

# MORE UNEQUAL OR NOT AS RICH?

REVISITING THE LATIN  
AMERICAN EXCEPTION

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WORKING PAPER N°2022/13

UPDATED VERSION  
OCTOBER 2023

WORLD .....  
INEQUALITY  
..... LAB

The logo for the World Inequality Lab features the text 'WORLD', 'INEQUALITY', and 'LAB' stacked vertically. The word 'WORLD' is followed by a horizontal row of dots. The word 'INEQUALITY' is followed by a grid of dots that forms a staircase shape, with the number of dots increasing from left to right and bottom to top. The word 'LAB' is preceded by a horizontal row of dots.

# More Unequal or Not as Rich?

## Revisiting the Latin American Exception

October 2023

### **Abstract**

Latin America is often portrayed as a global exception to the rising or consolidating income inequality trends of the early twenty-first century. In this paper we revisit this exceptionalism by innovatively combining harmonised surveys, social security and tax data, and national accounts for ten countries. The reconciliation of micro and macro incomes present us with a critical dilemma: either the region is more unequal or it is not as rich as officially reported. Distributing the data gaps shows a more heterogeneous region in terms of inequality trends. Falling inequality is most visible among the bottom 99%, but the trend flattens or reverses in the largest economies once the top 1% and capital incomes are better accounted for. Taxes and transfers do not alter the main picture, except when in-kind social spending is considered. These results confirm the strengths and highlight the limits of Latin America's redistributive policies during the period.

Keywords: Inequality; Redistribution; Macroeconomic Growth; Latin America.

JEL Codes: C81; D31; E01.

# Introduction

Inequality has been on the rise in most countries and regions for the best part of thirty years, spurring academic and political debate worldwide. Latin America seems to have been a notable exception in more recent times. Numerous studies have documented and explained the apparent decline of income inequality taking place throughout Latin American countries during the first decade and a half of the twenty-first century (López-Calva and Lustig, 2010; Lustig et al., 2011; Cornia, 2014; Alvaredo and Gasparini, 2015; Gasparini et al., 2018). This trend has even been viewed as historically unprecedented in a region characterised by extreme inequality legacies (Bértola and Williamson, 2017). However, its narrative, built on the use of publicly available household survey data, has come to be questioned by the increasing use of administrative data on upper incomes in the region (Alvaredo, 2010; Alvaredo and Londoño Velez, 2014; Morgan, 2018; Souza, 2018; Flores et al., 2020; Burdín et al., 2022), which have shown either milder reductions in top income concentration or more stable, if not increasing, trends in some countries. These doubts are compounded by the large discrepancies between incomes in micro data sources (surveys, tax data) and the national accounts.

Such gaps present us with a distributional conundrum: if they are widest in capital incomes, as has been found historically and more recently, then this would entail significant repercussions for existing inequality indicators (Alvaredo et al., 2022). Moreover, if these gaps are subject to changes over time, as also appears to be the case, our assessment of inequality trends would be severely compromised. With all this cumulative information at our disposal, how confident can we be in thinking that Latin America was an exceptional outlier in the global income inequality narrative? The stakes of this question are high, since accepting the survey-based narrative outright, in the context of large and growing micro-macro data gaps, could mean putting into serious question the official macroeconomic growth statistics of countries in the region. Seeing whether the conventional narrative on Latin American income inequality is robust to the reconciling of micro-macro data gaps is the focus of the present paper.

Our first contribution is to use all available data —including several brand new sources— to build novel estimates of macro-consistent inequality in a region with high heterogeneity in data quality. We present distributional results for ten countries (Argentina, Brazil, Chile, Costa Rica, Colombia, Ecuador, Mexico, Peru, El Salvador and Uruguay) over the last two decades, a period when the region as a whole experienced strong economic growth spurred by very favourable terms of trade for the most part (circa 2003-2013) and relative stagnation during the latter years (circa post-2015).<sup>1</sup>

In order to build our estimates, we combine harmonized survey microdata with administrative data from tax records and social security registers (based on the re-weighting method put forward by Blanchet et al., 2022) before scaling incomes to the national macroeconomic accounts (both the household sector accounts and the total economy sector accounts). Thus, we reconcile all available income data to build inequality estimates that not only adjust for surveys' measurement issues, but also ensure overall macroeconomic consistency. As anticipated in Alvaredo et al. (2022), the adjustments end up doubling the total income originally declared in most surveys. Hence, to ensure transparency, we show the impact that each step of our methodology has for the resulting distributions. We distinguish four steps: first, we estimate the distribution of income in the harmonized survey data; second, we adjust for the low representativeness of top incomes in surveys using administrative records; third, we scale the main income components to their matched national accounts aggregates (these are wages, property incomes, mixed income, pensions and imputed rents); and fourth, we impute incomes not flowing to the household sector in the national accounts (corporate retained earnings and other incomes) or incomes that need to be added back (such as net product and production taxes) to reach the net national income of the total economy.

This sequence describes what we call the pre-tax national income series. It includes all gross incomes, including pensions, before taxes, but after social security contributions. We

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<sup>1</sup>Our methodology, codes and estimates will be made public on a dedicated open-source website that is currently under construction. Users will be able to view and download distributional information at the percentile level for different income definitions and observational units.

also produce a number of post-tax series which account for taxes, monetary transfers and in-kind public spending. Although we directly observe the incidence of some items, such as the personal income tax in administrative records or social cash benefits in surveys, we use external sources to impute other items. Aggregates and compositions of national taxes and social spending come from OECD and World Bank public databases respectively. We combine these with incidence profiles from the Commitment to Equity (CEQ) database, which are mainly based on budget surveys, to allocate consumption taxes and in-kind spending to individuals. In other cases, we either use micro-simulation techniques or proxies, as described further on.

While the reconciliation of micro and macro estimates of income may seem a relatively new and important topic for the developed world (the next revision of the United Nation's System of National Accounts intends to incorporate it into its guidelines), we recall that this is not a new topic in Latin America. Following the pioneering work by Altimir (1987), macro-adjustments to inequality estimates in Latin American countries were made by the UN's Economic Commission for Latin American and the Caribbean (ECLAC) during more than two decades, before being discontinued for data reasons. Our work seeks to build on this 'lost tradition' in the region.

This exercise allows us to offer more precise answers to basic questions: How is macroeconomic growth distributed within countries? How progressive or regressive are the systems of redistribution in each country if one accounts for all taxes and transfers? To answer these questions, distributional estimates must necessarily be reconciled with macroeconomic aggregates, which follow homogeneous definitions across countries. Despite recent efforts to define benchmark methods to achieve consistency, leading initiatives have mostly focused on a handful of countries with exceptional national statistics so far, overlooking problems that are particular to a majority of countries, including both developed and developing ones (WIL, 2021; OECD/Eurostat, 2022). For instance, two pioneering studies in the United States and France heavily rely on detailed tax micro-data to portray income distributions, only using surveys to describe small sections at the very bottom of the

distribution (Piketty et al., 2018; Garbinti et al., 2018). The same approach would be poorly adapted for countries where tax coverage and compliance are much lower, which is the case of most countries in the world. In such a setting, tax data can only be trusted to portray top income groups relatively accurately, while household surveys can better inform on middle and bottom incomes, which generally have higher informality rates and higher shares of un-taxed incomes. Thus, while we take Latin America as our case study in this paper, the relevance of our approach to determine whether prevailing inequality narratives are robust to the bridging of micro-macro data gaps in other parts of the world deserves to be emphasised.

Our second contribution is to revisit the prevailing narrative of falling inequality in Latin America over the first fifteen years of the twenty first century. Regarding the *level* of inequality, we are faced with a mutually-exclusive dilemma. If we assume that the national accounts are an accurate benchmark for aggregate incomes, and proceed to distribute the macroeconomic income of the household sector or the total economy, our conclusion is that inequality is in fact much higher than previously thought. After adjusting surveys based on administrative data and scaling income components to the national accounts, inequality levels increase significantly —the Gini coefficients in our sample increase by about 10 points, with notable heterogeneity across countries. If, on the other hand, we assume that official surveys are closer to the benchmark for household incomes, our results are consistent with the current consensus. However, one would also need to accept that Latin American households are considerably poorer than what is reported by official macroeconomic statistics.

The analysis of inequality *trends* is not as clear cut. The adjustments we make to the survey distribution are enough to cancel out the pre-tax inequality decline in countries where it was present —Brazil, Chile, and Mexico— or to increase inequality where it was stable —Costa Rica. In the remaining countries (Argentina, Colombia, Ecuador, Peru, El Salvador, and Uruguay) the falling inequality trends persist after the three sets of adjustments, although in a milder fashion. In some cases, such as Brazil or Mexico, a

trend reversal is visible before ensuring macro consistency (i.e. at the adjusted survey level), so there is room to believe that both statements may be true: inequality did not fall as the prevalent narrative says it did, even if countries are not as rich as what is estimated by national accountants. In other countries, however, changes in trends are more clearly visible when scaling up to household incomes or national income, and so the answer may again be mutually exclusive. Furthermore, although our estimates confirm the regressive distributive effect of national taxes and cash transfers (mainly due to consumption taxes), the progressive impact of in-kind social spending (in health and education) allows for the falling inequality narrative to emerge with greater clarity. Mexico is the sole exception to this trend: inequality in the unadjusted and adjusted surveys do not mirror each other in any of the definitions. Mexico then presents us with a conundrum of its own.

In light of these findings, we attempt to reconcile competing inequality narratives by clarifying issues that affect comparability such as units of analysis, income concepts and the choice of inequality indicators. More importantly, we analyze the contribution of capital incomes and top income groups, which are by all accounts the main missing pieces of household surveys. We document that inequality among the bottom 99% of the total income distribution and among wage earners falls even after making all adjustments. We show how divergent trends in total income inequality are the result of an increasing contribution of capital incomes and top 1% incomes after each adjustment procedure. This is due to both an increasing distance between the top 1% and the bottom 99%, and to increasing inequality within the top 1%. Thus, we do not fully contradict the prevailing narrative; if anything, we confirm it with some qualifications. Fundamentally, we claim that the role played by capital incomes and top 1% incomes reveals the limits of Latin America's much heralded re-distributive effort of the early twenty-first century, even if certain policies appear to be key for a robust inequality decline (such as public spending on health and education).

Given the scale of the data deficiencies we are dealing with, we stress caution in proclaiming definitive statements for the region. Our goal is to contrast competing inequality narratives

and provide broad insights on the driving forces of divergent trends. In this sense, country-specific studies are usually better equipped to discuss details about the specific evolution of different series for each country. However, by systematically applying the same set of methodological decisions to the whole region, we are able to provide a bird-eye's view of the evolution of inequality among its six hundred million inhabitants in the only part of the world in which it just might have fallen over this time-period.

We stress from the outset that this procedure is experimental, intended to answer a specific research question. Although it can also have a broader interest for policymakers and the general public, it is by no means a gold standard. The implication of our work is to highlight the deficiencies in the myriad of current statistics on incomes, which cloud our understanding of the crucial issue of economic growth and its distribution. If anything, it is a call to data producers in the region, and the world at large, to provide better, more integrated and coherent statistics on the incomes of their populations.

The remainder of the paper is structured as follows. Section 1 describes the data and methodologies used to construct the series. Section 2 presents the pre-tax inequality estimates, while section 3 discusses the redistributive effects of taxation and spending. In section 4, we attempt to reconcile the competing narratives that emerge from alternative inequality series, before ending with concluding remarks in section 5.

## **1 Building macro-consistent inequality estimates**

This section summarises the challenge of reconciling micro and macro estimates of income, before assessing results in the following sections. A more detailed description of the methods used to build the estimates presented in the rest of the paper is available in Appendix B.2.

## 1.1 Statistical inconsistency as a rule

There is a longstanding gap between the statistics used to study the distributions of income, wealth and consumption at the micro level and macroeconomic aggregates in the system of national accounts (SNA). A wide body of work shows, in many different contexts, that major discrepancies are found when studying aggregate levels, as well as in their observed growth rates (Ravallion, 2003; Deaton, 2005; Bourguignon, 2015; Nolan et al., 2019). A noteworthy finding is that national income, which is measured by the SNA, is larger and has been growing faster than other income concepts traditionally used to study inequality. Whenever survey aggregates are compared to SNA aggregates, capital incomes appear to be remarkably less covered than labor incomes (Törmälehto, 2011; Bourguignon, 2015; Flores, 2021; Alvaredo et al., 2022). Such gaps make it hard to assess how macroeconomic growth is distributed among the population, and to what extent existing distributional statistics (based both on surveys and tax records) are an accurate representation of material living standards.

An approach taken in the literature on global inequality to address these gaps has been to assume that the discrepancy between total survey income and national income, or Gross Domestic Product (GDP), from the national accounts is entirely due to an underrepresented top tail, usually the top 10% or top 1%. The entire gap is thus imputed to this income group to adjust global estimates of Gini indices (Lakner and Milanovic, 2016; Anand and Segal, 2017). The issue with this type of adjustment is that it is arbitrary and restrictive, in the sense that it attributes the entire difference between two aggregates to a top group, without assessing the decomposition of the aggregate gap across income types and thus population groups in the micro-level statistics.

Recent work in this field has now embarked on a process of combining data sources (surveys, national accounts, administrative registries, rich lists, etc.) through the development of two large-scale projects aiming to ensure the macroeconomic consistency of inequality estimates. On one side, following recommendations by the Canberra Group (2001) and Stiglitz et al.

(2009), the Organization for Economic Co-operation and Development (OECD) started hosting periodic Expert Group meetings on Disparities in a National Accounts Framework (EG-DNA), focusing exclusively on the income, consumption and savings of the household sector (Fesseau and Mattonetti, 2013; Zwijnenburg et al., 2017; OECD, 2020).<sup>2</sup> On the other side, the World Inequality Lab at the Paris School of Economics started publishing its own Distributional National Accounts guidelines (WIL, 2021); alongside numerous country-case studies.<sup>3</sup> The main difference with respect to the OECD’s approach is that DINA aims to distribute the national income of the total economy as opposed to just the household sector (for an in depth comparison of these projects see Zwijnenburg, 2019).

In Latin America there is an old tradition of aligning micro and macro data for distributional analysis, largely following the work of Altimir (1987). This seminal study critically analyzed available tax, social security and census data, as well as variety of household surveys, systematically comparing the latter with the national accounts. The author concluded that there was a 15-30% gap in aggregate household income, which could be significantly higher for certain income sources such as property income. These results were explicitly assumed to be an indicator of underestimation of each type of survey-based income. Hence, the United Nations’ Economic Commission for Latin America and the Caribbean (ECLAC) proceeded to correspondingly adjust survey-based incomes, with significant implications for inequality analysis —the Gini coefficients increased by 10-15%). Despite its positive intentions, this methodology was shown to have many caveats (Bourguignon, 2015), and was progressively abandoned by ECLAC in recent years for reasons that are not entirely clear. The rise and fall of this experience are the result of both the need for a reconciliation of data sources —or at least of the need to fully understand its potential consequences— and of the significant challenges of such an endeavour. Our goal in this paper is precisely to recover this critical comparative tradition with the latest data and methods presently available. We turn to these in the following sections.

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<sup>2</sup>See [https://stats.oecd.org/Index.aspx?DataSetCode=EGDNA\\_PUBLIC](https://stats.oecd.org/Index.aspx?DataSetCode=EGDNA_PUBLIC) for experimental statistics based on the output of this project.

<sup>3</sup>See Piketty et al. (2018); Garbinti et al. (2018) for pioneering applications of the methodology and <https://wid.world> for further applications

## 1.2 Data inputs

Our estimates rely on four main data sources: households surveys, income tax records, social security records, and national accounts.

We use survey micro-data harmonised by the Statistics Division of ECLAC for ten countries over the 2000-2020 period. These countries are: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Peru, and Uruguay. ECLAC’s harmonisation process builds on the original surveys produced on a yearly basis by the official statistics institutes of each country. It seeks to create comparable income variables across countries in terms of labour, capital and mixed incomes, pensions, owner occupier rental income, transfers and other incomes.<sup>4</sup> In all cases but one, post-tax incomes are recorded on an individual basis (where “post-tax” also refers to after social contributions), the exceptions being Brazil and Cost Rica, where pre-tax incomes are recorded by surveyors. Part of the harmonisation process involves the imputation of rental income of owner-occupiers, which is absent in the surveys. This calculation is based on an internal estimation model that matches data from similar rented dwellings. Figure A.1 shows the inequality trends computed from ECLAC’s survey database mirrors that from the World Bank’s database, with differences in levels for the same unit of analysis being minor.<sup>5</sup> Table A.1 describes the original surveys and administrative data available for each country that we study in this paper.<sup>6</sup>

Available distributional data from administrative sources in Latin America can be classified in four groups.<sup>7</sup> First, microdata covering the population required to submit a tax return on their income (e.g. Mexico and Uruguay). Second, grouped (tabulated) data organised by ranges of total income (e.g. Argentina, Brazil and Chile). Third, distributional

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<sup>4</sup>The only exceptions concerning the frequency of the surveys are Chile and Mexico, which collect data every two to three years.

<sup>5</sup>This should be of no surprise given that the underlying surveys are the same in both databases, with differences arising from interventions both both institutions. For a representation of the composition of survey income among five categories in the ECLAC database see Figure A.2.

<sup>6</sup>Excluded countries with some household survey data are presented in Table A.2. These countries do not form part of our analysis due to inefficiencies in survey data and/or unavailable administrative data to complement them.

<sup>7</sup>See Table A.1 for further details. In this paper we use the terms “administrative”, “register” and “tax” data interchangeably to describe data from personal income tax declarations or social security records on wages and salaries.

data covering income tax payers with wage income only, either in microdata format (e.g. Argentina, Costa Rica), or in tabulated form (e.g. Brazil). And Fourth, in an increasing number of countries, information on the distribution of wages is made available from the social security administration, either in micro-data or grouped-data format. Naturally, this is restricted to the formal sector, and, depending on each country institutional arrangements, this may include the universe of formal workers, or only those in the main social security regime. We use social security records in the case of Costa Rica. The ten countries can be divided in two groups. On the one side, those regularly publishing and updating their administrative records (Brazil, Chile, Costa Rica, Mexico and Uruguay). On the other side, those that gave external researchers access to microdata at some point, but do not produce distributive information from tax registers on a regular basis (Colombia, Costa Rica and Ecuador). For these cases, we use estimates prepared by the authors of previous studies (Alvaredo and Londoño Velez, 2014; Cano, 2015; Zuniga-Cordero, 2018, 2022; Rossignolo et al., 2016), which are restricted to the top percentile of the distribution only. In section B.1 we report the use of income tax data in the literature on top incomes for eight of our ten countries. In the remaining two countries (Peru and El Salvador), we obtained access to new tabulated data on incomes from the respective country tax offices for the purposes of this project.<sup>8</sup>

The information from the System of National Accounts (SNA) was obtained by scrapping the United Nations Statistics Division database (<http://data.un.org>), which gathers a variety of series produced by national statistical offices or central banks. We complement this source with country-specific data on National Accounts published by either Central Banks or National Statistical Institutes, which are sometimes more up-to-date. We also use data from the World Inequality Database on undistributed corporate profits, the OECD on taxation, and the World Bank on social transfers in kind. Although the macro aggregates produced by national accountants are often considered among the most reliable and internationally comparable data sources (e.g. to rank countries according to their

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<sup>8</sup>At the time of writing, the authorities of the Dominican Republic have made income tax data exclusively available to us for the purpose of a separate study, which is currently under embargo.

total output, per capita GDP, etc.), detailed information on the income approach, which is the one we need for our purpose, is scarce in the region, to say the least. Even in countries that produce this kind of data regularly, statistical agencies can update their estimates with three to five years of lag. The level of aggregation also varies across countries.

Figure A.3 (from Alvaredo et al., 2022), provides a visual comparison of the main aggregates across the different sources we exploit. It shows the decomposition of gross national income (GNI) into the household sector, the government sector and the corporate sector. It also presents the aggregate income informed by surveys, before any adjustment, as percentage of GNI, as well as the reported income in administrative data. Three countries, Argentina, Uruguay and El Salvador, do not report aggregates from the income approach in their SNA. For the other countries that do so, the time coverage is rather short, and usually below that of surveys. However, one result is clear: the gap between micro-distributional statistics and the national accounts is very large, usually above 40-50%.

## **1.3 Methods**

### **1.3.1 Pre-tax distribution**

Our estimation procedure is based on four steps. First, we estimate inequality indicators from the harmonised survey microdata of the full population of each country. We compute income shares and Gini coefficients of total income and of wage income. Second, we adjust these surveys to improve their coverage of top incomes using administrative data. Third, we scale the different income components of these top-corrected surveys to match equivalent aggregates from the national accounts. Fourth, we impute the remaining items (corporate undistributed profits and other pretax incomes) that make up national income. We briefly describe each of these steps in turn.

Given the nature of the harmonised household survey database, the estimation of distributional indicators is relatively straightforward. From the microdata, we rank the population

by total income (or total wages) and subsequently compute shares of total income or Gini coefficients. Total income is in this stage the sum of net-of-social-contribution wages, pensions, self-employment income and capital income. The reason for including pensions in this definition of income is that wages in the surveys are reported net of social contributions in all countries (except for Brazil), without information on the amounts paid per person. This makes it unfeasible to leave pensions and their contributions for the redistributive analysis. The second step consists in combining household surveys and distributive information from administrative sources, mainly to improve the coverage of top income groups, which are often badly captured (especially when register data is not used in the surveying process, which is the case in all countries in the region).

In practice, we use the method described in Blanchet, Flores, and Morgan (2022), which uses the ratio of survey observations to administrative observations by income percentile beyond a cut-off point (or “merging point”) to adjust survey weights. Figure B.3 displays the intuition behind this re-weighting process. The density ratio described can be interpreted as a rate of response, which is generally lower than one for top incomes. For surveys where administrative records do not exist, we assume within-country stability for these coefficients to make the adjustment. Prior to reweighting the survey we deduct tax paid from the declared income in tax data for all countries where the survey reports post-tax income (i.e. all countries except Brazil). Appendix B.2 explains this procedure in more detail. This ensures that we are adjusting the survey using a comparable income definition.

The second step consists in scaling the adjusted survey incomes to equivalent aggregates in the household sector account of the system of national accounts (SNA). Before doing so, we add back the effective income tax paid by percentile group to the distribution so that we compare pre-tax micro-level incomes with pre-tax macro-level incomes. Table B.2 summarises the matching we perform between incomes in surveys and the SNA. Since the income decomposition of the SNA is not available for every country and every year, we assume within-country stability of these coefficients. For countries where this decomposition is never reported (Argentina, El Salvador and Uruguay), we use the period’s regional

average to scale each type of income. Figure B.5 reports the “scaling factors” we use for each component in each country, that is, we multiply each survey component by  $1/\text{scaling factor}$ , taking comparable household incomes from the national accounts as benchmarks. As found in Alvaredo et al. (2022), capital income in the survey is systematically under-covered in all countries by the largest margin, implying that we multiply the income component by a factor of 5-10 in most cases. Some income aggregates need to be deflated to arrive at the SNA benchmark, typically either imputed rents, mixed income or social benefits. These gaps are a function of comparability issues (outlined in Table B.2) and complications with annualizing composite survey income variables from reference periods (see Alvaredo et al., 2022 for more details).

The final step of our procedure is to impute the remaining incomes included in the net national income of the total economy. By definition, these do not match any of the income variables that are present in the distributive data we use. Essentially, this stage boils down to the imputation of corporate undistributed profits to households, since we impute other missing incomes proportionally. Figure B.7 shows that aggregate undistributed profits from the SNA (sourced from <https://wid.world/>) are usually in the order of 10-20% of total survey income, which is a significant amount. In order to distribute this aggregate amount to individuals, we need a proxy for corporate ownership. Since wealth surveys are mostly absent from the region, we use variables from our income surveys as proxies. One option would be impute them to dividends. However, too few people declare dividends in our surveys. Our benchmark allocation is to impute them proportionally to the sum of dividends and employer income, where an employer’s income refers to the total income of individuals that declare being an employer in surveys when asked about their occupation. Since the amount of undistributed profits is not available for every country and every year, we proceed similarly to what was done for scaling factors, i.e. we assume within country stability of these coefficients and use regional averages for countries with no data. Figure B.8 documents the incidence of total corporate retained earnings across the distribution, showing that almost all of the amount is allocated to the top decile, especially the top 5% and 1%, as one would expect.

### 1.3.2 Post-tax distribution

After estimating the pre-tax national income series, we produce a number of post-tax series which account for taxes, monetary transfers and in-kind spending. Although we directly observe the incidence of some items, such as the personal income tax in administrative records or social benefits in surveys, we use external sources to impute other items. We use incidence profiles from the Commitment to Equity (CEQ) database, which are mainly based on family budget surveys, to allocate consumption taxes and in-kind spending to individuals.<sup>9</sup> Macroeconomic aggregates on each tax and social spending category are taken from OECD and World Bank databases, respectively.

From the pre-tax national income distribution we estimate three varieties of post-tax distributions. In the first variety, we deduct all direct taxes on personal and corporate income and add all social assistance transfers in cash. The amount of direct taxes to impute are taken from the OECD/ECLAC/CIAT/IDB (2022) database, which correspond to taxes present in the national accounts.<sup>10</sup> We impute personal income taxes using the profile presented in income tax declarations for countries (depicted in Figure B.1). For corporate income taxes we impute them proportional to the distribution of retained corporate earnings from the pre-tax distribution, that is, the joint distribution of dividends and employer income in surveys. To add social assistance transfers in cash we simply impute the aggregate present in the national accounts (D623 in SNA 2008) proportional to the micro-distribution of these transfers observed in the household surveys (that is, social transfers excluding pensions and other contributory social insurance transfers, D621 and D622). We label this the “post-tax spendable” distribution.

