EXTREME INCOME INEQUALITY IN ECUADOR - DOLLARIZATION, COMMODITY PRICE BOOM, AND CITIZEN REVOLUTION

MARKUS NABERNEGG

WORKING PAPER N°2026/08

MARCH 2026

WORLD INEQUALITY LAB

Extreme Income Inequality in Ecuador - Dollarization, Commodity Price Boom, and Citizen Revolution

Markus Nabernegg*[1]

[1] *University of Giessen, Germany*

Acknowledgments: I am grateful for advising and feedback on this work from Thomas Kopp. I also thank Sebastian Carvajal and Carla Chamorro from the *Servicio de Rentas Internas* Ecuador for research cooperation and data provision, and Lorena Moreno, Joan Vilá, Alvaro Zuñiga-Cordero, and Vipul Chawla for valuable comments on the manuscript.

*markus.nabernegg@uni-giessen.de, Zeughaus Senckenbergstr. 3, 35390 Gießen, Germany .

Extreme Income Inequality in Ecuador - Dollarization, Commodity Price Boom, and Citizen Revolution

Abstract: The literature on inequality and top-income concentration in developing countries lacks studies covering longer time frames. This study introduces Ecuador's first comprehensive Distributional National Account (DINA) series, covering the period from 1990 to 2022, and provides detailed pretax and posttax income indicators. An innovative integration method that merges extensive household and tax microdata allows for a nuanced analysis of income inequality across three decades characterized by economic booms and crises. The results indicate that Ecuador's extreme income concentration at the top persists into the present. In 2022, the top 1% captured 25% of pretax income, and Ecuador stands out among Latin American countries for having the highest income share held by the top 0.1%. Although not designed for causal inference, this study offers insights into the political economy of inequality in a primary goods exporting country during exogenous economic shocks. Economic institutions in Ecuador have probably passed from an extractive equilibrium before the banking crisis and subsequent dollarization in 2000 to a weak inclusive equilibrium during the commodity price boom until 2014. This inclusive equilibrium has been endangered in recent years, as economic power concentration could not be further reduced and the redistributional capacity built up during the commodity price boom has been undermined after the COVID-pandemic.

Keywords: Distributional National Accounts, Ecuador, dollarization, commodity price boom, redistribution, institutions

JEL codes: D31, O23, O24, O43, P16

1. Introduction

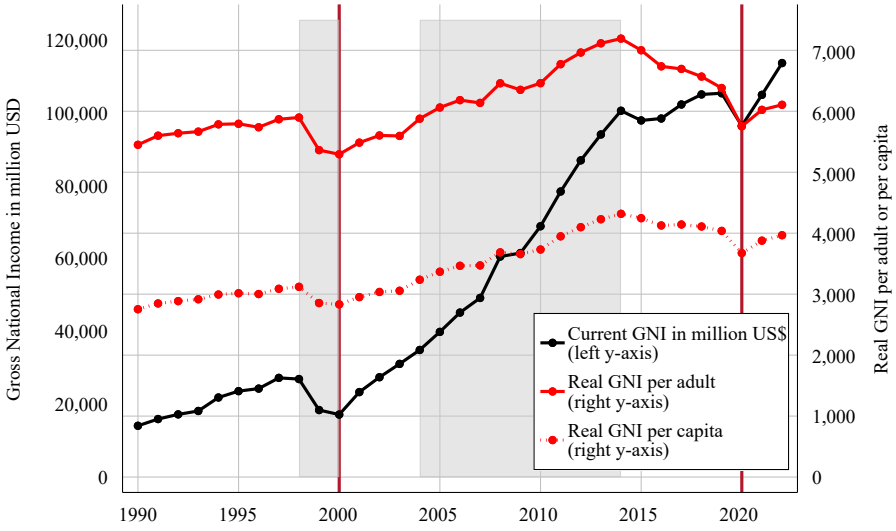
The past three decades in Ecuador have been characterized by substantial economic volatility. Figure 1 illustrates the evolution of national income in nominal and real terms over the period between 1990 and 2022. Average yearly real national income growth *per capita* between 1990 and 2022 reached only 1.4%, and average growth *per adult* did not exceed 0.4%. However, low real growth over three decades does not necessarily imply that income stagnated for all groups alike. Unfortunately, Ecuador lacks systematic information on long-term income distribution trends,

given incomplete national accounts and tax data, changes in household survey methodologies, and – most problematically – the lack of high-income individuals (the so-called "missing rich", Lustig, 2020) in household surveys. This study provides the first comprehensive series of the distribution of national income over the period 1990-2022 by combining a wide range of survey and tax microdata. Granular microdata allows to analyze the evolution of income inequality along changing institutional settings in a small export-oriented country like Ecuador, and provides insights on how the income distribution is affected by external price shocks, abrupt monetary regime changes, and fiscal policy variations.

Macroeconomic instability has characterized Ecuadorian economic development during various periods in the last 33 years: Weak growth in the 1990s was abruptly halted by a severe banking crisis, which led to the abolition of the national currency. In 2000, the Ecuadorian government decided to adopt the United States dollar (US$) as the exclusive legal tender - an unprepared measure introduced within a few weeks, but with profound implications for fiscal and trade policies. This transition preceded the global commodity price boom in the early 2000s. During the fifteen years between 2000 and the end of the commodity price boom in 2015, the Ecuadorian economy expanded five-fold in nominal terms. High political instability up to 2007, was followed by the progressive "Citizen Revolution" government. The policy interventions of this government included progressive tax reforms, minimum wage increases, investment in infrastructure, among others (Ubasart-González and Minteguiaga, 2022). The reforms were financed by a considerable increase in resources stemming from primary product exports during the commodity price boom (2004-2014), and leveraged public spending on education and health, the development of productive infrastructure, and poverty reduction. However, some of these reforms were gradually reversed after the end of the commodity price boom and the "Citizen Revolution" government in 2016. The reduction of income from exports in combination with political instability marked the onset of economic instability, culminating in a recession that was exacerbated by the COVID-19 pandemic in 2020.

Despite growing interest for understanding the inequality trends in Ecuador (De Rosa et al., 2024; Gachet et al., 2019; Ponce and Vos, 2014; Amarante, 2016), the country lacks systematic information on long-term income distribution trends, including the wealthiest individuals. Scholars have partially tackled these problems for the Ecuadorian distribution estimates, either by using tax register for short periods (Cano, 2015; Rossignolo et al., 2016), or by including Ecuador in a regional study for Latin America, without accessing tax microdata (De Rosa et al., 2024). For the study at hand, I have for the first time, exclusive access to historical individual tax declarations in Ecuador and integrate this information to the national employment survey

Figure 1: Evolution of National Income 1990-2022



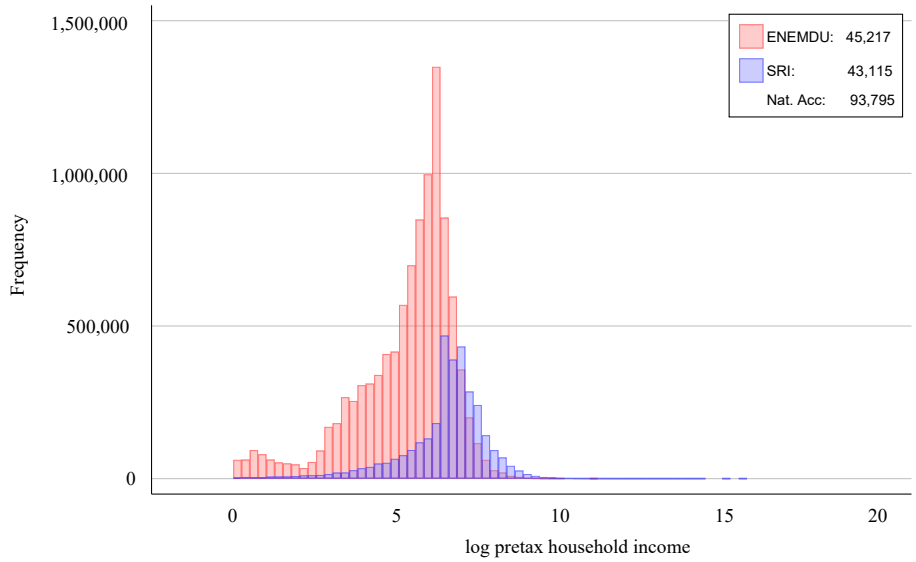
Note: The figure indicates the evolution of current gross national income (GNI) in million US$ (black), real GNI per adult (solid red), and real GNI *per capita* (dashed red). Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis, and the 2004-2014 commodity price boom.
The share of the adult population (20 years and older) increased from 50% in 1990 to 64% in 2022, reducing the gap between GNI per adult and GNI per capita over time.
Source: Ecuadorian Central Bank (BCE).

by improving the existent integration method proposed by the Distributional National Accounts methodology (DINA, Blanchet et al., 2020). The resulting granular dataset is combined with national accounts to be comparable to macroeconomic indicators and allows to analyze the evolution of national income growth for different groups. Figure 2 illustrates the importance of accurately combining the distributions of income provided by the employment survey (red) and the tax register (blue), given that both capture different segments of the income distribution.

This paper makes two main contributions: First, it produces for the first time a distributional series covering over three decades and improves the inequality estimates by applying Distributional National Accounts and by introducing an extension to the integration method for survey and tax microdata. Results from the integration method are compared with results from De Rosa et al. (2024), who provide a series since 2000 with a simpler DINA method. In addition, I provide a range of robustness checks with different national accounts extrapolations, integration methods, and assumptions for the incidence of distributional policies. Second, although not explicitly designed to draw causal inferences, the paper contributes to the discourse on the political economy of commodity prices in resource-rich countries, as well as on the impact of fiscal and monetary policies on inequality.

Existing studies on Ecuador (Gachet et al., 2019; Ponce and Vos, 2014) find steadily declining inequality indicators between 2000 and 2015, followed by a slight increase unit the most

Figure 2: Log-Distribution of Pretax Household Income in 2022: Survey vs. Tax Data



Note: This histogram compares the log-distribution of pretax household income in 2022 based on two data sources: the national household survey (ENEMDU, red) and the personal income tax register (SRI, blue). Both sources report comparable aggregate income levels (ENEMDU: US$45,217 million; SRI: US$43,115 million). However, the ENEMDU provides more comprehensive coverage of the lower and middle segments of the income distribution, while the SRI register more accurately captures incomes at the upper end.
Source: Own elaboration based on ENEMDU, SRI, BCE.

recent years – a trend consistent with the broader Latin American region during and after the commodity price boom (Flechtner and Middelanis, 2024). However, my findings for this period indicate higher and more persistent income concentration at the top. In 2022, the bottom 50% of the population captured only 12% of national income after taxes and transfers, while the top 1% captured 21% of national income. Notably, Ecuador ranks first in Latin America in terms of income concentration among the top 0.1%. The analysis further reveals that the period following dollarization and during the commodity boom was characterized by pro-poor growth and an increased redistributional capacity, but also shows that the middle-income group did benefit significantly less from the economic expansion than the bottom 50%. To assess the evolution of inequality under different fiscal and monetary regimes, I use the commodity price elasticity of pretax national income inequality and the difference between pretax and posttax national income inequality as proxies to evaluate whether institutions have been inclusive or extractive (Acemoglu and Robinson, 2012; Acemoglu and Robinson, 2019). The results indicate that prior to dollarization, economic power was highly concentrated, while the state's capacity for redistribution remained weak. In the immediate aftermath of dollarization, the concentration of power diminished, yet redistribution efforts continued to be limited. It was only during the initial years of the commodity price boom (2004–2010) that the state's capacity to collect tax and social security revenues was significantly strengthened, enabling redistribu-

tion policies to effectively transform rising pretax inequality into a decline in post-tax income inequality. In the later years of the commodity price boom, in addition to further strengthening of redistributive institutions, market incomes for the bottom 90% grew at a faster rate than for top income earners, suggesting that Ecuador had entered an equilibrium of inclusive institutional arrangements. However, the commodity price elasticity of pretax income declined in the years following the boom, and the redistributive capacity built during the commodity boom was subsequently undermined by the economic crisis triggered by the COVID-19 pandemic.

The remainder of this paper is organized as follows: Section 2 reviews the literature on Distributional National Accounts and on the political economy associated with commodity booms, progressive state intervention, and monetary regime changes. In section 3, I describe the data and the steps applied to produce the inequality estimates for Ecuador. Results are presented in section 4, and discussed in section 5. Section 6 concludes.

2. Literature Review

This paper contributes to two strands of literature: First, it introduces an extension to the existing Distributional National Accounts method for the integration of survey and tax microdata, and produces a new series of income inequality indicators for Ecuador. Second, it examines the evolution of the national income distribution in a primary good exporting developing country, particularly during periods of external price shocks and changes in fiscal and currency policies.

2.1. Distributional National Accounts for Developing Countries

Over the last decade, scholars have made significant advances in estimating income distribution in ways that align with macroeconomic aggregates and that are comparable over time and across countries. A key driver behind the expansion of distributional data across a broad range of countries has been the World Inequality Lab (WIL) and the adoption of the standardized Distributional National Accounts (DINA) methodology by scholars, developed by the WIL. This study follows the general DINA guidelines (Blanchet et al., 2020) and extends the integration method to incorporate both survey and tax microdata. The primary contribution of the Distributional National Accounts (DINA) methodology is its integration of top income groups into inequality estimates, addressing the systematic underestimation inherent in traditional measures based solely on household surveys. Existing studies for developing countries often face difficulties to access tax data to account for these top incomes, or only have access for relatively

short periods.[1] One solution to this lack of information and access is to apply "simplified" DINA (Piketty et al., 2019) based on survey or tax tabulations and regional or global averages (De Rosa et al., 2024; Assouad et al., 2018; Novokmet et al., 2018). Such studies can shed light on the distribution of income even in the absence of detailed and balanced microdata. In addition, standardized programs to convert tax tabulations into distributions (Blanchet et al., 2022c) or to reweight household survey observations to resemble incomes at the top (Blanchet et al., 2022b) have contributed to produce more country studies with limited tax data (Chatterjee et al., 2021; De Rosa et al., 2024). Despite the improvement in general inequality estimates, these simplified methods and standardized programs usually fail to correct the structure of income by components (Ledić et al., 2024). This study aims to overcome this correction problem by directly integrating tax microdata into the survey microdata.

Tax data from Ecuador has been used before to produce top income shares: Cano (2015) for 2008-2011 and Rossignolo et al. (2016) for 2012-2014 estimated top income shares exclusively relying on tax data for short periods. De Rosa et al. (2024) use the results from the former studies as sources to correct household surveys by reweighting the richest individuals in the Ecuadorian employment survey, and extrapolating to the years before 2008 and after 2014. The study by De Rosa et al. (2024) focuses on comparability between different Latin American countries and therefore uses the harmonized household survey database from the Socio-Economic Database for Latin America and the Caribbean (CEDLAS and The World Bank) for a great number of Latin American countries. Section 3 explains how I use the Ecuadorian employment survey in combination with other surveys and additional data sources to obtain a longer study period.

In addition, this study is one of the fortunate cases, for which a researcher has access to confidential tax microdata in a developing country, spanning over three decades. In section 3, I provide a detailed methodology to integrate survey and tax observations through an extension to the existing Stata command `bfmcorr` (Blanchet et al., 2022b).

2.2. The political economy of institutions and inequality in primary-goods exporting countries

My second contribution is to the political economy literature by analyzing the income distribution across diverse economic cycles in a primary-good exporting economy. The impact of the in-

[1] Exceptions to the short period restriction are studies for emerging or peripheral European countries including Flores et al. (2020), Koutentakis and Chrissis (2020), Novokmet et al. (2018), and Chancel and Piketty (2019), each of them facing different limitations with access to microdata over the studied period.

tegration of primary-good exporting economies like Ecuador into global value chains on income, poverty, and inequality has been analyzed by neoclassic, institutionalist, and post-development economists alike, pointing at factor endowments and commodity price booms (Williamson, 2013), extractive institutional arrangements (Acemoglu and Robinson, 2012), or "extractivist" modes of accumulation (Acosta, 2012, p. 18).[2] Consequently, this study examines the evolution of inequality in Ecuador during periods of external commodity price shocks and under varying fiscal and monetary institutional regimes.

The dynamics of commodity prices and the concentration of rents from natural resource extraction are deeply interconnected in developing countries. Williamson (2015, p. 326) estimates that the proportion of surplus appropriated by the elite (referred to as the "extraction rate") has historically been high in Latin America, and that around the turn of the 20th century, commodity booms amplified inequality in Latin America to a greater extent than in other commodity-exporting regions. According to Williamson (2015, p. 338), Latin America diverged from the "ubiquitous Great Egalitarian Leveling" that occurred globally between 1913 and 1970, continuing instead along a trajectory of rising inequality that originated during the commodity boom of the late 19th century.[3]

One of the explanations for the rise of inequality during commodity price booms is provided by Acemoglu and Robinson (2019) and their approach of political and economic institutional arrangements: While inclusive economic institutions create universal economic incentives and opportunities, extractive economic institutions hold economic opportunities within a small group in the society. Which economic institutions prevail is based on the underlying political institutions evolving from social choice. Inclusive political institutions are characterized by a functioning state and a broad distribution of political power, while extractive political institutions have either a high concentration of economic and political power, or a weak state, or both. In economies like Ecuador, where the concentration of economic power is reflected mainly by the access to natural resources, "rent seeking" (Tullock, 1967) is highly correlated with rents from these natural resources traded in international markets and framed by international commodity prices.

Hence, in an inclusive institutional setting, rising commodity prices would benefit the entire

[2] "Extractivist" economic systems typically develop in resource-dependent countries and focus on the large-scale extraction and export of natural resources, without significant local added value or diversification of the economy (Gudynas, 2018).

[3] In contrast, for the French and British colonies, which gained independence later than the Spanish ones, Alvaredo et al. (2021) use income tax tabulations to examine how these countries addressed the legacy of colonial inequality. They find that following World War II, both the colonial powers and their colonies experienced a marked decline in income concentration. However, by the 1950s, top income shares in the colonies had stabilized at levels higher than those observed in the former colonial powers.

society through their more equally distributed economic participation (based on the broad political participation) and by improved public services provided by a functioning state, such as monetary and in-kind transfers, education and health. On the other hand, in an extractive setting, gains from high commodity prices would either be concentrated in the hands of elites with political power, or channeled into an inefficient state (characterized by corruption and bureaucratic inefficiencies), or, more commonly, both. Consequently, corrupted and (elite-captured) predatory states would be characterized by an extreme income concentration, where the ruling elite is able to extract large rents over long periods at the expense of the poorer majority (Alvaredo et al., 2019; Assouad, 2023).

In the presence of inclusive institutions, rising commodity prices can contribute to reducing inequality. In extractive institutions, inequality would probably rise with increasing commodity prices, as the unequal access to rents lifts income at the top more than at the bottom and the middle, and without an effective state, redistribution cannot catch up with this higher primary income concentration. The prevalence of inclusive or extractive institutions in terms of inequality is more difficult to observe in times of unfavorable commodity prices: With inclusive institutions, the loss in primary income would be shouldered by a broader base given a broader allocation of resources, probably leaving market income inequality untouched or potentially increasing it. However, broad political participation and a functioning (redistributive) state would avoid a rise in poverty and income inequality. Under extractive institutions, market income is likely to decline first for resource-owning top-income earners, with broader societal impacts arising through a general contraction in economic activity. In such contexts, primary income inequality may paradoxically decrease during economic crises. However, extractive institutions tend to impede effective income redistribution mechanisms that could alleviate poverty or sustain the consumption-driven incomes of the middle class. As a result, the potential reduction in inequality between pre- and post-state intervention income levels remains constrained. In the discussion section, I will estimate commodity price elasticities of pretax income inequality and the inequality reduction of taxes and transfers for different periods, and analyze which institutional setting prevailed in these different periods.

The empirical literature assessing the impact of commodity prices on income inequality presents diverse and often conflicting conclusions (Mohtadi and Castells-Quintana, 2021; Sánchez-Ancochea, 2021; Bhattacharyya and Williamson, 2016; Kim and Lin, 2018). Mohtadi and Castells-Quintana (2021) estimate the effect of international prices for 23 globally traded commodities on the evolution of inequality between 1990 and 2016, and find that capital-intensive non-agricultural price increases significantly rise income inequality, especially in Latin

American countries, where inequality levels are high and institutional quality is low. Kim and Lin (2018) find that oil abundance and dependence alleviate income inequality in the long run (mainly increasing incomes at the bottom). The authors identify better education attainment and improved health status as transmission channels, but also highlight the institutional dimension: Corruption (e.g. through rent seeking) is inequality-enhancing, and puts at risk the positive effects of improved education and health. Leamer et al. (1999) investigate natural resource abundance in Latin America and find that land-abundant countries (that are more strongly affected by commodity price changes) have higher measured income inequality, mainly associated to lower capital stocks and fewer secondary-educated workers. Sánchez-Ancochea (2021) relates commodity booms in Latin America to increasing income inequality, because they benefit landowners and elites in control of mining and hydrocarbons (and the skilled worker working in these sectors), and because states have been unwilling or unable to redistribute the additional incomes. However, for the recent commodity boom in the early 2000s, the author finds deviations to this traditional pattern for two reasons: On the one hand, market forces produced lower unemployment and an expansion of formal jobs; on the other hand, government intervention became more efficient and progressive. While these policies reduced income inequality in the short run, the study does not find evidence for a systematic and enduring change in the elite-centered model of distribution.

Beyond the concentration of economic power in primary sectors, a state's ability to generate revenue from primary exports and tax collection (fiscal capacity) plays a crucial role in shaping income inequality dynamics across economic cycles in resource-rich countries such as Ecuador. Masi et al. (2024) show that this fiscal capacity in developing countries depends on the type of natural resources prevailing in an economy (point-source resources like coal, gas, minerals, and oil negatively effect fiscal capacity while diffuse resources do not), and on the institutionalized constraints limiting executive power that could neutralize the negative effect. Higher fiscal capacity can reduce income inequality if taxes are designed progressively, and provide enough financial resources for redistributive public spending (mostly social spending). This second relationship is, however, not straightforward in Latin America: Direct taxes (e.g., taxes on income and wealth) increase social spending in the short run, while indirect taxes (e.g., value added and consumption taxes) increase social spending in the long run (Mayoral and Nabernegg, 2015). The direct impact of commodity prices on the level and structure of public expenditures in Latin America has been studied by Flechtner and Middelanis (2024): In Ecuador, the commodity boom between 2004 and 2014 is linked to a sustained increase in public social spending, which potentially altered the income distribution.

