SOUTHMOD

Technical note

Top income adjustments and tax reforms in Ecuador

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December 2018

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UNITED NATIONS UNIVERSITY
UNU-WIDER

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Introduction

This technical note has been produced alongside a WIDER Working Paper (Jara and Oliva 2018) assessing the effects on income inequality and income tax simulations of adjusting top incomes of employees in survey data based on administrative tax records in Ecuador. The paper and the technical note are based on ECUAMOD version v1.4. The aim of this technical note is to describe the methodology used to adjust top incomes in the National Survey of Income and Expenditures of Urban and Rural Households in Ecuador (*Encuesta Nacional de Ingresos y Gastos de Hogares Urbanos y Rurales*, ENIGHUR), 2011–12, which is the input data used in the tax-benefit model ECUAMOD. While the approach taken for such exercise has to be country-specific, the approach taken for ECUAMOD illustrated here, may provide helpful insights for similar exercises in other countries.

This note is divided in three sections. Section 1 describes the approach used to adjust top incomes in the survey based on information from tax records. Section 2 presents two alternatives to implement the adjustment in practice within the ECUAMOD framework. Section 3 discusses additional points to take into account on the topic of combining survey and tax records data, which could not be considered as part of the Working Paper but deserve attention for future research.

1 Adjusting top incomes in the survey data based on information from income tax return data

1.1 General considerations

Two sources of administrative data contain income information which could be used to assess the extent to which household survey data in Ecuador suffers from income underreporting and top income under-coverage. The first dataset is the administrative records from the Ecuadorian Institute of Social Security (*Insituto Ecuatoriano de Seguridad Social*, IESS). The second is the administrative tax records from the Internal Revenue Service (*Servicio de Rentas Internas*, SRI).

Both of these datasets could potentially be matched directly, based on national ID numbers, with household survey data from the Survey on Employment, Unemployment and Underemployment of Urban and Rural Household (ENEMUR), which is a quarterly labour force survey also used to estimate official statistics on income poverty and inequality. Access to administrative data or

linked survey and administrative data is, however, subject to important restrictions and in general the use of such sources requires a collaboration with public institutions.

Our study benefited from a collaboration with a researcher from the Internal Revenue Service to make use of administrative tax records together with ENIGHUR. ENIGHUR was chosen over ENEMDUR because direct linkage between ENEMDUR and administrative data was restricted. The advantage of working with ENIGHUR is that it currently works as input data for ECUAMOD. The approach used to adjust top income information in ENIGHUR data based on income tax records is described in detail below.

1.2 Adjusting top incomes in ENIGHUR data

The adjustment used to correct top incomes in the survey draws from the methodology used by the Department for Work and Pensions (DWP) in the UK (DWP 2015) and from the revisions to this methodology proposed by Burkhauser et al. (2016). The two approaches consist of replacing incomes from the top of the distribution in the survey with cellmean values of the top of the distribution in the tax return data.

Some preliminary requirements need to be ensured before adjusting top income data in the survey. First, we need to make sure that the units of analysis are the same in both datasets. Income tax in Ecuador is assessed at the individual level. Therefore, the unit of analysis in both cases can be the individual. Second, we need to make sure that we compare similar populations in the survey and in the tax records. In particular, Ecuador is characterized by a large informal sector, with informality defined as non-affiliation to social security. Tax records fail to capture individuals in the informal sector. For this reason, we decided to consider only workers in the formal sector (reporting affiliation to social security) in the survey to compare them with the population captured by tax records. Finally, we need to make sure that we are comparing the same income concept across data sources, and in particular, we are interested in gross labour income because we use it to simulate social insurance contributions and income tax in our model. For employees, it was possible to construct a harmonized concept of gross employment income for both, the survey and the tax records. However, for the self-employed, it was not possible to construct a concept of gross self-employment income because salary payments to workers by the self-employed and social insurance contributions are part of a single variable in the tax records data and this is considered as a cost to deduct from self-employment activities. For this reason, we restricted our analysis to formal employees.

The following steps were then used to adjust top incomes of formal employees in the survey based on information from tax records:

- First, in both datasets we create a variable of gross employment income with a harmonized definition, which is the sum of salaries, extra pay, bonuses, utilities participation, 13^{th} and 14^{th} month pay, and reserve funds.
- Second, we select only formal employees (employees who report being affiliated to social security) in the survey data and compare it to the sample of employees in the income tax return data.
- Third, we rank individuals by their gross employment income in the two datasets and allocate them to income percentile groups.
- Fourth, we calculate the average income for each income percentile in the two datasets.
- Fifth, for each percentile group we calculate the ratio between the average income in the tax records and the average income in the survey data.