In the second variety, which we label the “post-tax disposable” distribution, we deduct all indirect taxes on production and consumption. The amount of these taxes are taken from the OECD/ECLAC/CIAT/IDB (2022) database (see Figure A.12), while their distribution

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<sup>9</sup>See <https://commitmenttoequity.org/>.

<sup>10</sup>The reason for using this database over UN or country-level national accounts is that it presents a more detailed breakdown of the tax categories to be imputed to the distribution. Figure A.12 describes these categories for Latin American countries as well as the average for the whole region.

is imputed proportional to the incidence estimated by the studies in Lustig (2018) and updated in CEQ (2021).

In the third variety, which we label the “post-tax national” distribution, we add social transfers in kind received by households (D63) and all other remaining incomes. Social transfers in kind correspond to government spending on services like education, healthcare and other collective expenditures (defence, roads, administration, etc.). Their aggregate amount by category is taken from the World Bank database.<sup>11</sup> To impute their distribution, we distinguish between education and health expenditures on the one hand, and all remaining expenditures on the other. The reason is that for the former we avail of their estimated incidence from the studies in Lustig (2018) and CEQ (2021), which attribute spending on education and healthcare services to household members according to their use of the services. For the remaining collective expenditures we impute them proportional to the post-tax disposable income distribution due to a lack of reliably justifiable estimates of their incidence. The remaining incomes that make up post-tax national income are imputed proportionally to the disposable income distribution, including other current transfers between households for which we don’t avail of a reliable breakdown in the surveys.<sup>12</sup>

Alongside these three varieties of post-tax distributions, which build on the pre-tax national income distribution combining all the sources previously described, we also estimate a distribution of post-tax spendable income just based on the surveys, which we label the “post-tax raw” distribution. This series is the common one used in the inequality literature in the region, and we use it to compare to the series we estimate based on the combination of survey, register and national accounts data. The following sections present our results and discussion of our findings.

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<sup>11</sup>See <https://data.worldbank.org/>.

<sup>12</sup>The separation of private transfers from other (social) transfers in CEPAL’s harmonized surveys is a line of future work that is being explored by the institution. This is important as these private transfers include transfers between households in the country and also between domestic and foreign households, the latter of which (i.e. remittances) can be especially large for smaller economies in the region.

## 2 Growing richer and less unequal?

The new millennium brought an exceptional growth cycle to Latin America, mainly led by a global increase in commodity prices, which inflated exports from the region and is often cited among the main causes in the falling-inequality narrative that derives from survey-based statistics (Ocampo, 2017; Cornia, 2014; Sánchez-Ancochea, 2021). This section analyses the evolution of pre-tax income inequality over a period encompassing such event. The first subsection reveals the impact of each step of our macro-adjustment procedure over that period, while the second, investigates on who actually benefited from the commodity boom (2003-2013) if one accounts for the distribution of macroeconomic income.

### 2.1 Reassessing pre-tax income inequality

Figure 1 depicts the evolution of the Gini coefficient of the four distributions described in the previous section (see section 1.3.1).<sup>13</sup> In all cases, the distributional estimates refer to per-capita household income for comparability reasons with survey-based series (more on this in section 4).

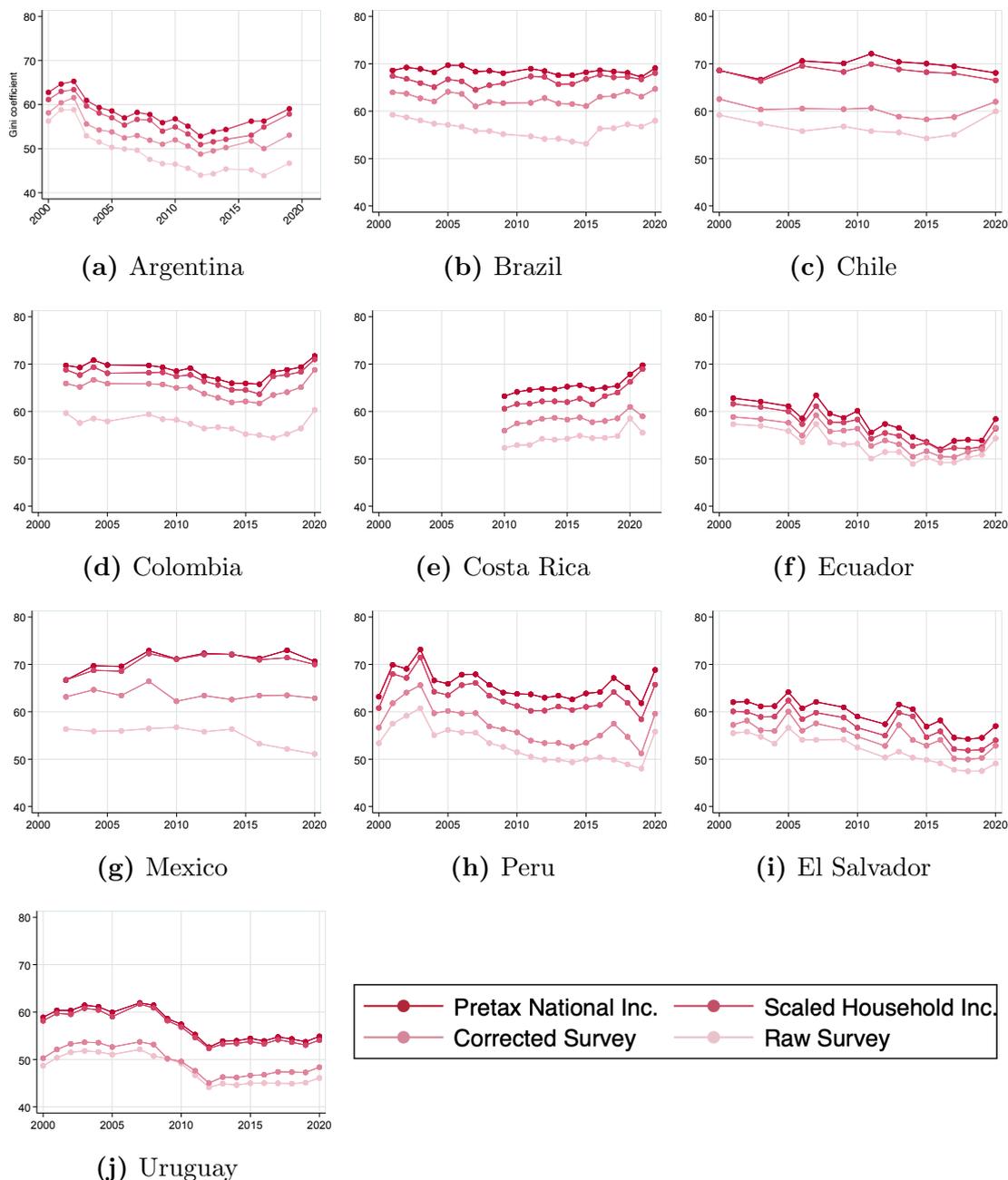
Three key comments regarding the evolution of the Gini coefficients are worth highlighting. First, inequality estimates increase after each of the adjustments to the raw surveys for all countries and years considered. The adjustment of surveys based on available tax data increases overall income inequality as a result of increasing the weight of higher income individuals. The subsequent scaling of household incomes to national accounts increases inequality, as incomes that are scaled up by higher factors are precisely those that are more concentrated in the top tail (especially property incomes, see Figure B.5). The final adjustment to national income increases inequality as the result of the allocation of undistributed corporate profits, which represent a large share of aggregate income

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<sup>13</sup>For details on income shares, see Figure A.4, Figure A.5, Figure A.6, and Figure A.7, which depict the shares of the Bottom 50%, Middle 40%, Top 10% and Top 1% for each of the four distributions respectively.

(Figure B.7), and are imputed mostly to top percentiles, given the hypothesised structure of business ownership (Figure B.8).

**Figure 1:** Gini coefficients in four distributions



**Note.** Authors' elaboration. The figures depict four distributions: the household survey-based distribution and the three augmented distributions based on three adjustment steps to the survey. The first step uses administrative data (income tax data or social security wage data) to reweight the raw survey; the second step scales the income totals in the tax-adjusted survey to their equivalent household-level aggregates in the national accounts; the third step imputes missing incomes needed to reach national income. The distributions are of pre-tax household per capita income (including pensions and after social contributions).

As far as the level of inequality goes, we are left with quite an unambiguous result (or dilemma): the region is either more unequal than previously thought or not as rich as what

is reported by official macroeconomic statistics. How should we interpret this finding? Unlike the pioneering efforts by Altimir (1987) or the current agenda of Distributional National Accounts (WIL, 2021), we do not claim that the national accounts are without question the benchmark source for measuring incomes, at least not in the Latin American case, precisely because of the major shortcomings and opacity of national accounting in the region. What we do claim is that if we take all data sources seriously, there is a large micro-macro gap with significant effects on inequality. As already noted in Alvaredo et al. (2022), not all of the survey income–national income gap is the result of measurement issues (only about half). A significant share is explained by conceptual differences, most notably those related to undistributed profits, which are incomes attributed to the financial or non-financial corporate sector in the national accounts, and thus not to households. Imputing these incomes to households ends up adding 5-10 points to the Gini, as the step from the scaled household income distribution to the pretax national income distribution in Figure 1 shows. A case can certainly be made for their exclusion from any household income inequality indicator on a conceptual basis (indeed, even national accountants keep them separate from the household sector). Yet, taking data sources seriously also means recognising the purpose of their construction. The national accounts are built around the concept of production, and the distribution of produced value-added between aggregate production units at the institutional level. Although a share of total corporate profits may remain in corporate accounts as retained earnings for future use, a strong argument can be made to impute these earnings to the owners of such businesses, which after excluding foreign shareholders and government involvement, are ultimately household individuals (participating shareholders and working directors) who have property and command over such incomes. Thus, including them in inequality measures incorporates actually produced incomes as well as the concept of power into the analysis. Moreover, it is a way of assuring that tax-based incentives to distribute or withhold corporate profits do not affect estimates of inequality over time.

Secondly, as far as inequality trends go, in some cases the broad downward trajectory from the beginning of the period to the end holds after each of the three adjustment steps. This

is the case for Argentina, Colombia, Ecuador, El Salvador, and Uruguay (at least prior to 2020).<sup>14</sup> For other countries —such as Brazil, Chile, Mexico and Peru— we observe trends that gradually flatten or even increase with each step. In the cases of Brazil or Mexico, stability is already visible after the first step, while for others the trend stability is more visible after scaling incomes to the household sector account, e.g. Chile, and Mexico. Furthermore, around 2015 it appears that the falling inequality trend comes to a halt and even reverses in several countries, detectable already in the raw survey.

Third, as shown by previous literature (see section B.1), falling aggregate inequality may coexist with stable or even growing shares going to the top 1% (Figure A.7). In all cases where the survey-based top 1% share was stable or slightly decreasing, after the top-income and macro-income adjustments it increases (most dramatically in Mexico). Figure A.8 shows that even in the presence of a stable or increasing top 1% share, the dynamics between the top 10% and the bottom 50% and middle 40% shares can still produce falling inequality for a number of countries, such as Uruguay, Argentina or Ecuador. Thus, a much more heterogeneous and complex picture emerges from the anatomy of macro-consistent inequality than that coming from the survey-based narrative.

## 2.2 Who benefited from the commodity boom?

Even though the national income inequality series is not necessarily the benchmark, it does represent, by construction, the only series out of the four that may be used to analyse officially reported economic growth and inequality consistently. In particular, studying the evolution of inequality in surveys together with GDP, although informative, is miss-leading since they each refer to widely different and often divergent aggregates (Nolan et al., 2019; Alvaredo et al., 2022). This makes it quite difficult to directly answer important questions, such as who benefited from the commodity boom in the region. By all accounts, the commodity boom that took place roughly between 2003 and 2013, which brought very

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<sup>14</sup>In the case of Costa Rica, the trends are also consistent among the four distributions, but in the opposite direction.

favourable terms of trade and significant export-led growth (Ocampo, 2017), played a substantive role in influencing the direction of inequality in the region, at least according to inferred evidence from surveys (Cornia, 2014; Sánchez-Ancochea, 2021). This is precisely the type of event that should be analysed under a micro-macro consistent framework.<sup>15</sup>

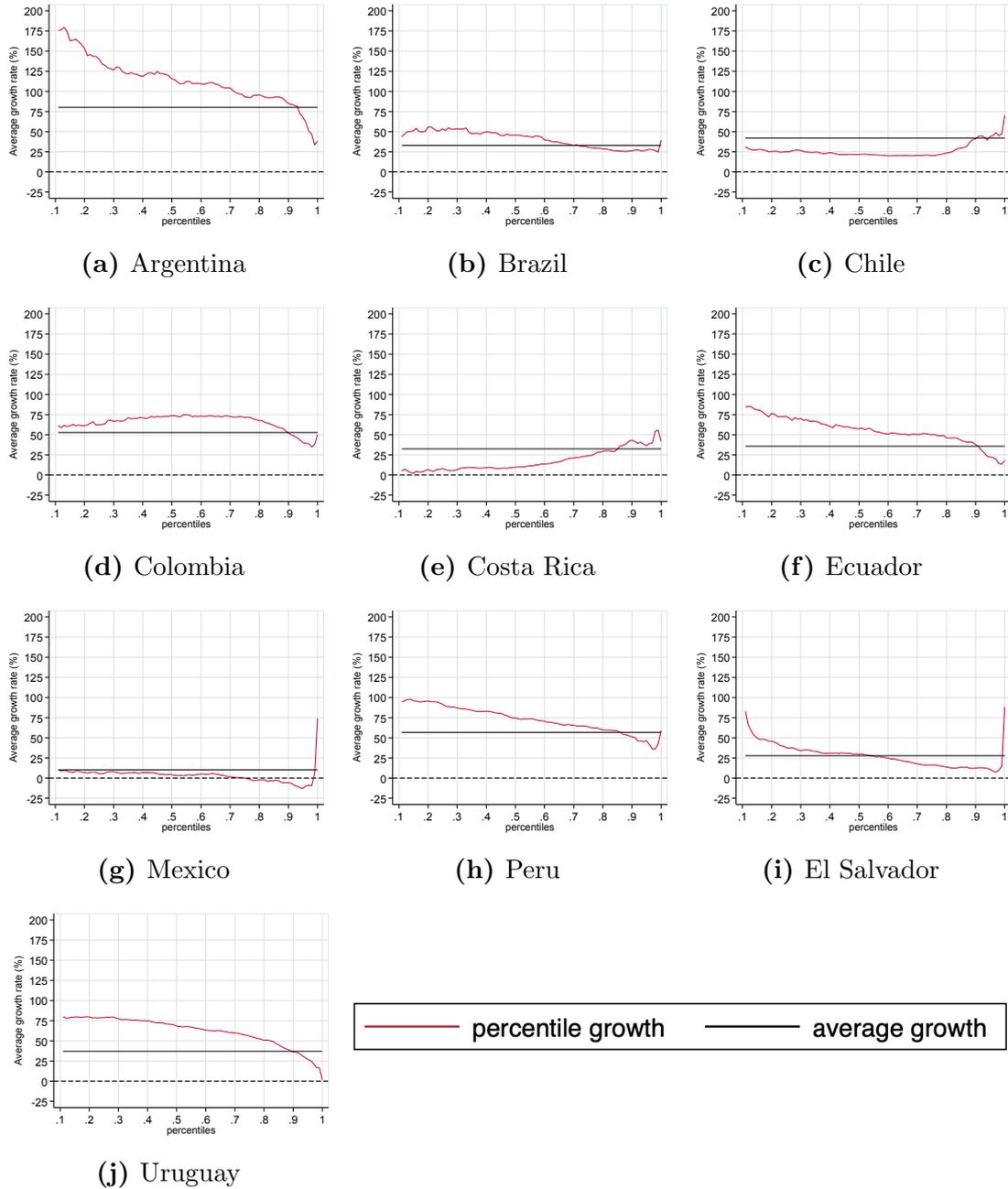
Figure 2 presents growth incidence curves of pre-tax national income for the period of the commodity boom (broadly 2003-2013). The first aspect to note is that upper incomes outgrew lower incomes in a minority of cases. Only in Chile, Mexico and El Salvador did the top 1% outperform the average, while in Brazil and Costa Rica it grew at the same rate as the average.<sup>16</sup> In most cases the next 9% (that is, the top 10-1%) experienced lower growth than the average. Overall, the commodity boom seems to have benefited lower income groups relatively more than the average, except in Chile, Colombia, Costa Rica and Mexico. The two most unambiguously progressive profiles are found in Argentina and Uruguay, where lower incomes benefited from higher growth rates than richer groups right across all percentiles. These dynamics are quite indicative of the primary effects of the commodity driven growth (on market incomes), which directly feeds into inequality trends over this period (see Figure A.10). It is worth reiterating the importance of adopting a macro-consistent framework to properly study these kinds of phenomena. In allocating corporate income to households, after their incomes have been scaled to the national accounts, we are fully accounting for the distribution of economic power (as mentioned in the Introduction), and thus all market-based channels through which the commodity boom could affect the the population. The next section focuses on secondary effects, including taxation and, more notably, cash transfers and public spending more generally.

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<sup>15</sup>Income growth for the entire period (including the crisis of the early 2000s and the end of the commodity boom) are depicted in Figures A.9 and A.10 for pre-tax national income and A.11 for post-tax national income.

<sup>16</sup>This is consistent with the picture provided by Figure A.7. The top 1% income share will be stable across this period if its average income grew at the same rate as the average growth rate.

**Figure 2:** Growth incidence curves during the commodity boom



**Note.** Authors' elaboration. Income is household per-capita pre-tax national income. Baseline year is 2003 for every country except Mexico, Costa Rica and Peru (2004), while the final year is 2013 for all except Mexico (2014). Growth rates are average growth rates of real income by percentile (red line) and for the whole population (black line).

### 3 Redistribution: taxation, transfers and spending

The redistributive effect of public policies has been extensively analysed in the region. In general terms, previous research has found that direct taxes and cash transfers have a very limited redistributive effect compared to richer countries (Hanni et al., 2015; Goñi et al., 2011). Moreover, the overall redistributive effect is neutralised by consumption taxes, while only when social spending is considered does the re-distributive effect emerge (Lustig et al., 2014; Clifton et al., 2020). We revisit this analysis by considering not only the totality of national income —as opposed to the income reported in household surveys—, but also all national taxes and national social expenditures. Note that national taxes include corporate taxes, which are seldom brought into consideration and most likely affect higher income individuals, potentially increasing overall progressivity (see e.g. Saez and Zucman, 2020). This allows us to provide a supplementary view of redistribution in the region.

Figure A.12 depicts the composition of national taxes in the region since 1990. It suggests that there are diverse patterns in the region: while some countries have high and growing tax receipts as a percentage of GDP throughout the period (Argentina, Brazil and Uruguay), others have a share of around 20% and only slightly increasing or even stable (Colombia, Chile and Peru). Countries such as Mexico have low and stable shares (except for the end of the period), while the rest (e.g. El Salvador and most notably Ecuador) present large increases from low starting points. For the region as a whole, consumption and production taxes make up more than half of the total take, a trend replicated in most countries. Personal income taxes represent a comparatively small share, as expected from the size of the taxable income and the effective rates levied (as shown in Figure B.1). Social security contributions (SSC) vary considerably more by country, with the most important shares in countries where the overall tax take is highest, like Argentina, Brazil, Costa Rica, and Uruguay. These countries are those where pensions represent a higher share of total income (see Figure A.2). Property and corporate income taxes represent about a quarter of total taxes, with corporate income taxes representing the bulk of these

receipts.

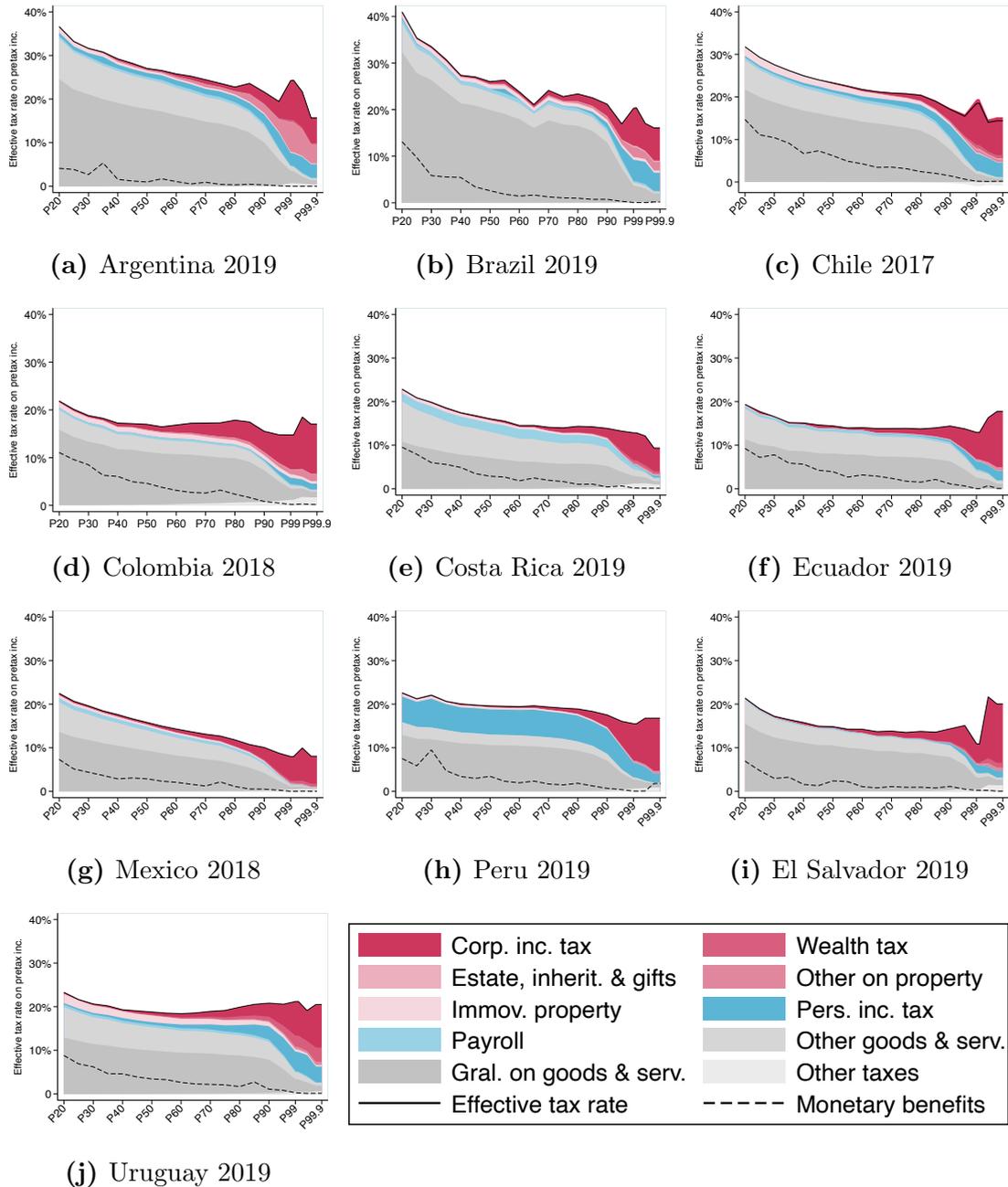
The distributive effect of these trends depends on both the level of taxes as well as their incidence throughout the income distribution. Figure 3 shows effective incidence rates by type of tax, as well as monetary benefits, across the distribution of total pre-tax national income. Among progressive taxes (those whose effective tax rate increases with percentiles), personal income taxation is broadly redistributive in every country except for Peru.<sup>17</sup> This progressive profile is largely because such a small share of the population have positive effective tax rates (as shown in Figure B.2, where only at the very summit of the distribution do effective rates fall). All types of wealth/property taxation and corporate income taxes are also progressive, while taxes on goods and services as well as the residual category “other taxes” are clearly regressive. Given the larger share of the latter two, the overall result is a regressive pattern in the region, which has a steeper gradient in countries such as Argentina, Chile, Mexico or Costa Rica, and more neutral in Colombia, Uruguay or Ecuador. In all countries, corporate income taxation plays a key role in taxing incomes at the top of the distribution, given that its incidence falls on corporate owners (employers and shareholders). Monetary benefits have a clearly progressive profile across all countries, with a higher amount of transfers below the median of the distribution.

The effect of these taxes and transfers on the income distribution is presented in Figure 4. It depicts the post-tax disposable income distribution, which is the result of applying all taxes and monetary transfers of Figure 3 to the the pre-tax national income (from Figure 1, which is plotted again for comparative purposes). The net effect of taxes and transfers is in general terms slightly regressive, or neutral in the best case scenarios (e.g. Colombia after 2010 or Uruguay after 2009). Most of the regressiveness is given by value-added taxes: when removed, the post-tax spendable income distribution results in a significantly lower inequality throughout the region. The redistributive effect of the remaining taxes and transfers is mild, and close to negligible in countries such as Mexico, Colombia or Costa Rica. More importantly, these taxes and transfers do not seem to be powerful drivers of

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<sup>17</sup>This outlier could be due to the fact that the personal income tax statistics sent to us by the Peruvian tax office excludes income from foreign sources as well as entrepreneurial incomes.

**Figure 3: Incidence of taxes and transfers**



*Note.* Authors' elaboration. The Pre-tax per capita household income.

reducing inequality, since trends do not visibly change, except in Brazil around 2004-2005 or Uruguay in 2007. Thus, changes to the income distribution are substantially driven by pre-tax incomes, stressing the importance of pre-tax inequality as documented for France and the United States (Piketty et al., 2020).