Finally, the impact of monetary policies on income inequality has been mostly discussed for industrialized countries (Mumtaz and Theophilopoulou, 2017; Andersn et al., 2023). Beside the question of whether restrictive monetary policy increases income inequality or not, a more pressing concern for Ecuador is the effect of dollarization (the loss of autonomy in monetary policies by adopting the US$ as the local currency) on inequality. From a theoretical point of view, this corner solution (on the other extreme would be a completely flexible exchange rate regime) can be interpreted as the most effective "commitment device" to stable monetary policies (Alesina and Barro, 2001, p. 382), providing a "good housekeeping seal of approval" for international money inflow into the country (Jameson, 2003, p. 653). Cachanosky et al. (2022, p.432) argue that dollarization served as a constrained optimal choice within Ecuador's institutional framework, "providing credibility by limiting the state's ability to implement populist policies". Despite several assessment studies on dollarization in Ecuador (Soto, 2009; Özyurt and Cueva, 2020), there remains a gap in the literature concerning how income distribution evolved before and after the adoption of the new currency. An additional difficulty in assessing the direct impact of official dollarization in 2000 is the fact that the economy was already tending towards dollarization step by step in the late 1990s. Between 1994 and 1999, deposits in US dollars increased from 15.7% to 47.3% (Acosta, 2012, p. 284).

The study at hand is not designed to answer the question of causality between different economic shocks and income inequality. However, the results provide insights on whether certain episodes in recent Ecuadorian history reduced or increased income inequality and enhanced heterogeneous growth for different income groups. The study further allows to assess the difference in income inequality that arise from market forces (pretax national income distribution) and policy intervention (posttax national income).

3. Data and Methodology

I follow the methodology of Distributional National Accounts (DINA), a method to estimate the distribution of income consistent with macroeconomic accounts and comparable across time and countries. The problem of the "missing rich" (Lustig, 2020, p. 2) causes official inequality estimates based on household surveys to omit the concentration at the top and therefore to potentially underestimate income inequalities. The solution to this lack of information proposed by the DINA method is the inclusion of data sources that better capture high incomes, such as tax records or rich lists. A second feature of the DINA method is the possibility to assigns the entire national income to individuals or households, including the income generated by the

corporate and government sector.[4]

For Ecuador, I use three main data sources: national accounts, household surveys, and tax records. The steps to produce the DINA series with these data sources for Ecuador are (a) construction of a national accounts series, (b) harmonization of income concepts, (c) integration of tax and survey data on the micro level, and (d) imputation of national income concepts. In what follows, I outline the characteristics of the data sources and the principal features of the DINA steps. Appendix A contains additional information and discussions on each point. This section also formalizes the relationship between commodity prices and pre- and posttax income distributions, linking them to institutional configurations across different periods in Ecuador. The final part of this section outlines the robustness checks conducted to ensure that the results are not driven by specific assumptions.

3.1. Data sources

Privileged data access for this study allows to establish a distributional series over a relatively long period for developing country - 33 years between 1990 and 2022. The main sources comprise national accounts from the Ecuadorian Central Bank (*Banco Central del Ecuador*, BCE), employment survey microdata from the National Statistical Office (*Instituto National de Estadistica y Censos*, INEC), and tax record microdata from the Internal Revenue Service (*Servicio de Rentas Internas*, SRI). National income totals from national accounts are available for all years, but detailed income item and institutional sector disaggregations only exist between 2007 and 2022. The national accounts series therefore, requires assumptions for the years before 2007 and adjustments due to methodological ruptures for the last years. The adjustments include an extrapolation on the sectoral and component level for years 1990-2006, refined with corrections from OECD tax data and remittances statistics. Details are described in appendix A.2.

The employment survey (*Encuesta Nacional de Empleo, Desempleo y Subempleo*, ENEMDU) has been conducted annually since its inception in 1989. Given the change in currency and methodological improvements over such a long period, I applied several harmonization steps, detailed in appendix A.1. These steps include harmonizing income concepts and converting income from the national currency *Sucre* to US$ for the years before dollarization in 2000. Additionally, the survey was adjusted for the lack of rural data in the years 1990-1999 and 2002 with information from urban and rural *Encuesta de Condiciones de Vida* (ECV) for five rounds

[4] An alternative systematic approach to produce inequality estimates consistent with national accounts is the methodology of the Expert Group on Disparities in a National Accounts framework (EG-DNA) from Eurostat and OECD. The EG-DNA method is focused on OECD countries and their harmonized household surveys. For a comparison between the DINA and EG-DNA methods, see Zwijnenburg et al. (2021).

between 1995 and 2014. Finally, the same ECV survey was used to account for imputed rents, which is a notional income source, specifically important for lower-income groups.[5]

Tax records are available from the SRI since 2004 from individual tax declarations, consolidated by the SRI, whereby all income items are comparable throughout the entire series based on a conversion matrix tracing back all changes in the tax forms. Due to expected low data quality for the first years, I use the dataset starting in 2008 where the number of declarations stabilized.[6] For the years before 2004, no tax registers are available, which requires making assumptions on the distribution of income at the top for this period. I use the distribution of income from the tax records in 2008 and extrapolate it to earlier years, anchoring the income of each individual in the tax register to the evolution of national income totals. Consequently, the results of the integration of the survey and (extrapolated) tax register for the years 1990-2007 will primarily reflect differences driven by household surveys and changes in national accounts. This limitation of available tax information before and around dollarization requires taking the results for this period with care. In appendix B.2 I discuss the diverging trends between existing survey-based studies and the study at hand in detail, by decomposing changes in the trends for different DINA steps.

3.2. Unit of observation and harmonization of income concepts

The DINA method uses for its benchmark estimates a unit of observation called the "equal-split adult", which refers to income distributed to adults (aged 20 years or older)[7] and distributed equally within couples or households; and also estimates the distribution for the "individualistic adult", for which income is not shared between the adults in a household. Income concepts in this study also follow the DINA Guidelines (Blanchet et al., 2020): The income concept for the integration of survey and tax data contains only income sources that appear in both micro sources, and is called *pretax household income* (PRTHHI). Imputations and scaling at this step takes exclusively the institutional sector of households from national accounts as benchmark. Once income from other institutional sectors, such as the government and corporations, is assigned to the observations of the integrated dataset, I can produce the national income before (*pretax national income* PRTNI) and after taxes and transfers (*posttax national income* POTNI). Distinguishing between these two distributions allows to assess the impact of redistribution

[5]The income groups in the study are divided into 127 "fractiles", which encompass 99 percentiles and more granular groups at the top. For easier understanding, I will always refer to percentiles when addressing income groups in the manuscript.
[6]One of the robustness checks starts with the original declarations in 2004, see sections 4.6 and appendix B.
[7]This unit of analysis assumes that nearly all income is earned by adults.

policy from public intervention.

3.3. Integration of tax and survey data

The central methodological contribution of this paper is the integration of survey and tax microdata at the individual level. While previous studies have combined tax and survey information at the aggregate level (e.g., Bach et al., 2020; Bartels and Metzing, 2019; Blanchet et al., 2022a; De Rosa et al., 2024), the study at hand uniquely applies this integration at the individual level, addressing a gap in the literature. Studies focusing on income or wealth concentrations beyond household surveys typically use registers from countries with long-standing tax records (Piketty and Saez, 2003; Garbinti et al., 2018). In these cases, survey data is used to correct for demographic inaccuracies and undercoverage, without the need for detailed income information from survey microdata.

In many developing countries, comprehensive historical tax records are lacking or their access is restricted, and studies often rely on tax tabulations to address top-income data limitations (De Rosa et al., 2024; Assouad et al., 2018; Alvaredo et al., 2019). These tax tabulations aggregate taxable income for different groups and years, and are sometimes the only available information provided by tax authorities. Research by Bach et al. (2020), Bartels and Metzing (2019), and Blanchet et al. (2022c) shows that simple tax tabulations can approximate income distributions derived from detailed tax registers when interpolation methods are used. This approach is supported by evidence that top income and wealth distributions often follow a Pareto distribution (Atkinson, 2007; Clementi and Gallegati, 2005; Piketty and Saez, 2003). Recent contributions have standardized correction methods for household surveys with simple tax tabulates. For example, the R package `gpinter` (Blanchet et al., 2022c) and the Stata command `bfmcorr` (Blanchet et al., 2022b) reweight survey microdata to align with tax information, facilitating the production of Distributional National Accounts and enabling regional comparisons of inequality and concentration levels.[8]

However, interpolation and reweighting methods have limitations. Ledić et al. (2024) compare the results from the `bfmcorr` command – that interpolates and reweights tax tables to correct the survey at the top – with real tax microdata from Croatia. The study emphasizes that reweighting methods are unable to address sampling errors, such as the undercoverage of rich households, and thus fail to accurately represent very small groups at the top of the income distribution. I take advantage of the access to tax and survey microdata for Ecuador to extend

[8] Examples include studies on the most unequal region of the world (Alvaredo et al., 2019), income concentrations in Africa (Chancel et al., 2023)), and inequality comparisons in Latin America (De Rosa et al., 2024).

the `bfmcorr` command. This approach overcomes the limitations of traditional reweighting approaches, such as low maximum income levels and a lack of accurate income component information at the top of the distribution.

The proposed method for the integration of real tax and survey microdata consists of four steps: First, survey observations are reweighted with `bfmcorr`. Second, weighted observations from rich households are expanded. For the Ecuadorian survey, this means that one observation from the highest income decile in the survey represents approximately 200 individuals. Third, these individuals are then replaced by real observations from the tax register, assuming rank stability.[9] For micro-integration, it is also important to define the percentile at which observations from the tax register replace the survey observations. I introduce a data-driven approach to define this percentile. The algorithm searches for the replacing point that minimizes the difference between the total value from national accounts and the result of the integration method (see equation 3 and figure A.11 in appendix A.4.1). As illustrated in figure 3, the resulting integrated dataset has lower densities for income groups at the bottom and higher densities for groups at the top, now including individuals with incomes beyond the survey's range.[10] Fourth, the procedure increases the coverage and reliability of income data after the micro integration by imputing income for replaced individuals from the survey, when the value from the survey is greater than the one observed in individual tax declarations.[11]

Finally, all income items are scaled up to 100% of the corresponding income totals of the household sector in national income. Assumptions for the imputation of social contributions in the household sector and negative income items are explained in appendix A.4.

3.4. Imputation of national income components

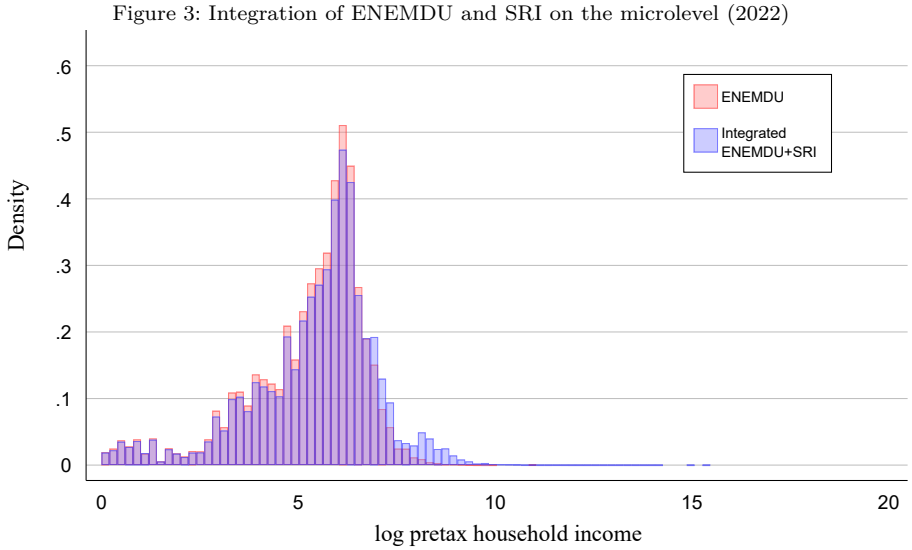
National income consists of income generated by the household sector, the corporate sector, and the government. At the initial stage, pretax income captures only the portion directly attributed to the household sector, representing 100% of household income in national accounts. However, to fully account for national income, it is necessary to allocate income originating from the corporate and government sectors to individuals. Corporate income —- including retained earnings accruing to enterprise owners and taxes on production paid by firms —- ultimately

[9] Rank stability is essential for integrating individuals' income characteristics into the household structure in the survey. It assumes that demographic attributes (e.g., household size, age, and sex structure) are preserved and that the household composition of the wealthiest individuals in the survey aligns closely with that of their counterparts in the tax register. For a detailed discussion, see appendix A.4.1.

[10] The integrated dataset includes extremely high incomes (see blue histogram in figure 3). E.g., a logarithmic income of 15 corresponds to an annual income exceeding 3.3 million US$.

[11] Details of the procedure are explained in appendix A.4.2.

Figure 3: Integration of ENEMDU and SRI on the microlevel (2022)



Note: The histogram plots the log-distribution of pretax household income in 2022 for the original household survey (ENEMDU, red) and the integrated dataset (blue). The density for observations at the bottom and the middle of the distribution decreases, the density at the top increases, and top incomes report more extreme incomes with the integration procedure.
Source: Own elaboration based on ENEMDU and SRI.

benefits households and tends to be concentrated at the top of the distribution. In contrast, government income is redistributed through both individual transfers and collective public expenditure, which are typically more evenly distributed. To incorporate these components, this study imputes the relevant income flows from the corporate and government sectors to households, enabling the construction of a comprehensive pretax national income distribution.

First, *pretax factor income* (PRTFI) adds undistributed corporate income (e.g., retained profits) and income from the government to pretax household income (PRTHHI). To produce *pretax national income* (PRTNI), social benefits and contributions are added for each individual. In addition, I include remittances (other transfers in national accounts) to PRTNI, considering the importance of this item in the Ecuadorian economy. Finally, *posttax national income* (POTNI) deducts corporate taxes from individual income (assuming that capital owners pay this tax), and net indirect taxes (taxes minus subsidies).

In a second step, individual and collective government spending is allocated to individuals' income. In the benchmark scenario, I applying the estimated incidence rates for Ecuador from Llerena-Pinto et al. (2015).[12] Indirect taxes and in-kind government spending—such as education and health—are assigned to individuals using these incidence estimates, while collective government consumption is distributed as a uniform lump sum across the population.

[12]These estimates were developed for the Commitment to Equity Institute (CEQ) reports, and also used by De Rosa et al. (2024).

A key limitation of the CEQ approach is that the incidence estimates are based exclusively on data from 2012 and are assumed to remain constant over the entire analysis period. As a robustness check, I implement an alternative dynamic incidence imputation. In this specification, consumption taxes and all categories of government spending—except health, which remains allocated as a lump sum—are distributed proportionally to pretax household income. Further details can be found in subsection 4.6 and appendix B.

3.5. Measuring institutional inclusivity

Subsection 2.2 outlined how commodity prices and the distribution of income, both before and after fiscal intervention, can be linked to two dimensions of institutional inclusivity, as proposed by Acemoglu and Robinson (2019). These dimensions reflect, first, the extent to which economic gains from commodity price increases are broadly shared across the population, and second, the state's capacity to redistribute resources and reduce income inequality.

The first dimension measures the inclusivity of market income in the light of commodity price changes. The commodity price elasticity of market income inequality is defined as the percentage change in inequality (measured by the pretax Gini index) associated with a 1% increase in commodity prices in period p, as given in equation 1.

$$\varepsilon^{Gini^{pretax}}_{terms\,of\,trade_p} = \frac{log(\Delta Gini_p^{pretax})}{log(\Delta terms\,of\,trade_p)}, \tag{1}$$

where Δ represents the change between the last and the first year of the period. Negative values imply that inequality falls with higher commodity prices, and *vice versa*.

The second dimensions measures the state capacity for redistributional policies by calculating the inequality reduction that occurs between pretax and posttax national income. The reduction of the Gini index is defined in equation 2:

$$\overline{\Delta G}_p = \frac{1}{T_p} \sum_{t \in p} \left(Gini_t^{\text{posttax}} - Gini_t^{\text{pretax}} \right). \tag{2}$$

Plotting different periods along these two dimensions allows to observe the trajectory of institutional changes in the last three decades in subsection 4.5.

3.6. Robustness checks

The production of Distributional National Accounts series requires several steps to prepare, homologize, and impute data. To ensure that the results are not driven by assumptions made in the homogenization and imputation procedures, I construct 23 additional scenarios as robustness checks to the benchmark specification. For a detailed explanation and supplementary figures, see appendix B.

The first source of variation arises from changes in national accounts totals for the years 1990 to 2006, a period for which no detailed national accounts data are available from the Ecuadorian Central Bank. While the benchmark scenario uses secondary information to extrapolate the series, the alternative series assumes a constant structure of income for the institutional sectors between 1990 and 2006. The second variation is the incorporation of tax microdata for the years 2004-2007 (and extrapolation to earlier years with the distribution from 2004). Tax data from these years is excluded from the benchmark scenario, as it is not clear whether the increase in total tax revenue was caused by better data quality or an effective rise in income and formalization. Third, in place of the micro-level integration method proposed in this study, I adopt the more conventional `bfmcorr` approach from Blanchet et al. (2022b), which reweights household survey data using tax tabulations constructed from tax microdata. In this scenario, very high incomes are potentially not accurately reflected, and the composition of income components at the top are poorly represented (Ledić et al., 2024). Finally, I use different assumption for the distribution of net indirect taxes and government spending. While the benchmark scenario applies the (static) CEQ-incidences, the robustness check applies dynamic imputations which depend on the distribution of pretax household income for indirect taxes and public education spending, and assigns public health expenditure as lump-sum.

I also calculate the equal-split individual series for all 24 scenarios and compare it to the benchmark inequality series. The choice of the unit of observation is expected to change the level of inequality considerably, as the equal distribution of individual income within a household to all members 20 years or older decreases the level of inequality.

Finally, I compare the benchmark results to those from a recent study by De Rosa et al. (2024) for a group of Latin American countries between 2000 and 2020. For Ecuador, the mentioned study uses tax tabulations from Cano (2015) and Rossignolo et al. (2016) and apply only a reweighting correction for the missing rich. Detailed methodological explanations and figures for this comparison are available in appendix B.1.

4. Results

This section presents, for the first time, a continuous time series of Ecuador's income distribution spanning the 33 years from 1990 to 2022. It starts with stylized facts on the distribution of income in 1990 and in 2022 and the evolution of pretax and posttax income during the period between both years in subsection 4.1. The evolution of real income is described in subsection 4.2, and provides insights on which groups experienced income gains or losses during the three decades. Subsection 4.3 illustrates which components of income are most important for different income groups. Subsection 4.4 puts inequality in Ecuador in context with other countries in the region. Subsection 4.5 provides a quantitative analysis of institutional settings and inequality for different economic periods in Ecuador. Finally, robustness checks are presented in subsection 4.6.

4.1. The distribution of income 1990-2022

Table 1: Distribution of Income in Ecuador 1990

Income group	Number of adults	Pretax national income			Posttax national income		
		Income threshold	Average income	Income share	Income threshold	Average income	Income share
Full adult population	5,220,000		2,800	100.0%		2,800	100.0%
Bottom 50%	2,609,000		144	2.6%		294	5.2%
Middle 40%	2,089,000	1,000	2,300	32.4%	1,100	2,300	32.9%
Top 10%	522,000	5,000	18,000	65.1%	4,000	17,000	61.8%
incl. Top 1%	52,000	32,000	89,000	31.8%	30,000	83,000	29.9%
incl. Top 0.1%	5,200	124,000	308,000	11.0%	117,000	287,000	10.2%
incl. Top 0.01%	521	382,000	892,000	3.2%	355,000	834,000	3.0%
incl. Top 0.001%	53	1,119,000	4,095,000	1.5%	1,046,000	3,859,000	1.4%

Note: The table illustrates statistics on the distribution of pretax and posttax national income in 1990 in current US$. Monetary values have been transformed from Ecuadorian Sucres to US$ with the official exchange rate of 1990. The income groups are ranked by pretax income in the pretax statistics and by posttax income in the posttax statistics, therefore, the groups do not include the same individuals. Numbers are rounded for better legibility.
Source: Own elaboration based on ENEMDU, SRI, BCE.

A first look at Ecuador's national income distribution in tables 1 and 2, illustrates the pretax and posttax income of the adult population in 1990 and 2022. In 1990, the average national income for the slightly more than 5 million adults was about US$ 2,800. The bottom 50% of the population earned only US$ 144 on average before taxes and transfers, which is barely 5% of average income and only 2.6% of total pretax income. The next group is the middle 40% (capturing the population between percentile 50 and 90), who with an average income of US$ 2,300 or 32.4% of total pretax income. This "middle class" of the population, therefore,

captured a share of income that is considerably lower than their share in the population (40%). The top 10% earned US$ 18,000, which is 7 times the average income, and this group accounted for almost two-thirds of the total national income. The concentration becomes even more remarkable at the upper extreme of the distribution: The richest 53 adults had yearly incomes above US$ 4,000,000 and captured 1.5% of national pretax income. Their income was therefore more than 1,400 times the average income and 28,000 times the income of the bottom 50%. State intervention via taxes and transfers produced a slightly more equal distribution for the posttax national income statistics: The posttax income of the bottom 50% duplicated to US$ 294 or 5.2% of total national income. However, this is still only 10% of the average income. The change for the middle 40% is negligible: Posttax income remained at about US$ 2,300, which indicates that taxes and transfers canceled themselves out on average for this group. The top 10% only marginally lost income after state intervention (about 5% of their average pretax income) and still accounted for almost 62% of total posttax income.

