployment.

Table 3: Mean net replacement rates to unemployment under baseline and counterfactual scenarios (%)

	Baseline	Scenario A	Scenario B
all	54.45	57.43	58.02
male	45.75	49.06	49.67
female	67.89	70.36	70.94
age 15–29	58.18	61.06	61.61
age 30–50	51.91	55.16	55.03
age 50+	56.13	58.53	61.03
low-skilled	52.63	54.43	58.04
medium-skilled	56.45	60.06	57.61
high-skilled	58.24	64.41	58.41
employee	52.55	57.23	55.95
self-employed	57.47	57.49	61.23
formal	56.87	64.12	57.99
informal	52.76	52.76	58.04
earnings Q1	80.00	80.00	87.45
earnings Q2	55.58	55.82	62.41
earnings Q3	50.97	54.08	54.00
earnings Q4	46.66	51.15	47.86
earnings Q5	43.52	49.97	43.67

Source: Authors' elaboration based on EUROMOD v1.4.

In terms of protection against poverty, Table 4 compares the extent to which our hypothetical reforms would reduce the percentage of workers falling into poverty in case of entering unemployment. Our results show that the percentage of workers who would face poverty in case of unemployment would be reduced by 2.1 and 2.8 percentage points under scenario A and B, respectively. Scenario B would, however, have a larger effect in reducing the percentage of workers falling below the extreme poverty line in the event of unemployment, with a 4 per cent points reduction compared to the baseline UI scheme, whereas scenario A would achieve only a 1.4 reduction. The results are consistent with the observed gains in terms of net replacement rates among low-skilled, low earners under scenario B, due to the coverage of self-employed and informal workers under such scheme. The reduction achieved by scenario A is, on the contrary, mainly driven by the extension of payment duration as it was the case for net replacement rates.

Table 4: At risk of poverty under baseline and counterfactual scenarios (%)

	Baseline	Scenario A	Scenario B
At risk of poverty	28.80	26.71	26.01
At risk of extreme poverty	21.49	20.07	17.42

Source: Authors' elaboration based on EUROMOD v1.4.

Finally, the effect of our counterfactual reforms on household income stabilization is presented in Table 5. Our results show that overall the income stabilization coefficient would increase by 48 percent under scenario A and by 17 percent under scenario B. As it was the case for previous outcomes, the main driver of the increase in income stabilization under scenario A is the extension of benefit payment. Income stabilization under scenario B is smaller than that of scenario A due to the lower benefit amount of unemployment assistance. Scenario B would, however, result in higher income stabilization for low skilled workers, the self-employed and workers in the informal sector compared to scenario A.

Table 5: Income stabilization coefficient under baseline and counterfactual scenarios

	Baseline	Scenario A	Scenario B
all	0.16	0.24	0.19
male	0.16	0.23	0.18
female	0.18	0.27	0.20
age 15–29	0.11	0.19	0.15
ge 30–50	0.16	0.24	0.19
age 50+	0.20	0.28	0.23
low-skilled	0.08	0.12	0.14
medium-skilled	0.16	0.23	0.17
high-skilled	0.26	0.37	0.26
employee	0.20	0.31	0.23
self-employed	0.07	0.07	0.10
formal	0.26	0.40	0.27
informal	0.01	0.01	0.07
earnings Q1	0.00	0.00	0.26
earnings Q2	0.01	0.01	0.13
earnings Q3	0.09	0.16	0.14
earnings Q4	0.13	0.21	0.15
earnings Q5	0.23	0.23	0.23

Source: Authors' elaboration based on EUROMOD v1.4.

7 Conclusion

Latin American countries, traditionally characterized by having systems of severance payments, have recently shifted to a system of Unemployment Insurance Savings Accounts (UISA), and in some cases to systems combining UISA with more traditional systems of Unemployment Insurance, characterized by a shared funding mechanism. Ecuador has followed this pattern and introduced an UI scheme (seguro de desempleo) in 2016, which provides a fixed payment, from a common pool of funds (public insurance) and a variable top-up payment with funds from individual UISAs (self-insurance).

This paper makes use of ECUAMOD, the tax-benefit microsimulation model for Ecuador, to evaluate the degree of income protection provided by the recently introduced UI scheme in the event of unemployment. Our approach consists in simulating transitions from work into unemployment for all individuals observed in work in the data. The effect of the UI scheme is then assessed by comparing household disposable income when individuals are in work to household disposable income when individuals are unemployed before and after the introduction of UI.