When social spending in-kind is incorporated, particularly the two categories that affect the distribution —health and education—, trends *do* change.<sup>18</sup> The falling inequality narrative re-emerges even for countries where the sequential process of adjusting and scaling the raw survey results in stable pre-tax inequality trends. The clearest exception is Mexico, for which inequality continues to rise even after in-kind transfers are accounted for. This is because health and education spending in Mexico has remained pretty stagnant over the last twenty years (Figure A.13), despite progressive (or slightly progressive) spending profiles estimated for both categories by the CEQ studies (see Figures A.14 and A.15). For all other countries the mix of growing health and education expenditures and progressive incidence suffices to produce falling inequality across the board.

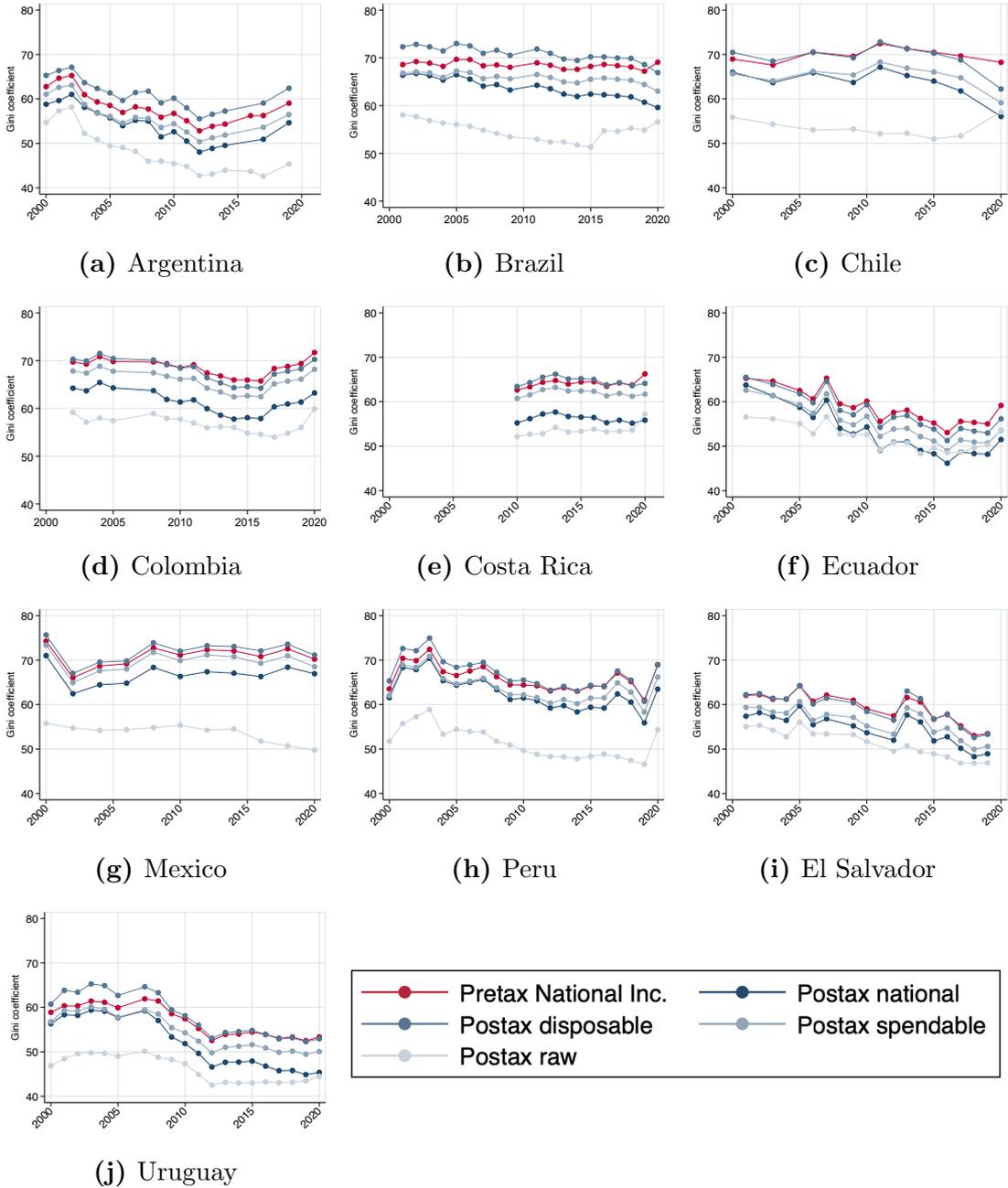
At this point it is worth recalling that the literature on income inequality in Latin America seldom considers in-kind social spending, due to debatable assumptions about how to impute these expenditures to households. Thus, the conventional narrative is largely built on a disposable income definition, which unlike the national accounts definition does not include consumption taxes. As specified in section 1.3, we construct a post-tax spendable income distribution to compare with the common definition behind the conventional narrative, a survey-based definition of income which we label “postax raw” in Figure 4. The comparison of these two series is consistent, allowing us to scrutinise the conventional narrative of falling inequality in the region after accounting for missing top and household incomes. In at least three countries (Argentina, Chile, Mexico) the downward post-tax raw trend is not replicated in the post-tax spendable series. In all other countries the two series track each other pretty well, suggesting that the conventional narrative holds up to scrutiny on its own terms. However, it is worth reiterating that its definition of income

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<sup>18</sup>As stated before, all other social expenditures in kind are imputed proportionally to the disposable income distribution.

does not fully account for the entirety of the tax and transfer system, which on cash terms produces regressive disposable income profiles, due to the weight and regressiveness of consumption taxes, as Figures 3 and 4 reveal.

**Figure 4:** Gini coefficients: pretax vs post-tax series



**Note.** Authors' elaboration. The figures depict the pretax national income distribution and four post-tax distributions: the raw survey series (after taxes and cash transfers as reported in surveys), the spendable series (the surveys combined with administrative data and national accounts, after taxes and cash transfers except consumption taxes), the disposable series (after all taxes and cash transfers), and the national series (after all taxes, cash transfers, and in-kind spending). The distributions are of household per capita income.

## 4 Reconciling competing narratives

### 4.1 The conventional narrative and its limits

Research based on household surveys has consistently shown a downward trend in per-capita household income inequality in Latin America between 2000 and 2015, fostered by the improvements in international economic conditions, terms of trade, and a new social policy model in most of the region (Gasparini et al., 2018). These estimates, with relatively minor variations, represent the core of the series shown by all major inequality databases of the region, i.e. the World Bank, SEDLAC, CEQ and ECLAC.<sup>19</sup> Despite its multiple causes, it is wage inequality which has been found to be the main driver of falling inequality in the region (López-Calva and Lustig, 2010; Messina and Silva, 2017).

Whereas the rise in inequality in the 1980s and early 1990s is typically explained by skill-biased technological change (after the liberalisation of international trade flows), the decline is explained by demographic factors and, more importantly, by the reduction in labour income inequality. For the latter, the educational upgrading of the labour force played a major role. Cornia (2014) documents that the average regional decline in the Gini index was 5.5 points from 2002 to 2010, after two decades of systematic increases. After noting that conventional data sources are not able to properly account for capital incomes or labour incomes of the “working rich”, he shows that the evolution in 1990-2010 was driven by wage income inequality, matched by skill premium shifts benefiting the bottom of the distribution. The increase in social assistance also played a role, but its contribution was relatively less important than changes to the labour income inequality. Rodríguez-Castelán et al. (2022) find that the decline in wage inequality was driven by an increase in real hourly earnings among the bottom of the distribution, which in turn was associated to a fall in education and experience premiums, as well as to a reduction

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<sup>19</sup>See Bourguignon (2015) for a systematic comparison of SEDLAC and ECLAC’s data. See also <https://data.worldbank.org/>, <https://www.cedlas.econo.unlp.edu.ar/wp/estadisticas/sedlac/>, <https://commitmentoequity.org/datacenter> and <https://statistics.cepal.org/portal/cepalstat/index.html?lang=es>, respectively.

in the wage dispersion among workers with the same observable attributes. Amarante (2016) argues based on factor component analysis that it was mainly informal wages which pushed inequality downwards (while the opposite happened with the formal sector).

Tax data have seldom been integrated into the picture nor have findings from this literature been reconciled with the “conventional wisdom” in a systematic way. Where it has been attempted, the conclusion reached is that the conventional wisdom regarding inequality trends remains solid. For example, De la Torre et al. (2014, p.35) ask “does the pro-poor growth story still hold once we incorporate the missing top earners to the distribution?” Complementing survey data with information on top earners from tax data and comparing with survey-based results for Argentina (1998-2003) and Colombia (2002-2010), the authors indeed find that inequality levels are corrected upwards. However, they also find that inequality dynamics are more prone to diverge between both scenarios during times of economic crisis than during smooth business-cycle periods. They nonetheless conclude that while “extending this exercise to the rest of the region could shed more light on the determinants of income distribution over time, we feel confident that the trends in income inequality unveiled by the household survey data are a good approximation to the real Gini for much of LAC” (De la Torre et al., 2014, p. 36). This conclusion is supported by Winkelried and Escobar (2020), who reveal for the case of Peru that a range of simulated adjustments to the top tail of the survey—using Pareto models and top income shares from other countries—still produce declining Gini coefficients. Burdín et al. (2022) study pre-tax adults inequality for the Uruguayan case between 2009 and 2016. They find that synthetic inequality indices fall according to survey data and administrative data (the latter supplemented by survey data for the unaccounted population and incomes), but find divergent trends for top income shares. While the top 1% share decreases in the survey, it remains stable first and then grows based on administrative data. This divergence is the result of increasing inequality in the right tail of the distribution of the administrative data, driven in turn by an increasing share of reported dividends.

While Amarante and Jiménez (2015) do not extrapolate lessons from a small sample of

countries to the whole region, they recognize the similar evolution of the standard Gini and tax-adjusted Gini for the countries with survey and administrative data at their disposal (Argentina, Colombia, Uruguay). Even with the acknowledged problems of tax data (evasion, avoidance, exemptions, threshold changes), the authors think that tax data can add value to the study of inequality in the region, particularly from the perspective of top income concentration.

Recent top incomes literature based on tax data has shown a more persistent pattern of inequality —particularly from the perspective of top income concentration— in this period (Alvaredo, 2010; Alvaredo and Londoño Velez, 2014; Morgan, 2018; Souza, 2018; Burdín et al., 2022; Flores et al., 2020).<sup>20</sup> Making sense of divergent trends is not straightforward, since there are differences in units (adults, households), income definitions (pre or post-tax) and more importantly, the differences in the way top income groups are accounted for in different sources and the coverage of capital incomes, not only in surveys but also in top-corrected surveys compared with the national accounts (Alvaredo et al., 2022). We turn to these issues in the following section.

## 4.2 Making sense of divergent trends

Do estimates discussed in sections 2 and 3 of this paper, alongside the tax-based literature contradict the conventional inequality narrative for Latin America? Addressing this question is not straightforward, since competing narratives are riddled with comparability issues that need to be cleared beforehand. Thus, in order to reconcile different inequality narratives that emerge from alternative sets of estimates, we need to distinguish between conceptual and measured sources of divergence. Among the former, it is necessary to clarify: (i) the unit of analysis; (ii) the inequality indicator; and (iii) the income definition, since differences in one or more of these may render estimates incomparable from a purely conceptual point of view. Among the latter, we analyse the role of the two main sources of divergence in each estimation step, i.e. capital incomes and top income groups.

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<sup>20</sup>For more details see Appendix B.1.

**Unit of analysis.** Most estimates for Latin America (e.g. World Bank official estimates) are based on per-capita household income, while tax-based studies usually use adults or equal-split adults (where the income of couples is equally split among the individuals) (WIL, 2021). Thus, to avoid comparability problems in this area throughout this study we use per-capita household income as the reference unit of analysis. Note that this is in turn only possible because we depart from surveys and adjust them using administrative data not the other way around as is the case in most studies on developed and underdeveloped countries (Piketty et al., 2018; Garbinti et al., 2018; Burdín et al., 2022; Flores, 2021).<sup>21</sup> Nevertheless, in order to clarify the effect of this issue on trends, in Figure A.1 we show the evolution of the Gini coefficient in the World Bank’s database and in the surveys we use from ECLAC’s database according to alternative unit definitions.<sup>22</sup> To dismiss differences in harmonisation, we reproduce the World Bank’s downward trend in the inequality of per-capita household income based on ECLAC’s surveys. Individual-adult and equal-split-adult inequality series are also depicted, showing that trends are not altered, except for Mexico and Chile to a lesser degree. Thus, at least for these two countries one should expect that considering individuals instead of per-capita household income should mechanically change trends, even before even changing the data source or incomes considered, while this does not seem to be an issue for the remaining countries.

**Inequality indicator.** As Figure A.8 shows, even in cases where inequality does fall according to indicators like the Gini index or the top 10% share, this can coincide with stability or even an increase in top 1% income shares. This is not surprising, and has been found for countries such as Brazil, Colombia or Uruguay (Morgan, 2018; Souza, 2018; Alvaredo and Londoño-Vélez, 2013; Burdín et al., 2022). This should be kept in mind when comparing competing narratives. To what extent one should prioritise one approach or the other depends on normative considerations, such as privileging individuals at the bottom

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<sup>21</sup>All series based on alternative unit definitions are available upon request and will be available in a dedicated website that will be made public in November 2022.

<sup>22</sup>Note that the World Bank database on Latin American household surveys is the Socio-Economic Database for Latin America and the Caribbean (SEDLAS), which is produced in collaboration with the CEDLAS institute (*Centro de Estudios Distributivos, Laborales y Sociales*) of the Universidad Nacional de la Plata. As with ECLAC’s database, it is based on official household surveys run by country statistical offices or central banks.

of the distribution in the Rawlsian sense, or favouring a limitarianist approach (see for example Robeyns, 2019). Mechanically, it is to be expected that the income dynamics of a very small group in the population like the top 1%, will not necessarily impact a synthetic indicator like the Gini coefficient in the same direction, when these incomes are included into the distribution. This is largely because the Gini coefficient, still the most widely used summary measure of inequality, weights all income groups equally, and by its construction from the Lorenz curve is more sensitive to changes in the middle of the distribution than its tails. These points have been recognised by the literature (see for example Leigh, 2006, and Atkinson, 2007). But as shown by Alvaredo (2011), if top incomes not covered by surveys experience a large enough increase relative to lower incomes, then trends in the Gini coefficient and top income shares can diverge. What we observe, therefore, is that increases in top incomes from administrative data are not large enough relative to the growth of lower incomes to reverse the downward tendency of the Gini coefficient. What arguably does make more of a difference are dynamics in micro-macro income gaps as we've shown.

**Income definition.** There are two dimensions to consider regarding the definition of income. The first one is that the conventional narrative is based on household surveys which generally report disposable incomes, that is after tax incomes and including social transfers with the exceptions of Brazil and Costa Rica, where gross wages are reported. On the other hand, tax-based studies rely on pre-tax income excluding social transfers, except where they are taxable (like pensions). Naturally, the redistributive effect of taxes and transfers changes income distribution as shown in section 3 and hence hinders comparability. In Figure 4, we depict the Gini index based on post-tax definitions. We include a series for post-tax disposable income in the raw survey, without being subject to any adjustments for top incomes or macro incomes. Together with our post-tax spendable series (post-tax disposable income without subtracting value-added taxes (VAT)), they both represent income inequality after taxes and transfers and before VAT. Thus, both are comparable and importantly both show downward trends. The post-tax spendable income series shows higher inequality than the post-tax national income series since it does

not consider health and education spending (but lower than the post-tax disposable, as a result of ignoring the regressive effect of VAT). In most cases, with the notable exception of Mexico, significant periods of downward inequality trends are observed in the series, mirroring what happens with the raw survey.

The second dimension is the aggregate income concept the series refer to, which was discussed in sections 2 and 3. Expanding the income reported in the raw surveys to include missing top incomes and especially absent aggregate capital incomes softened the downward inequality trends in most countries, and was enough to stabilise or reverse the trend in at least three large countries of our sample. The crux of the debate thus lies in the contributions of the top 1% and of capital incomes to the narrative. This is what we turn to in the remainder of this section.

**Bottom 99% vs top 1%.** The contribution of top incomes to overall inequality is the result of their distance from the rest of the distribution and to the distance between themselves. These between-group and within-group dimensions can be decomposed in the Theil index of inequality. Figure A.16 shows the contribution of the inequality between the bottom 99% and the top 1% for three pre-tax distributions and the post-tax spendable distribution. With each step of the adjustment the top 1% and the rest grow apart and hence between group inequality contributes more to overall inequality. Note that in the pre-tax national income series, it explains 40-50% of total inequality, while it was around 30% or less in the raw survey for most countries (results are the same with for post-tax spendable series). Moreover, in some cases such as Mexico, and to a lesser degree Chile, the contribution of the distance between groups increases in time for the national income series relative to other series (or as in the case of Peru it flattens while remaining series are falling).

Overall within-group inequality is the sum of inequality within the top 1% and with the rest of the distribution. Figure A.17 shows that not only is the top 1% more distant from the rest after each adjustment, but also that is more internally unequal, fostering overall inequality. Moreover, in most countries across a significant portion of the period

there is an upward trend in the national income series, which means that the adjustments push inequality up through time via inequality within the top 1%. Thus, each step of the sequence from raw survey to national income increases the distance between groups and inequality within the top 1%, and in some cases this gap widens over time, contributing to diverging inequality trends between the raw survey series and the augmented series. Within-group inequality among the bottom 99% (Figure 5), on the other hand, shows a decreasing trend for most countries, even in the pre-tax national income series. The only clear exception to this pattern is Costa Rica, for which inequality among the bottom 99% increases regardless of the series.

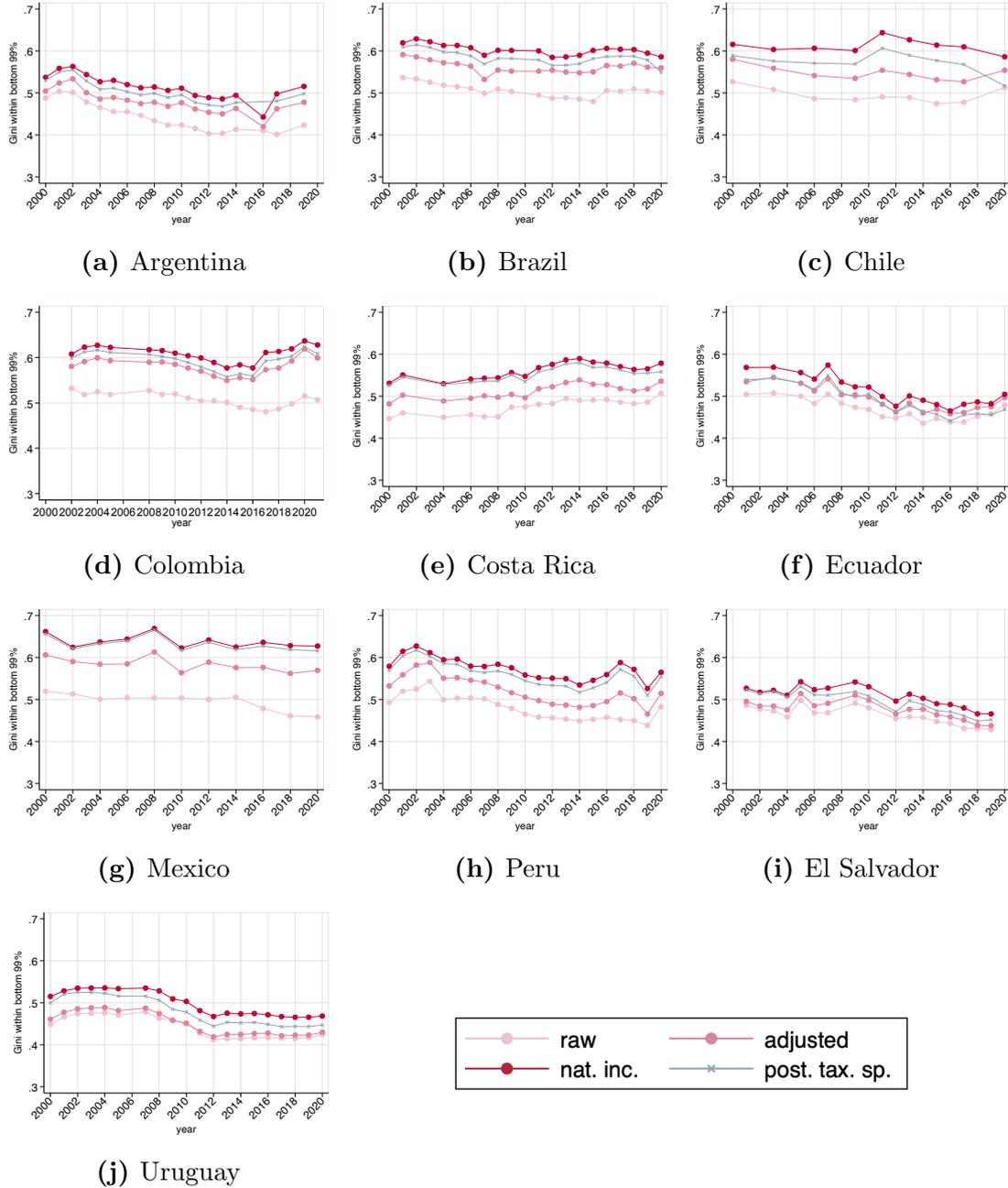
**Capital incomes vs wages.** To assess the effect of capital incomes on divergent trends, we first look at the distribution of each of the income sources for each aggregate definition of income, depicted in Figures A.18 to A.21. The first thing to note is that the Gini index of wages decreases for most countries between the early 2000s and the mid 2010s. In fact, as shown in Figure A.22, the trend in wage inequality after adjusting the survey using administrative and macroeconomic data, respectively, mirrors the raw survey. This is an important result given that wage inequality is one of the driving forces behind the falling inequality narrative, and it remains in most countries after incomes have been adjusted using administrative data on top incomes and macro data for different income sources.

Secondly, capital incomes are as expected extremely concentrated, which is already a feature of raw surveys. To better understand the role capital incomes, Figure 6 depicts their contribution to overall inequality based on Lerman and Yitzhaki (1985)'s Gini decomposition, which is the result of within source inequality and their share in total incomes. As can be seen it is the scaling up to household sector and national income that significantly increases the contribution of capital income to overall inequality, increasing by a factor of 3 in many cases.

To sum up, competing narratives are sometimes affected by comparison problems affecting the unit of analysis, the income definition or the choice of inequality indicators. In some cases these can lead to divergent results even if the same data sources were used.

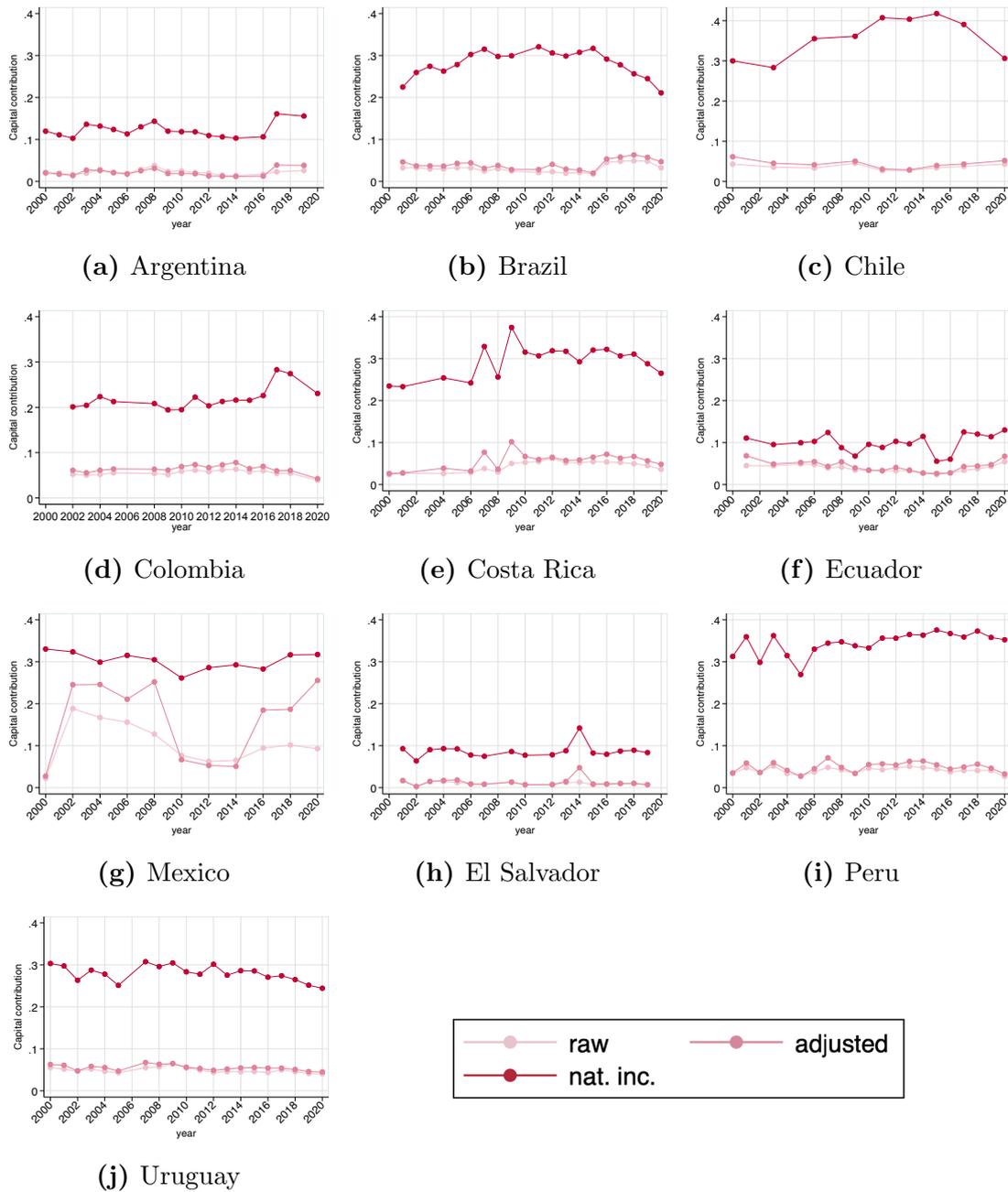
However, a reconciliation of various micro and macro data sources on income can produce diverging trends relative to raw surveys when the contribution of ignored top income groups and aggregate capital incomes to overall inequality increase over time, even in the presence of the decreasing concentration of wages. Thus, our results confirm the conventional narrative of falling Latin American inequality within the bottom 99% of the post-tax income distribution and especially related to earnings, but they also suggest that these trends change for some countries once top income groups and capital incomes are better accounted for. The “debate” among the research community over Latin American inequality largely boils down to one about trust in micro and macro data sources in region where all suffer from glaring imperfections.