Table 2: Distribution of Income in Ecuador 2022

Income group	Number of adults	Pretax national income			Posttax national income		
		Income threshold	Average income	Income share	Income threshold	Average income	Income share
Full adult population	11,453,000		10,200	100.0%		10,200	100.0%
Bottom 50%	5,726,000		1,700	8.4%		2,400	11.5%
Middle 40%	4,581,000	4,900	8,500	33.3%	5,500	9,000	35.4%
Top 10%	1,145,000	18,000	60,000	58.4%	19,000	54,000	53.1%
incl. Top 1%	115,000	105,000	254,000	25.0%	94,000	219,000	21.4%
incl. Top 0.1%	11,500	412,000	1,029,000	10.1%	354,000	865,000	8.5%
incl. Top 0.01%	1,145	1,491,000	4,584,000	4.5%	1,212,000	3,826,000	3.7%
incl. Top 0.001%	115	6,822,000	24,010,000	2.4%	5,814,000	20,093,000	2.0%

Note: The table illustrates statistics on the distribution of pretax and posttax national income in 2022 in current US$. The income groups are ranked by pretax income in the pretax statistics and by posttax income in the posttax statistics, therefore, the groups do not include the same individuals. Numbers are rounded for better legibility.
Source: Own elaboration based on ENEMDU, SRI, BCE.

The picture changes for the most recent year (see table 2): In 2022, the average income for Ecuador's 11.5 million adults exceeded US$10,000 in nominal terms. Pretax income for the bottom 50% amounted to over US$1,700—approximately 17% of the average income—corresponding to 8.4% of total national income. The middle 40% received roughly one-third of total pretax income, a slight increase compared to 1990. Meanwhile, the top 10% captured 58.4%, representing a decline of six percentage points since 1990, though still indicating a high level of concentration. However, Table 2 shows that income concentration at the very top in-

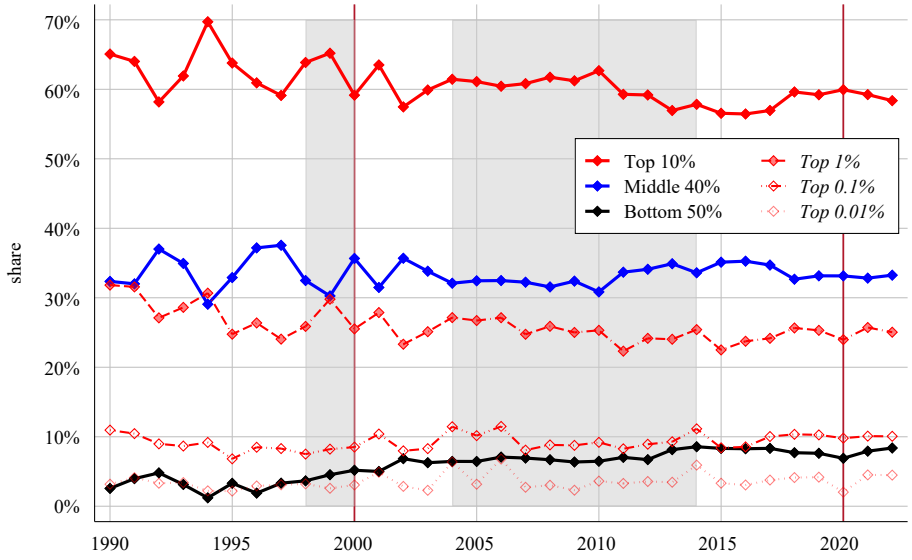
creased over the 33 years: the top 0.01% (1,145 adults) accounted for 4.5% of national pretax income, while the top 0.001% (115 adults) captured 2.4%. The progressive tax and transfer system increased the income of the bottom 50% to US$ 2,939. The middle-income group slightly benefited from taxes and transfers overall by increasing its share in income to 35.6%, and redistribution reduced the top 10% income share to 50%. For all top income groups, this reduction is more progressive than in 1990, but the posttax shares are still higher than in 1990, e.g., the richest 0.001% of the population captured 1.0% in 1990 and 1.9% in 2022. In section 4.4, I will show that this concentration of income at the top is not only much higher than in official sources, but also the highest in the Latin American region.

Figure 4 illustrates the share of the pretax national income that goes to the different groups of the population over the entire period. The share of the bottom 50% (black line) fluctuated around 3% throughout the 1990s and increased slowly but steadily after dollarization and during the commodity price boom to about 9% in 2014, decreased in the years up to the COVID-pandemic and recovered again to about 9% in 2022. The share of the middle 40% (blue line) increased during the 1990s from 32% up to almost 40% in 2007 before plunging during the banking crisis.[13] After dollarization, this group steadily lost participation in pretax income, falling again to 30% in 2010. Since then, this middle-income group has slightly recovered participation to levels above 33%. The top 10% (red solid line), on the other hand, captured an astonishing 65% of the total pretax income in 1990, and this share fluctuated between 60% and 70% in the 1990s. During dollarization and the subsequent years entering the commodity price boom, the share stayed at around 60%, and this group could later even increase its participation in the distribution of pretax income to 63% in 2010. After a drop to 58% in 2015 its participation accounts now for 59% of total pretax income. Figure 4 also indicates that the share of the top 1% decreased from 32% in the early 1990s to 26% in 2000, and has maintained this share since then. More stability can be observed for the top 0.1% (top 0.01%), for which shares fluctuated around 10% (4%) throughout the whole period. Interestingly, although the COVID-pandemic represented a mayor national income loss in absolute terms, it did not alter the distribution of national income significantly.

The impact of redistributive policies becomes evident by comparing the pretax national income series in figure 4 to the posttax series in figure 5. The bottom 50% captured almost 6% of posttax income in the 1990s (3% in the pretax series) and increased its share continuously to 12% during the commodity price boom (9% in the pretax series). On the other hand, while

[13] Recall that part of the high fluctuation for the pre-dollarization period can be due to the limitation of data, described in section 3.1. A discussion about the pre-dollarization trend is provided in appendix B.2.

Figure 4: Pretax income shares in Ecuador (1990-2022)

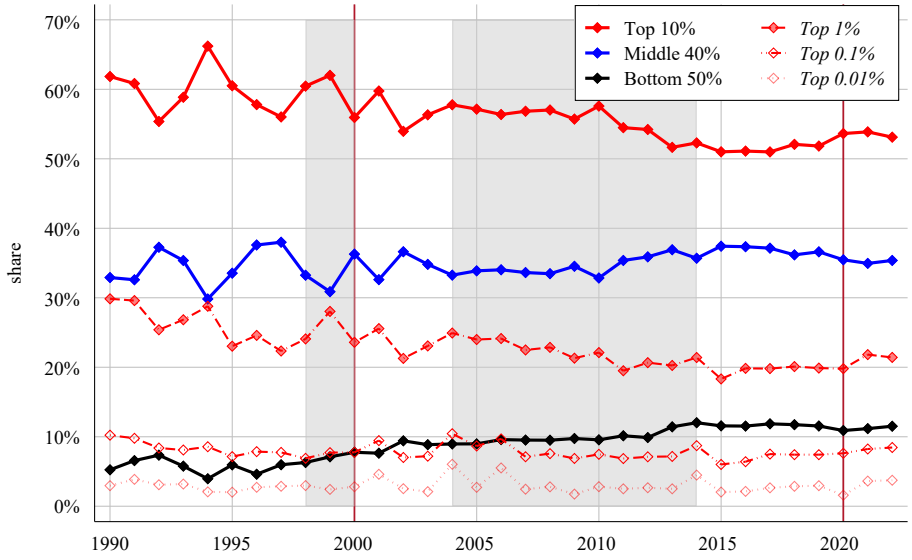


Note: Evolution of pretax national income shares for different groups. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis and the 2004-2014 commodity price boom.
Source: Own elaboration based on ENEMDU, SRI, BCE.

the share of the top 10% in the 1990s fluctuated around 65% in the pretax series, the posttax income share of this group moved at around 60% in the 1990s and fell since the early 2000s to levels of around 50% after the commodity price boom (60% in the pretax series). Also for the top 1%, taxes and transfers reduced the relative share by up to 6 percentage points. The series for the middle 40% confirms that taxes and transfers have a limited net effect on income for this group. However, while in the 1990s the share of the middle income group only increased by 1 percentage point between pretax and posttax income, the difference was 4 percentage points just before the crisis caused by the COVID-pandemic. Another insight from the figures is that the evolution of the bottom group's share is slow and smooth, while the richest decile's share is more volatile and mirrors what happens to the middle 40%, indicating that short-term income shifts happen primarily between these groups.

Figure 6 confirms the trend of increasing difference between pretax and posttax income: Subfigure (a) draws effective incidence rates for direct taxes (personal and corporate taxes on income and wealth), and subfigure (b) net indirect taxes (consumption taxes such as value added tax minus indirect subsidies), along the distribution for different years between 1990 and 2022. Direct taxes were progressive throughout the period, as income and wealth taxes were paid almost exclusively by the top 20% of the income distribution. However, prior to 2000, the effective tax rate remained below 5% and declined for the highest income groups, indicating

Figure 5: Posttax income shares in Ecuador (1990-2022)



Note: Evolution of posttax national income shares for different groups. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis and the 2004-2014 commodity price boom.
Source: Own elaboration based on ENEMDU, SRI, BCE.

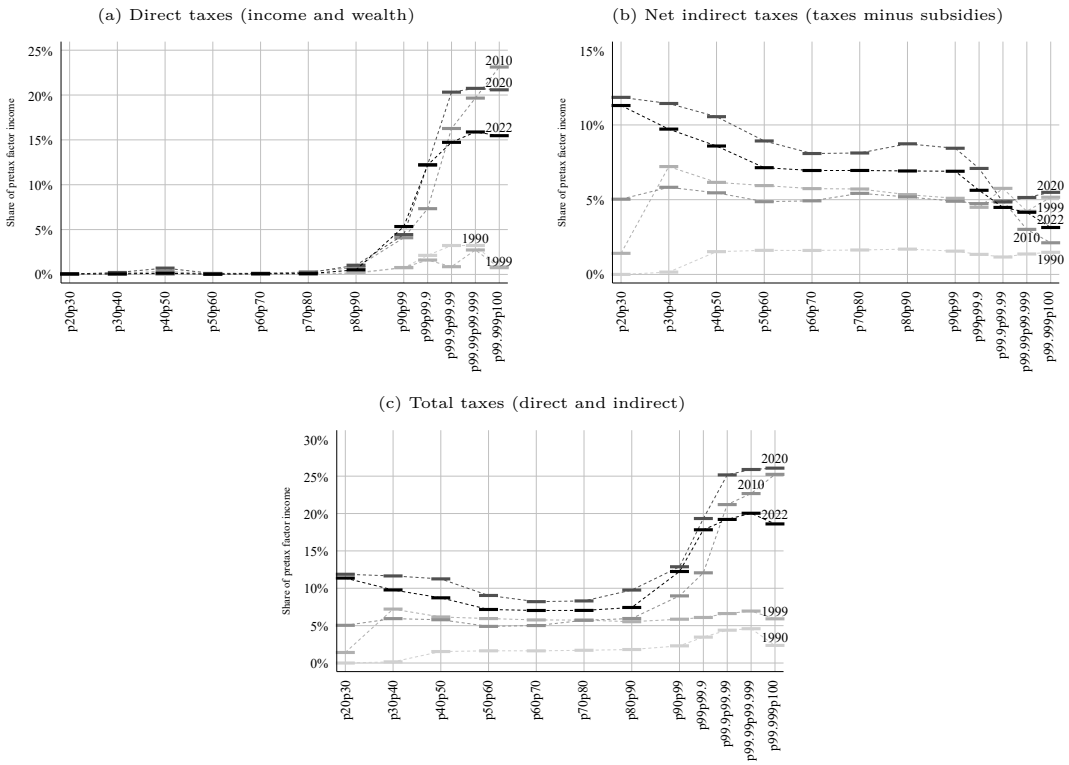
limited redistributive capacity. It was not until 2010 that a more robust degree of progressivity was established across the entire distribution, with the richest groups contributing nearly 25% of their pretax factor income in direct taxes. In 2020, the incidence increased for the top 0.1%, but flattened out for richer groups. In addition, this tendency reverted in 2022, when the richest only paid 15% of effective taxes. Estimated effective indirect tax rates in subfigure (b) resemble a flat line for the years 1990, 1999, and 2010; and regressive incidences for the years after 2010. The bottom 50% increased indirect tax payments to more than 10% of pretax factor income, while indirect taxes for the richest groups fell below 5%. Overall, the tax system became more progressive after 2000, which explains part of the increasing difference between pretax and posttax income.

4.2. Growth rates by income group

Figure 1 in the introduction illustrates the volatile evolution of real income per adult, which finally results in a poor annual average real growth rate of 0.4% per adult. On the other hand, the pretax and posttax series of subsection 4.1 suggest increasing shares in national income for the bottom 50% and relatively constant shares for the middle 40% and the top 10% between the first and the last years. Next, I will breakdown national income growth for different population groups.

To illustrate how income changed over time in real terms, I set the base value of real income

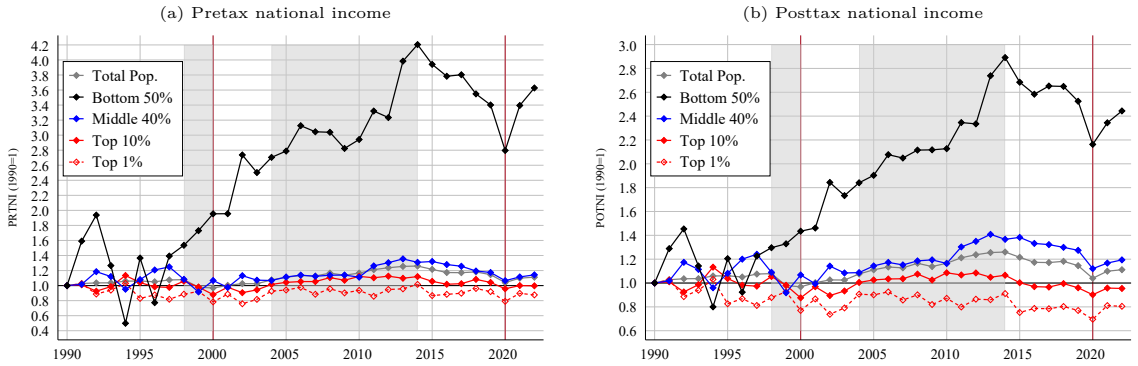
Figure 6: Tax incidence by percentile and year



Note: Subfigure (a) indicates the share of direct taxes (taxes on income and wealth) in pretax factor income by pretax national income percentiles. Subfigure (b) illustrates the share of net indirect taxes (production taxes minus production subsidies) in pretax factor income, which are mostly value added and importation taxes, by pretax national income percentiles. Subfigure (c) combines both direct and indirect taxes per pretax national income percentile. The year 1999 was chosen instead of 2000, due to the replacement of the income tax by a capital circulation tax in 2000, reinstated again in 2001.
Source: Own elaboration based on ENEMDU, SRI, BCE.

for each group to 1 in 1990 with values above 1 indicating higher real income and values below 1 lower real income relative to the base year in figure 7. For pretax national income (subfigure (a)), the bottom 50% experienced high volatility in the 1990s but finally received twice the income in 2000 compared to 1990. The middle 40% earned 20% more in 1997 than in 1990, but lost this income gain in the banking crisis 1998-2000. Also the richest groups lost income in real terms (minus 10%) in the crisis at the turn of the century. After dollarization, real income for the bottom 90% boosted within a few years: In 2006, the poorer half of the population received three times the income of 1990, and the middle 40% reached an income 20% higher than in 1990. The top 10% – who had lost 10% of real income until dollarization – recovered the level of 1990 again. At the early stage of the commodity price boom, and the beginning of the "Citizen Revolution" government, pretax income for the bottom and middle income groups stagnated, while the top 10% income group recovered its real income growth pattern. Between 2010 and 2014 – the more intensive period of the commodity price boom– real growth returned for the bottom (+33%) and the middle income groups (+15%) between 2010 and 2014, while the top

Figure 7: Real growth of different income groups



Note: The index represents the real pretax and posttax income levels per adult in comparison to the base year of 1990. For instance, the pretax index (subfigure (a)) for the bottom 50% of the population in the year 2000 is about 2, which indicates that the group's real income in 2000 was twice as high as its income in 1990. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis and the 2004-2014 commodity price boom.
Source: Own elaboration based on ENEMDU, SRI, BCE.

income groups could not increase their real pretax income. In the following years, the bottom 90% of the distribution fell back to its level of 2010, and the top 10% closed the year 2020 with real income slightly below its value of 1990. After the COVID-crisis, again, all groups recovered parts of their loss during the economic downturn.

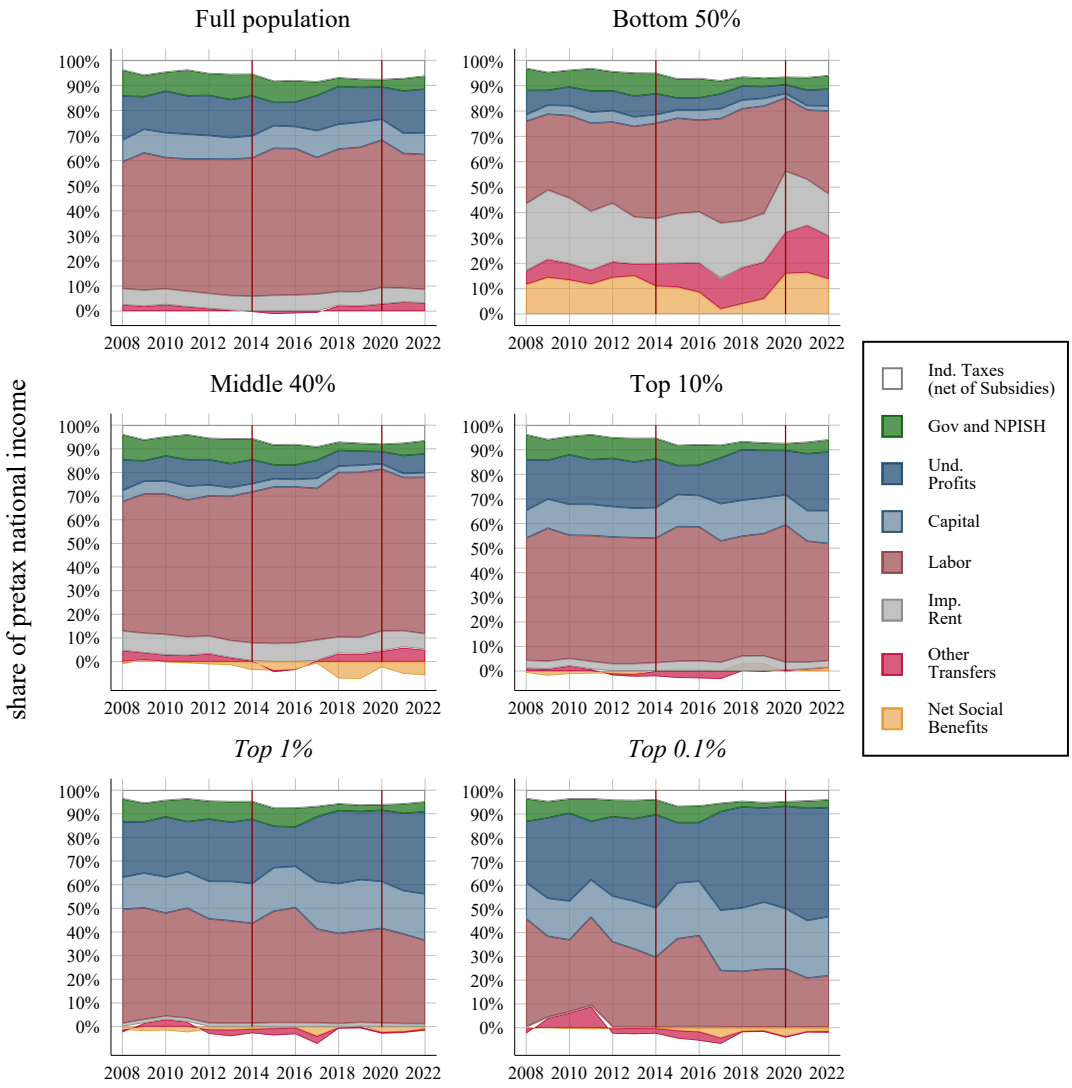
For posttax national income (subfigure (b)), the evolution is similar, but booms and busts were slightly weaker for the lower 90%. E.g., growth for the bottom evolved more steadily between 2006 and 2010 but also more moderately than in the pretax growth series. Overall, real income increased substantially for the bottom 50% (up to three times the income of 1990 at the end of the commodity price boom), taking into consideration that this poorer half of the population only captured 5% of posttax national income in 1990. The middle-income group received incomes in 2020, which were 20% above its 1990 level, and in real terms, the top income holders were slightly worse off in 2022 compared to 1990.

4.3. Composition of income

One key advantage of integrating survey and tax microdata is the ability to generate a more reliable breakdown of income components across the entire distribution, including the top percentiles. Tracking this composition over time allows for the analysis of structural shifts affecting different income groups. Figure 8 displays the composition of pretax national income for the years 2008 to 2022, the period for which tax microdata are available. For the full population (subfigure (a)), labor income (red) represented about half of all pretax income, capital income (light and dark blue) about 25%, and government income imputed to households (green), net

indirect taxes (white, indirect taxes minus subsidies), and imputed rents (gray) between 5% and 10%. Other transfers (pink, mainly remittances) fluctuated around zero, and net social benefits (orange, contributions minus benefits) are set to zero by construction.