Our study provides a number of important findings. First, the degree of income protection provided by the Ecuadorian UI scheme in case of unemployment is very limited. Due to the large informal sector in the country, the UI would cover only around a quarter of the working age population in case of unemployment. Second, mean net replacement rates would increase only by 3 percentage points with the introduction of the UI scheme. Moreover, the decomposition of net replacement rates by income component shows that market incomes from other household members play the largest role in protecting individuals in case of unemployment, with only a most role of the tax-benefit system. Third, the Ecuadorian UI would reduce the risk of falling into poverty in case of unemployment and would increase household income stabilization, although to a limited extent. Finally, the largest protection provided by the UI scheme is concentrated among middle-age, high-skilled formal workers at the top of the earnings distribution because only workers affiliated to the general social security regime with a sufficient number of contributions are eligible to UI and the benefit amount is proportional to previous earnings.

Our simulations of hypothetical reforms to the Ecuadorian UI allow us to highlight the factors affecting the degree of income protection provided by the scheme. First, the characteristics of the UI affect the impact it would have on income protection. For instance, less stringent eligibility conditions would achieve larger coverage of the scheme, particularly so for young workers. Extending the duration of payment would reduce the risk of falling into poverty in case of unemployment and have a positive effect on income stabilization. Second, the specificities of the Ecuadorian labour market, namely the large informal sector in the economy, limit the degree of income support provided by the scheme.

From a policy perspective, this paper provides a novel approach to estimate the degree of income protection provided by UI schemes in developing countries characterized by a large informal sector. In practice, providing protection against unemployment shocks to informal workers remains a challenge. This paper has not considered the administrative costs related to implementing an unemployment assistance scheme which would target workers in the informal sector of the economy, neither have we discussed the potential effects on employment of such program. Evidence from the Argentinian unemployment assistance program, Plan Jefes, shows that the scheme may have created disincentives to search for work and reduced the probability of re-entering employment (Iturriza et al. 2011). The design of the scheme plays again an important role, as Plan Jefes was characterized by an unlimited duration of payment.

Our simulations of the Ecuadorian UI benefit based on the information available in household survey data from ENIGHUR have required a number of assumptions. The use of work history as a proxy for the number of contributions made to social security would tend to overestimate potential coverage of the scheme. A similar upward bias could affect the other outcome variables (i.e. net replacement rates, income stabilization, and protection against poverty) due to the use of employment income over the last month as a proxy for the average monthly earnings of the last 12 months before unemployment, to calculate the benefit amount. Future work should aim at combining household survey data with contribution records from the Ecuadorian Social Security Institute (Instituto Ecuatoriano de Seguridad Social, IESS) in order to provide a more precise picture of the degree of income protection provided by the UI and to assess the extent to which our assumptions provide biased estimates. More generally, the combination of survey and administrative data to evaluate the redistributive and stabilizing effects of tax-benefit instruments in developing countries represent a promising area for future research.

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Appendix

Table A1: Characteristics of the working population

	Sample of observations	Population in work (15-65)	Percentage
all	51,307	5,171,783	100.00
male	30,688	3,140,306	60.72
female	20,619	2,031,476	39.28
age 15-29	13,808	1,383,869	26.76
age-30-50	27,104	2,730,051	52.79
age 50+	10,395	1,057,863	20.45
low-skilled	29,986	3,152,593	60.96
medium-skilled	11,053	1,069,646	20.68
high-skilled	10,268	949,543	18.36
employee	32,611	3,278,678	63.40
self-employed	18,443	1,863,390	36.03
formal	20,876	2,124,235	41.07
informal	30,431	3,047,548	58.93

Source: Authors' elaboration based on EUROMOD v1.4.

Table A2: Percentage of informal workers by category

all	58.93
male	58.30
female	59.90
age 15-29	61.56
age-30-50	57.10
age 50+	60.21
low-skilled	71.05
medium-skilled	50.57
high-skilled	28.08
employee	45.54
self-employed	82.24
Earnings Q1	82.52
Earnings Q2	83.22
Earnings Q3	59.34
Earnings Q4	46.64
Earnings Q5	27.68

Source: Authors' elaboration based on EUROMOD v1.4.