**Figure 5:** Within-group Gini coefficient (bottom 99%)



**Note.** Authors' elaboration. Gini coefficient of per-capita household income for the bottom 99% in the raw pre-tax survey, the adjusted pre-tax survey with tax data, the pre-tax national income series and the post-tax spendable income series (i.e. disposable income without excluding value-added taxes).

**Figure 6:** Capital income contribution to inequality



**Note.** Authors' elaboration. Capital income contribution to the Gini coefficient of per-capita household income, based on Lerman and Yitzhaki (1985) in the raw pre-tax survey, the adjusted pre-tax survey with tax data, and the pre-tax national income series.

## 5 Concluding remarks

Trust in data sources is at the heart of the dilemma we pose in this paper when revisiting the Latin America inequality story. If it is accepted that the region is as rich as macroeconomic data report, then it is also significantly more unequal. A rejection of this conclusion implies accepting that Latin America grew less rich, but remained less unequal throughout. The former outcome may be easier to digest if it were just about levels. What the debate is really about, however, is trends, and here we showed that the region is more inequality-heterogeneous than previously understood. In at least three countries of our sample of ten countries (Brazil, Chile and Mexico) inequality trends during the high-growth years (2003-2013) change after the survey's reported income is augmented to include ignored top incomes from administrative data and macroeconomic incomes of the household sector and total economy from the national accounts. This holds even for the same income concepts and units of analysis commonly used in the literature. In all cases the declining inequality trend of the high growth years softens with each of the adjustments made to the raw survey. Moreover, during the low-growth years at the end of our period of analysis (post-2015), inequality has increased faster in the augmented series than in the raw series.

Was Latin America exceptional after all? It turns out to be a matter of degree. Taken at face value, our results suggest that the region's exceptionalism is no longer uniformly shared across all countries. Broadly speaking, we showed that while inequality did fall for the bottom 99% and for wages across the region, this is not the case for every country once top income groups and capital incomes from extra-survey sources are accounted for. Even if only a part of this were true, on account of the many weaknesses of both the region's administrative data and national accounts, it does reveal certain limits of the Latin America's redistributive experience of the early twenty first century. While it was widely successful in increasing the incomes of the poor and reducing overall inequality, it was relatively unsuccessful in redistributing income from the rich and from capital in particular. Interestingly, we find that the falling inequality narrative emerges with most strength once in-kind social spending is considered, which highlights an important feature

of the redistributive process that deserves greater attention in future research.

It is worth stressing once again that this exercise relies on imperfect and heterogeneous data alongside numerous necessary assumptions to bridge them all together. However, it is also true that it represents a unique attempt to make use of such a wide array of data sources in a coherent manner to provide conceptually consistent inequality estimates. Moreover, we see it as an effort to build a bridge between different inequality approaches and narratives. In this sense, this work should be regarded as a contribution to open a debate on an important topic and not to close it.

Following the path laid out by Alvaredo et al. (2022), the large gap between the micro distribution and macro distribution of household incomes we estimate shows that the seminal findings by Altimir (1987) are still essentially true. The credibility of the scaling of survey incomes to the national accounts obviously depends on our confidence in macroeconomic statistics, as well as the way in which we view incomes that households do not directly receive on an annual basis. From our perspective, regardless of the accounting convention on whether to allocate corporate retained earnings to firms or to their owners, it is evident that they are resources controlled by individuals and they should be accounted for in any meaningful inequality analysis, if only to avoid cross-country biases affecting the distribution of profits.

Naturally, the above conclusions are highly dependent on the particular assumptions made. Considering that surveys miss about half of national income, we are perfectly aware that many other distributions can theoretically be estimated with a different set of assumptions. Yet, we find it difficult to plausibly settle on alternative assumptions given the data at our disposal. Having said this, as we pointed out in the introduction, our procedure should not be taken as a gold standard going forward. Further research is still needed at the country-level—exploiting the rich country data lost in our generalised approach and the local knowledge of data producers and researchers—to provide greater clarity on data gaps and their implications for inequality analysis. A host of public policies lie in the balance of such an approach, especially if policymakers wish to adequately tailor them to

the distribution of actually measured economic growth.

# Appendix

## A Supplementary Tables and Figures

**Table A.1: Included countries**

Country	Survey microdata		Administrative data		
	Source	Availability	Source	Availability	Population (% of total)
Argentina	Encuesta Permanente de Hogares (EPH) and EPH-Continua from 2003, Insituto Nacional de Estadística y Censos (INDEC)	2000-2014, 2016-2020	Income tax tabulations, Administración Federal de Ingresos Públicos (AFIP), Employee microdata, Ministerio de Trabajo, Empleo y Seguridad Social	2000-2017, 2000-2015	2% 40%
Brazil	Pesquisa Nacional por Amostra de Domicílios (PNAD), Instituto Brasileiro de Geografia e Estatística (IBGE)	2001-2009, 2011-2020	Income tax tabulations, Receita Federal (RFB)	2000, 2002, 2006, 2007-2019	14%
Chile	Encuesta de Caracterización Socioeconómica Nacional (CASEN), Ministerio de Desarrollo Social	2000-2009 (triannual), 2011-2020 (biannual)	Income tax tabulations, Servicio de Impuestos Internos (SII)	2000-2018	70%
Colombia	Encuesta continua de hogares (Gran Encuesta Integrada de Hogares from 2008), Departamento Administrativo Nacional de Estadística (DANE)	2002-2005, 2008-2020	Alvarado and Londoño-Vélez (2013), Income tax tabulations (DIAN)	2000-2010, 2014-2020	1% 8%
Costa Rica	Encuesta Nacional de Hogares, Instituto Nacional de Estadística y Censos (INEC)	2000-2020	Wage income, Non-wage income Zúñiga-Cordero (2018)	2000-2017, 2010-2016	28% 5%
Ecuador	Encuesta Periódica de Empleo y Desempleo (EPED) and Encuesta de Empleo, Desempleo y Subempleo (ENEMDU) from 2003, Insituto Nacional de Estadística y Censo (INEC)	2001, 2003, 2005-2020	Cano (2015) Rossignolo et al. (2016)	2008-2011, 2012-2014	14% 38%
El Salvador	Encuesta de Hogares de Propósitos Múltiples, Dirección General de Estadística y Censos (DIGESTYC)	2000-2007, 2009, 2010, 2012-2019	Tax tabulations (wages), Tax tabulations (diverse income) Dirección General de Impuestos Internos (DGII)	2000-2019	4% (wages) 4% (diverse)
Mexico	Encuesta Nacional de Ingresos y Gastos de los Hogares, Instituto Nacional de Estadística, Geografía e Informática (INEGI)	2002-2020 (biannual)	Income tax microdata, Servicio de Administración Tributaria (SAT)	2009-2014	20% (wages) 2% (diverse)
Peru	Encuesta Nacional de Hogares - Condiciones de Vida y Pobreza, Instituto Nacional de Estadística e Informática (INEI)	2000-2020	Income tax tabulations, Superintendencia Nacional de Aduanas y de Administración Tributaria (SUNAT)	2016-2018	25%
Uruguay	Encuesta Continua de hogares (ECH), Instituto Nacional de Estadística (INE)	2000-2005, 2007-2020	Income tax microdata, Dirección General Impositiva	2009-2016	75%

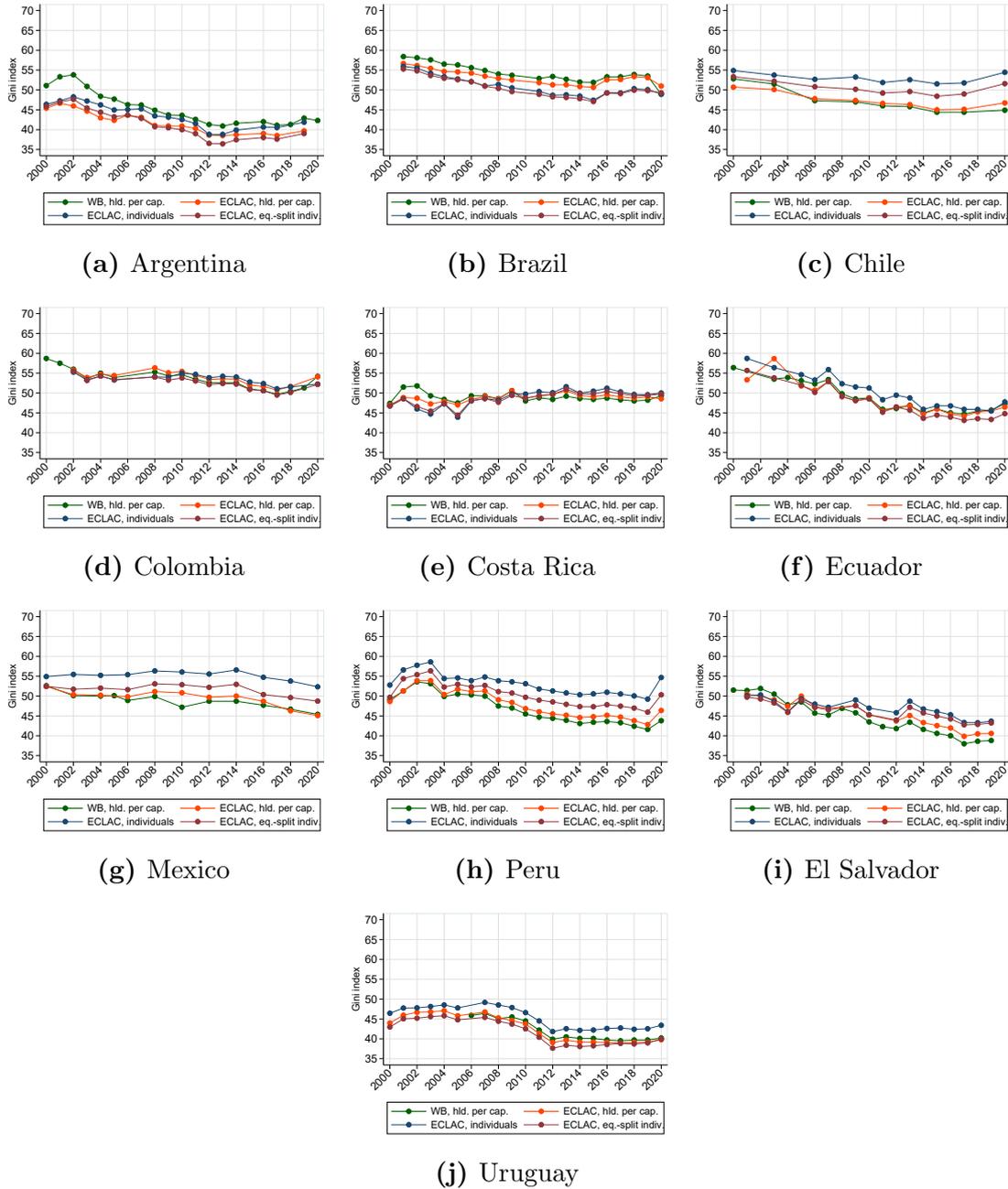
*Note.* Authors' elaboration.

**Table A.2:** Excluded countries

Survey microdata			
Country	Source	Sample size, thousands of individuals	Availability
Bahamas	Bahamas Living Conditions Survey	6	2001
Belize	-	-	-
Bolivia	Encuesta de Empleo, Desempleo y Subempleo, Instituto Nacional de Estadística y Censo (INE)	15 – 40	2000-2019
Cuba	-	-	-
Dominican Republic	Encuesta Nacional de Fuerza de Trabajo (ENFT)	15 – 30	2000-2019
Guatemala	Encuesta Nacional de Condiciones de Vida and Encuesta Nacional de Empleo e Ingresos	10 – 70	2000, 2002- 2004, 2006, 2011, 2014
Guyana	-	-	-
Haiti	-	-	-
Honduras	Encuesta Permanente de Hogares de Propósitos Múltiples (EPHPM), Instituto Nacional de Estadísticas (INE)	20 – 100	2001-2018
Jamaica	-	-	-
Nicaragua	Encuesta Nacional de Hogares sobre Medición de Nivel de Vida, Instituto Nacional de Estadística y Censos de Nicaragua	20 – 35	2001, 2005, 2009, 2014
Panama	Encuesta de Hogares, Instituto Nacional de Estadística y Censo (INEC)	40 – 55	2000-2019
Paraguay	Encuesta Integrada de Hogares (EIH) and Encuesta Permanente de Hogares (EPH) from 2002, Dirección General de Estadística, Encuestas y Censos (DGEEC)	15 – 40	2001-2019
Suriname	-	-	-
Trinidad and Tobago	-	-	-
Venezuela	Encuesta de Hogares Por Muestreo (EHM), Oficina Central de Estadística e Informática	80 – 240	2000-2006

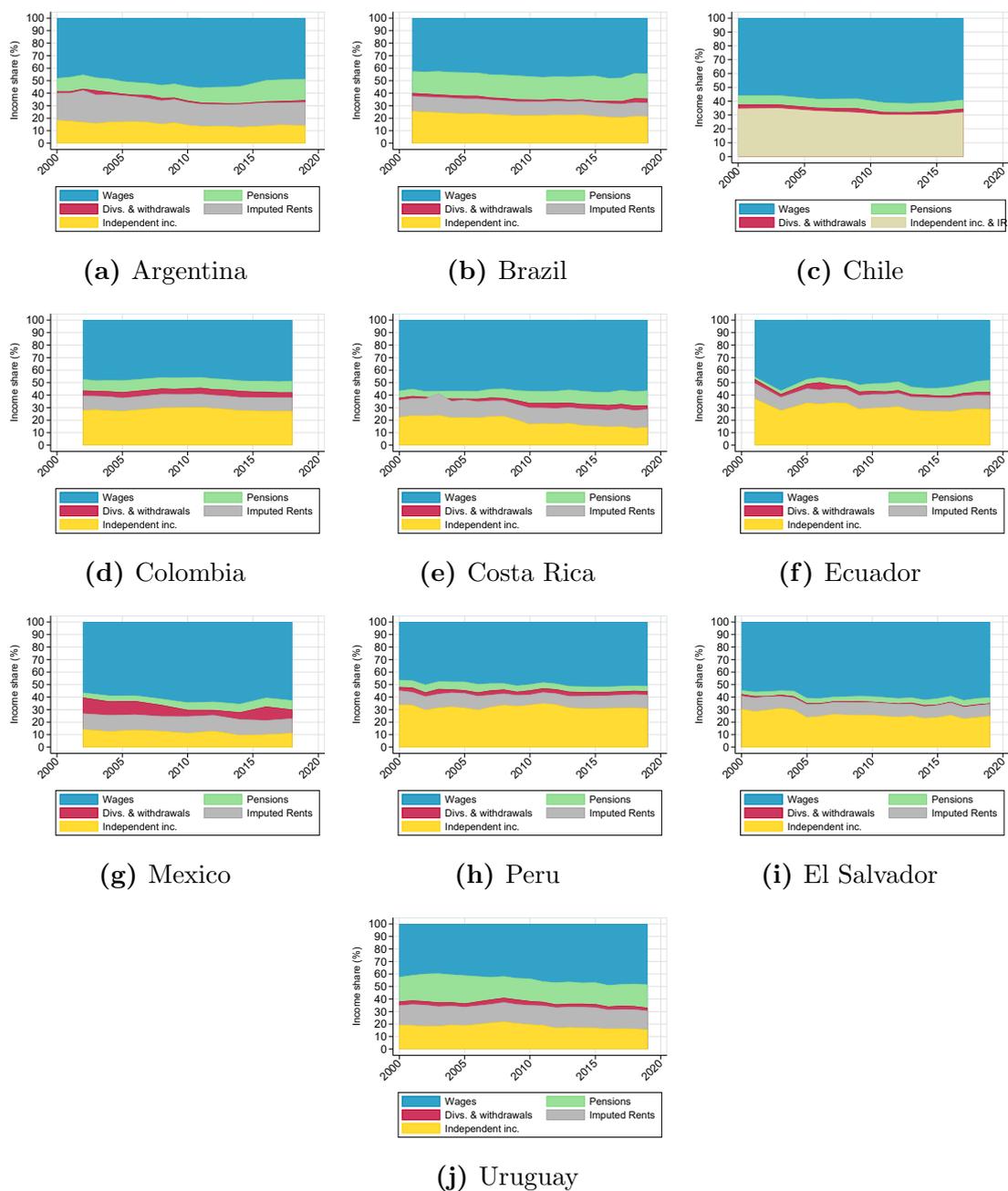
*Note.* Authors' elaboration.

**Figure A.1:** Survey-based Gini indexes by source and income definition



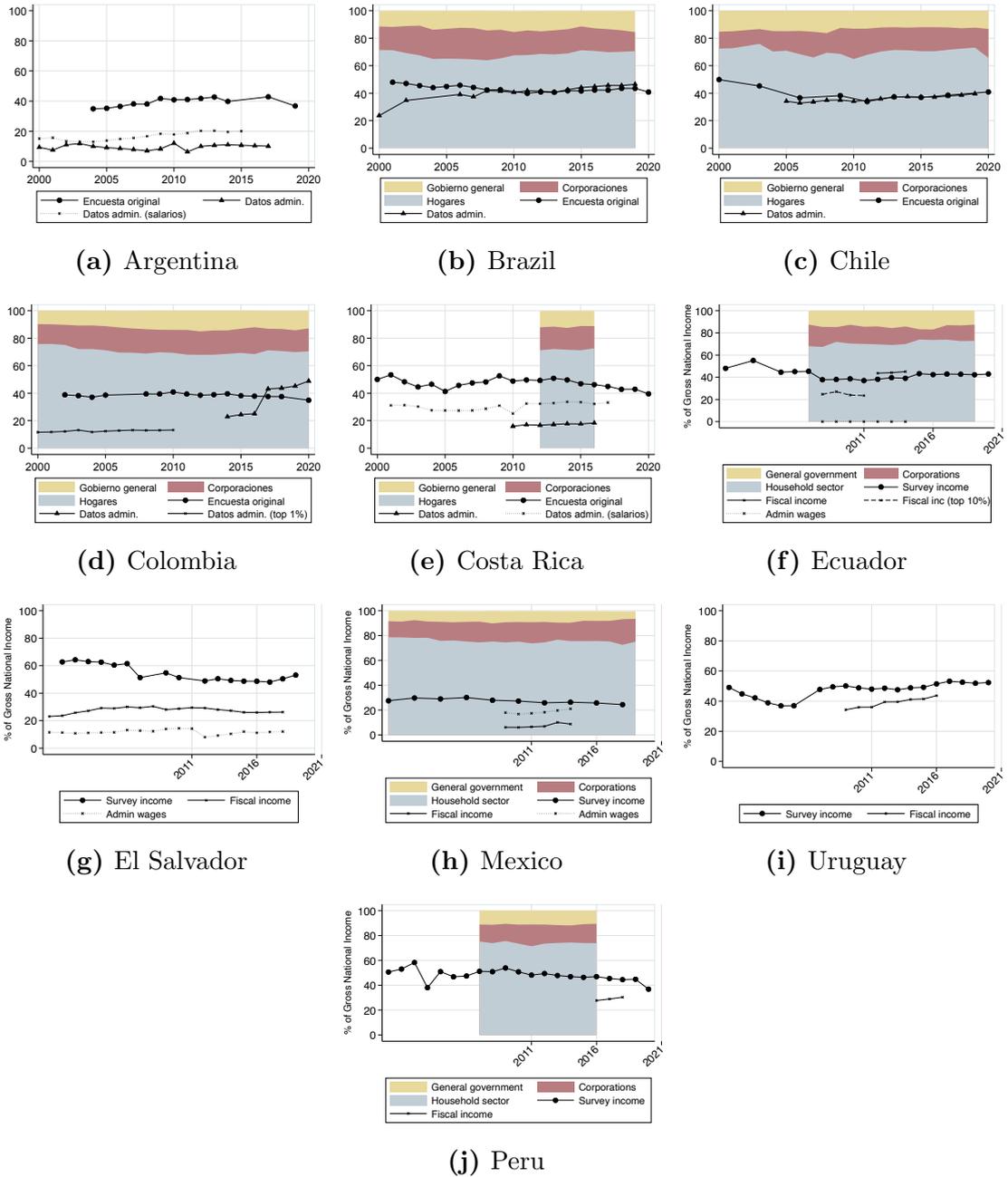
**Note.** Authors' elaboration based on World Bank data (<https://data.worldbank.org/>) and ECLAC's harmonized surveys. World Bank (WB) and ECLAC's household per capita income series ("hld. per cap.") show identical trends and very similar levels. Personal income Gini indexes for adult population (20 and more years) based on ECLAC's harmonized surveys are also depicted along two dimensions – individual earners and equal-split individuals (where the total income of couples is divided by two).

**Figure A.2:** Income composition - raw surveys



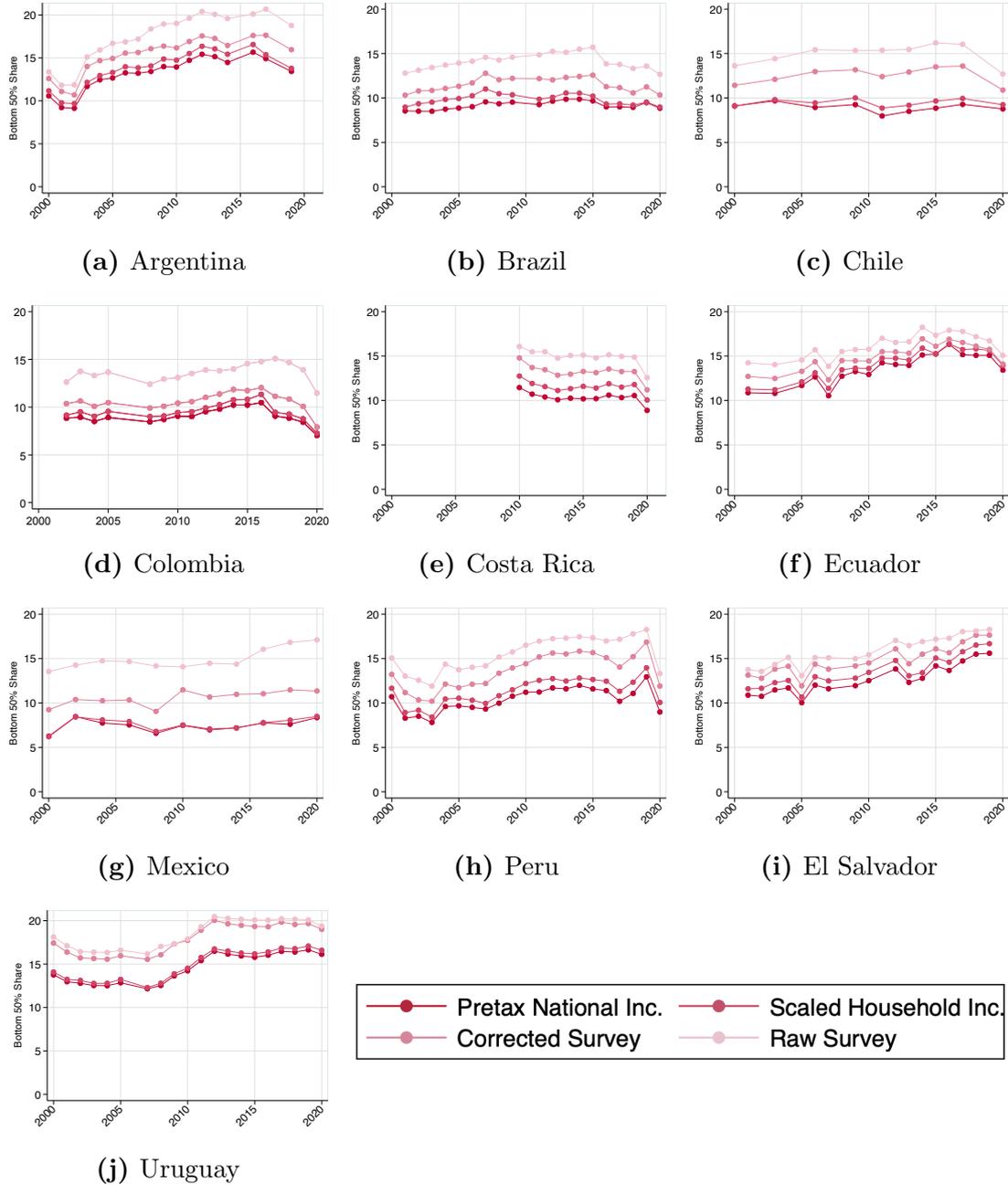
*Note.* Authors' elaboration based on ECLAC's harmonized surveys. Income is pretax, net of pension contributions.