Figure 8: Composition of pretax national income 2008-2022



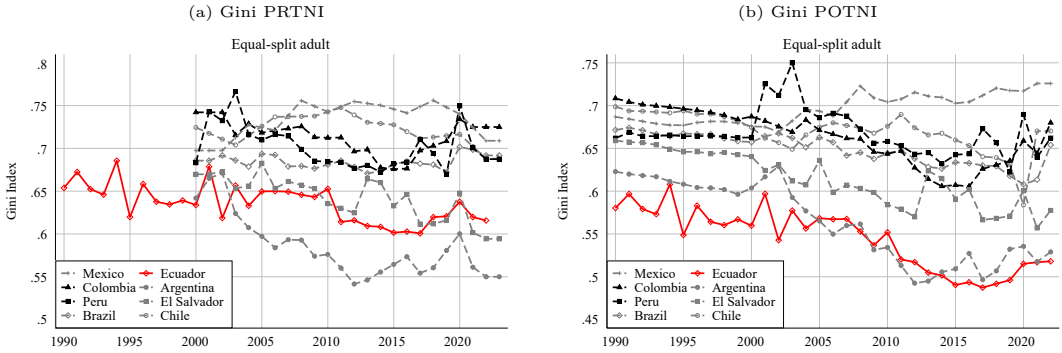
Note: The figure presents the composition of pretax national income for the full population and different income groups between 2008 and 2022. Red vertical lines indicate the end of the commodity price boom in 2014 and the COVID-pandemic in 2020.
Source: Own elaboration based on ENEMDU, SRI, BCE.

For the bottom 50% (subfigure (b)), imputed rents, transfers, and net social benefits made up half of pretax income, labor income 30%, and capital income less than 10%. Transfers increased continuously, but the share of social benefits in income decreased heavily between 2014 and 2017, before recovering in the following years. The income of the middle class (subfigure (c)) was composed primarily (and increasingly since 2014) by labor income (almost 70% in 2022), while capital income lost importance over time (from 15% to 7%), and imputed rents stayed

at a constant 8%. Interestingly, net social benefits for this group were always slightly negative, which means that this group was a net payer of the social system in Ecuador. Transfers followed the general tendency of positive shares in all years except the period between 2014 and 2018. The richest 10% (subfigure (d)) accrued a higher share of their income from capital (40%) and less from labor (50%), while net social benefits were positive for this group since 2018. The last two subfigures (e) and (f) plot the component shares for the top 1%, divided by the lower part (p99-p99.9) and the richer part (p99.9-p100). The lower top 1% increased the income share from capital since 2016 from 35% to 40%, and the upper top 1% from 45% to 70%. In terms of taxes and transfers, these groups had negative social benefit income (net payers to the social system), but indirect taxes made up a smaller share for these high-income groups than for the bottom and middle class.

4.4. International comparison

Figure 9: Gini index for countries in the region



Note: Subfigure (a) indicates the Gini index for pretax national income, subfigure (b) for posttax national income. Solid red lines represent the Gini index estimated for Ecuador in the equal-split adult scenario. All other countries (neighboring countries Colombia and Peru in black, other countries in gray) from the WID also represent the equal-split individual.
Source: Own estimations for Ecuador based on ENEMDU, SRI, BCE; all others from World Inequality Database (www.wid.world).

The DINA method enables cross-country comparisons within Latin America since 2000. However, the unit of observation for Latin American countries in the World Inequality Database (WID) is the equal-split individual, as the results are derived from reweighted survey data (De Rosa et al., 2024). I therefore compare the results from the Latin American region with the equal-split adult results from Ecuador (which produce lower inequality estimates due to intra-household distribution from Ecuador).[14] Observing the Gini index in subfigure 9(a) for pretax

[14]Comparing the results for Latin American countries presented in De Rosa et al. (2024) with those from the present study for Ecuador requires ensuring that the estimates for Ecuador are comparable across both analyses. In addition to the robustness checks presented in subsection 4.6, figure B.7 in appendix B.1 shows that the Gini coefficients for pretax and post-tax national income are at similar levels and exhibit comparable trends across the two studies. Although there are differences in the estimated income shares of the bottom 99%—with

income, Ecuador (red) presents lower levels (between 0.6 and 0.65) than its neighbors Colombia and Peru (around 0.7), but a similar evolution (significant reductions between 2008 and 2015, followed by an increase). Chile, Argentina and El Salvador also experienced an overall decrease in the pretax Gini index, while inequality in Brazil stagnated and even increased in Mexico over the last 20 years. Turning to posttax income in subfigure (b), Gini estimates place Ecuador among the most equal countries, together with Argentina. The tendency is still similar to the neighbors Colombia and Peru, but the Gini level now lies more than ten percentage points below.

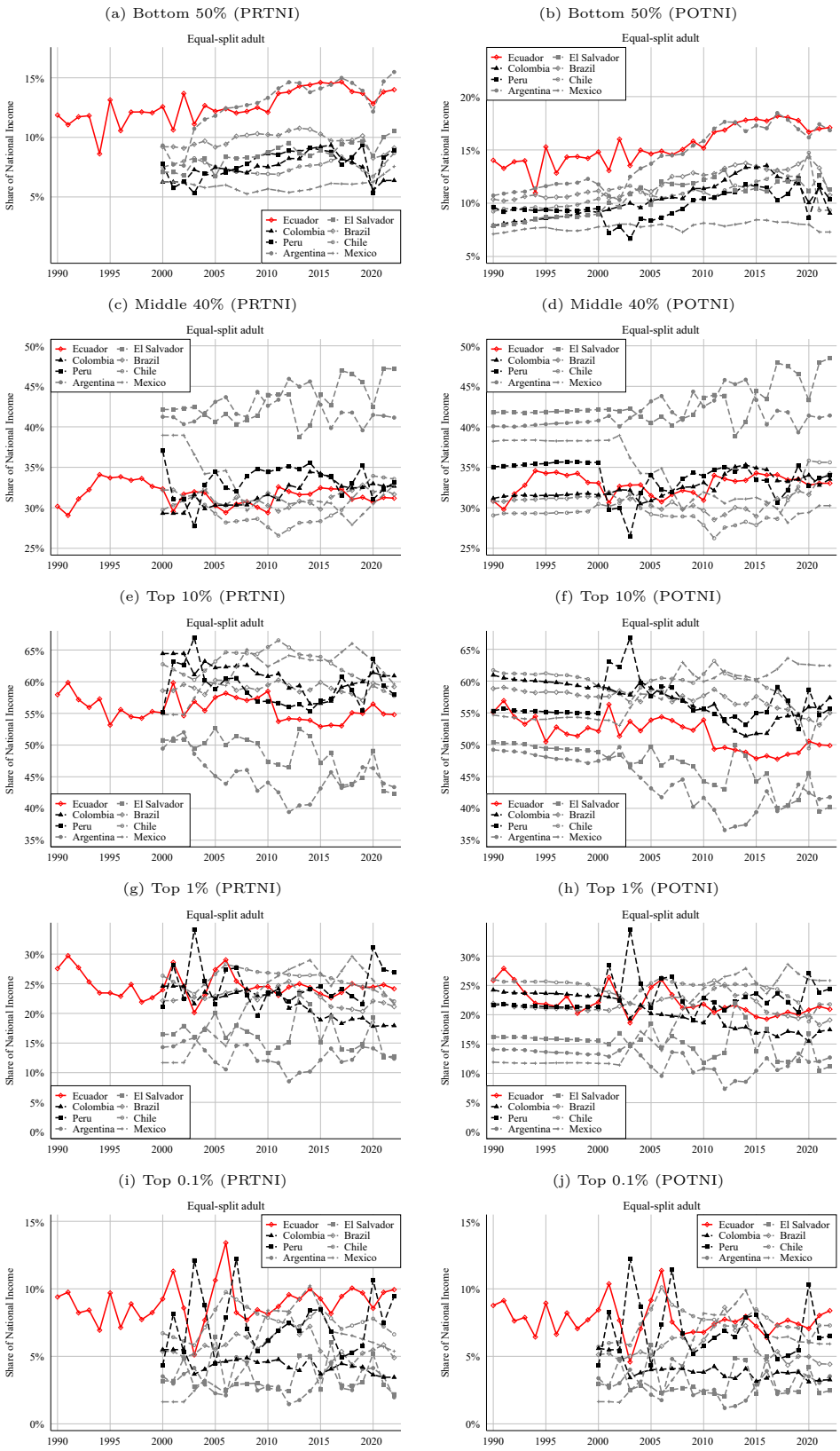
However, only looking at a synthetic indicator can obscure developments for different income groups. I therefore compare the shares of income groups between countries in figure 10. The share of pretax income (left subfigures) and posttax income (right subfigures) for the bottom 50% increased in all Latin American countries between 2000 and 2022. Ecuador started from a higher level of the bottom income share than other countries, and this gap was preserved over the two decades, except Argentina which kept up with Ecuador. The middle 40% income shares are more similar to the other countries in the Andean region between 30% and 35% for posttax income, while in Argentina and El Salvador, this group captures more than 40% and 45% of national income. For the top 10%, the pretax and posttax income shares in Ecuador are slightly lower than in Colombia and Peru, but significantly undercut by Argentina and El Salvador (40%). Up to this point, the analysis of shares resembles the results from the Gini index, at a more nuanced level. What cannot be accurately derived from the Gini index are different concentrations at the top: The pretax income share of the top 1% in Ecuador is the second highest after Peru with 25%, but state intervention moves Ecuador again towards the regional average for the posttax share. Finally, the share of the top 0.1% fluctuated at around 10%, which is at the top of all countries of the region. Despite reductions after taxes and transfers, Ecuador is still the country with the highest share of posttax income going to the richest 0.1% in 2022.

4.5. Linking inequality to institutions

This subsection systematizes the results along two dimensions related to the institutional features of Acemoglu and Robinson (2019), as explained in subsection 3.5. In figure 11, the vertical axis is the Gini elasticity for commodity prices where negative values imply that inequality falls with higher commodity prices, and *vice versa*. The horizontal axis indicates the

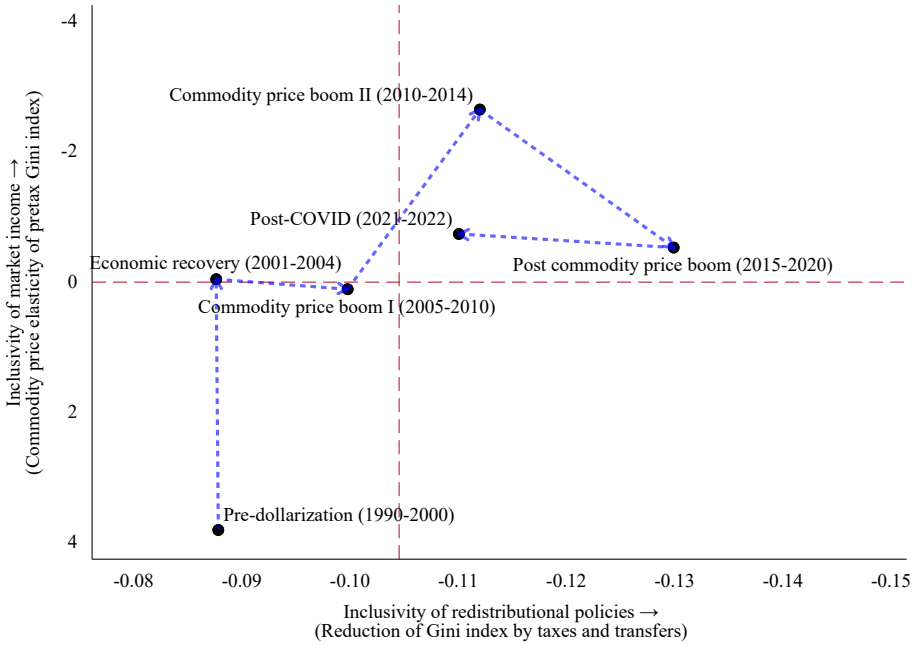
greater fluctuations observed in De Rosa et al. (2024)—the income shares of top earners are nearly identical by 2020 (see figure B.8).

Figure 10: International comparison of income shares by group



Note: Subfigures on the left indicate shares in pretax national income, subfigures on the right indicate shares in posttax national income. Solid red lines represent the shares estimated for Ecuador in the equal-split adult scenario. All other countries (neighboring countries Colombia and Peru in black, other countries in gray) from the WID also represent the equal-split individual.
Source: Own estimations for Ecuador based on ENEMDU, SRI, BCE; all others from World Inequality Database (www.wid.world).

Figure 11: Institutional changes between 1990 and 2022



Note: Each point represents a period on the two dimensions of institutional arrangements following Acemoglu and Robinson (2019): The vertical axis represents the inclusivity of the market institutions in the economy, measured by how the pretax Gini index reacts to changes in the terms of trade for Ecuador. Negative values suggest that increases in the terms of trade (caused by increases in international commodity prices) decrease market income inequality. The horizontal axis represents the redistributional capacity and therefore the inclusivity of public policies, measured by the average difference between the posttax and pretax income Gini index. Higher negative values suggest stronger income redistribution. The figure is divided into four quadrants: On the vertical axis at zero, indicating inequality reducing or enhancing effects of commodity price increases; and on the horizontal axis at the average difference between the pretax and posttax Gini. Inclusive institutions are situated in the upper right quadrant.
Source: Own estimation based on ENEMDU, SRI, BCE, and IMF.

reduction in the Gini index from pretax to posttax income, representing the effectiveness of redistributional policies. Each point in the graph represents a particular period in the last three decades. Red lines separate the graph into positive and negative elasticities (on the vertical axis), and into Gini reductions below and above the average of all periods (on the horizontal axis). Blue arrows indicate the trajectory over time. Following Acemoglu and Robinson (2019), inclusive institutions would be found in the upper right quadrant of figure 11, while institutions that are extractive in both dimensions (increased market income capture by the rich and lack of government capacity to redistribute income) would be situated in the lower left quadrant. The upper left and lower right quadrants represent areas where institutions are inclusive in one regard, but not in the other.[15] As a robustness check, figure C.9 in appendix C plots income share ratios (top 10%/bottom 90% and top 1%/bottom 90%) instead of the Gini index. The results are similar to the results using the Gini index.

For the decade before dollarization (1990-2000), the average commodity price elasticity of the pretax Gini index is strongly positive, suggesting that the decreases in international prices of this period affected the elite most (the Gini index decreased) – a sign of economic power concentration. In addition, the reduction of inequality from pretax to posttax was weak. After the banking crisis and dollarization, the Ecuadorian economy recovered (2001-2004), whereby the modest commodity price increases left the pretax Gini index almost unchanged (the elasticity is close to zero), and redistribution policies stacked at a modest level. During the first phase of the commodity price boom between 2005 and 2010, the escalating commodity prices still slightly increased the pretax Gini index (illustrated by the small positive elasticity), but redistribution effectiveness increased. In the second phase of the commodity price boom between 2010 and 2014, the rising commodity prices considerably decreased the pretax income Gini index (strong negative elasticity), and redistribution further reduced inequality by an additional eleven points. As a result, this period is positioned for the first time in the upper-right quadrant, indicating both market income inclusivity and effective redistribution. The strong negative commodity price elasticity of the pretax Gini index observed during the boom years could not be sustained in the subsequent period (2015–2020). However, the state's redistributive capacity continued to strengthen, reaching its highest level over the entire observation period. Following the COVID-19 pandemic shock (2021–2022), also this redistributive capacity contracted significantly.

[15] The division of the horizontal axis above and below the average of the redistributional capacity of Ecuador does not necessarily indicate whether Ecuador has a sufficiently functioning state capacity, but rather indicates which episodes in recent history had better functioning institutions than others. E.g., Sweden reduced the Gini index from pretax to posttax income on average by about 20 points in in the last decades – almost twice the average of Ecuador.

4.6. Robustness checks

To assure that results are not driven by the assumptions in the homogenization and imputation, I produce 23 additional scenarios as robustness checks to the benchmark scenario. For a detailed explication and additional figures see appendix B.

Table B.1 in appendix B provides results for the average level of pretax and posttax national income shares going to the bottom 50%, middle 40%, and top 10%, and their change between 1990 and 2022. Results indicate that the benchmark scenario lies between outer bounds of estimates, and that although differences in the shares for each income group between scenarios arise as expected,[16] the same tendency is shared by all scenarios (see figures B.1, B.2, and B.3). The equal-split individual series for all 24 scenarios (see figures B.4, B.5, and B.6 in appendix B) change the level of inequality as expected. Nevertheless, the trend over the studied period is similar to the benchmark series.

Finally, in the comparison with De Rosa et al. (2024), both studies show overlapping estimates for pretax income inequality in 2001 (the first year in the De Rosa et al. (2024) study). However, they report a more pronounced decline in inequality up to 2019. Their post-tax income Gini also starts at a higher level and declines more steeply than in the present study. As a result, by 2019, the two studies converge in terms of post-tax income inequality, while pretax inequality remains lower in De Rosa et al. (2024). A further notable divergence appears in 2020: De Rosa et al. (2024) estimate a sharp increase in inequality, whereas the rise is more moderate in the present analysis. A detailed methodological comparison and corresponding figures are provided in Appendix B.1.

5. Discussion

In this section, I take up the theoretical considerations from the political economy literature in section 2, to discuss the evolution of inequality in light of the institutional arrangements, public policies, and commodity prices in Ecuador.

Pre-dollarization and economic crisis (1990-2000): The last decade of the 20th century was characterized by falling terms of trade (figure D.1a), a stagnation in minimum wages (figure D.1c), and a limited formalization of the labor market that only slightly increased in the middle class (Ponce, 2011). The biggest share of the modest growth during the pre-crisis,

[16] For example, the share of the bottom 50% is considerably lower in the integration scenarios than in the `bfmcorr` scenarios, and vice versa for the top 10%.

pre-dollarization period was absorbed by the bottom 90% of income earners. As the middle class was more heavily affected only by the banking crisis in 1998 and 1999, the findings suggest that negative international market conditions hit the economic elite during the pre-dollarization period in the first place. These reductions of market income inequalities under falling international prices (translating into a positive commodity price elasticity of the pretax Gini index in figure 11) represent non-inclusive market institutions. In addition, the state lacked of functioning redistributive policies (low reduction of the inequality between pre- and posttax income distributions in figure 11): Low tax collection (figure D.1e) and social security contributions (less than 10% of GDP, see figure D.1f) only marginally changed the distribution between pretax and posttax income (e.g., only 3% of national income was redistributed from the top 10% to the bottom 90%). In the severe crisis at the turn of the century, the regressive tax structure and the lack of social policies impeded cushioning the plunge of pretax income for the bottom 90%.

Economic recovery (2001-2004): After the banking crisis and the shock induced by dollarization in 2000, the Ecuadorian economy recovered within a few years (Jameson, 2003).[17] However, it is not clear if this was a direct response to the dollarization-effect on the economy or to other macroeconomic developments. Terms of trade marginally increased at low levels, and annual inflation decreased from almost 100% to less than 10% already in 2003. Although politically unstable, this recovery period was also characterized by a real pretax income growth for the bottom 50%, while the income for the middle class stagnated, and income at the top slightly recovered. The lack of growth in the middle 40% can be explained by insufficient market conditions and policies in favor of formal employees: Minimum wage increased only by the inflation rate, and historically growing informality since the 1990s, even increased during the first years of the new century (Ponce and Vos, 2014). Formal wage income is by far the most important income source for the middle 40%, which makes market income growth for this group more sensitive to labor market policies than for the bottom and the top. The modest commodity price increases and the lack of progressive labor market policies left the pretax Gini index almost unchanged.[18] Results therefore suggest, that the enhanced credibility in the Ecuadorian economy caused by dollarization (Quispe-Agnoli and Whisler, 2006; Alesina and Barro, 2001) allowed pretax income growth for the bottom and the top, but not for the middle class. The quick stabilization of top incomes after the crisis was also associated with the

[17] Real national income per capita reached the pre-crisis level of 1998 in 2005.

[18] The commodity price elasticity of the pretax Gini index in figure 11 is zero. However, the robustness checks with income ratios instead of the Gini index in figure C.9 suggest positive elasticities for the economic recovery period due to the increasing income shares at the top.

narrow primary goods exporting portfolio and the concentration of access to these resources in a few hands. Levy-Yeyati (2021) considers that albeit inequality-reducing in the first years, dollarization in this phase could have prevented productive diversification and therefore worked against a sustained inequality reduction in the long run. On the other hand, fiscal capacity and social expenditures were still at a precarious level in this period, confirmed by the stagnation of the redistributive capacity of taxes and transfers before the commodity price boom (see figure 6), and the low redistributional strength in the horizontal dimension of figure 11.[19]

Commodity price boom and "Citizen Revolution" (2005-2014): During the first phase of the boom until 2010, pretax income shares stagnated for the bottom 50% of the population and decreased for the middle 40%, while the top 10% experienced minor increases. As a result, the pretax Gini index slightly increased while commodity prices escalated, suggesting that institutions favored the richest groups more and were therefore still extractive (represented by a small negative commodity price elasticity of the pretax Gini index in figure 11). Interestingly, 2005-2010 is also the period with the highest growth of taxes and social expenditures (the latter doubled as a percentage of GDP), together with a decrease in debt service from 12% to 3% of GDP. The incidence of taxes and transfers increased notably, converting the stagnation of real pretax income for the bottom 90% into a real posttax income growth (movement towards the average in the redistributive capacity dimension in figure 11). Only during the second phase of the boom (2010-2014), with even higher international commodity prices, national pretax income growth favored the bottom 90% more than the top incomes. The increasing incidence of taxes and transfers reinforced this trend. From an institutional perspective, the commodity boom first favored the economic elites within an extractive market configuration, while economic opportunities in the second phase (and with even higher commodity prices) were more equally distributed (strong negative commodity price elasticity). On the other hand, while the state was absent in the first post-dollarization years, public intervention in favor of redistributional policies inclined towards more inclusive institutions. These findings are in line with Sánchez-Ancochea (2021, p. 96), who considers that in Latin America, the "commodity boom was thus better managed this time than in the past, at least in the short run."

[19] Fiscal capacity was 15% and social expenditures only represented 5% of GDP, see figures D.1e and D.1f. Only one remarkable social policy was introduced at the turn of the century: The monetary transfer program *Bono de Desarrollo Humano* started in 1998 and was originally designed to compensate poor families for eliminating the electricity and gas subsidies during the crisis, but evolved into an efficient vehicle for poverty reduction, with take-up rates of 73% of households in the poorest quintile (Rinehart and McGuire, 2017). The amount transferred to households was increased several times during the leftist government in charge since 2006 (Mideros and Gassmann, 2021, see figure D.1g).