- Sixth, we identify the point at the top of the income distribution when the gap between the average income in the survey and the average income in the tax records starts widening. For this, we select as threshold the point where average income in the tax records is more than 10 per cent larger than the average income in the survey (a ratio above 1.10).
- Finally, for formal employees in the top percentiles of the survey data where the ratio between the average income in the tax record and the average income in the survey is above 1.10, we adjust their gross employment income by multiplying it to the ratio of their corresponding percentile.
- In ECUAMOD, following the adjustment of top incomes for employees in the input data, we relax the assumption of full compliance in the simulation of personal income tax and simulate it only for workers in the formal sector.

2 Accounting for top income adjustments in ECUAMOD

There are technically two ways in which the top income adjustments proposed in the previous section could be implemented within the ECUAMOD framework. The discussion of these alternatives could be potentially useful for a wider range of applications in SOUTHMOD models, where changes in the data are considered as part of a simulation exercise. Moreover, considering these alternatives opens the door to discussion about how to handle technical improvements to ECUAMOD baseline results.

The first alternative consists of adjusting top incomes in the survey data as part of the production of the ECUAMOD input data. The advantage of this procedure is that complex data manipulation might be easier to handle within the stata do-files as part of the input data production. The disadvantage of this procedure is that it is less transparent for the user to know what data adjustments were made as part of the input data production, and that this would result in two parallel input datasets: the baseline and the adjusted input datasets.

The second alternative consists of implementing the adjustments of top incomes as part of the model simulations. The disadvantage of this procedure is that it is unclear whether complex adjustments to the input data could be handled within EUROMOD. For example, complex statistical imputation procedures to adjust top incomes in the survey might anyway require the use of statistical packages such as stata. The advantage of this procedure is that if the data adjustments are sufficiently simple, they could be implemented as part of the baseline model, for instance as a switchable policy, and the user would then have the possibility to activate or deactivate the policy to analyse the effects of top income adjustments. Because the adjustment proposed in this paper was relatively simple, it was implemented as part of the model simulations although a new policy system was created, rather than using a switchable policy in the baseline.

The discussion of these alternatives becomes important thinking ahead in terms of the model developments and extensions which could be shared with users as part of the baseline models. In the particular case of ECUAMOD version v1.4, we decided for now not to modify the baseline model, nor the input data based on results from this research.

3 Additional considerations on adjustments to the survey data based on income tax return data

Two additional considerations need to be kept in mind as part of this work, which could not be taken into account in the Working Paper.

First, our approach consisted of adjusting only top incomes of formal employees in the survey. The decision to limit the adjustment to employees was driven by the fact that it was not possible to construct a harmonized concept of self-employment income gross of social insurance contributions in the income tax return data. Further work is needed to analyse the effect of adjusting incomes for the self-employed. In particular, preliminary analysis based on self-employment income net of social insurance contributions points to a problem of underreporting throughout the whole distribution of self-employment income rather than only under-coverage of top incomes. However, social insurance contributions reported in the survey data were used to construct net self-employment income. It is still unclear how precisely this could be integrated within the ECUAMOD framework. An alternative would be to compare the concept of self-employment income gross of all costs. This might be possible both in the survey and in the tax records and requires exploring.

Second, our study has not considered the effect of another important source of information for the simulation of personal income tax in Ecuador, namely deductions from personal expenditures. In ECUAMOD, we use information from household expenditures reported in the survey to calculate deductions from personal expenditures as part of the simulation of personal income tax. Our simulations of personal income tax could be affected by two factors. First, there could be misreporting of household expenditures in the survey which could bias our simulations of personal income tax. Second, by default our simulations attribute all household expenditures to the person with the highest market income in the household for the purpose of the calculation of deduction from personal expenditures in the simulation of personal income tax. This simplifying assumption could not necessarily reflect the behaviour of household members in terms of declaring deductions from personal expenditures for tax purposes. Income tax return data from Ecuador contains information on deductions from personal expenditures, which could, in some way, be used to validate our assumption.

References

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