**Figure A.3: From Household Surveys to National Income**



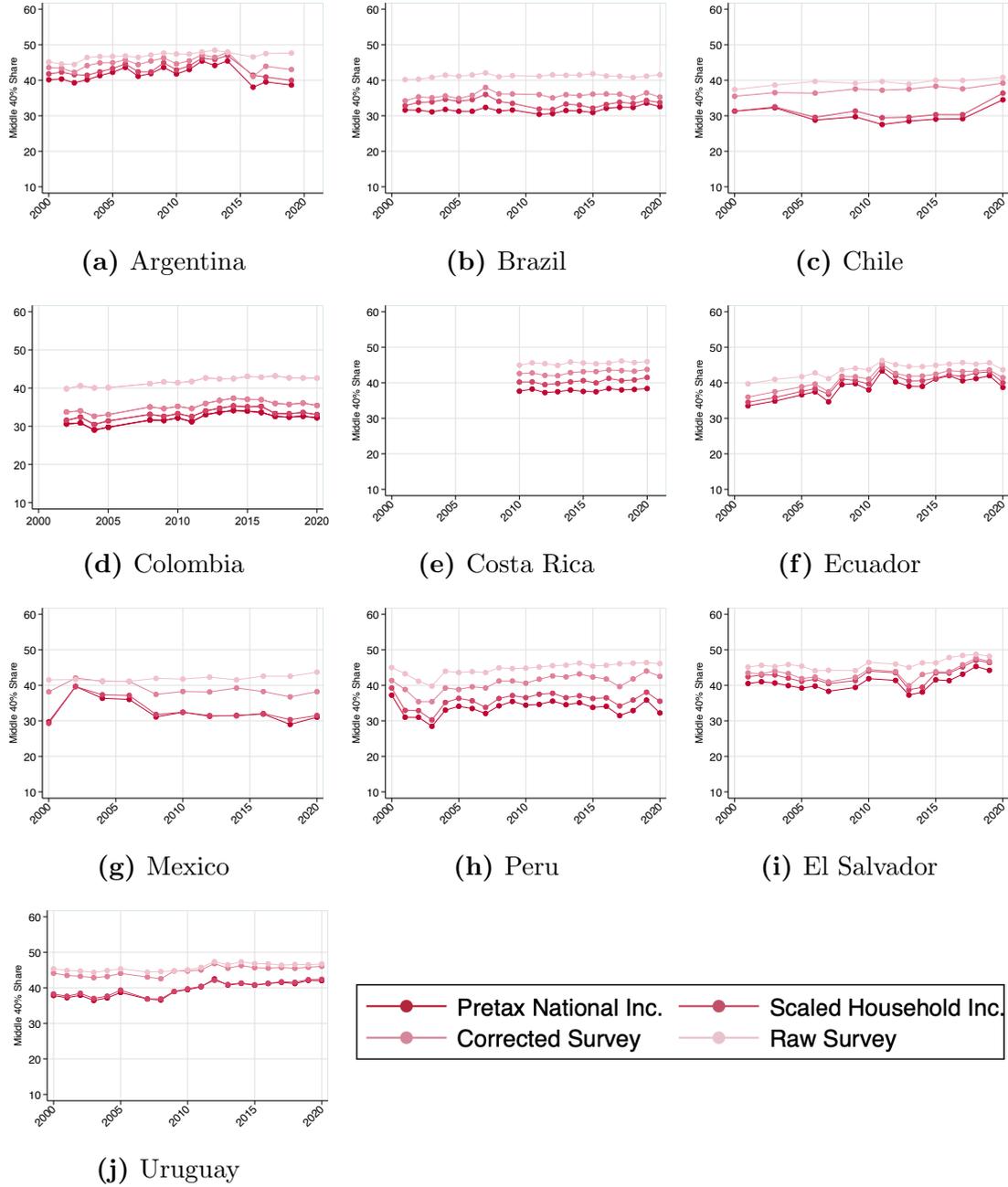
**Note.** The survey series are for total pretax income. Shaded areas are the balance of primary incomes of the household sector (B.5g, S.14), corporations (B.5g, S.11 + S.12) and general government (B.5g, S.13). Source: Alvaredo et al. (2022) for all countries (we incorporate the new administrative tax data available for Colombia post-2010).

**Figure A.4:** Bottom 50% Share in four distributions



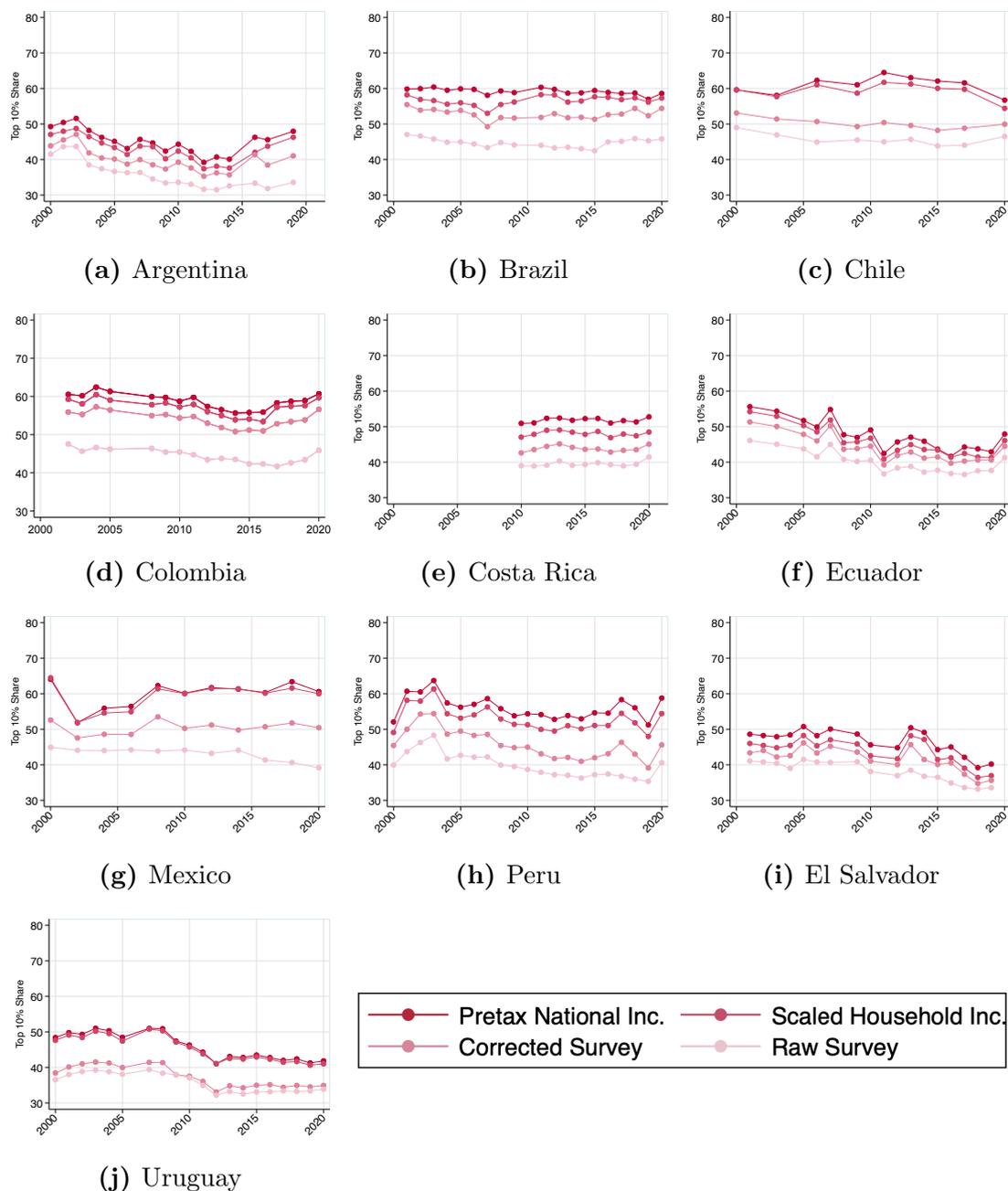
**Note.** Authors' elaboration. The figures depict four distributions: the household survey-based distribution and the three augmented distributions based on three adjustment steps to the survey. The first step uses tax data to reweight the raw survey; the second step scales the income totals in the tax-adjusted survey to their equivalent household-level aggregates in the national accounts; the third step imputes missing incomes needed to reach national income. Brighter points indicate that at least part of the data necessary for the adjustment step was imputed based on remaining country/year averages. The distributions are of pre-tax household per capita income (including pensions and after social contributions).

**Figure A.5:** Middle 40% Share in four distributions



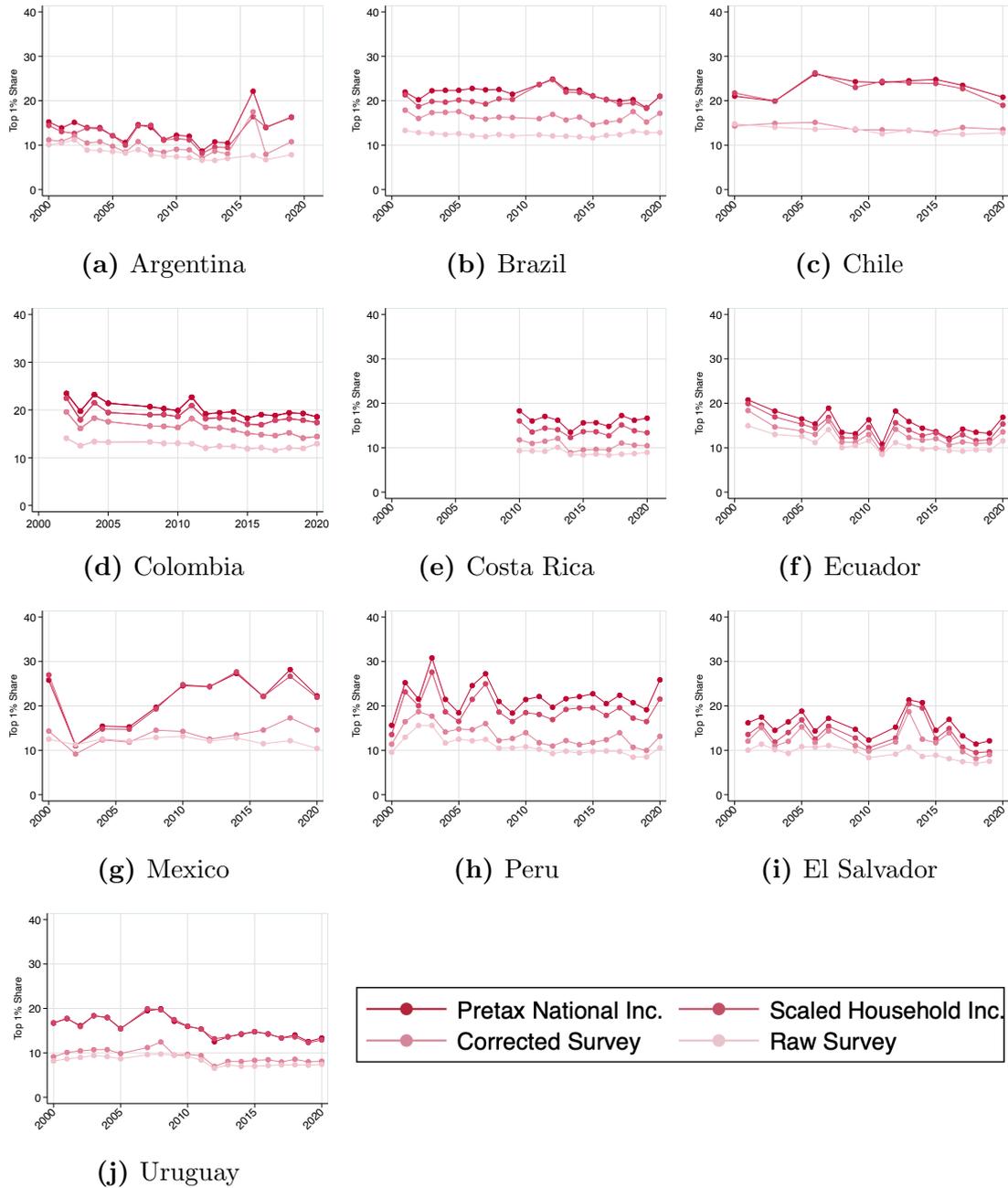
**Note.** Authors' elaboration. The figures depict four distributions: the household survey-based distribution and the three augmented distributions based on three adjustment steps to the survey. The first step uses tax data to reweight the raw survey; the second step scales the income totals in the tax-adjusted survey to their equivalent household-level aggregates in the national accounts; the third step imputes missing incomes needed to reach national income. Brighter points indicate that at least part of the data necessary for the adjustment step was imputed based on remaining country/year averages. The distributions are of pre-tax household per capita income (including pensions and after social contributions).

**Figure A.6:** Top 10% Share in four distributions



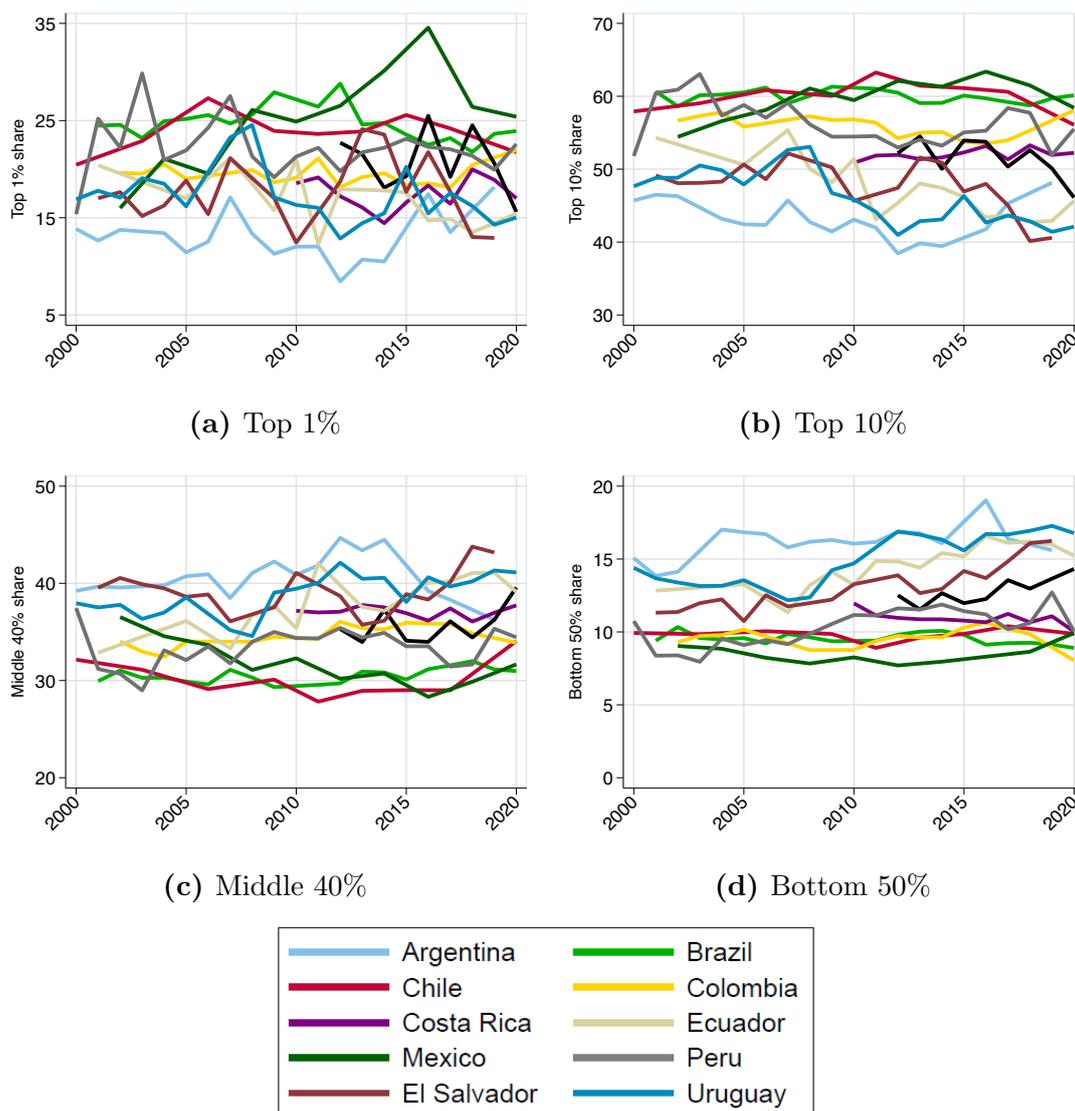
**Note.** Authors' elaboration. The figures depict four distributions: the household survey-based distribution and the three augmented distributions based on three adjustment steps to the survey. The first step uses tax data to reweight the raw survey; the second step scales the income totals in the tax-adjusted survey to their equivalent household-level aggregates in the national accounts; the third step imputes missing incomes needed to reach national income. Brighter points indicate that at least part of the data necessary for the adjustment step was imputed based on remaining country/year averages. The distributions are of pre-tax household per capita income (including pensions and after social contributions).

**Figure A.7:** Top 1% Share in four distributions



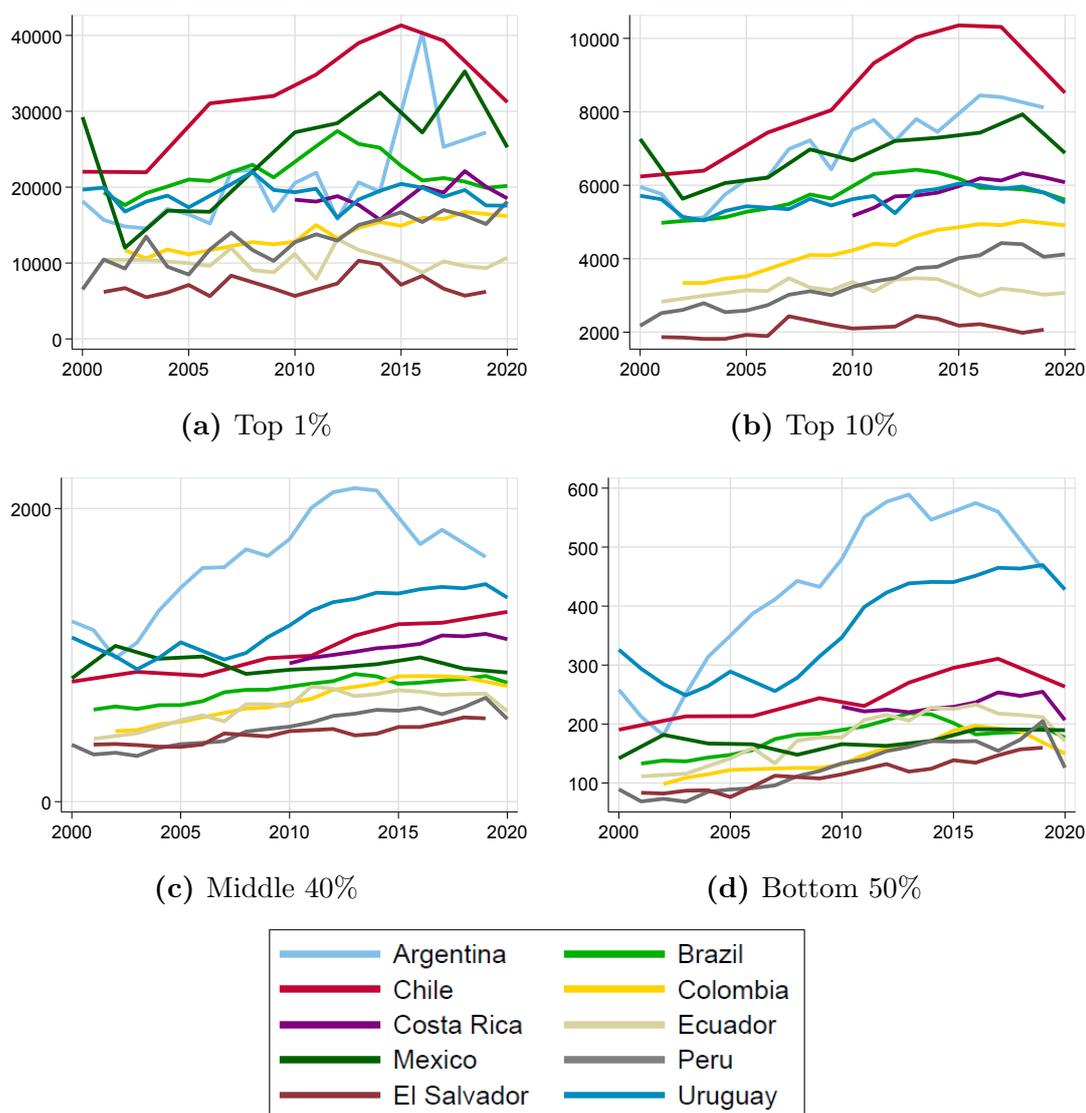
**Note.** Authors' elaboration. The figures depict four distributions: the household survey-based distribution and the three augmented distributions based on three adjustment steps to the survey. The first step uses tax data to reweight the raw survey; the second step scales the income totals in the tax-adjusted survey to their equivalent household-level aggregates in the national accounts; the third step imputes missing incomes needed to reach national income. Brighter points indicate that at least part of the data necessary for the adjustment step was imputed based on remaining country/year averages. The distributions are of pre-tax income (including pensions and after social contributions).

**Figure A.8:** Pre-tax national income shares



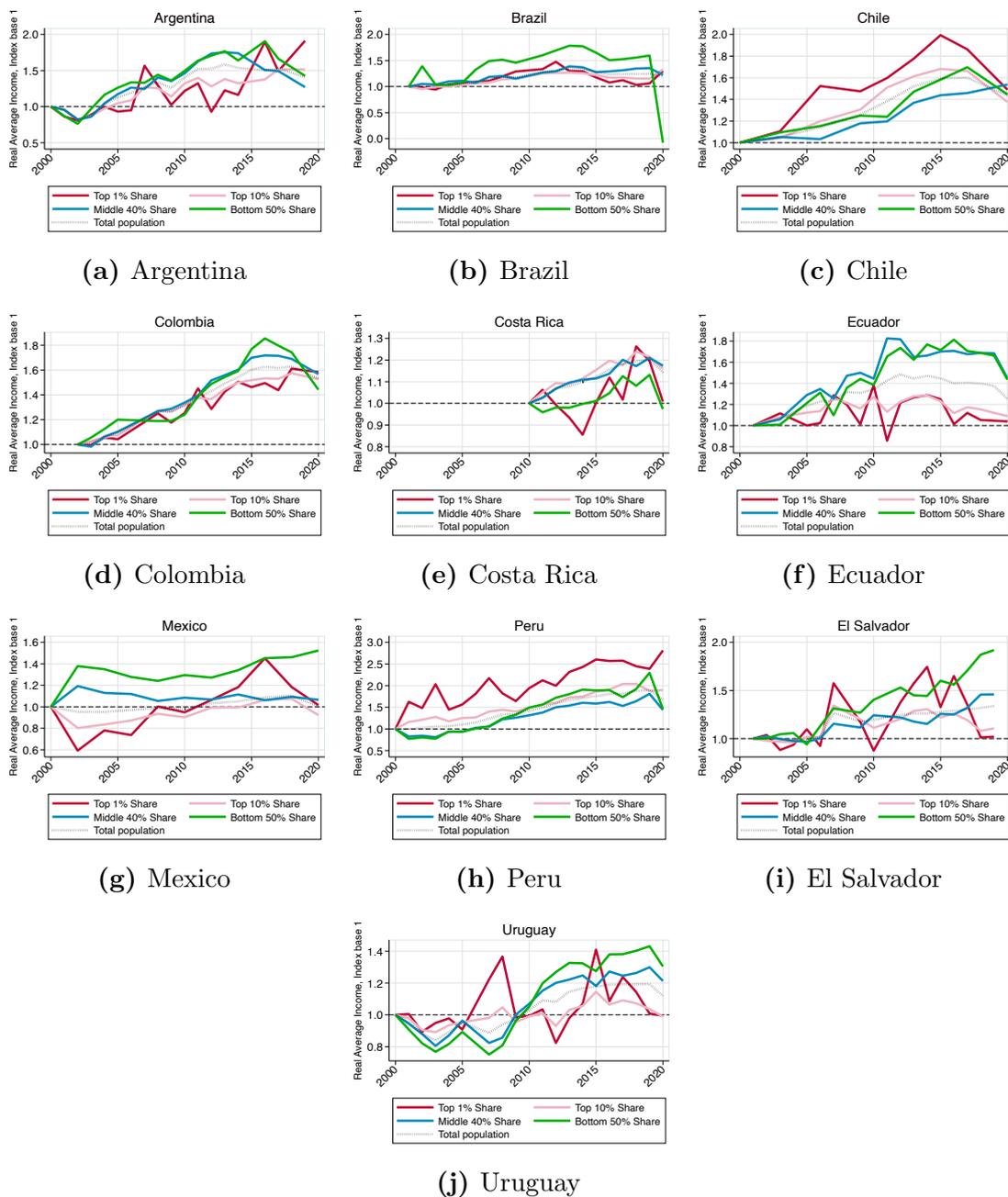
*Note.* Authors' elaboration based on the combination of household surveys, administrative data and national accounts.