Post commodity price boom and COVID-crisis (2015-2022): The drop in commodity prices in 2015 hit the lowest income groups hardest: The bottom 50% lost one third of their pretax real income between 2014 and 2020 (the beginning of the COVID-pandemic), and the middle 40% more than 20%. On the other hand, real income loss for the top 10% was only slightly above 10%, although smaller top-income groups, such as the top 1%, experimented reductions of 20% up to the year 2020. The small but negative elasticity illustrated in figure 11 (increasing inequality at falling international prices) suggests that a commodity price shock in this period – acting through a more inclusive participation in income from natural resources – affected the income of all economic strata. One explanation for this tendency is changing labor market conditions after 2014, when some of the achievements of the commodity boom years were reversed: Informality was considerably reduced between 2008 and 2014 from 44% to 40%, but increased to almost 47% in 2019, before peaking during the COVID-pandemic at 52%.[20] A second explanation is the evolution of minimum wage, especially relevant for the bottom and middle class: The minimum wage rise between 2000 and 2014 could not be sustained after the boom period,[21]. At the same time, austerity policies – public investment dropped from 15.7% in 2014 to 7.8% of GDP in 2019[22], and debt service passed the mark of 10% of GDP in 2020 again – restricted state interventions to boost economic activity or to increase labor market dynamics directly through public investment. This withdrawal from the state as economic actor made economic institutions less inclusive in terms of market income (the strong negative commodity price elasticity of the pretax Gini index contracted to almost zero), but the state still managed to partially compensate for the pretax income loss of the bottom 50% by cushioning the posttax income loss with social benefits. In terms of redistributive public policy intervention, tax revenues and social expenditures maintained their previous level in percentages of GDP up to the COVID-pandemic. The recovery of pretax national income after the COVID-crisis (2021-2022) was at least partially pushed by an increase in commodity prices. Pretax income shares for the bottom 50% increased, and the share of the top 10% slightly dropped, which indicates a more inclusive growth in terms of market income. Remittances also

[20] See https://www.ecuadorencifras.gob.ec/enemdu-trimestral/. Figure C.7 in appendix C indicates that formalization increased in the vast majority of percentiles between 2008 and 2014, but decreased in 2022 again – in the poorest percentiles even to levels below those of 2008. Although the definition of employment in the formal sector does not include whether an employer is affiliated to the social security system, formal employment and social security are highly correlated. Information from the social security system reveals that the number of affiliated employers doubled between 2009 and 2016 from 1.7 million to 3.4 million in 2015, and fell to 3 million in 2020, see https://www.ecuadorencifras.gob.ec/registro-empleo-seguridad-social/

[21] Driven by a boost of the minimum wage between 2000 (US$ 57) and 2014 (US$ 340), the share of labor income in total income for the bottom and middle income groups increased in this period. See figure 4.3 and D.1c in appendix D

[22] https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Catalogo/CuentasNacionales/Anuales/Dolares/FBKFweb.xlsx

increased by 42% between 2020 and 2022, which elevated income mostly for the bottom and middle income groups. However, the redistributive capacity of the state declined considerably: the average reduction in inequality between pre- and post-tax national income due to taxes and transfers was significantly lower than during the commodity price boom. The reversion to less inclusive economic institutional arrangements suggests that, even during the commodity price boom, fragile political institutional configurations hindered reforms aimed at reducing the high concentration of access to natural resources and designing distributional policies beyond mere commodity rents (Sánchez-Ancochea, 2021). In this context, the exceptional redistributive capacity observed after the boom can be interpreted as a precursor to the austerity measures that weakened redistribution following the COVID-19 crisis.

6. Conclusion

This study analyses how income inequality in Ecuador has evolved over the last three decades. Previous studies on Ecuador base their findings on household surveys and lack information on the households at the top. Recent efforts to correct for these "missing rich" have covered short periods or used tax tabulations with no detailed individual information, probably underestimating the concentration at the top of the income distribution. This is the first study that combines survey and tax microdata, national accounts, and additional data sources to produce Distributional National Accounts for Ecuador, covering the period from 1990 to 2022. This new series addresses the underrepresentation of high-income households in surveys and accounts for 100% of income from national accounts. The methodological contribution of the study is the introduction of a novel integration method for merging survey and tax microdata, and the discussion of the political economy of inequality changes in a small primary goods exporting country.

I find that the distribution of income in Ecuador was highly unequal during the first years of the studied period, with extreme concentrations at the top. Despite improvements for lower-income groups, this concentration continues to persist in 2022. The share of income earned by the bottom 50% of the population increased from 2.6% in 1990 to 8.4% in 2022 for pretax income, and from 5.2% to 11.5% for posttax income. The middle 40% of the income distribution only insignificantly increased its share from 32% to 33% in pretax income in this period, with state interventions via taxes and transfers having a negligible net effect for posttax shares on this group. In contrast, the top 10% captured an impressive 65% of pretax income in 1990 and 58% in 2022. The top 1% accumulated 25% of income in 2022, while the top 0.001% (115

individuals) earned 2.4% of national pretax income. Redistribution policies were more effective in 2022 than in 1990, reducing the share from pretax to posttax income for the top 10% to 53%, for the top 1% to 21%, and for the top 0.001% to 2.0%. However, compared to other Latin American countries, Ecuador has the highest share of pretax and posttax income held by the top 0.1% in 2022.

Although this study is not designed for causal inference, it provides important insights into the relationship between institutional settings and income inequality. Drawing on the framework of Acemoglu and Robinson (2012) and Acemoglu and Robinson (2019), I interpret the commodity price elasticity of pretax income inequality and the redistributive effectiveness of state interventions as proxies for two core dimensions of institutional inclusiveness: the extent to which economic power and opportunities are broadly shared, and the presence of an effective redistributive state.

For the pre-dollarization period since 1990, the evidence points to features of extractive institutions in Ecuador, characterized by a concentration of economic power — as reflected in the disproportionate impact of falling commodity prices on higher-income groups — and limited state capacity for redistribution. During the economic recovery following the dollarization-induced shock in 2000, pretax income inequality remained stagnant, and the state continued to lack effective policies to reduce it. Even during the first phase of the commodity price boom (2004-2010), pretax income growth was still mainly captured by the top 10%, but taxes and social expenditures increased substantially – converting the stagnation of the bottom 90% into a real posttax income growth. In the second phase of the commodity price boom (2010-2014), the pro-poor and middle class pretax income growth in combination with an ever-increasing incidence of taxes and transfers suggest a switch towards an inclusive institutional equilibrium. Falling international prices (2015-2020) reduced the capacity for public intervention in the productive processes of the economy, but existing redistributional policies in place still managed to partially compensate for the pretax income loss of the bottom 50% with social benefits. After the COVID-pandemic, austerity measures weakened the effectiveness of taxes and transfers to reduce posttax income inequality, and pushed Ecuador again closer to an extractive institutional equilibrium.

The persistent concentration of pre- and posttax income at the top and the volatility of posttax income at the bottom raise the question about the limits of social expenditures and tax revenues as effective equality-enhancing tools. In a small primary-goods exporting country, as long as institutions lack universal opportunities and incentives (e.g., due to a weakly developed

diversification of the economy), the state capacity for redistribution will suffer the effects of international market unpredictability and price volatility. Further research could explore the role of productive diversification in resource-rich developing countries in reducing market income inequality.

Acknowledgments

I am grateful for advising and feedback on this work from [blinded for review]. I also thank [blinded for review] for research cooperation and data provision, and [blinded for review] for valuable comments on the manuscript.

Bibliography

Acemoglu, Daron and James A. Robinson (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Crown Business.

Acemoglu, Daron and James A Robinson (2019). "Rents and economic development: the perspective of Why Nations Fail". *Public Choice* 181, pp. 13–28.

Acosta, Alberto (2012). *Breve historia económica del Ecuador; Corporación Editora Nacional*. Quito: Corporación Editora Nacional.

Alesina, Alberto and Robert J Barro (2001). "Dollarization". *American Economic Review* 91.2, pp. 381–385.

Alvaredo, Facundo, Lydia Assouad, and Thomas Piketty (2019). "Measuring lnequality in the Middle East 1990–2016: The World's Most Unequal Region?" *Review of Income and Wealth* 65.4, pp. 685–711.

Alvaredo, Facundo, Denis Cogneau, and Thomas Piketty (2021). "Income inequality under colonial rule. Evidence from French Algeria, Cameroon, Tunisia, and Vietnam and comparisons with British colonies 1920–1960". *Journal of Development Economics* 152, p. 102680.

Amarante, Verónica (2016). "Income Inequality in Latin America: A Factor Component Analysis". *Review of Income and Wealth* 62.S1, S4–S21. eprint: `https://onlinelibrary.wiley.com/doi/pdf/10.1111/roiw.12236`.

Andersn, Asger Lau, Niels Johannsen, Mia Jørgensen, and José-Luis Peydró (2023). "Monetary Policy and Inequality". *The Journal of Finance* 78.5, pp. 2945–2989.

Assouad, Lydia (2023). "Rethinking the Lebanese economic miracle: The extreme concentration of income and wealth in Lebanon, 2005–2014". *Journal of Development Economics* 161, p. 103003.

Assouad, Lydia, Lucas Chancel, and Marc Morgan (2018). "Extreme Inequality: Evidence from Brazil, India, the Middle East, and South Africa". *AEA Papers and Proceedings*. Vol. 108, pp. 119–23.

Atkinson, Anthony B (2007). "Measuring top incomes: methodological issues". *Top incomes over the twentieth century: A contrast between continental European and English-speaking countries*, pp. 18–42.

Bach, Stefan, Charlotte Bartels, and Theresa Neef (2020). "Distributional National Accounts: A Macro-Micro Approach to Inequality in Germany". *Measuring and Understanding the Distribution and Intra/Inter-Generational Mobility of Income and Wealth*. University of Chicago Press.

Bartels, Charlotte and Maria Metzing (2019). "An integrated approach for a top-corrected income distribution". *The Journal of Economic Inequality* 17.2, pp. 125–143.

Bhattacharyya, Sambit and Jeffrey G. Williamson (2016). "Distributional Consequences of Commodity Price Shocks: Australia Over A Century". *Review of Income and Wealth* 62.2, pp. 223–244.

Blanchet, Thomas, Lucas Chancel, Ignacio Flores, and Marc Morgan (2020). "Distributional National Accounts (DINA) guidelines: Concepts and methods used in the World Inequality Database". *updated and extended version of the DINA Guidelines first published as WID Working Paper 2016/2*.

Blanchet, Thomas, Lucas Chancel, and Amory Gethin (2022a). "Why is Europe more equal than the United States?" *American Economic Journal: Applied Economics* 14.4, pp. 480–518.
Blanchet, Thomas, Ignacio Flores, and Marc Morgan (2022b). "The weight of the rich: improving surveys using tax data". *The Journal of Economic Inequality* 20.1, pp. 119–150.
Blanchet, Thomas, Juliette Fournier, and Thomas Piketty (2022c). "Generalized pareto curves: Theory and applications". *Review of Income and Wealth* 68.1, pp. 263–288.
Cachanosky, Nicolás, Alexander W Salter, and Ignacio Savanti (2022). "Can dollarization constrain a populist leader? The case of Rafael Correa in Ecuador". *Journal of Economic Behavior & Organization* 200, pp. 430–442.
Cano, Liliana (2015). *Income mobility in Ecuador: New evidence from individual income tax returns*. Vol. 2015. UNU-WIDER.
Chancel, Lucas, Denis Cogneau, Amory Gethin, Alix Myczkowski, and Anne-Sophie Robilliard (2023). "Income inequality in Africa, 1990–2019: Measurement, patterns, determinants". *World Development* 163, p. 106162.
Chancel, Lucas and Thomas Piketty (2019). "Indian Income Inequality, 1922-2015: From British Raj to Billionaire Raj?" *Review of Income and Wealth* 65, S33–S62.
Chatterjee, Aroop, Léo Czajka, and Amory Gethin (2021). "Can Redistribution Keep Up with Inequality? Evidence from South Africa, 1993-2019". *World Inequality Lab – Working Paper N° 2021/20*.
Clementi, Fabio and Mauro Gallegati (2005). "Pareto's law of income distribution: Evidence for Germany, the United Kingdom, and the United States". *Econophysics of wealth distributions*. Springer, pp. 3–14.
De Rosa, Mauricio, Ignacio Flores, and Marc Morgan (2024). "More unequal or not as rich? Revisiting the Latin American exception". *World Development* 184, p. 106737.
Flechtner, Svenja and Martin Middelanis (2024). "The role of the commodity price boom in shaping public social spending: Evidence from Latin America". *World Development* 182, p. 106717.
Flores, Ignacio, Claudia Sanhueza, Jorge Atria, and Ricardo Mayer (2020). "Top Incomes in Chile: A Historical Perspective on Income Inequality, 1964–2017". *Review of Income and Wealth* 66.4, pp. 850–874.
Gachet, Ivan, Diego F Grijalva, Paúl A Ponce, and Damián Rodríguez (2019). "Vertical and horizontal inequality in Ecuador: The lack of sustainability". *Social Indicators Research* 145, pp. 861–900.
Garbinti, Bertrand, Jonathan Goupille-Lebret, and Thomas Piketty (2018). "Income inequality in France, 1900–2014: evidence from distributional national accounts (DINA)". *Journal of Public Economics* 162, pp. 63–77.
Gudynas, Eduardo (2018). "Extractivisms: Tendencies and consequences". *Reframing Latin American Development*. Routledge, pp. 61–76.
Jameson, Kenneth P (2003). "Dollarization in Latin America: Wave of the future or flight to the past?" *Journal of economic issues* 37.3, pp. 643–663.
Kim, Dong-Hyeon and Shu-Chin Lin (2018). "Oil abundance and income inequality". *Environmental and Resource Economics* 71, pp. 825–848.
Koutentakis, Franciscos and Kostas Chrissis (2020). "Top Income Shares in Greece From Dictatorship to Crisis: 1967–2017". *Review of Income and Wealth*.
Leamer, Edward E, Hugo Maul, Sergio Rodriguez, and Peter K Schott (1999). "Does natural resource abundance increase Latin American income inequality?" *Journal of Development Economics* 59.1, pp. 3–42.
Ledić, Marko, Ivica Rubil, and Ivica Urban (2024). "Using tax records to correct for underrepresentation of top income sources in surveys". *Fiscal Studies* Contributed Paper, pp. 1–21.
Levy-Yeyati, Eduardo (2021). "Financial dollarization and de-dollarization in the new millennium". *Documento de Trabajo. Universidad Torcuato Di Tella. Escuela de Gobierno*.
Llerena-Pinto, Freddy, M Cristhina Llerena-Pinto, and M Andrea Llerena-Pinto (2015). *Social Spending, Taxes and Income Redistribution in Ecuador*. Tech. rep. Tulane University, Department of Economics.
Lustig, Nora (2020). "The "Missing Rich" in Household Surveys: Causes and Correction Approaches". *ECINEQ Working Paper Series 2020 520* 520, pp. 1–37.
Masi, Tania, Antonio Savoia, and Kunal Sen (2024). "Is there a fiscal resource curse? Resource rents, fiscal capacity and political institutions in developing economies". *World Development* 177, p. 106532.
Mayoral, F.M. and M. Nabernegg (2015). "Social spending in Latin America 1990-2010: A study of its determinants and a convergence analysis". *Revista de Economia Mundial* 2015 (40).

Mideros, Andrés and Franziska Gassmann (2021). "Fostering social mobility. The case of the Bono de Desarrollo Humano in Ecuador". *Journal of Development Effectiveness* 13.4, pp. 385–404.
Mohtadi, Soran and David Castells-Quintana (2021). "The distributional dimension of the resource curse: Commodity price shocks and income inequality". *Structural Change and Economic Dynamics* 59, pp. 63–78.
Mumtaz, Haroon and Angeliki Theophilopoulou (2017). "The impact of monetary policy on inequality in the UK. An empirical analysis". *European Economic Review* 98, pp. 410–423.
Novokmet, Filip, Thomas Piketty, and Gabriel Zucman (2018). "From Soviets to oligarchs: inequality and property in Russia 1905-2016". *The Journal of Economic Inequality* 16.2, pp. 189–223.
Özyurt, S and S Cueva (2020). "Twenty years of official dollarization in Ecuador: a blessing or a curse?" *Agence Française de Développement–Macroéconomie et développement, Working paper No. 31*.
Piketty, Thomas and Emmanuel Saez (2003). "Income inequality in the United States, 1913–1998". *The Quarterly journal of economics* 118.1, pp. 1–41.
Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman (2019). "Simplified Distributional National Accounts". *AEA Papers and Proceedings* 109.
Ponce, Juan (2011). "Desigualdad del ingreso en Ecuador: un análisis de los años 1990s y 2000s". *Documento de trabajo. Quito, Ecuador: FLACSO-Sede Ecuador*.
Ponce, Juan and Rob Vos (2014). "Redistribution without structural change in Ecuador: rising and falling income inequality in the 1990s and 2000". *Falling Inequality in Latin America. Policy Changes and Lesson, Oxford, United Kingdom*.
Quispe-Agnoli, Myriam and Elena Whisler (2006). "Official dollarization and the banking system in Ecuador and El Salvador". *Economic Review-Federal Reserve Bank of Atlanta* 91.3, p. 55.
Rinehart, Chloe S. and James W. McGuire (2017). "Obstacles to Takeup: Ecuador's Conditional Cash Transfer Program, The Bono de Desarrollo Humano". *World Development* 97, pp. 165–177.
Rossignolo, Dario, Nicolas Oliva, and Nestor Villacreses (2016). "Cálculo de la concentración de los altos ingresos sobre la base de los datos impositivos". *CEPAL: Serie Macroeconomia del Desarrollo* (184).
Soto, Raimundo (2009). "Dollarization, economic growth, and employment". *Economics letters* 105.1, pp. 42–45.
Sánchez-Ancochea, Diego (2021). "The surprising reduction of inequality during a commodity boom: what do we learn from Latin America?" *Journal of Economic Policy Reform* 24.2, pp. 95–118.
Tullock, Gordon (1967). "The welfare costs of tariffs, monopolies, and theft". *Western Economic Journal* 5.3, pp. 224–232.
Ubasart-González, Gemma and Analía Mara Minteguiaga (2022). "State transformations and welfare models: the significance of the return of public institutions in Ecuador of the Citizen Revolution (2007–2017)". *International Journal of Sociology and Social Policy* 42.1/2, pp. 23–41.
Williamson, Jeffrey G (2013). *Trade and poverty: when the Third World fell behind*. Cambridge, MA: MIT press.
Williamson, Jeffrey G. (2015). "Latin American Inequality: Colonial Origins, Commodity Booms or a Missed Twentieth-Century Leveling?" *Journal of Human Development and Capabilities* 16.3, pp. 324–341.
Zwijnenburg, Jorrit, Sophie Bournot, David Grahn, and Emmanuelle Guidetti (2021). "Distribution of household income, consumption and saving in line with national accounts: Methodology and results from the 2020 collection round". *OECD Statistics Working Papers 2021/01 No. 108*.

APPENDIX

Appendix A Supplementary information on data and methodology

A.1 Characteristics of data sources

This study combines three types of data: national accounts, survey microdata, and tax microdata. Each data source offers unique advantages and disadvantages, as summarized in table A.1. First, national accounts provide a benchmark for the total income of each income component, institutional sector, and year, and therefore comprehensively represent the income of the entire economy. However, their level of disaggregation is limited. Second, microdata from nationally representative household surveys contain information on household and individual incomes from major income sources, covering most of total income up to a certain point in the distribution (e.g., the lower 90%, or group A in the table), but lack information for the richest households (group B in the table). Household surveys usually include tens of thousands of observations featuring a high level of disaggregation and additional contextual variables beyond income. Finally, administrative records, such as tax registers, complement survey data by providing detailed information on higher-income individuals (group B), who are often underrepresented in household surveys. Tax microdata, while not covering the lower deciles of the income distribution (group A), offer detailed data on individual incomes, particularly for formal employees, business owners, and those declaring property income. Tax records are valuable for constructing income profiles of the wealthiest individuals in the country,[23] offering a high level of disaggregation at the individual level and sometimes including contextual variables from tax declarations or integrated registers.

However, these three data sources also have limitations, such as changes in methodologies and missing information, especially when studied over an extended period. The following subsections describe the preparation of these sources to make them compatible with the Distributional National Accounts (DINA) methodology, ensuring a comprehensive and accurate analysis of income distribution in Ecuador:

National accounts: The Ecuadorian Central Bank (*Banco Central del Ecuador, BCE*) publishes the "Cuadros Economicos Integrales", which contain national accounts following the United Nations' System of National Accounts SNA (United Nations, 2009) for the years 2007-

[23] Some studies include information from rich lists to try to cover a very reduced number of individuals at the top, but this information is primarily used to correct wealth inequality, and scarcely for income inequality estimates (Alvaredo et al., 2019).

Table A.1: Strengths and limitations of data types

Data type	Example	Completeness/ representativeness	Level of disaggregation	Context information
Macro aggregate	National accounts, Input-Output tables	high	low	low
Household survey	Labor market surveys, Expenditure surveys	middle (high for group A, low for group B)	high	high
Administrative record	Tax record, Social security records, Social assistance records	middle (high for group B, low for group A)	high	middle

Note: The table presents strengths and limitations of different data sources. Groups in column *Completeness/representativeness* can be interpreted as follows: Group A covers low and middle income observations, while group B covers high income observations.

2022.[24] These tables contain the internationally standardized income components for all institutional sectors. For the years before 2007, the BCE only publishes macro-aggregates (GDP, GNI) without detailed information on institutional sectors and income components (BCE, 2012).[25] Additionally, during the process of updating the national accounts, the BCE changed the fixed reference year from 2007 to a mobile reference year starting in 2018. For the years 2018-2020, both series (the fixed base year 2007 and the mobile reference year) are available. To disaggregate total GNI for the years before 2007. I use two additional sources: the remittances statistics published in BCE (2001) (1989-2000) and online (2001-2022);[26] and the "Details of Tax Revenue" dataset from the OECD.[27] The harmonization of these different sources to produce a series for detailed national account items is elaborated in section A.2.