**Figure A.9:** Pretax average national incomes by group



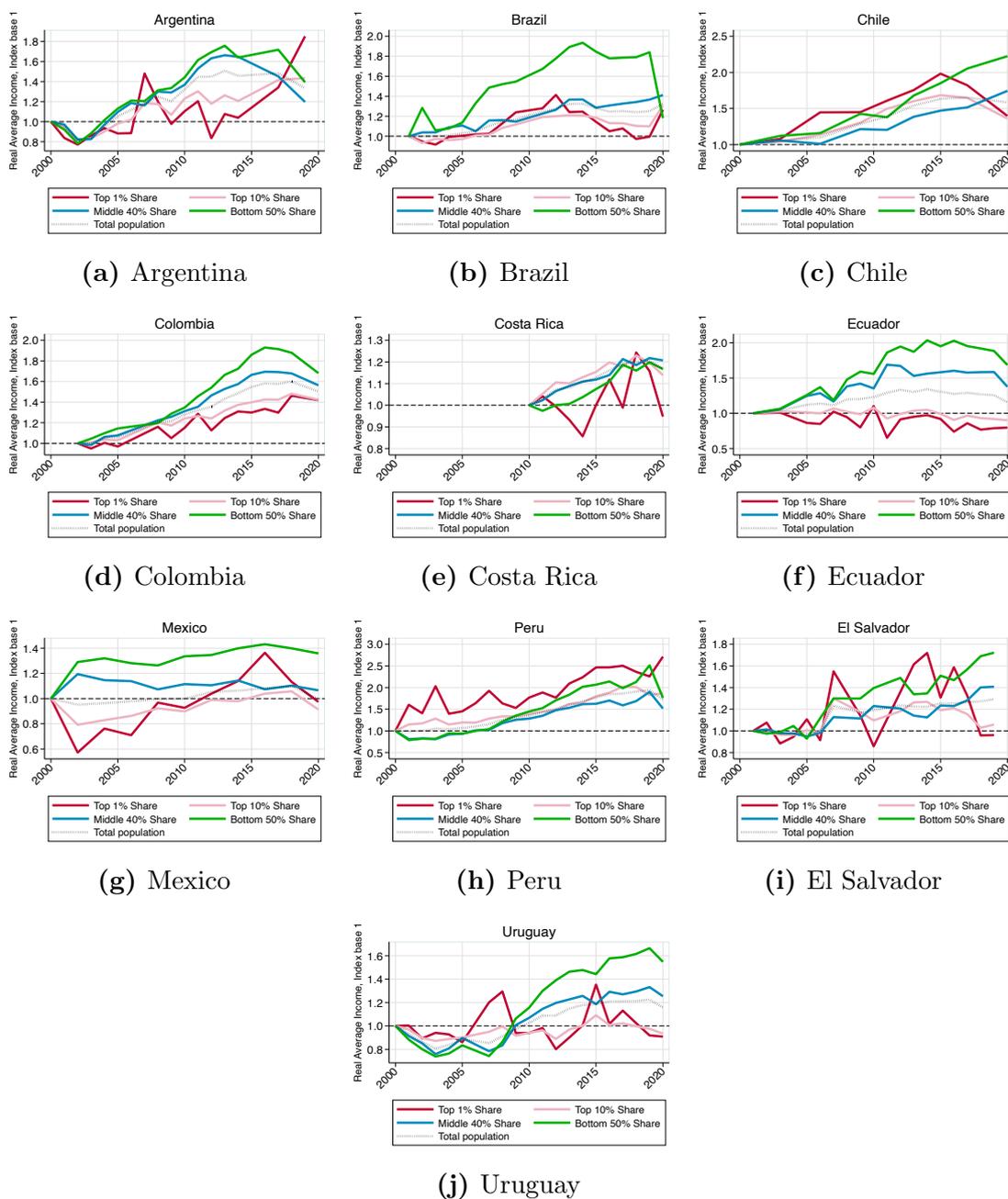
*Note.* Authors' elaboration based on the combination of household surveys, administrative data and national accounts.

**Figure A.10:** The distribution of pretax income growth across groups



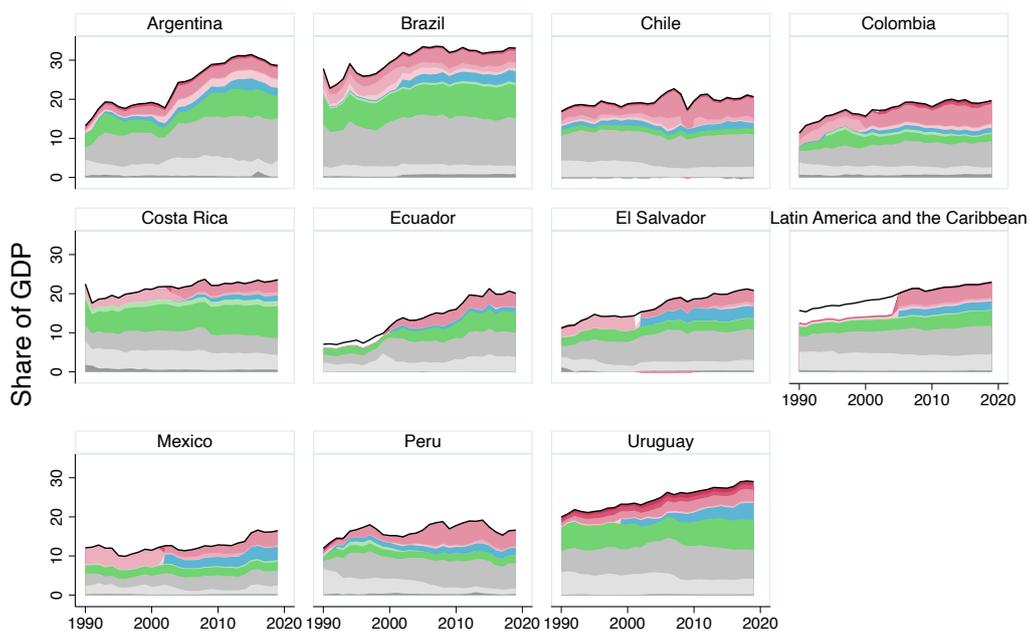
**Note.** Authors' elaboration. Income is pre-tax national household per capita income (surveys, tax data and national accounts, before all taxes, transfers and public spending, including pensions and deducting social contributions).

**Figure A.11:** The distribution of post-tax income growth across groups

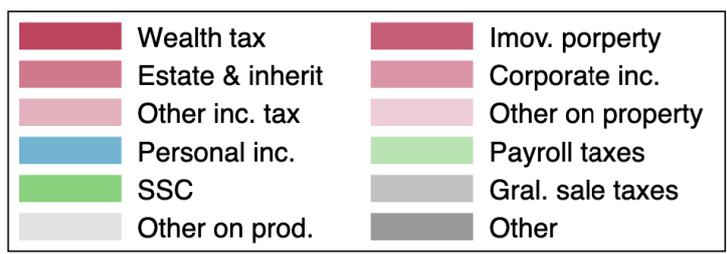


**Note:** Authors' elaboration. Income is post-tax national household per capita income (surveys, tax data and national accounts, after all taxes, transfers and public spending).

**Figure A.12:** The composition of national taxes

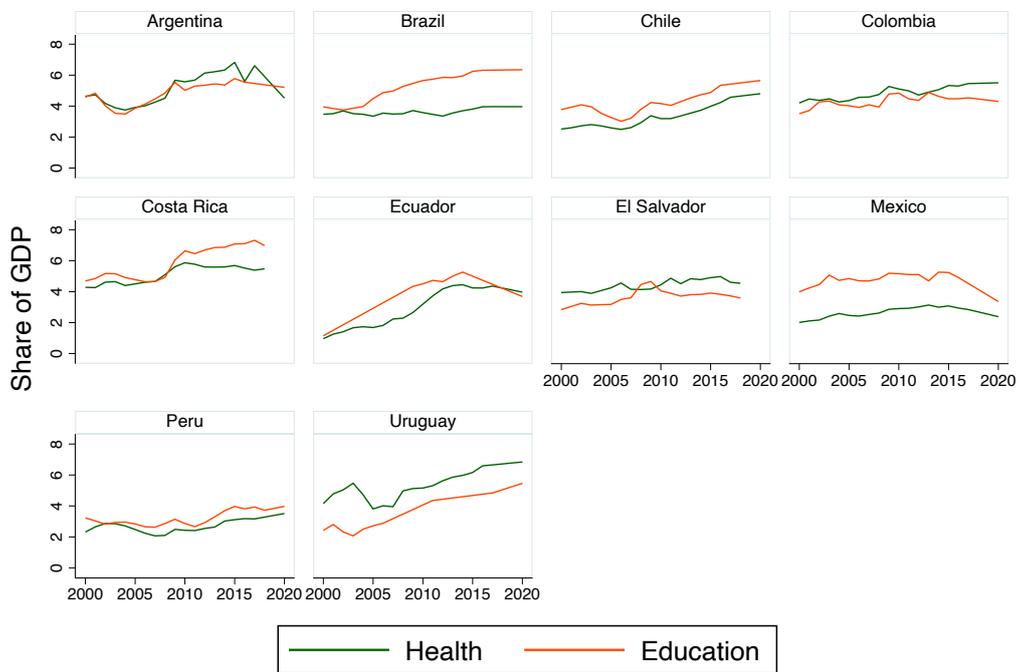


Graphs by country



*Source:* OECD, CIAT and CEPAL (2021).

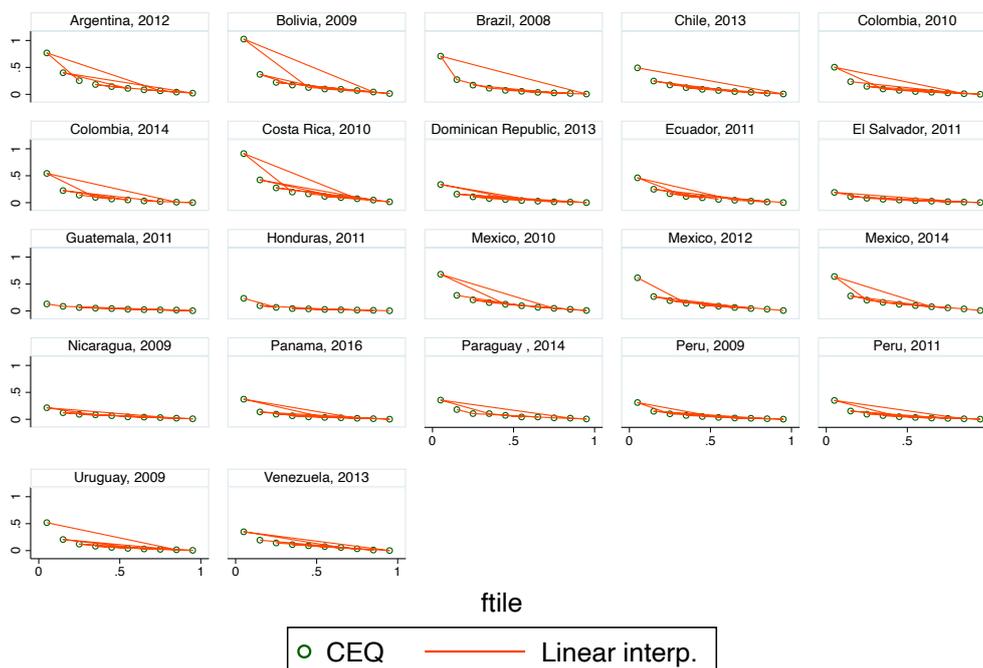
**Figure A.13:** The evolution of in-kind social expenditures



Graphs by country

*Note:* The graphs show the evolution of government expenditures on health and education as a share of GDP. Source World Bank (<https://data.worldbank.org/>).

**Figure A.14:** The incidence of education spending

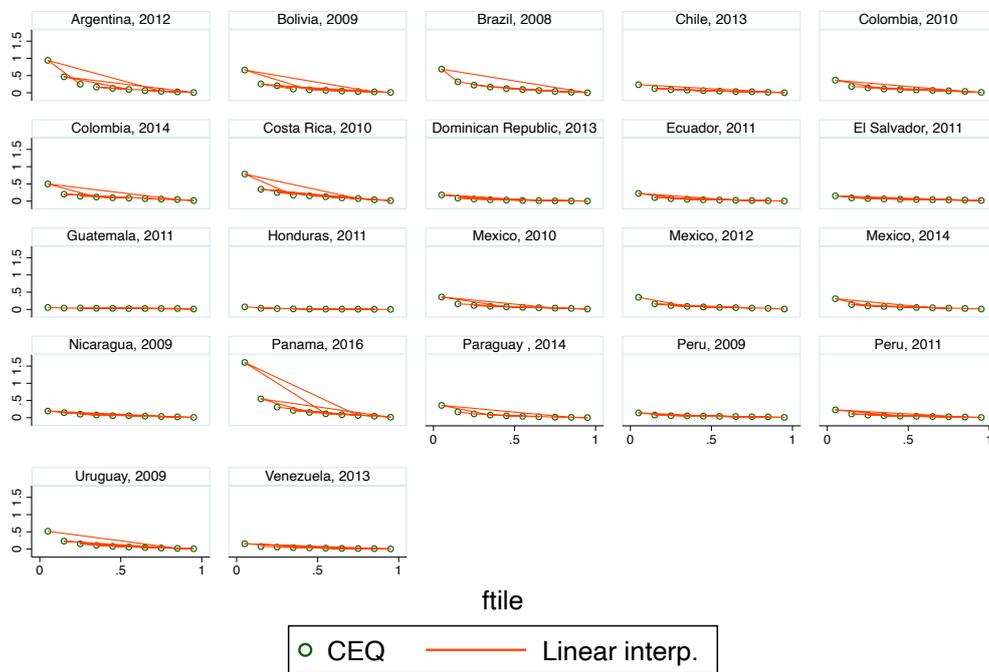


Graphs by (firstnm) country and (firstnm) year

*Note* The graphs show the share of public education spending attributed to each fractile in the distribution. Source: CEQ (2021).

Figure A.2 shows the decomposition of income in surveys, before any adjustment, in terms of wages, pensions, capital income, self-employment income, and imputed rents. Wages and self-employment income represent 60-90% of total household incomes, while capital incomes are much lower.

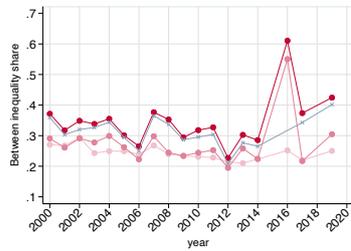
**Figure A.15:** The incidence of health spending



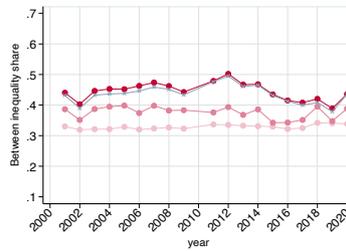
Graphs by (firstnm) country and (firstnm) year

**Note:** The graphs show the share of public health spending attributed to each fractile in the distribution. Source: CEQ (2021).

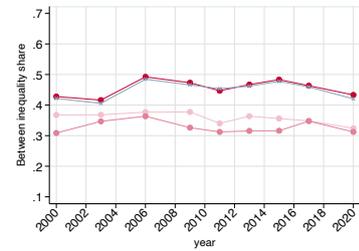
**Figure A.16:** Contribution of between-group inequality (bottom 99% and top 1%)



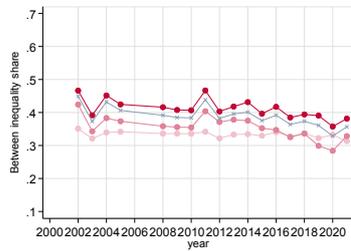
(a) Argentina



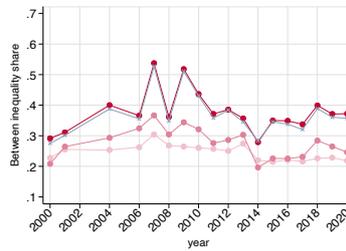
(b) Brazil



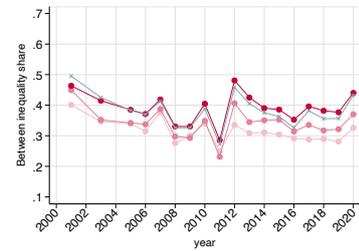
(c) Chile



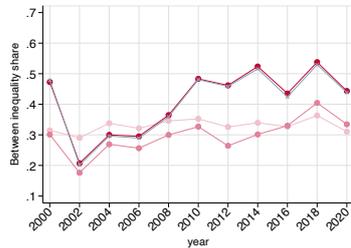
(d) Colombia



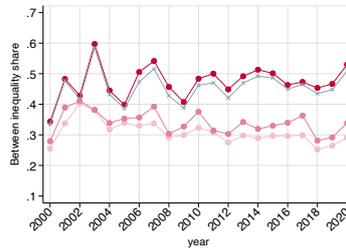
(e) Costa Rica



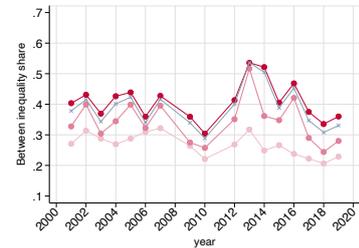
(f) Ecuador



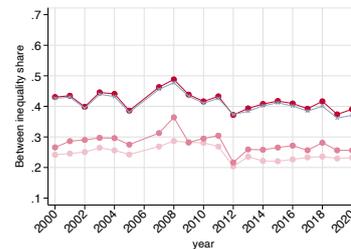
(g) Mexico



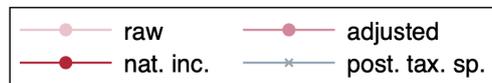
(h) Peru



(i) El Salvador

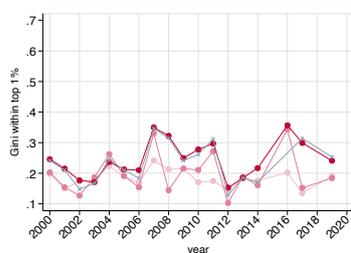


(j) Uruguay

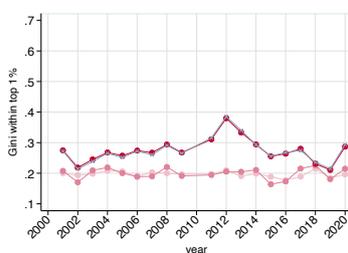


**Note.** Authors' elaboration. The graph shows the contribution of between-group inequality (between the bottom 99% and the top 1%) to total inequality of per capita household inequality using the Theil index decomposition.

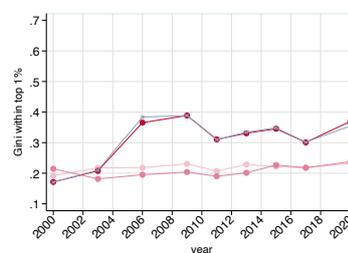
**Figure A.17:** Within-group inequality (top 1%)



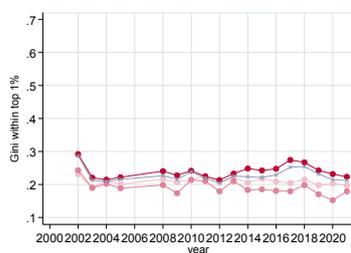
(a) Argentina



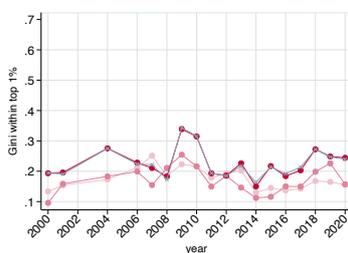
(b) Brazil



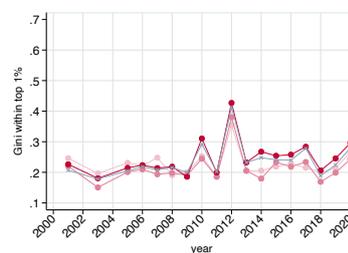
(c) Chile



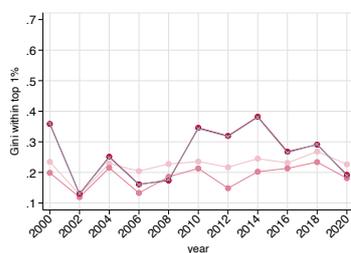
(d) Colombia



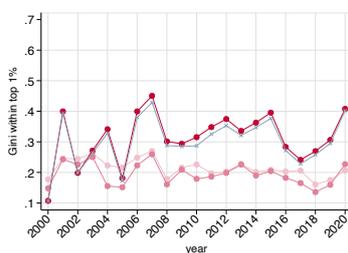
(e) Costa Rica



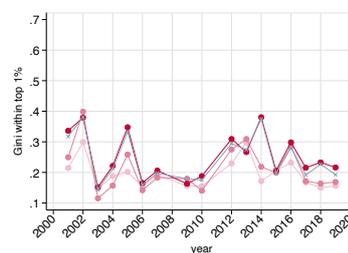
(f) Ecuador



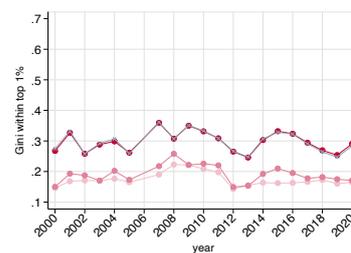
(g) Mexico



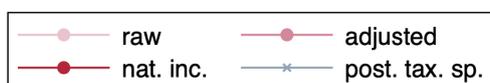
(h) Peru



(i) El Salvador

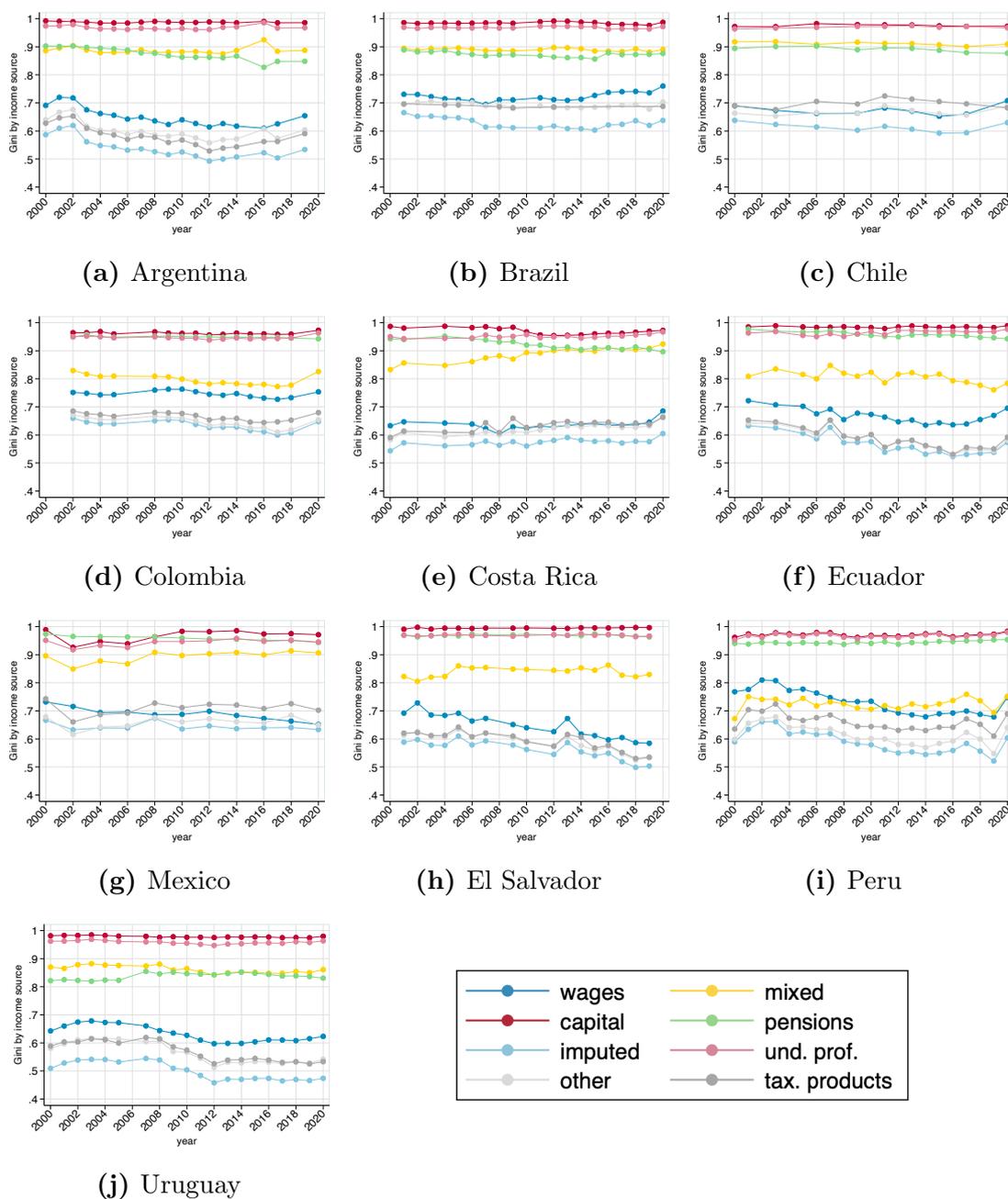


(j) Uruguay



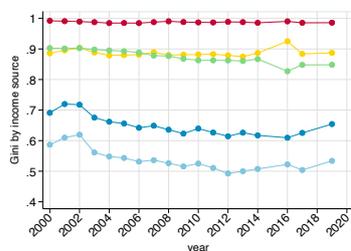
**Note.** Authors' elaboration. The graph within group inequality of per capita household income among the top 1% using the Gini coefficient.

**Figure A.18: Inequality by income source (pre-tax national income)**

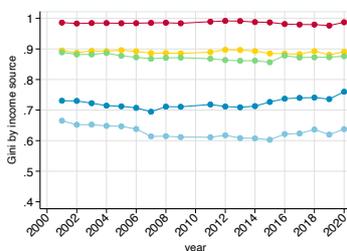


**Note.** Authors' elaboration. The graphs show the Gini index by source of national income for household per capita units based on Lerman and Yitzhaki (1985).

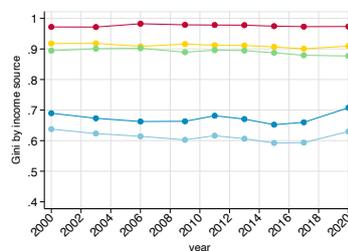
**Figure A.19:** Inequality by income source (household sector income)



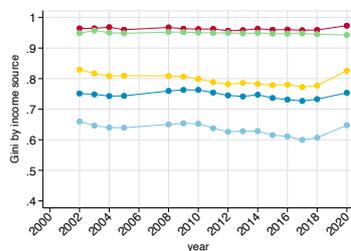
(a) Argentina



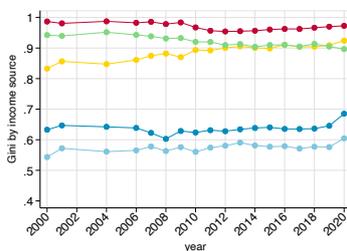
(b) Brazil



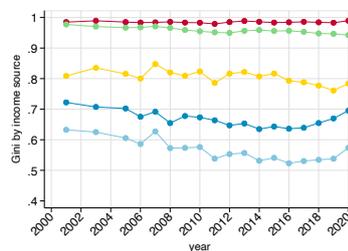
(c) Chile



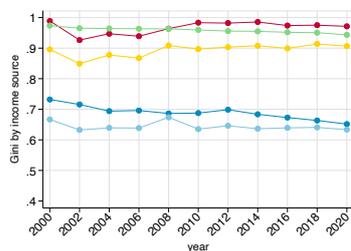
(d) Colombia



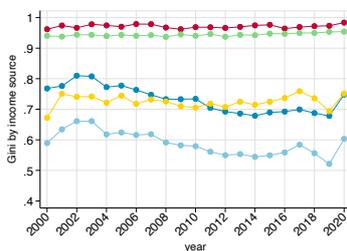
(e) Costa Rica



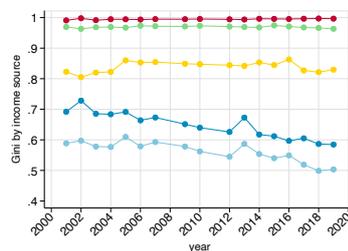
(f) Ecuador



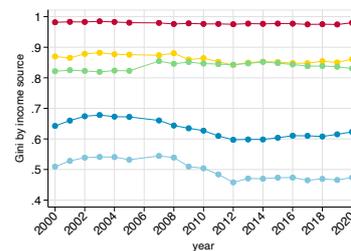
(g) Mexico



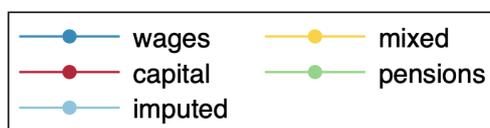
(h) Peru



(i) El Salvador

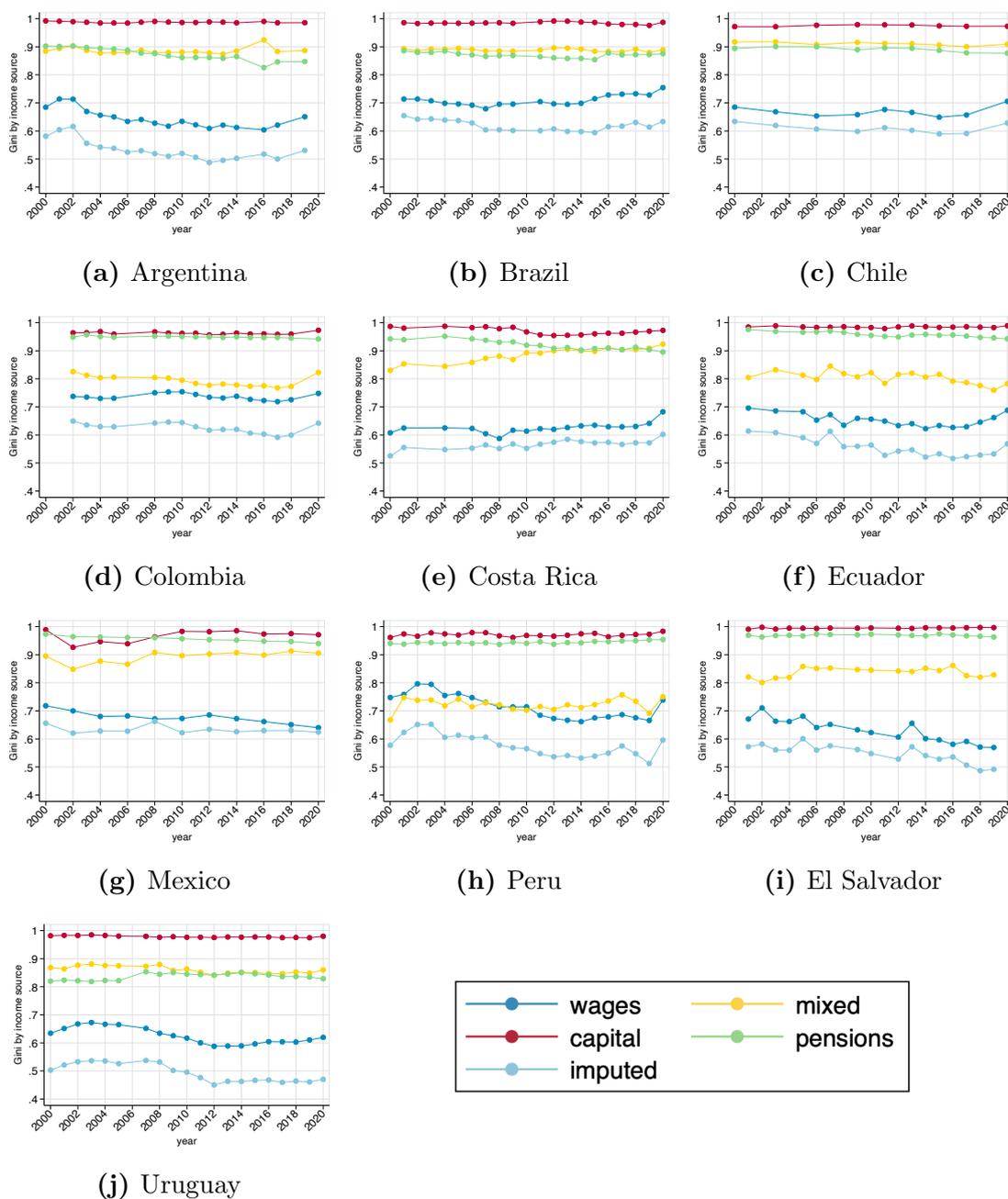


(j) Uruguay



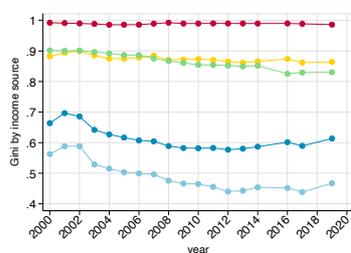
**Note.** Authors' elaboration. The graphs show the Gini index by source of household sector income for household per capita units based on Lerman and Yitzhaki (1985).

**Figure A.20:** Inequality by income source (top-corrected survey)

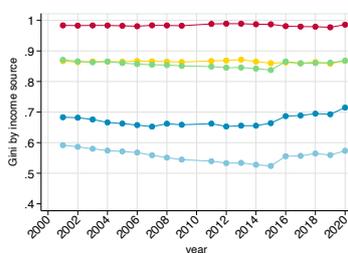


**Note.** Authors' elaboration. The graphs show the Gini index by source in the top corrected surveys for household per capita units based on Lerman and Yitzhaki (1985).

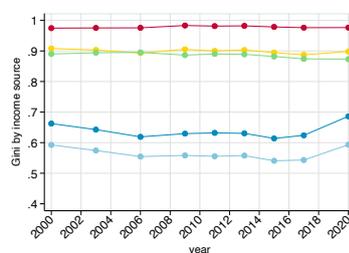
**Figure A.21:** Inequality by income source, (raw survey)



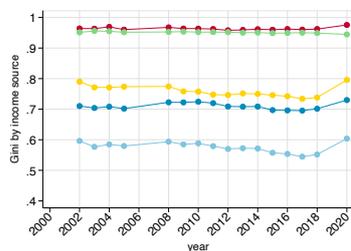
(a) Argentina



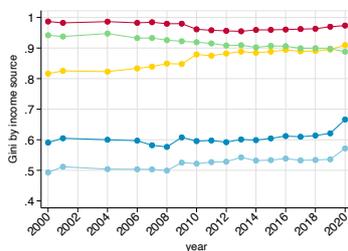
(b) Brazil



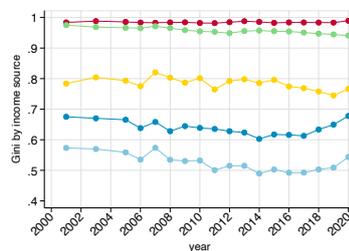
(c) Chile



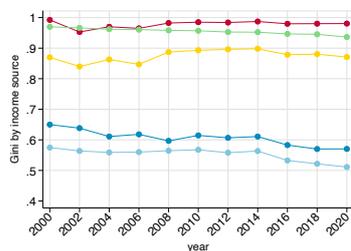
(d) Colombia



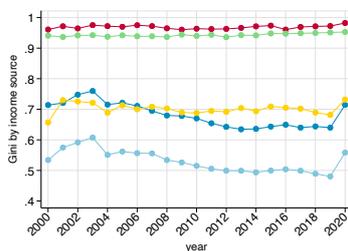
(e) Costa Rica



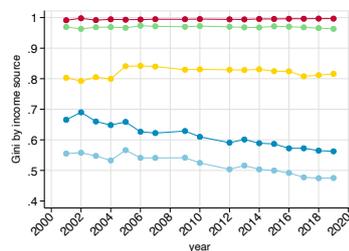
(f) Ecuador



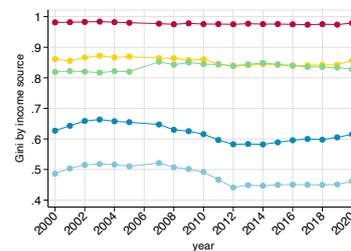
(g) Mexico



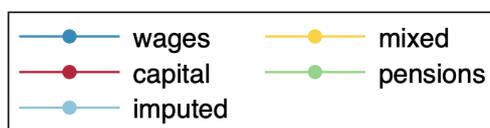
(h) Peru



(i) El Salvador

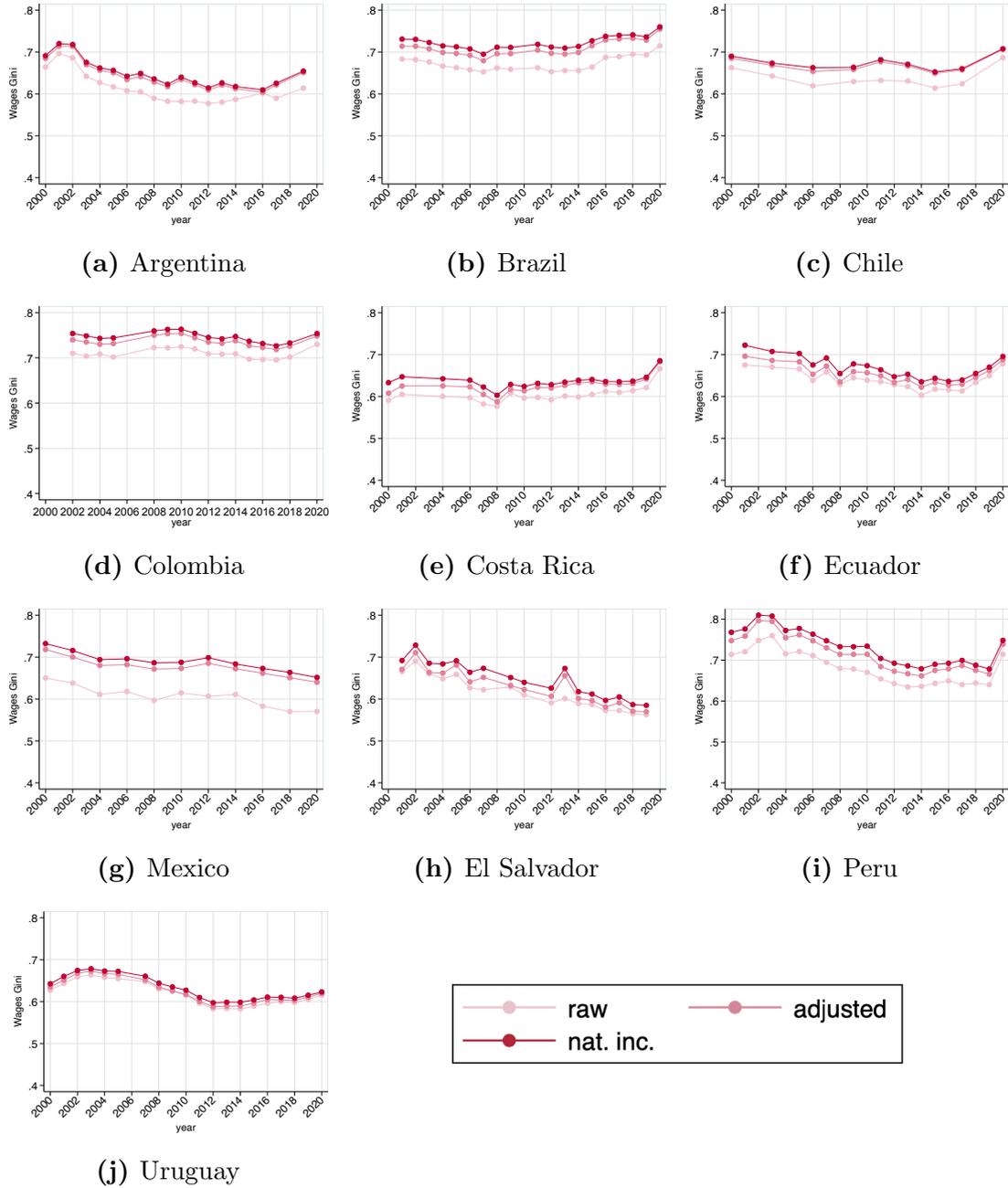


(j) Uruguay



**Note.** Authors' elaboration. The graphs show the Gini index by source in the raw surveys for household per capita units based on Lerman and Yitzhaki (1985).

Figure A.22: Gini index of wages



*Note.* Authors' elaboration. The figure shows the Gini index of the wage distribution in household per capita units.

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## B Online appendix

### B.1 Literature on top incomes using administrative data

**Argentina.** Alvaredo (2010), covering the period 1932-2004, is the seminal reference on the topic, with no precedent to our knowledge. This line of work was recently picked up again by Jiménez and Rossignolo (2019), who similarly use tax registries alongside updated national accounts statistics, for the period 2004-2015. The latter emphasize certain caveats regarding the use of statistical information, which they deem to be “scarce, incomplete, inconsistent or still nonexistent.”

**Brazil.** Mortara (1949) was the first scholar to use personal income tax records in Brazil, applying the Pareto interpolation to tabulated data to study income inequality. His contribution did not spur further studies until the 1970s, when scholars with ties to the military dictatorship, such as Kingston and Kingston (1972) and Langoni (1973), also relied on income tax data to try to push for more benign views of the rise in inequality in the 1960s. The use of tax records to study top incomes would not re-surface until the 2010s when newly-released income tax tabulations became available to researchers. Not only did this data show that surveys exaggerated the fall in inequality in the 2000s (Medeiros et al., 2015; Morgan, 2017), it was also used to measure distributional effects of taxation (e.g. Castro and Bugarin (2017); Gobetti and Orair (2017); Fernandes et al. (2018)). Coupled with archival data on historical income tax tabulations, this new data was used by Souza and Medeiros (2015), Morgan (2015) and Souza (2016, 2018) to estimate top income shares in the long-run for the first time. While the combination of survey and tax data into a single measure of inequality was attempted by Medeiros et al. (2015); Souza (2016); Medeiros et al. (2018), their reconciliation with national income statistics over the 2000s was studied by Morgan (2017) and by Morgan (2018) over the long run.

**Chile.** The earliest attempt to study top income trends did not come from the use of administrative tax data but from surveys (Sanhueza and Mayer, 2011). López et al. (2013) were the first scholars to employ personal income tax tabulations to study top incomes over the 2000s. Administrative microdata of tax declarations were used by Fairfield and Jorratt De Luis (2016) to better study top incomes in the context of an institutional set-up tailored for the retention of a large amount of corporate profits not included in income tax returns for two individual years, refining the similar estimates made by López et al. (2013). Flores et al. (2020) has been to date the most comprehensive study on top incomes, combining features from previous attempts – long run estimates from income tax tabulations (1964-2017) with imputations of retained earnings from national accounts.

**Colombia.** Londoño-Vélez (2012) was the first work to incorporate income tax databases, which were used in Alvaredo and Londoño Velez (2014) for the study of top incomes and their composition between 1993 and 2010. The latter reconciled the results with survey-based measures using Gini-adjustment methods from Atkinson (2007) and Alvaredo (2011).

**Costa Rica.** Zuniga-Cordero (2018) is the first study to use multiple administrative sources of income (social security records, income tax data, national accounts) to study inequality, alongside household surveys, for Costa Rica, for the 2000-2017 period. Zuniga-Cordero (2022) revised these numbers and updated the series until 2020.

**Ecuador.** Few studies exist for the analysis of top incomes, with Cano (2015) initiating the trend based on microdata from tax registries over the period 2004-2010. This attempt was followed by Rossignolo et al. (2016), updating the previous series to 2014.

**Mexico.** Alvaredo et al. (2017) is the only study that used income tax data on universe of personal income taxpayers from the Mexican Tax Administration Service (SAT) and formal wage data from the universe of employer-reported information in the Declaración

Informativa Múltiple (DIM) from 2009 to 2014. The authors perform a comparative analysis of incomes declared in these administrative datasets with those reported in the household surveys (ENIGH) for the same years in order to explore a potential reconciliation.

**Uruguay.** The decrease in income inequality shown in household surveys (e.g. Cornia (2014)) has been confirmed by the use of income tax records (Burdín et al., 2022) for the 2009-2016 period, although milder and with stability in top income groups. Capital incomes are the key drivers of divergent trends between survey and administrative records. Falling inequality also emerged from Distributional National Accounts (DINA) estimations (De Rosa and Vilá, 2023), which is found to be more pronounced than in the fiscal incomes series given the decreasing share of undistributed profits. In all cases, unlike this study, the departure point is the administrative dataset, which is supplemented with household surveys and national accounts, as opposed to survey correction.

## B.2 Estimation Methods

Our estimation procedure is based on four stages. We first estimate a survey-based distribution of income. The transition from this distribution to the distribution of national income as measured in the national accounts is accomplished in three subsequent steps. In the first step, we adjust household surveys to include distributive information from administrative records; in the second step, we proportionally scale the different income components to match aggregates from the national accounts; finally, in the third step, we impute corporate undistributed profits (retained earnings) and remaining missing incomes. In this section we provide a brief summary of these adjustment steps.<sup>23</sup>

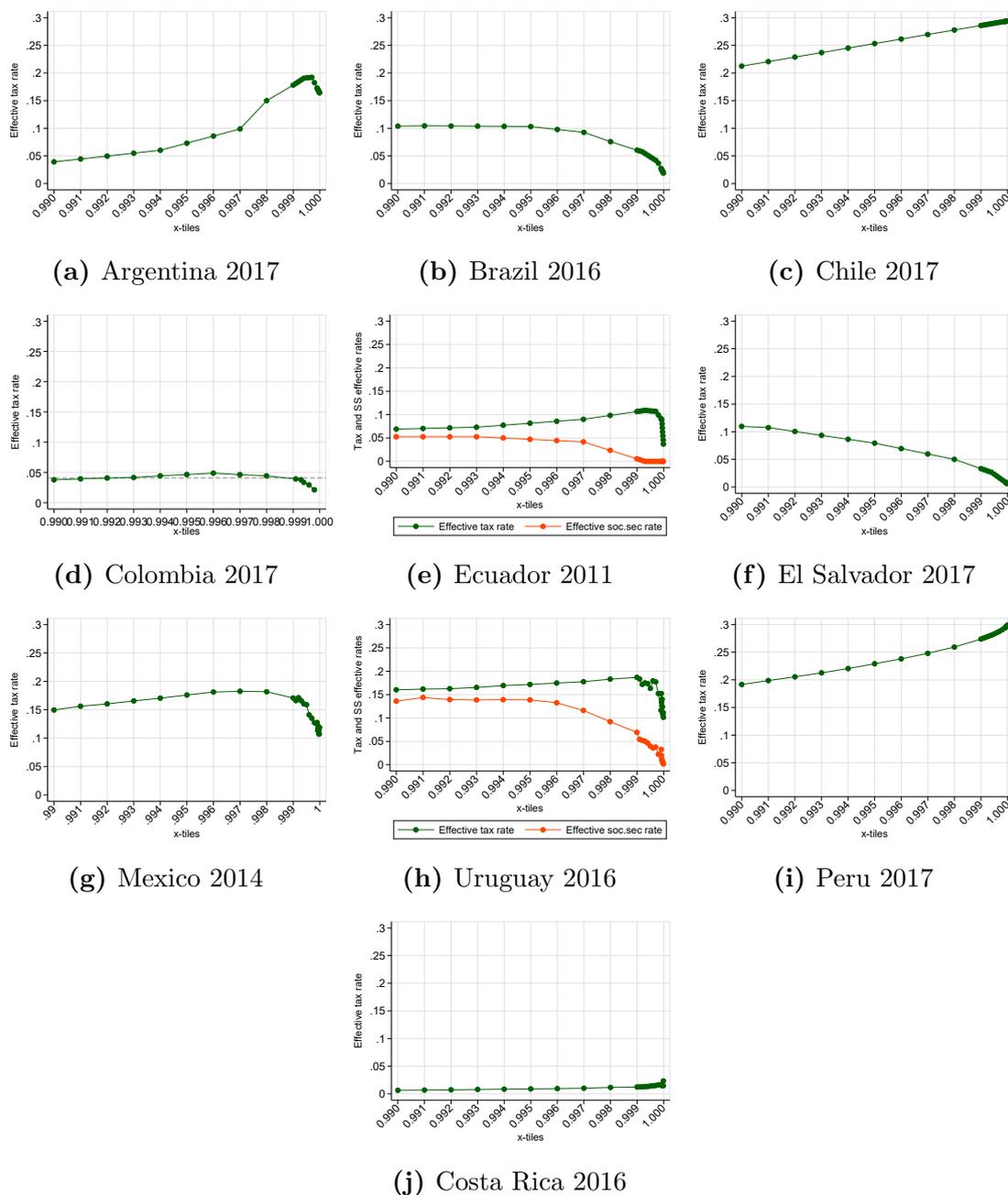
**Estimation of pre-tax incomes in surveys** The inequality estimates we present in this paper concern pre-tax incomes. However, the main data source on which our estimates are based are harmonized household surveys, which account for post-tax incomes in Latin

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<sup>23</sup>For a more detailed description of the general procedure we employ in this paper see WIL (2021).

America.<sup>24</sup> In order to scale incomes to their pre-tax aggregates in the national accounts it is necessary to calculate pre-tax incomes in surveys.

**Figure B.1:** Effective tax and social security rates - Top 1% - Latest year



*Note.* Authors' elaboration.

As data on direct taxes paid by households is not collected in surveys we tax data to estimate pre-tax incomes. Broadly speaking, we compute effective tax rates by income fractile in the tax data, and use these tax rates to calculate pre-tax incomes in the survey,

<sup>24</sup>The only exceptions are Brazil and Costa Rica, whose survey accounts for pre-tax incomes.

based on the income fractiles to which individuals belong to.<sup>25</sup> Effective tax rates by income fractile are computed for the years for which we have access to income tax data, and the average effective tax rate by fractile is used to calculate pre-tax incomes when this data is not available.<sup>26</sup> Tax data quality and coverage, however, varies significantly across countries and so specific procedures and assumptions have to be made for each country. In Table B.1, the main characteristics of the data and estimation procedure by country are shown.

**Table B.1:** Effective tax rates estimation by country

Country	Period	Pop. Cov.	Data	Method	Ref. income	Rates
Mexico	2009-2014	Top 2%	Microdata	Directly computed	Gross income	Tax rate
Argentina	2002-2017	Universe	Tabulations	Interpolated	Gross income	Tax rate
Brazil	2008-2016	Universe	Microdata	Directly computed	Net income	Tax rate
Colombia	2006-2010	Top 1%	Tabulations	Interpolated*	Gross income	Tax & SS rate
Chile	2005-2017	Universe	Tabulations	Interpolated	Net income	Tax rate
El Salvador	2000-2017	Universe	Tabulations	Interpolated	Gross income	Tax rate
Uruguay	2009-2016	Universe	Microdata	Directly computed	Gross income	Tax & SS rate
Peru	2016-2017	Universe	Microsim.	Interpolated	Net income	Tax rate
Ecuador	2008-2011	Top 10%	Tabulations	Interpolated*	Gross income	Tax & SS rate
Costa Rica	2010-2016	Universe	Tabulations	Interpolated	Gross income	Tax rate

*Note.* Authors' elaboration.

In the cases where data comes from tax tabulations, effective rates are computed for observed points (e.g. the average of a given income bracket) and linearly interpolated. For Colombia and Ecuador, effective tax rates are taken directly from the same studies we use to extract top income information – Londoño-Vélez (2012) for Colombia or Cano (2015); Rossignolo et al. (2016) for Ecuador. In the case of Peru, effective rates were microsimulated based on the statutory tax schedule. Finally, for countries in which we

<sup>25</sup>We consider, whenever possible, 127 income fractiles, which account for the whole income distribution (the first 99 percentiles) and a very detailed break-down of the top 1%, where tax rates may experience significant changes.