Household surveys: The National Statistical Office of Ecuador (*Instituto Nacional de Estadistica y Censos*, INEC) has conducted the National Employment Survey (*Encuesta Nacional de Empleo, Desempleo y Subempleo*, ENEMDU) under different names since 1989 (Ponce and Vos, 2014). This study primarily relies on this long-term survey as a key source of household income data. However, it is important to note that the survey's coverage and methodologies have evolved over this long period. Initially, the definitions and disaggregations related to income concepts were less clear, and the questionnaires were relatively brief in the 1990s. Since

[24]Retrieved from https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Catalogo/CuentasNacionales/Anuales/Dolares/indicecn1.htm (years 2007-2020) and https://contenido.bce.fin.ec/documentos/informacioneconomica/cuentasnacionales/ix_cuentasnacionalesanuales.html (years 2018-2022).

[25]Retrieved from https://contenido.bce.fin.ec/documentos/PublicacionesNotas/Catalogo/CuentasNacionales/Anuales/Dolares/indicecn1.htm

[26]Retrieved from https://contenido.bce.fin.ec/documentos/Estadisticas/SectorExterno/BalanzaPagos/Remesas/indice.htm.

[27]Retrieved from https://data-explorer.oecd.org/vis?tenant=archive&df[ds]=DisseminateArchiveDMZ&df[id]=DF_REV&df[ag]=OECD&dq=...&lom=LASTNPERIODS&lo=5&to[TIME_PERIOD]=false&vw=tb.

2003, the survey has employed more detailed questionnaires, which have enhanced the clarity and depth of the data collected. Despite these changes, all significant income items have been consistently included in the survey from its inception. The coverage of total household income in the national accounts was approximately 40% in the early years, increasing to around 50% in the last decade. This level of coverage is considered reasonable for the purposes of this study.

Second, the abolition of the Sucre as Ecuador's currency presents a challenge on the comparability of *absolute* income of households for the years around 2000. The period was marked by galloping inflation and significant discrepancies between Ecuador's official and unofficial exchange rates, particularly in the late 1990s. These factors complicate comparisons of household income, especially between 1999 and 2000.[28] While these economic conditions introduce volatility in absolute income comparisons for the years around 2000, they do not necessarily affect the comparison of income *distribution*. To ensure general comparability across the entire series, I use the official national accounts series in US$ and the official exchange rates to standardize the data before and after the currency change.

Third, the ENEMDU survey is nationally representative for most years, but from 1990 to 1999 and again in 2002, it only includes data from urban areas. This lack of rural data poses challenges for comparing the series before and after 2000, despite most income being generated in urban areas, particularly at the top income levels. To address this issue, I use data from of a second survey in Ecuador, the Living Condition Survey (*Encuesta de Condiciones de Vida*, ECV, INEC, 2015). The survey was conducted in the years 1995, 1998, 1999, 2006 and 2014 and contains information on both urban and rural households. The ECV contains similar income-related questions to those in the primary ENEMDU survey, allowing to construct pre-tax household income for all income fractiles (percentiles 1 to 99 and smaller shares for the top percentile) for the years 1995, 1998, 1999, and 2006, and therefore to derive the share of rural individuals within each fractile.[29] To estimate rural population shares for the years 1990-2002, I use the 1995 shares for the years 1990-1995 and interpolate the years between 1995 and 2002 using data from 1995, 1998, and 2006. For 2002, the rural shares are interpolated from ENEMDU data from 2001 and 2003, as both these years already include rural households. Figure A.1 illustrates that the participation of rural population is generally lower for higher income

[28] The exchange rate Sucre-US$ increased from 7.000 in January to almost 18.000 in December of 1999, and was finally frozen at 25.000 in January 2021 (`https://www.bce.fin.ec/cotizaciones`). Accumulated inflation in 1999 was 60.7% (`https://www.ecuadorencifras.gob.ec/historicos-ipc/`.

[29] Results for income from 1999 deviate sharply from results in 1998 and 2006, likely caused by difficulties in the collection during the currency change. I therefore exclude the 1999 ECV survey from the series.

fractiles in both surveys.[30] By multiplying the weight of each observation in the ENEMDU survey with the share derived from the ECV, the ENEMDU survey is corrected for the missing rural population. For example, if the rural share in fractile 50 in the ECV is 30%, I adjust the weights of observations in fractile 50 in the ENEMDU by a factor of 1.3. Figure A.2 illustrates the series of share of rural population.

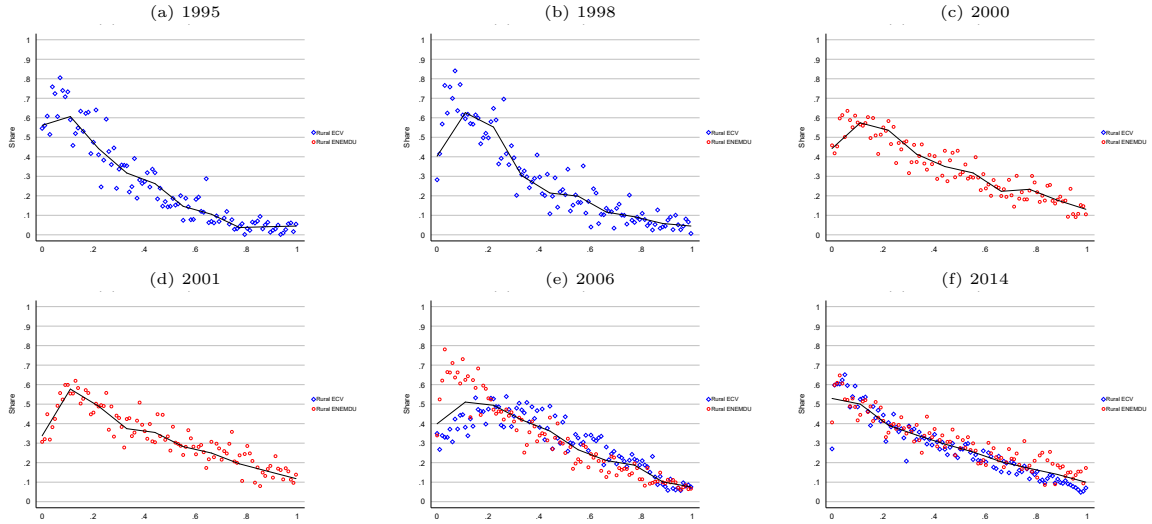
Fourth, the ENEMDU survey does not account for imputed owner-occupied rents (income concept B2R1 in national accounts), a notional income source that is crucial for making national accounts comparable across countries. For many Ecuadorian households, particularly in rural areas, imputed rents represent a significant portion of their total income, even though they are notional. Therefore, including this income source is essential for accurate national income estimates (see figure A.3). To address this lack of information, I utilize data from the ECV survey, which includes information on imputed rents for the years 1995, 1998, 1999, 2006, and 2014. I first derive absolute values of imputed rents by fractile[31] for these years. Then, I interpolate and extrapolate these values for all years between 1990 and 2022. For the years before 1995 and after 2014, I maintain the share of imputed rents in total pretax household income and adjust the absolute values according to the growth rates of income. This approach was chosen over a pure extrapolation method, which appeared problematic, particularly for the period before 1995 (see figure A.4).

Tax records: Initially, tax collection in Ecuador was handled by the Ministry of Finance, which had limited administrative capacity and was highly susceptible to corruption. Significant improvements in tax administration only began in the early 1990s, following a series of legal reforms (Arias et al., 2008). Greater autonomy granted in 1994 and the establishment of the *Servicio de Rentas Internas* (SRI) in 1997 were pivotal in enhancing tax collection efficiency, more than doubling revenues from less than US$600 million to almost US$1.5 billion between 1990 and 1998. Throughout the study period, Ecuador implemented several tax reforms in response to changing economic conditions. For instance, the deteriorating macroeconomic environment in the late 1990s prompted short-term measures, such as the introduction of a tax on the circulation of capital (*Impuesto a la Circulacion de Capitales*, ICC) in December 1998 replacing the income tax. However, this measure was discontinued after just twelve months.

[30] Note that in later years the rural population share is highest around the percentile 20. This shift indicates that - at least looking at income from household surveys - over time more urban households belong to the poorest income groups.

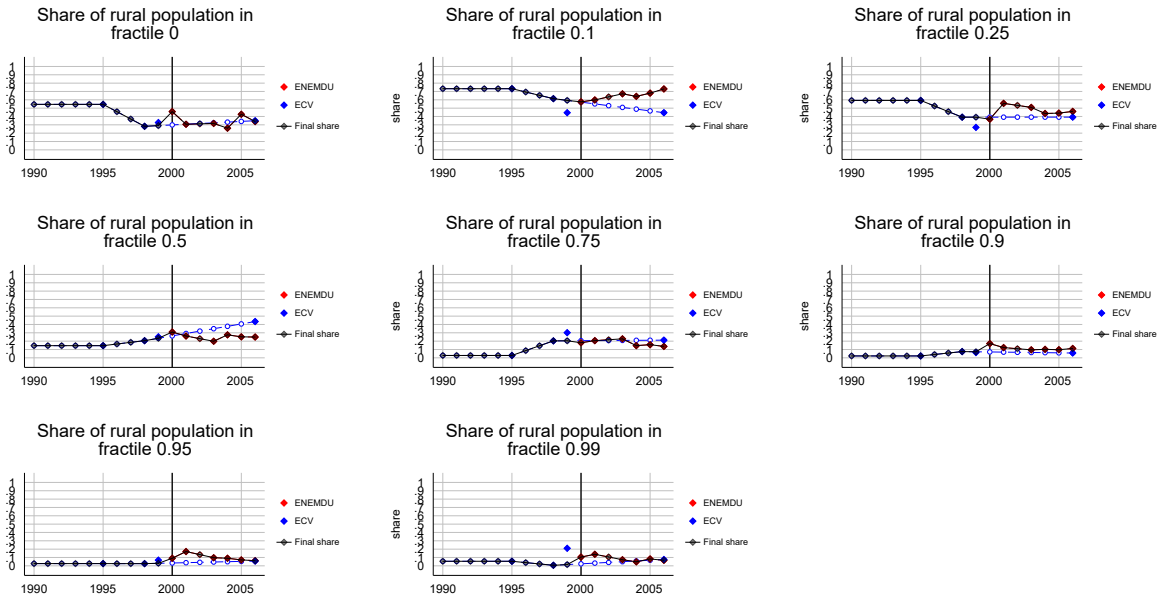
[31] Fractiles in the ECV survey are calculated excluding imputed rents, to ensure comparability with pretax household income fractiles from ENEMDU.

Figure A.1: Rural population shares 1995-2014 (ENEMDU and ECV)



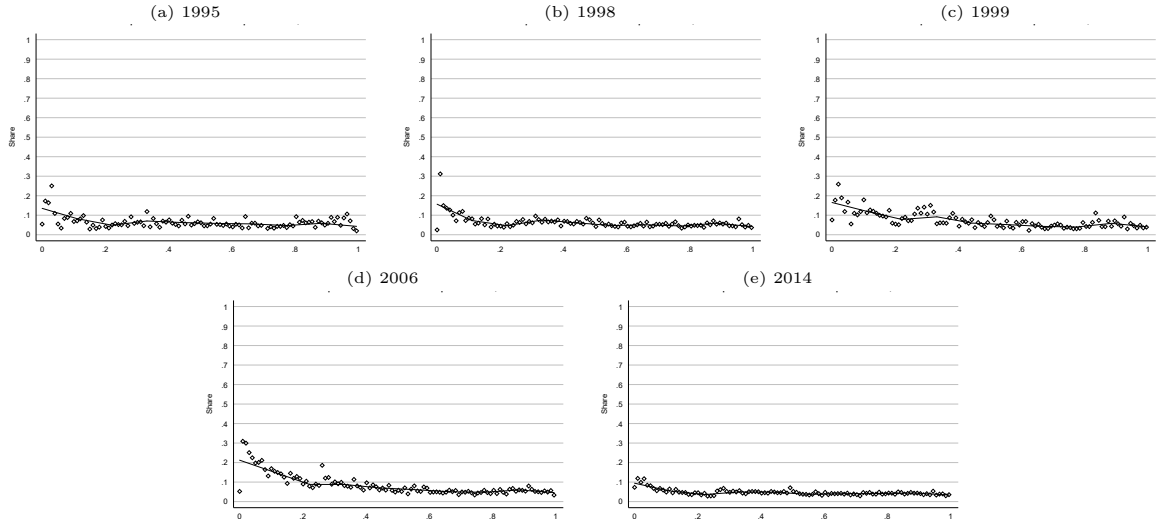
Note: Dots indicate population share from rural area in each fractile.
Source: ENEMDU, ECV.

Figure A.2: Comparison: Share of rural population series for fractiles



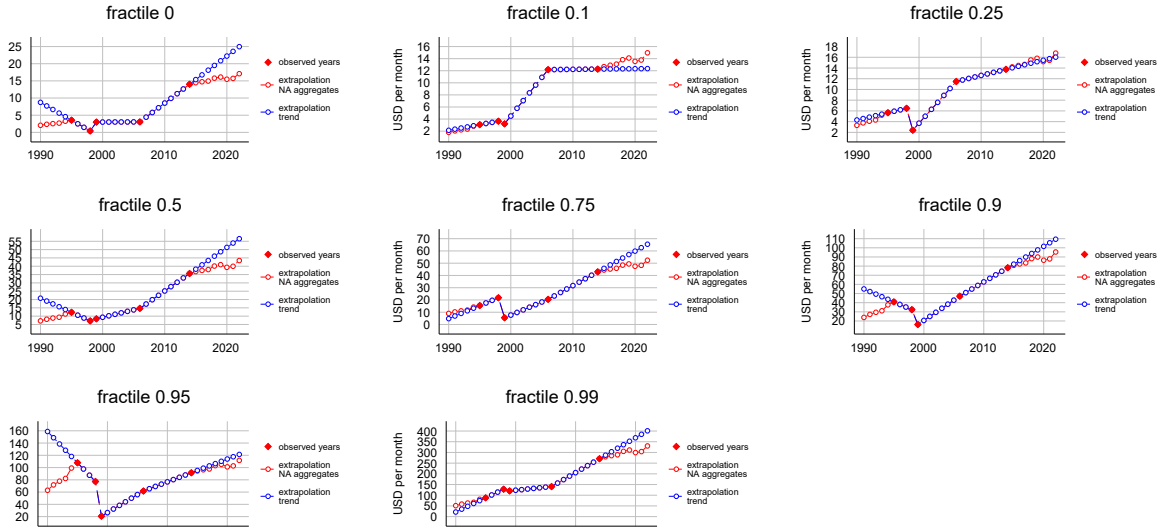
Note: The figures indicate the share of rural populations for different fractiles. The ENEMDU survey (red lines) collected information for rural households in 2000, 2001, and from 2003 on, while the ECV survey (blue dots) collected rural information in all rounds (1995, 1998, 1999, 2006, and 2014). Blue bordered series are inter- and extrapolations from the ECV survey, and the gray series is the final rural population series per fractile.
Source: Own elaboration based on ECV and ENEMDU.

Figure A.3: Share of imputed rents per fractile



Note: The figures represent the importance of imputed rents in pretax household income for different years (rounds of the ECV survey) across different fractiles.
Source: ECV.

Figure A.4: Imputed rents in US$ (monthly) for fractiles



Note: The figures indicate imputed rents in US$ for different fractiles and years. Red solid dots are observed years from the ECV survey. Blue open dots represent interpolations and trend extrapolations, while red open dots illustrate extrapolations based on the trend of national accounts aggregates.
Source: Own elaboration based on ECV and BCE.

Despite representing a significant shift in the tax structure, the fiscal impact was moderate: income and wealth taxes accounted for 30% of overall tax revenues on average in the years 1995-1998, while the ICC contributed 35% in 1999 (Ramírez and Carrillo Maldonado, 2020). Following dollarization, the share of income tax in total tax revenue recovered gradually from 25% to 32% in 2007. With the Constitution of 2008 entering into force, tax policies were focused on a more progressive income tax collection (progressive income tax scale, targeted incentives and benefits, stricter tax controls, etc.). These measures increased the contribution of income taxes to over 35% of total tax revenues after the Global Financial Crisis (Ramírez and Carrillo Maldonado, 2020).[32]

Given these ruptures in tax policies and the increasing capacity of tax collection, it is crucial to assess the content and quality of statistical information derived from individual tax records before incorporating them into this study. The first electronic and digitized income tax declarations date back to 2004. Since then, individuals have either declared exclusive labor income using tax form 107 or their comprehensive income—including labor, capital, mixed income, inheritance, etc.—using tax form 102. The SRI consolidates these forms using the individual identifying tax number (*Registro Unico de Contribuyente*, RUC), and maintains a rigorous conversion matrix for all subsequent years to account for changes in tax forms. This approach allows for the consistent construction of income items for the entire period from 2004 to 2022. However, the quality of the digitized information in the initial years following the introduction of digital tax declarations likely suffers from significant quality issues. The sharp increase in the number of declarations between 2004 and 2008 suggests that the observed data may be more reflective of improvements in tax administration rather than actual economic developments. Cano (2015, p. 11) notes that changes in income inequality patterns before 2007 were mainly to "a reinforcement of tax collection and [to] an expansion of the fiscal data, rather than by an increase in income inequality". For the years 1990-2003, no tax database or tax tabulations exist. I therefore use tax microdata for the years 2008-2022, and assume that the income distribution of tax declaration remained constant from 1990 to 2007, using the structure observed in 2008 as the baseline.

This assumption takes the share of income covered by the tax dataset in 2008 (41.2% of pretax household sector income) and the composition of wage, property and other incomes and imputes these constant shares for the years before 2008. As a result, the integration of survey and tax

[32]The share is higher if the tax on outward foreign-exchange transfers (*Impuesto a la Salida de Divisas*, ISD), introduced in 2009, is excluded. This tax accounted for up to 10% of total tax revenue in 2012, but was gradually reduced since 2019.

data (see section A.4) will primarily reflect differences in distribution driven by household surveys and changes in national accounts totals. To ensure robustness, I also consider tax declarations from 2004 to 2007, using the 2004 data as a starting point for extrapolation back to 1990-2003 (see section B). This robustness check addresses the possibility that the increase in total tax revenue during these early years was not only caused by data quality increases but by a real economic phenomenon.

A.2 National accounts series

For the purposes of this study, the information from the Ecuadorian Central Bank (BCE) regarding national accounts can be categorized into three distinct periods:

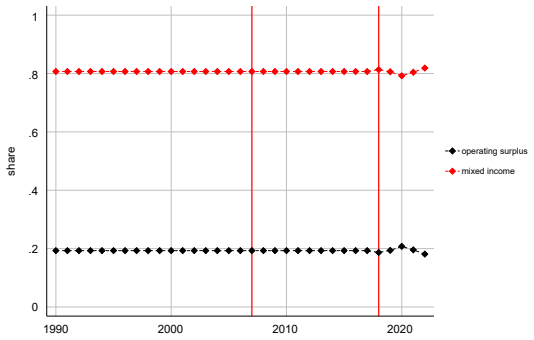
2007-2020: The period from 2007 to 2020 represents the longest span with a consistent methodological base in the national accounts, using 2007 as the fixed base year. This "fixed series" provides detailed information for the institutional sectors (households, government, financial/non-financial corporations, rest of the world), and dissagregations of the different income items. However, the BCE only published disaggregations for the years 2017 to 2020, prior to the change of the base year.

2018-2022: In 2021, the BCE introduced a significant update to the national accounts, implementing a new base year methodology that transitioned from a fixed base year approach to a "mobile series" that creates a new base for each year (BCE(2023)). For consistency with the longer 2007-2020 series, I use the traditional GDP and GNI totals that were produced simultaneously for the years 2018-2020 and published by the BCE, and the totals from the World Development Indicators (WDI) for 2021-2022, when the BCE ceased publishing comparable numbers.[33] This approach ensures that the structure of institutional sectors and income items from the "fixed series" is applied to total national income, allowing for comparisons with the 2007 base year. One advantage of the new series is the increased disaggregation for certain items, such as operating surplus and mixed income (see figure A.5 (a)). Notable changes include an increase in employers' social contributions as a share of total compensation of employees (see figure A.5 (b)), and a shift in the importance of interest income relative to distributed income from corporations within the property income component, a trend that began in 2015, as illustrated in figure A.5 (c)).

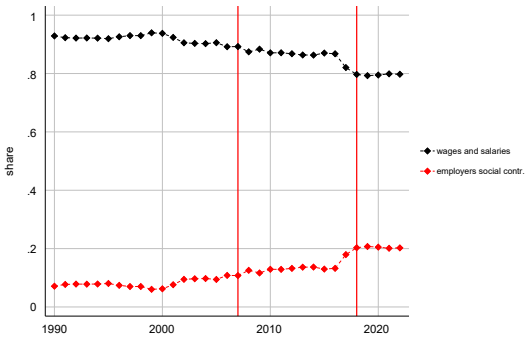
[33]The numbers from the WDI allign with BCE figures for the series 1990-2020. It is therefore assumed that the WDI figures for 2021 and 2022 were estimated using meethod from the "fixed series".

Figure A.5: Comparison of income components in three periods

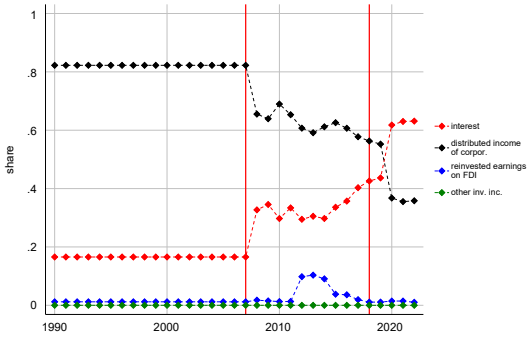
(a) Allocation of operating surplus and mixed income (household sector)



(b) Allocation of compensation of employees (household sector)



(c) Allocation of property income (household sector)



Note: The figures indicate the evolution of relevant income components in the household sector (S14). For the years before 2007, the composition of 2007 is extrapolated. In 2018, the BCE updated the national accounts methodology and changed to a mobile base year method.
Source: BCE

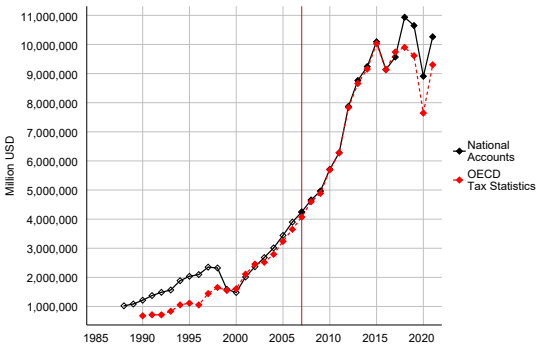
1990-2007: For the years before 2007, the BCE published only aggregate figures for GDP and GNI. To develop disaggregated indicators for these years, three main steps are undertaken:

- **Reproducing Component Ratios**: The relative sizes of each component and sector from the year 2007 are applied to the years prior to 2007. This involves using the sectoral and income component breakdowns from 2007 as a reference to estimate the distribution of income components for earlier years.
- **Adjusting with OECD Data**: OECD tax data, available since the 1980s, is used to adjust the income items for direct and indirect taxes, as well as social contributions. The four subfigures in figure A.6 illustrate that for the years after 2007, national accounts and OECD datasets report similar levels of taxes and social contributions. This consistency supports the use of OECD data for the years before 2007. The importance of incorporating OECD data becomes evident in the years before 2000, where a simple extrapolation of 2007 tax and contribution shares would overestimate state intervention in the economy, especially in taxes on products and imports (subfigure (a)), taxes on income and wealth (subfigure (b)), institutional sectors (subfigure (c)), and social contributions (subfigure (d)).
- **Incorporating Remittances**: An additional adjustment is to account for the economic impact of remittances, especially significant after the 2000 crisis. Figure A.7 compares the income concept "other current transfers" (D7) and the foreign remittances statistics from the BCE. Following the 2000 crisis, remittances became a major income source for many Ecuadorian families.[34] The similarity between "other transfers" and remittances series, particularly around the pivotal year 2007, suggests that a significant portion of "other transfers" are remittances. The two sources report the same amount for the year 2000, but directly extrapolating the importance of "other transfers" from 2007 would overestimate remittances' role in the Ecuadorian economy. I therefore use the remittances series to extrapolate "other transfers" for years before 2007. The resulting discrepancy in total income, where less income is assigned to the household sector, is adjusted by reallocating it to the corporate sector, as the government sector has already been adjusted using OECD tax statistics.

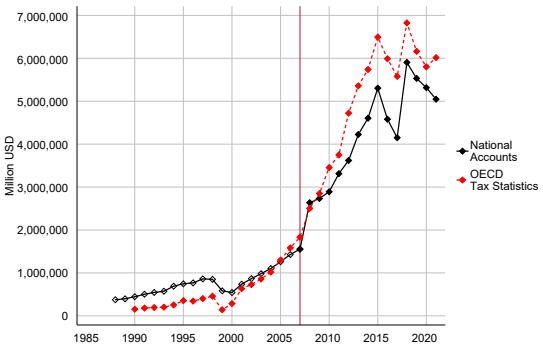
[34] Remittances arrived mainly from Spain, Italy, and the United States, and contributed up to almost 5% of national income after 2000 BCE (2001).

Figure A.6: Comparison retropolation and OECD tax database

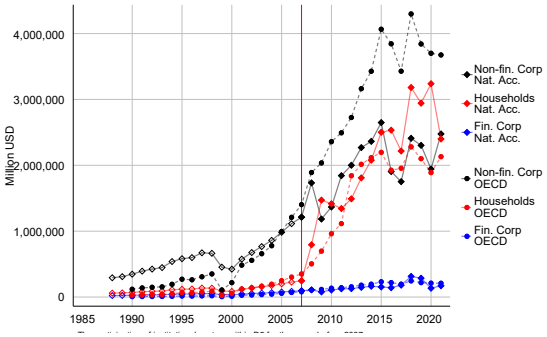
(a) Taxes on products and imports (D2).



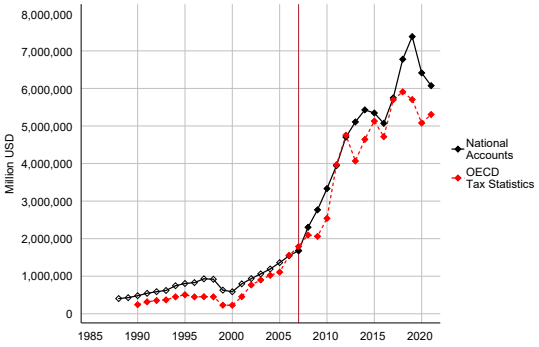
(b) Current taxes on income and wealth (million US$) (D5).



(c) Current taxes on income and wealth - different sectors (D5).

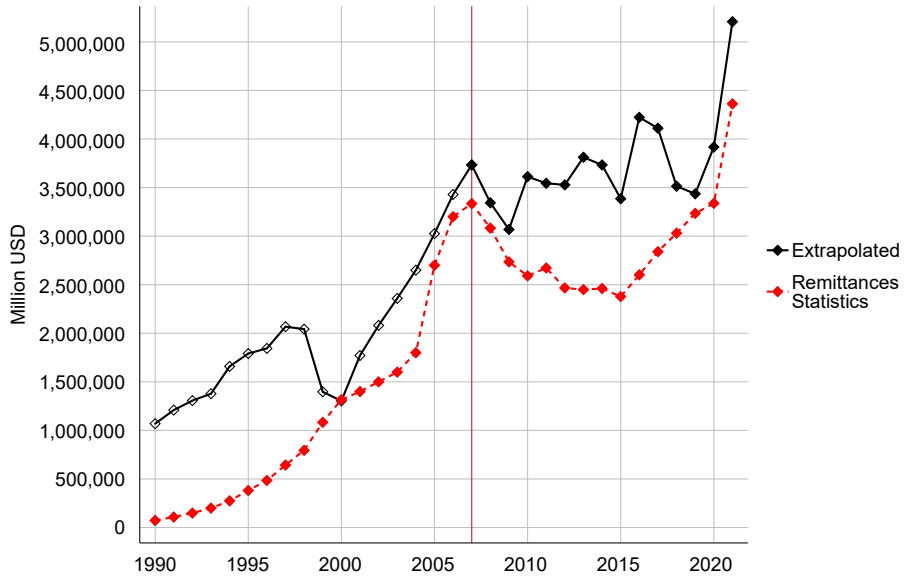


(d) Social contributions (to Gov. sector) (D61).



Note: The figure indicates different taxes and contributions from Ecuadorian national accounts (solid) and the OECD tax statistics (dashed). For national accounts the values before 2007 are extrapolated from the distribution of GDP of 2007.
Source: BCE, OECD

Figure A.7: Comparison: Remittances and other transfers received (household sector)



Note: The figure indicates the series of the remittances statistics from the BCE for all years (red), and the series for *other transfers* to the household sector (available since 2007), which includes remittances. The extrapolation for national accounts to years before 2007 overestimates remittances for years before 2000.
Source: BCE national accounts and BCE remittances statistics

A.3 DINA concepts

A.3.1 Unit of observation

In the benchmark scenario, the unit of observation is the individualistic adult, defined as individuals aged 20 years and older, consistent with the World Inequality Lab (WIL) definition (Blanchet et al., 2020). This approach aligns with the observation that nearly all income is earned by adults. Within households, there are two primary methods for distributing income: individualistic adult method, where each adult is considered separately, and income is attributed to individuals based on their own earnings; and equal-split adult method, where income is divided equally among all adult household members, regardless of their individual earnings. Ecuadorian tax declarations are filed individually, while household surveys provide detailed individual income data for each member together with the household structure information, therefore allowing for individual, narrow equal-split (spouses), broad equal-split (all adult members of the household), and per capita (all members, including children) income distribution.

Given the individualist tax register declarations, the individualistic adult is the starting point for the unit of observation. To account for certain income sources that are shared between members of the household I make use of one methodological improvement of this paper: the integration of the richest individuals from the tax register in the household structure of the survey (see assumptions for the integration of sources in section A.4). This method enhances the individualistic adult scenario and allows for the calculation of indicators for the equal-split adult scenario. However, some income sources primarily affecting the lower segments of the distribution cannot be fully attributed to individuals. For example, targeted transfers for low-income households or those with members with disabilities are often household-based and may not be directly received by the intended beneficiaries. Similarly, remittances reported at the household level in surveys might be distributed across the entire family or exclusively to children, depending on whether parents work abroad. In the benchmark scenario, the income is calculated for individualistic adults but social transfers and remittances are distributed equally among all adults within the household.

It is important to note that inequality indicators derived from the individualistic approach will, by construction, show higher levels of inequality compared to official indicators. Official measures of inequality are typically based on *per capita* calculations, where household income is distributed equally among all household members, regardless of their age.

Table A.2: Income concepts from the System of National Accounts (SNA)

Income component		N.A. code	sector
operating surplus	+	B2R	HH (S14)
mixed income	+	B3R	HH (S14)
wages and salaries	+	D11R	HH (S14)
property income received	+	D4R	HH (S14)
social benefits others than social transf.in kind	+	D62R	HH (S14)
other current transfers received	+	D7R	HH (S14)
pretax income of households	=	**PRTHHI**	**HH (S14)**

Income component		N.A. code	sector
operating surplus	+	B2R	HH (S14)
mixed income	+	B3R	HH (S14)
wages and salaries	+	D1R	HH (S14)
property income net	+	D4N	HH (S14)
primary income of households	=	**B5**	**HH (S14)**
primary income of corporations	+	B5	Corp. (S11+S12)
primary income of government*	+	B5	Gov. (S.13)
pretax factor income	=	**B5**	
other current transfers*	+	D7N	HH (S14)
social contributions	-	D61P	HH (S14)
social benefits others than social transf. in kind	+	D62R	HH (S14)
pretax national income	=	**PRTNI**	
net taxes on production (taxes - subsidies)	-	(D2-D3)	Gov. (S.13)
taxes on income and wealth	-	D5	HH (S14)
taxes on income and wealth	-	D5	Corp. (S11+S12)
posttax disposable income	=	**POTDI**	
collective consumption expenditure government	+	P32P	Gov. (S.13)
primary government surplus	+	(D2-D3)+D5-D63P-P32P	Gov. (S.13)
individual consumption government (=social transf. in kind)**	+	D63R	HH (S14)
posttax national income	=	**POTNI**	

Note: The table systematizes the calculation of different income aggregates. *Other current transfers is not part of pretax factor income by the definition of the SNA, but added due to the importance of remittances.
**The income from nonprofit institution serving households (NPISHs) represents only an insignificant share of national income (e.g., 0.4% in 2020), and is not represented as separate institutional sector in this table.
Source: United Nations (2009)

A.3.2 Income concepts

Table A.2 indicates the construction of the income variables used in this study. The integration process is applied exclusively to income from the institutional sector of the household (S14). To integrate the most comparable sources of income that are available in the survey and the tax register, the *pretax income of households* (PRTHHI) only aggregates positive income items from wage, labor, social benefits and transfers (including remittances). National income indicators extend beyond household income to include earnings from other sectors. *Pretax factor income* (PRTFI) adds the income from the corporate sector (S11+S12) and the government (S13) to the household sector income. *Pretax national income* (PRTNI) encompasses pretax factor income and additionally includes net remittances and the net of social benefits/contributions. *Posttax national income* (POTNI) further adjusts for taxes levied on households and the corporate sector, government expenditure, and social transfers in kind.

A.4 Integration of tax and survey data

The central methodological contribution of the paper – explained in the manuscript – is the integration of survey and tax microdata. Figure A.8 illustrates for the year 2022 which components have better coverage of income components, and the coverage compared to national accounts totals. The observable differences in the distributions of income from survey and tax data motivate the need for the correction of income, and to recover as much information as

possible from both sources.

A.4.1 The extended `bfmcorr` command

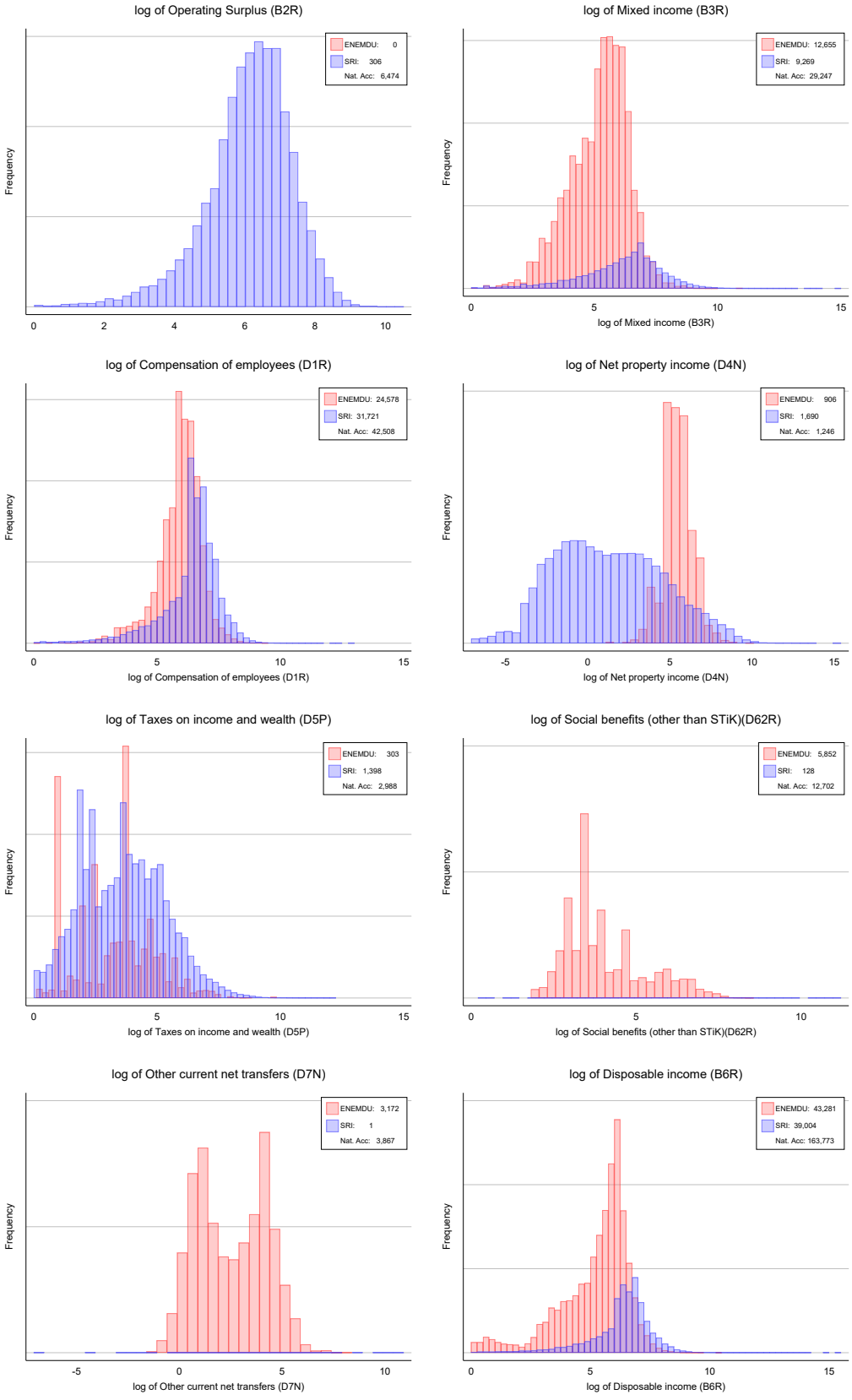
The aim of the proposed integration method is to reduce the disadvantages of existing methods and to exploit as much information as possible from the available sources. Instead of using interpolated synthetic microdata, I use the real tax microdata to replace the upper tail of the distribution. This replacement procedure is implemented by first reweighting the survey observations using the `bfmcorr` command. Subsequently, the weighted observations of rich households are expanded,[35] allowing the individuals residing in these households to be replaced by individual observations from the tax register. Up to this step the integration is exclusively undertaken on the individual level, meaning that the units of observation from the survey are individuals above the age of 20 years, and also tax declarations stem from individuals. The result of the integration procedure is observable in figure A.9, which exemplifies the procedure for the year 2022: The red histogram constitutes the log-distribution of the pretax household income from the survey, while the blue histograms reproduces the distribution from the integrated dataset, including the individuals from the tax register. By reducing the weight for the observations in the lower part of the distribution, the density for these income groups falls, while the introduced individuals from the tax register increase the density in the upper part of the distribution. Most importantly, the integrated distribution now includes observations with incomes that are out of the range in the survey.[36]

One critical assumption for integrating tax and survey data is the accuracy of maintaining the ranking order between individuals from both sources. This means that the "poorest" individual from the tax register replaces the "poorest" individual from the survey, and so on, up to the "richest" individual. This rank stability is essential for integrating individuals' income characteristics into the household structure in the survey. It assumes that demographic attributes (e.g., household size, age, and sex structure) are preserved and that the household composition of the wealthiest individuals in the survey aligns closely with that of their counterparts in the tax register. The credibility of this assumption depends on whether the household survey is representative for *demographic* characteristics of the entire population, including the "missing rich", and whether the richest individuals from the tax register have similar demographic char-

[35] For the case of Ecuador, one observation from the highest household income decile in the survey represents about 200 individuals.

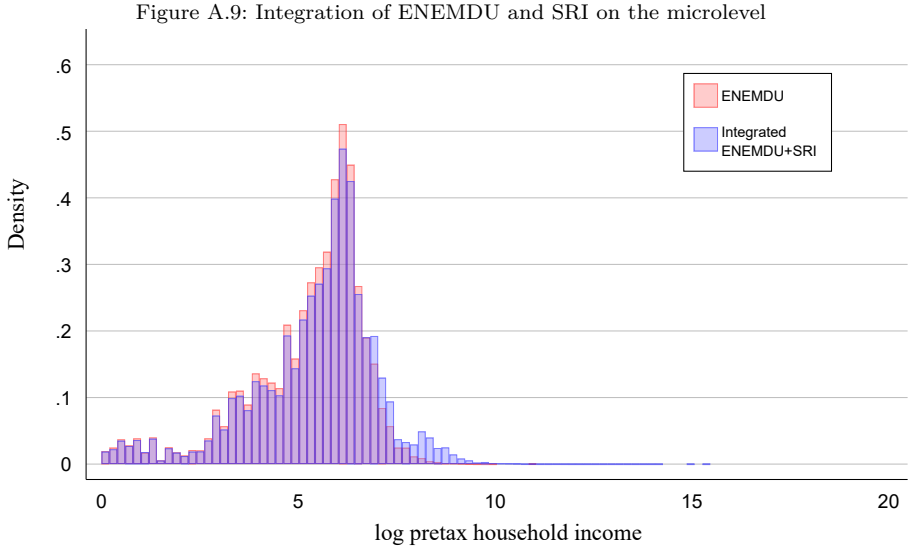
[36] Note that the highest incomes have values greater than log(15), which is more than 3.3 million US$ in absolute terms and little increases in this histogram mean huge increases in absolute terms (log(17) is almost 25 million US$).

Figure A.8: Histograms for ENEMDU and SRI for different income components (2022)



Note: Figures present histograms for the log-distribution of different income components in the ENEMDU survey (red) and the tax register (blue) in 2022. The legend also indicates the coverage of each component in US$ in both sources and in the national accounts totals.
Source: Own elaboration based on ENEMDU, SRI, and BCE.

Figure A.9: Integration of ENEMDU and SRI on the microlevel



Note: The histogram plots the log-distribution of pretax household income in 2022 for the original household survey (ENEMDU, red) and the integrated dataset (blue). The density for observations at the bottom and the middle of the distribution decreases, the density at the top increases, and top-incomes report more extreme incomes with the integration procedure.
Source: Own elaboration based on ENEMDU and SRI.

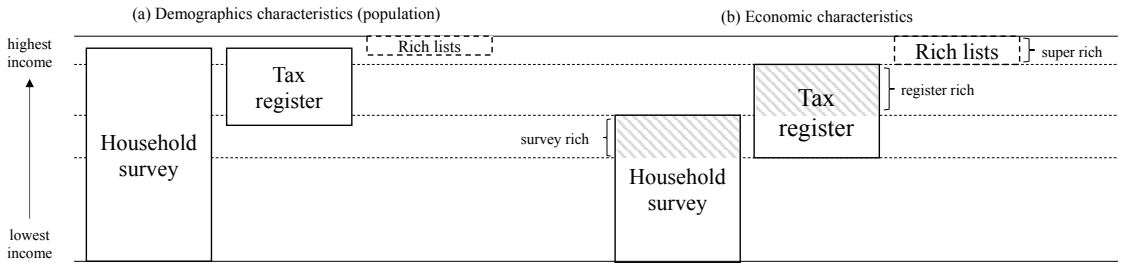
acteristics as the rich individuals from the survey.[37] For the case of Ecuador, demographic characteristics have relatively narrow boundaries: While average household size decreases from more than 5 members in decile one to slightly above 3 members in decile seven for the year 2022, this number fluctuates between 2.5 and 3 members for the highest two deciles. The share of households with female household heads also slightly increases with income from 22% to 25%, but remains at this level for the highest deciles. Finally, the survey covers the entire geographic area of Ecuador, which supports the assumption that the tax rich live in areas where also the survey rich were enumerated (mainly the major cities).

Figure A.10 exemplifies the representativeness of demographic characteristics in subfigure (a), and of economic characteristics in subfigure (b). A considerable part of the upper *income* distribution is not represented in the survey, indicated by the modest height of the household survey box in subfigure (b). Next to the household survey, the tax register box indicates an overlapping part between both sources for the survey rich, and a part which is only covered by the tax register (register rich). However, in terms of demographic characteristics, the box in subfigure (a) illustrates higher representativeness for income strata that are not captured by the survey. The tax register box therefore overlaps for these characteristics with the survey.

Another crucial step for the integration is to determine the point at which observations from the tax register replace the survey observations. Flachaire et al. (2023) apply simulations for

[37] See figure A.10 for an illustration of the representativeness of economic and demographic characteristics.