<sup>26</sup>This assumption is potentially problematic in the cases for which the absence of tax data reflects the absence of progressive income taxation (e.g. Uruguay prior to 2009), or when the availability of data followed a large tax reform.

have tax micro-data or very detailed tabulations, the effective tax rates were computed directly (e.g. Mexico and Uruguay).

Taxes are progressive, but effective rates decrease significantly in the very right tail of the distribution for most countries. In countries where this is not the case (e.g Argentina and Chile), we cannot observe the very high income fractiles in the data without extrapolating. When social security contributions are observed (Colombia, Uruguay and Ecuador), they are a lot more regressive than the income tax, especially for top fractiles, where it converges to zero as a result of truncated schedules (i.e. schedules where a maximum income is defined for contributions). The absence of information on social contributions is not problematic, given that the income definition we use in our estimates includes social security transfers, net of social contributions.

**Surveys adjusted with administrative data** The use of administrative data refers to both personal income tax declarations and social security records. These sources are mainly used to improve the coverage of top income groups in the survey, which are often badly captured; especially when register data is not used in the surveying process, which is the case in all countries in the region.

In general, administrative records not only include individuals that are richer than the richest survey respondents, but also report larger numbers of moderately high incomes. Therefore, when we compare the income distributions described in both sources, we usually find that the densities reported by administrative records tend to be higher for top incomes relative to surveys. Given that income tax declarations are made by real people, who might under-declare their income but are unlikely to over-declare, it seems natural to consider the distribution in register data as a lower bound that the survey should aim to match, at least when tax-data densities are higher.

In order to adjust the surveys we use the method described in Blanchet, Flores, and Morgan (2022), which mainly uses the ratio of survey to tax data densities to adjust survey weights. Although the method includes a “replacing” option, which allows users to

impute incomes above the maximum income observed in surveys, we only use re-weighting without replacing for practical reasons (it makes the extrapolation of years without tax data clearer). The impact of not using the replacing option does not seem to affect inequality estimates in any meaningful way. Figure B.3 displays the intuition behind this re-weighting process, while Figure B.4 depicts the theta coefficients of the adjustment, i.e. the ratio of the survey density to the administrative density by income fractile.

**Scaling to incomes from national accounts** Figure B.5 displays the adjustment factors used to scale five types of income (wages, capital incomes, mixed incomes, imputed rents, and social benefits) to corresponding aggregates from the national accounts. This is done proportionally to survey incomes after adjustment with administrative data. Since the relevant macro aggregates are reported before income tax in the national accounts we add effective income tax paid across the adjusted survey distribution for the nine countries with post-tax survey incomes. Appendix B.2 explains how these tax rates are computed.

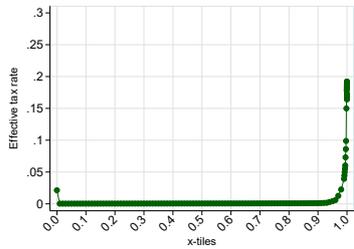
Table B.2 summarizes our benchmark matching of income concepts. For labor incomes, we subtract social security contributions from the compensation of employees before computing scaling factors. Since most countries' national accounts report pensions along with other benefits, we scale total benefits to that aggregate, assuming the joint distribution of pensions and other benefits is accurately described by the survey. The level of detail that is necessary to split the part of property incomes related to investment income disbursements (D44) – which includes investment income from insurance funds (D441), pension funds (D442), and collective investment funds (D443) imputed to households – in the national accounts is not available in most countries in the region. For the countries where the detail exists at least for a few years (Brazil, Colombia, Chile, Costa Rica, Ecuador and Mexico) we estimate that investment income disbursements represent a relatively stable 10% of total property income of households on average. Therefore, we scale total capital income in the surveys to 90% of total property income (D4) in the national accounts for each country to match the incomes actually received by households (i.e. interests and dividends).

**Table B.2:** Conceptual relation between incomes in surveys and national accounts

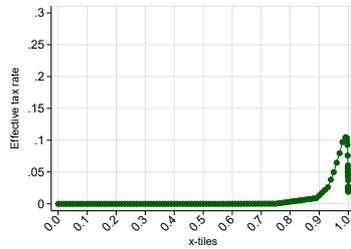
Survey	National Accounts	Comparable incomes	Less comparable incomes
Salaried work	Compensation of employees (D1)	Wages, salaries (D11)	Social security contributions (D61)
Rental income	Operating surplus (B2)	Imputed rent of owner occupiers	Effective rent of residential buildings
Non-salaried work	Mixed income (B3)	Self-employed income	Effective rent of non-residential buildings
Investment income	Property income (D4)	Interests received (D41r) Dividends (D42)	Interests paid (D41u) Rent of natural resources (D45) Investment income of insurance policy holders (D441) Investment income of pension funds (D442) Investment income of investment funds (D443)
Other incomes	Social transfers (D62) Other transfers (D7)	Pensions Other cash benefits	Unemployment insurance Sick leave Private transfers (remittances)

**Notes:** Table taken from Alvaredo et al. (2022), based on United Nations (2008) and OECD (2013). In column 4, the items with a code next to them can be subtracted for a better matching (depending on the detail provided by national agencies), while those without a code cannot be separated from the aggregates in column 2. Listed items are pre-tax in SNA, while most of them are post-tax in surveys. Operating surplus and mixed income are gross of depreciation in surveys and in the SNA.

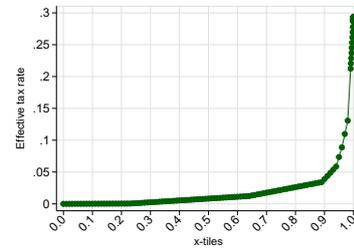
**Figure B.2:** Effective tax and social security rates - Latest year



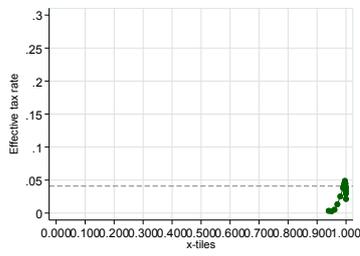
(a) Argentina 2017



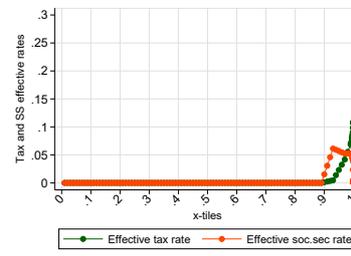
(b) Brazil 2016



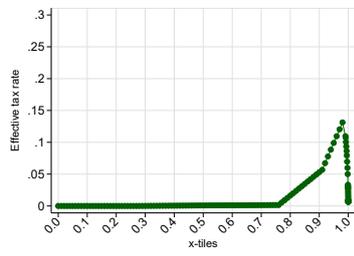
(c) Chile 2017



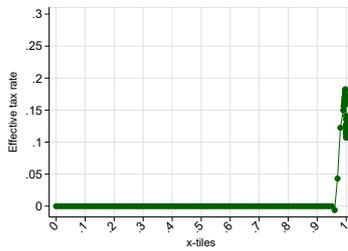
(d) Colombia 2017



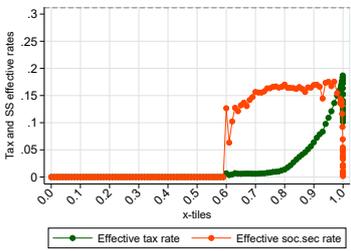
(e) Ecuador 2011



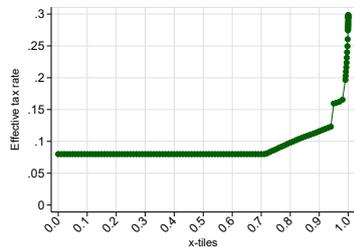
(f) El Salvador 2017



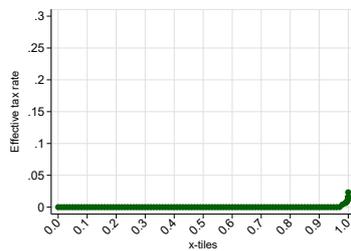
(g) Mexico 2014



(h) Uruguay 2016



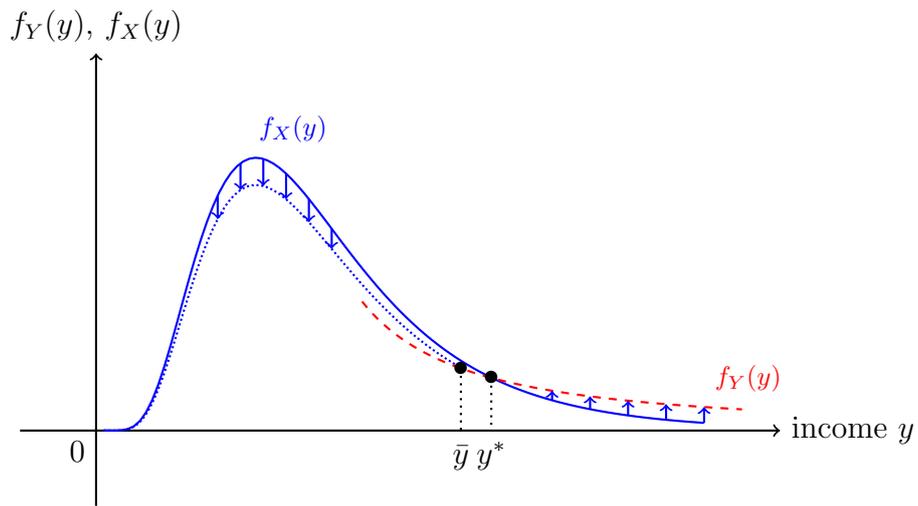
(i) Peru 2016



(j) Costa Rica 2016

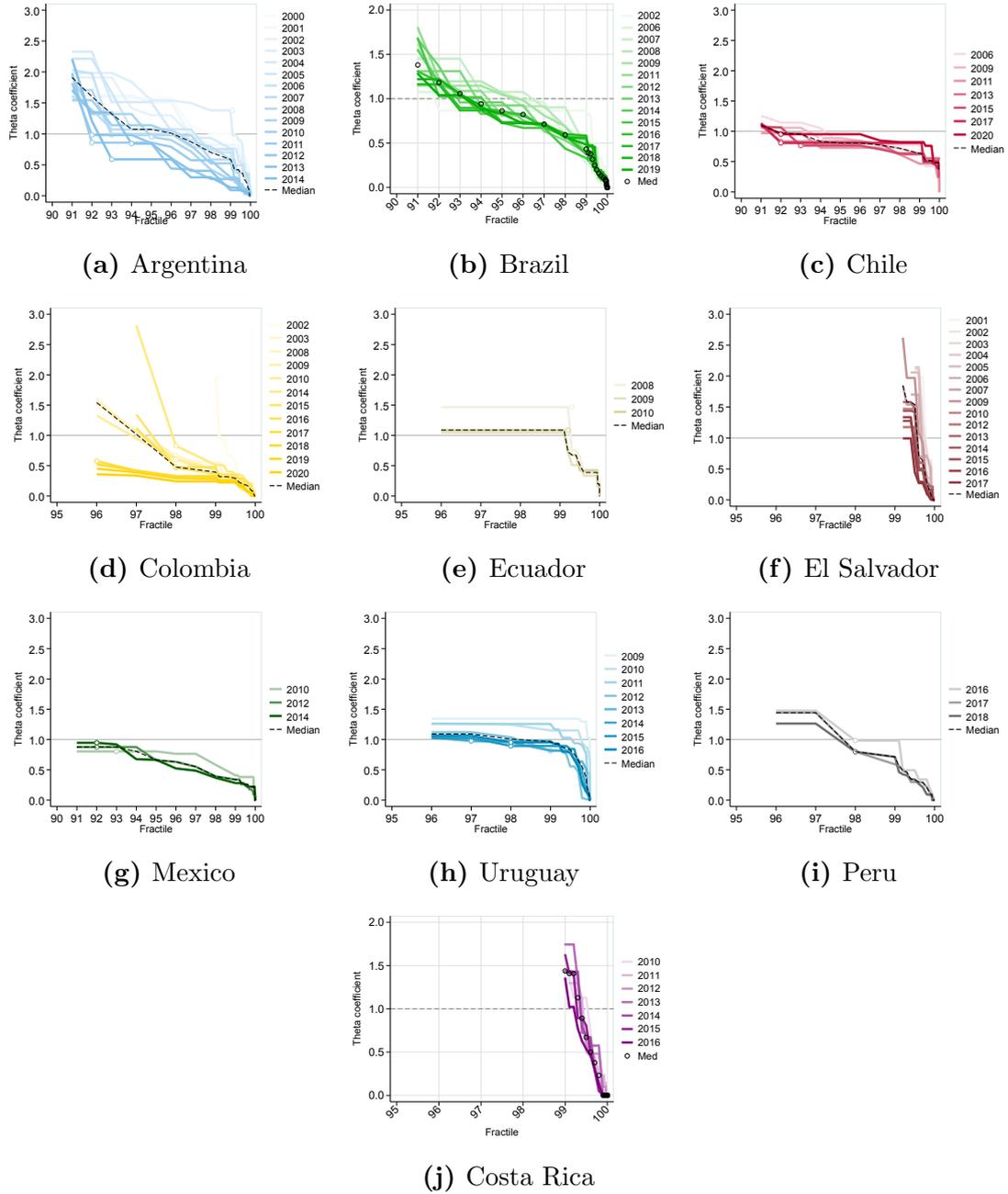
*Note.* Authors' elaboration.

Figure B.3: The intuition behind reweighting



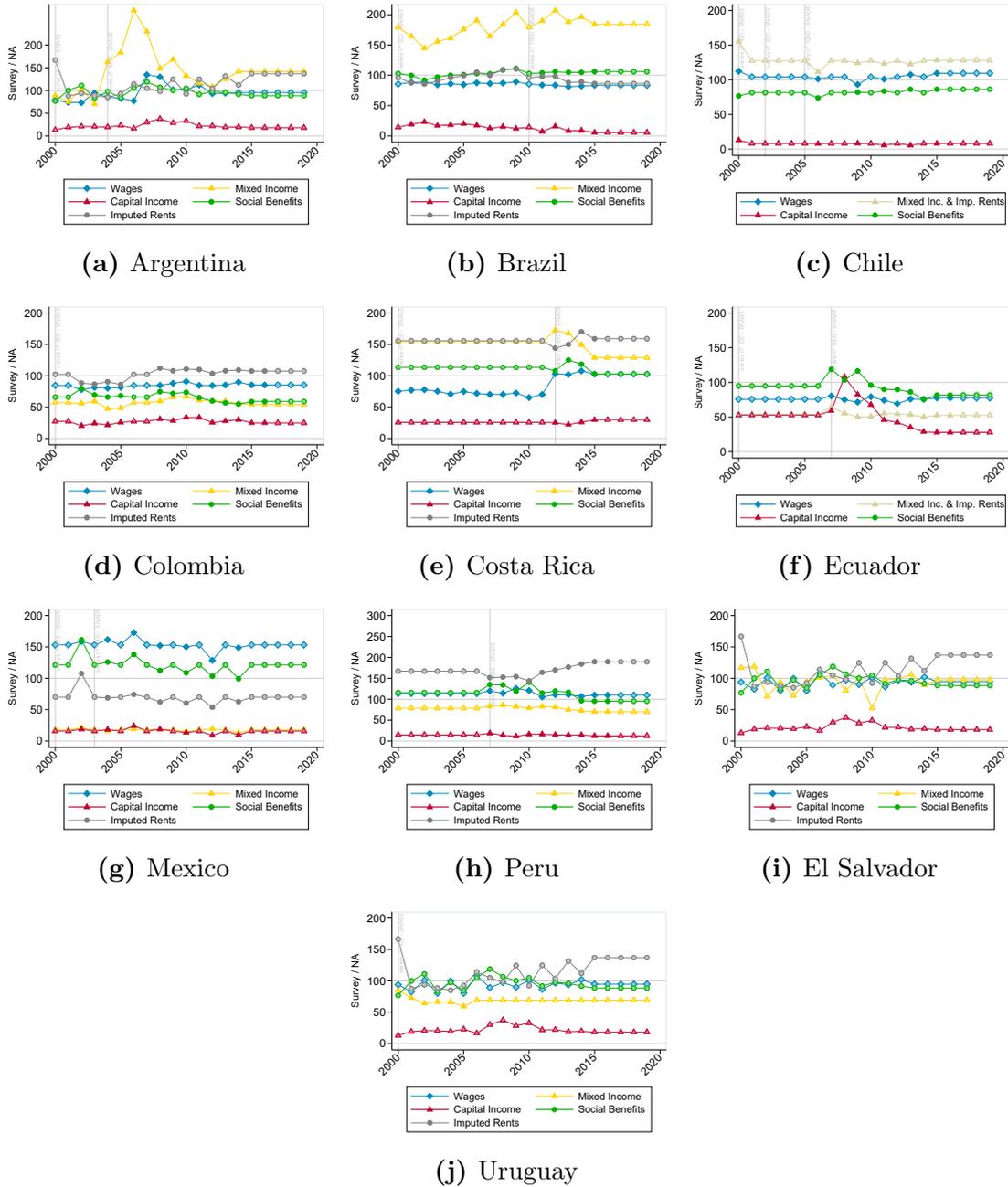
**Source.** Blanchet, Flores, and Morgan (2022). The solid blue line represents the survey density  $f_X$ . The dashed red line represents the tax data density  $f_Y$ . Above the merging point  $\bar{y}$ , the reweighted survey data have the same distribution as the tax data (dashed red line). Below the merging point, the density has been uniformly lowered so that it still integrates to one, creating the dotted blue line.

Figure B.4: Theta coefficients, by country and year



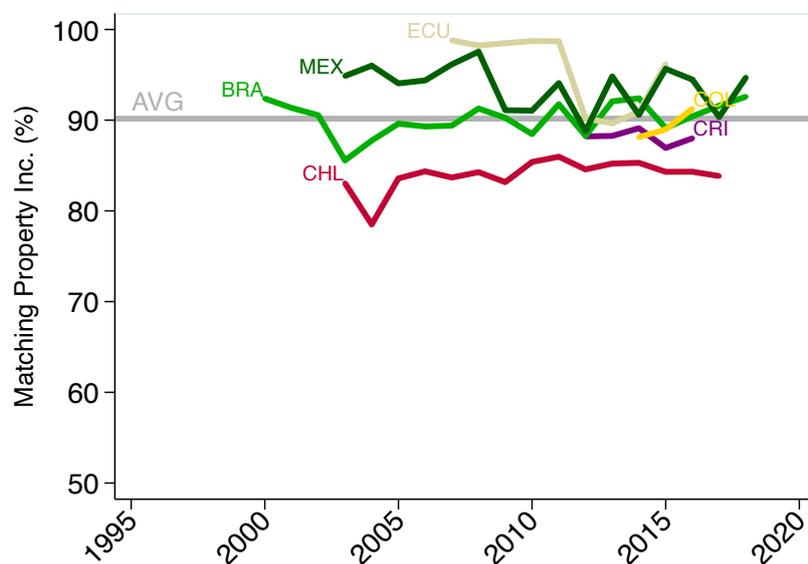
*Note.* Authors' elaboration based on Blanchet et al. (2022)

**Figure B.5:** Scaling factors for re-weighted surveys



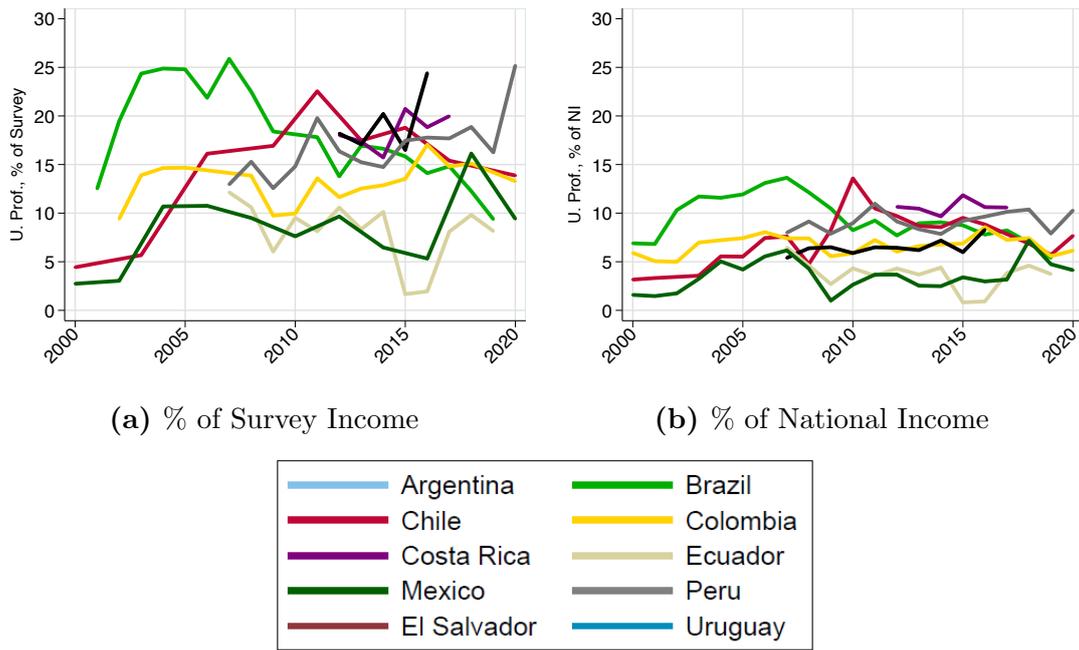
**Note.** Authors' elaboration using surveys, administrative data and national accounts. Each series is the ratio of survey income (adjusted using administrative data) to national accounts income for each component. Brighter points indicate imputed scaling factors due to missing information in National Accounts. Each survey income component is multiplied by the scaling factor ( $1/\text{ratio}$ ) for components where coverage is less than 100%, and divided by the factor for components where coverage is greater than 100%.

**Figure B.6:** Share of conceptually consistent property incomes



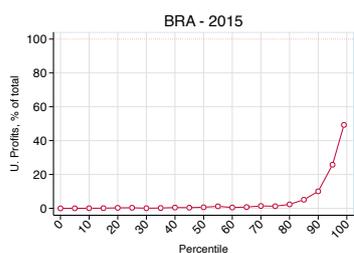
**Notes.** The share of property incomes from SNA that matches the definition of surveys' capital incomes (i.e. dividends and interests) is mostly above 80% of total property income, closer to 90% in most cases. The level of detail that is necessary to observe this is rare in Latin America. Non-matching concepts are SNA codes D.43 and D.44 (see table B.2). Authors' elaboration based on the public national accounts reported by each country's relevant institutions.

**Figure B.7:** Undistributed Profits as % of Aggregate Incomes

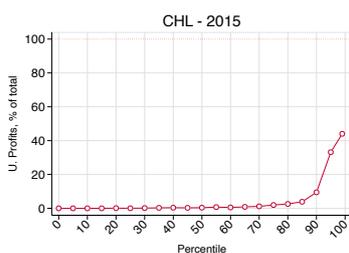


*Note.* Authors' elaboration using data from the World Inequality Database on undistributed profits, UN data or country-level data on national income and ECLAC on household surveys.

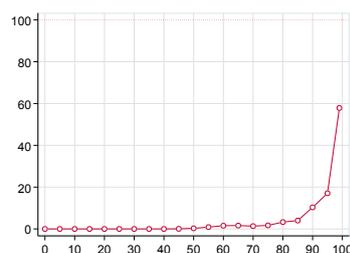
**Figure B.8:** Share of total undistributed profits imputed to each fractile



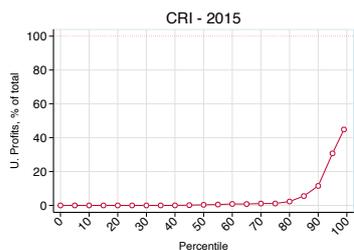
(a) Brazil 2015



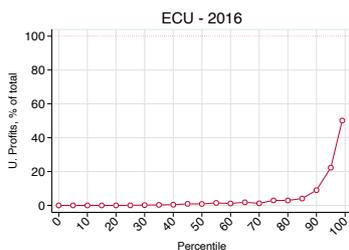
(b) Chile 2015



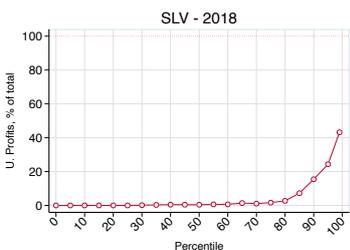
(c) Colombia 2016



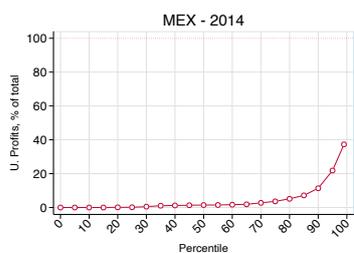
(d) Costa Rica 2015



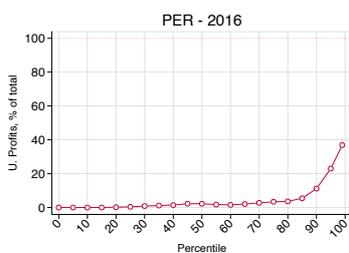
(e) Ecuador 2016



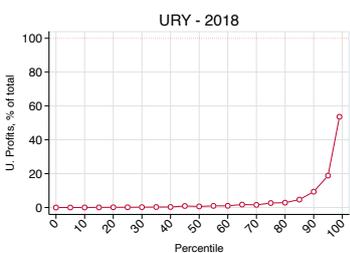
(f) El Salvador 2018



(g) Mexico 2014



(h) Peru 2016



(i) Uruguay 2018

*Note.* Authors' elaboration using distributional data from surveys on dividends and employer income and aggregate data on undistributed profits from the World Inequality Database (<https://wid.world/>).