Figure A.10: Demographic and economic coverage of data sources



Note: Subfigure (a) illustrates the coverage of demographic characteristics of the entire population in different data sources. The household survey is designed to capture these characteristics to a great extent. In subfigure (b) the economic characteristics of the entire population are partially covered in the survey, given limitations of undercoverage and underreporting. The inclusion of the tax register increases this coverage. In both cases a lack of information remains for the super-rich. *Source:* Own elaboration.

Uruguay and identify the threshold selection as the biggest challenge for correction methods, alerting that an incorrect threshold selection may significantly bias inequality measures. Three important thresholds in the distribution exist: First, one has to either identify the percentile in the tax register distribution from which on the data can be trusted to provide reliable information ("trust range"), or to directly set the "merging-point" above which the tax data is used to adjust the survey data from which. For the years since 2004 I set the trust range to start at percentile 80 and let the command `bfmcorr` identify the merging point through a data-driven approach, while for earlier years (where tax data is extrapolated) I set the merging point to the 95th percentile.[38] Finally, while the `bfmcorr` command allows for the creation of new observations at the top with the option *replace*, the percentile from which observations are replaced has to be selected manually (the default is 0.05 or the top 5% of the population). I introduce a data-driven approach, to define the percentile, from which the observations in the survey should be replaced by real observations from the tax register, as explained above. The algorithm searches for the replacing point that minimizes the difference between the total value from national accounts and the result of the integration method (see equation 3 and figure A.11 in appendix A.4.1).[39]

Whereas the *merging point* (Blanchet et al., 2022) – the point at which the density of the distribution of tax register is higher than the density of the survey data – has been programmed in `bfmcorr` to be found by a data driven approach, the point at which replacing starts has to be defined manually. I implement a search algorithm for an optimal replacing point, whereby

[38] This percentile corresponds to the merging point found by the data-driven approach in 2004. For the benchmark scenario, data is extrapolated for years before 2008, and in this year the merging point was found at percentile 94. See figure A.11 in appendix A.4.1

[39] The algorithm assures to replace at least 5% at the top with tax register observations, unless the threshold has been found to lie above percentile 95.

this algorithm minimizes the difference between the total value from national accounts and the result of the integration method. The brackets for the potential points is given by the interval from the *merging point* up to at least 5% of the population replaced (percentile 0.95).[40] The algorithm solves equation 3 and chooses the replacing point that results in minimizing the sum of differences for the strictly positive values of operating surplus and mixed income (B2R and B3R), wages and salaries (D11R), and property income received (D4R). The formula does not include components that are added after primary income, as their quality in both sources decreases and imputations become more important.

$$\text{replacing point} = min\Bigg(\sum_{\text{merging point} \leq i \leq 0.97} \Bigg(\left| \frac{(B2+B3)_{BCE} - (B2+B3)_{bfmcorr2}}{(B2+B3)_{BCE}} \right| + \left| \frac{D11_{BCE} - D11_{bfmcorr2}}{D11_{BCE}} \right| + \left| \frac{D4R_{BCE} - D4R_{bfmcorr2}}{D4R_{BCE}} \right| \Bigg) \Bigg) \tag{3}$$

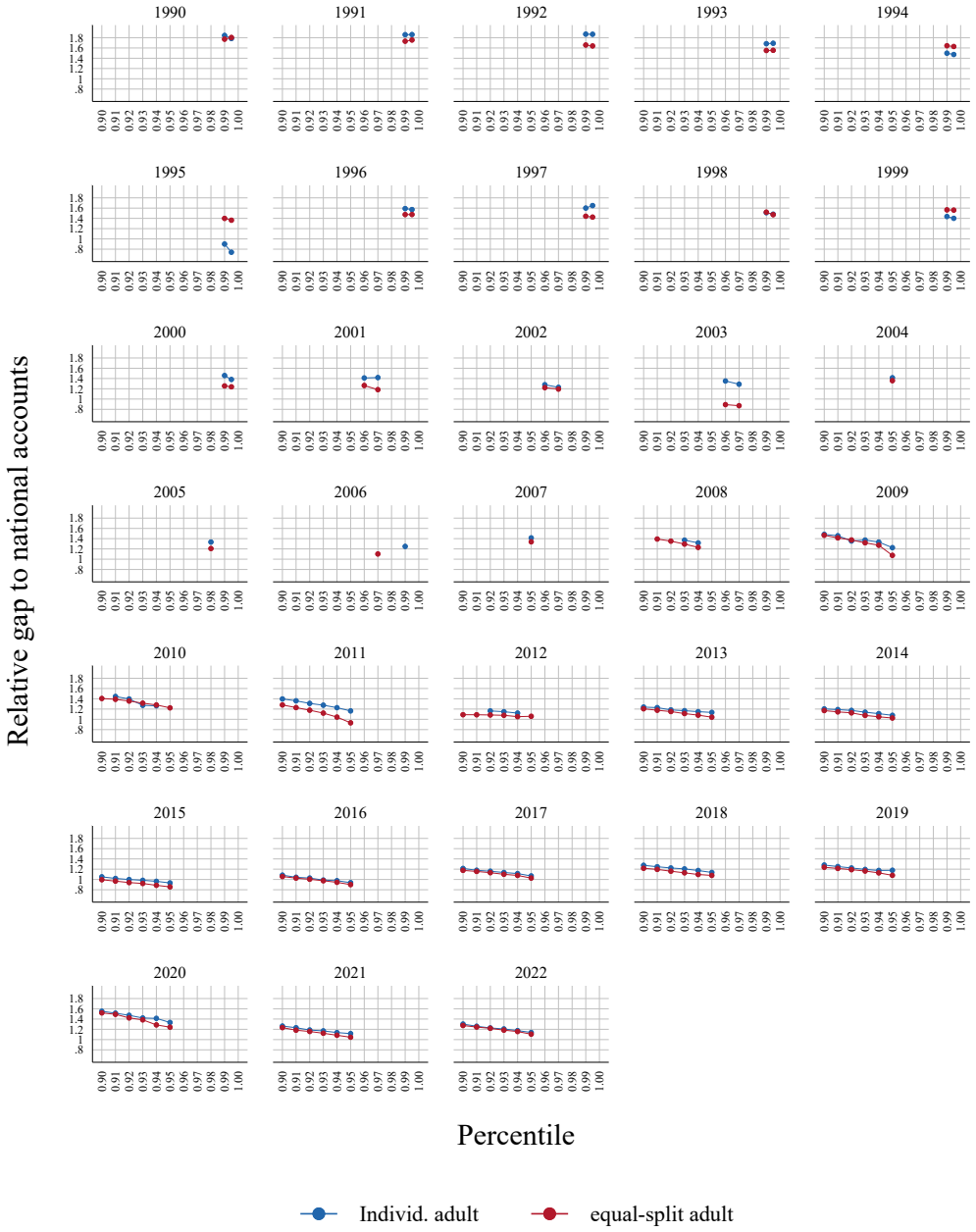
A.4.2 Use of survey information to improve coverage of integrated dataset

The integration procedure improves the coverage and reliability of the distribution of income. By integrating, nevertheless, some information from the survey is replaced by the tax register in the highest income strata, which is designed for income items better captured by the register (e.g., property income), see figure A.8. Nevertheless, income items that are better captured in the survey can get lost by the integration (e.g., imputed rents or social benefits others than pension payments). In addition, any income that is at least partially informal will only be captured in the survey. Within the System of National Accounts (SNA), this refers mainly to income from own account production, which is part of mixed income (B3R).

Second, recalling the representativeness of household surveys (see figure A.10), rich households' demographic attributes are relatively well captured in the survey. On the other hand, correcting distributional data is based on the assumption that underreporting and undercoverage of economic characteristics increases with higher deciles. Consequently, inheriting components better captured in the survey than in the register (operating surplus and mixed income (B2R

[40] For years before 2004, the merging point is directly set at percentile 95, and the algorithm is allowed to find replacing points above percentile 95.

Figure A.11: Optimization results: Selection of replacement point



Note: The figure shows the results of equation 3 for each year and for the individualistic adult (blue lines) and equal-split adults (red lines) scenarios. Lines indicate all potential replacement points, starting at the merging point. The replacement point is established, where the relative gap to the national accounts income is lowest.
Source: Own elaboration based on ENEMDU, SRI, and BCE.

and B3R), property income (D4R), social benefits (D62R) and other current transfers (D7R)) from the *survey rich* to the *register rich* does not create any upward bias of income in these higher income groups; it rather reduces the potential underestimation of income by imputing these income components when their values in the survey are greater than the values observed in the individual tax declaration.

A.4.3 Scaling to 100% of national accounts' household sector income

Some further assumptions are necessary to scale the income from the integrated data to the totals of the household institutional sector of national accounts. In a first step, general imputations based on legal information and accounting identities of the SNA structure (such as D611=D121) are imputed. This affects only labor income, where the social contributions are determined by regulations (e.g. in 2022, employers pay 11.45% social contributions). Finally, imputed rents from the ECV survey are assigned to each fractile (given the lack of information about interests paid in surveys or tax data, see section A.1), and negative property income (D4P) and negative current transfers are assigned based on the distribution of pretax household income. All other income components of the household sector (S14) are directly scaled to 100% of the corresponding national account totals.

A.5 Imputation of national income concepts

Table A.3: Imputation of national income components

Income component	N.A. code	sector	imputed to
primary income of corporations (private share)	B5	Corp. (S11+S12)	capital income
primary income of corporations (public share)	B5	Corp. (S11+S12)	pretax HH income
primary income of government	B5	Gov. (S.13)	pretax HH income
taxes on income and wealth	D5	Corp. (S11+S12)	capital income
indirect taxes and subsidies	D2R /D3R	Gov. (S.13)	CEQ incidences*
primary surplus	(D2R - D3R + D5R - D63P - P32P)	Gov. (S.13)	pretax HH income
collective consumption expenditure of the government	P32P	Gov. (S.13)	lump sum
individual consumption expendiure of the government	P91P	Gov. (S.13)	CEQ incidences*

Note: Table indicates the distribution of income items or incidence information used to impute income components from the government and corporate sector. The income from nonprofit institution serving households (NPISHs) is insignificant and assigned as lump-sum.
*For the robustness check without the CEQ-incidences (called the "dynamic" scenario in B), I use the pretax household income distribution for imputations instead.
Source: Own elaboration

A.5.1 Imputations for pretax factor income

The integration of sources and the scaling procedure produces pretax income that covers 100% of the household sector in national accounts. To estimate pretax factor income (PRTFI), the study assigns incomes from the government (S13) and the corporate sector (S11+S12), based on

different assumptions, resumed in table A.3. Primary income from corporations (B5R, S11+S12) (= undistributed rents from corporate activity) has to be distinguished between corporations owned by private and public actors. We use the share of property income (D4N) that goes to government and to corporations as a proxy to split this income component between private and public incomes The private share of primary income is assigned based on the capital income from households, as we view capital income as a proxy for stock ownership. For the public share we use the pretax household income as proxy for the distribution. Also primary income from the government (B5R, S13) is aligned to the pretax household income distribution excluding imputed rents Income from nonprofit institutions serving households (NPISH) is small and assigned via lumpsum.

A.5.2 Imputations for pretax national income

Pretax national income (PRTNI) adds social benefits and subtracts social contributions.[41] Considering the importance in years after economic crises, it includes other transfers - which mainly contain remittances. Therefore, the sum of PRTNI is not exactly the same as PRTFI.

A.5.3 Imputations for posttax disposable income

Estimating posttax disposable income (POTDI) requires assumptions about all direct taxes (D5) and indirect taxes (D2) from PRTNI. For the distribution of corporate taxes (direct taxes of institutional sector S11+S12) I assume that the owners pay this tax and use capital income, as suggested in Blanchet et al. (2020). For indirect taxes D2R (which is mainly value added tax and importation tax) and subsidies (D3R), I use the CEQ-incidences obtained from Llerena-Pinto et al. (2015) fr the benchmark scenario, and the pretax household distribution for the robustness scenario, as the household income distribution serves as a proxy for how consumption is assigned.

A.5.4 Imputations for posttax national income

Posttax national income adds government activity to POTDI, by making explicit assumptions about government spending: For the benchmark scenario, I assign collective consumption expenditure of the government (P32P) via lump sum, and individual expenditure (mainly health and education spending) following the CEQ-incidences (De Rosa et al., 2024). Again, the

[41] The aggregate surplus of social contributions less social benefits is assigned neutrally (similar to government property income).

robustness check assigns individual expenditure following the pretax household income distribution.

Appendix B Robustness Checks

Table B.1 resumes all results from the benchmark scenario and the 23 robustness checks. In addition the table includes the results for the individualistic adult and the equal-split adult estimations.

National accounts aggregates: One of the challenges to extend the series to the years before 2007 is the lack of detailed national accounts, especially the lack of breakdown of national income to institutional sectors. In the benchmark scenario, I use secondary information to observe variations in the incomes of the government, corporations and households, based on OECD tax information and remittances accounts. To assure that results before 2007 are not driven by these assumptions, I produce an alternative series assuming that the structure of income for the institutional sectors between 1990 and 2006 (and also for the income components within these sectors) to be constant is the same as in 2007. In addition, the more detailed national accounts published by the Ecuadorian central bank for the years 2018-2022 suggest changes in the income distribution of components within institutional sectors, compared to the 2007-based series. Therefore, the alternative scenario extrapolates the structure of 2016 to the years 2017-2022.

Tax extrapolation: In the benchmark scenario, I use tax declarations from 2008 at starting point, which is in line with Cano (2015) and De Rosa et al. (2024). In the robustness check I also consider tax declarations from 2004 to 2007, using the 2004 data as a starting point for extrapolation back to 1990-2003. This robustness check addresses the possibility that the increase in total tax revenue during these early years was not only caused by data quality increases but by a real economic phenomenon.

Integration method: In the benchmark scenario the integration of survey and tax data is accomplished on the micro level, where individual tax records are inserted into the household structure of the survey, taking advantage of the strengths of both data sources. The main assumption in this scenario is that register-rich individuals inherit the demographic characteristics of the survey-rich. In an additional robustness check, I apply the original `bfmcorr` method from Blanchet et al. (2022), where the survey observations are reweighted based on tax tabulates derived from the tax microdata. In this scenario, very high incomes are potentially not accurately reflected and the composition of income components at the top are poorly represented (Ledić et al., 2024).

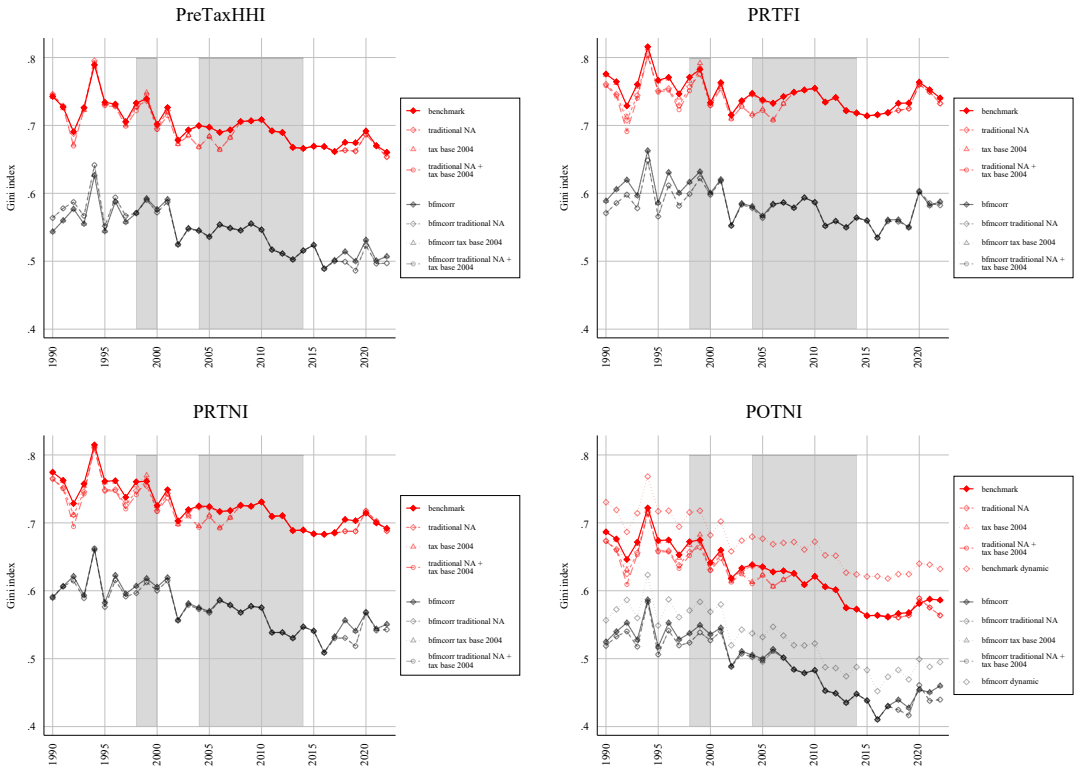
Distribution of posttax income components: The benchmark scenario for the posttax national income series uses the CEQ incidences from 2012, which derives incidences from observable survey data. However, this higher quality of the data is only available for one year and changes in incidences are not reflected in the benchmark scenario. As a robustness check I use different assumptions of how to assign net indirect taxes and government spending: Net indirect taxes are assigned following the pretax household income (assuming that the consumption distribution follows income distribution), public health expenditure is assigned via lump sum, and public education expenditure is assigned like pretax household income.

Table B.1: All robustness check results

bmk	Nat. inc. variable	unit of obs.	N.A. extrapolation	tax base extrapolation	integration method	POTNI distr.	Average			Difference 1990-2022		
							Bottom 50%	Middle 40%	Top 10%	Bottom 50%	Middle 40%	Top 10%
	PRTNI	ind. ad.	modern	tax base 2004	integrated		0.06	0.34	0.60	0.06	0.01	-0.07
bmk	PRTNI	ind. ad.	modern	tax base 2008	integrated		0.06	0.34	0.60	0.06	0.01	-0.07
	PRTNI	ind. ad.	traditional	tax base 2004	integrated		0.06	0.35	0.59	0.05	0.02	-0.07
	PRTNI	ind. ad.	traditional	tax base 2008	integrated		0.06	0.34	0.60	0.05	0.02	-0.07
	PRTNI	ind. ad.	modern	tax base 2004	bfmcorr		0.15	0.37	0.48	0.02	0.01	-0.03
	PRTNI	ind. ad.	modern	tax base 2008	bfmcorr		0.15	0.37	0.48	0.02	0.01	-0.03
	PRTNI	ind. ad.	traditional	tax base 2004	bfmcorr		0.15	0.38	0.47	0.03	0.02	-0.04
	PRTNI	ind. ad.	traditional	tax base 2008	bfmcorr		0.15	0.38	0.47	0.03	0.02	-0.04
	PRTNI	eq-sp. ad.	modern	tax base 2004	integrated		0.13	0.32	0.55	0.02	0.01	-0.03
	PRTNI	eq-sp. ad.	modern	tax base 2008	integrated		0.13	0.32	0.56	0.02	0.01	-0.03
	PRTNI	eq-sp. ad.	traditional	tax base 2004	integrated		0.13	0.32	0.55	0.02	0.01	-0.03
	PRTNI	eq-sp. ad.	traditional	tax base 2008	integrated		0.13	0.32	0.55	0.02	0.01	-0.04
	PRTNI	eq-sp. ad.	modern	tax base 2004	bfmcorr		0.15	0.37	0.48	0.02	0.01	-0.03
	PRTNI	eq-sp. ad.	modern	tax base 2008	bfmcorr		0.15	0.37	0.48	0.02	0.01	-0.03
	PRTNI	eq-sp. ad.	traditional	tax base 2004	bfmcorr		0.15	0.38	0.47	0.03	0.02	-0.04
	PRTNI	eq-sp. ad.	traditional	tax base 2008	bfmcorr		0.15	0.38	0.47	0.03	0.02	-0.04
	POTNI	ind. ad.	modern	tax base 2004	integrated	CEQ	0.09	0.35	0.56	0.06	0.02	-0.09
	POTNI	ind. ad.	modern	tax base 2004	integrated	dyn	0.12	0.36	0.52	0.06	0.02	-0.09
bmk	POTNI	ind. ad.	modern	tax base 2008	integrated	CEQ	0.09	0.35	0.56	0.06	0.02	-0.09
	POTNI	ind. ad.	modern	tax base 2008	integrated	dyn	0.12	0.35	0.53	0.06	0.03	-0.09
	POTNI	ind. ad.	traditional	tax base 2004	integrated	CEQ	0.09	0.36	0.55	0.06	0.03	-0.08
	POTNI	ind. ad.	traditional	tax base 2004	integrated	dyn	0.12	0.36	0.52	0.07	0.03	-0.09
	POTNI	ind. ad.	traditional	tax base 2008	integrated	CEQ	0.09	0.36	0.55	0.06	0.03	-0.09
	POTNI	ind. ad.	traditional	tax base 2008	integrated	dyn	0.12	0.36	0.52	0.07	0.03	-0.10
	POTNI	ind. ad.	modern	tax base 2004	bfmcorr	CEQ	0.17	0.38	0.44	0.03	0.02	-0.06
	POTNI	ind. ad.	modern	tax base 2004	bfmcorr	dyn	0.20	0.38	0.42	0.03	0.02	-0.06
	POTNI	ind. ad.	modern	tax base 2008	bfmcorr	CEQ	0.17	0.38	0.44	0.03	0.02	-0.06
	POTNI	ind. ad.	modern	tax base 2008	bfmcorr	dyn	0.20	0.38	0.42	0.03	0.02	-0.06
	POTNI	ind. ad.	traditional	tax base 2004	bfmcorr	CEQ	0.18	0.39	0.44	0.04	0.03	-0.06
	POTNI	ind. ad.	traditional	tax base 2004	bfmcorr	dyn	0.20	0.39	0.41	0.04	0.02	-0.07
	POTNI	ind. ad.	traditional	tax base 2008	bfmcorr	CEQ	0.18	0.39	0.44	0.04	0.03	-0.06
	POTNI	ind. ad.	traditional	tax base 2008	bfmcorr	dyn	0.20	0.39	0.42	0.04	0.02	-0.07
	POTNI	eq-sp. ad.	modern	tax base 2004	integrated	CEQ	0.16	0.33	0.51	0.03	0.02	-0.05
	POTNI	eq-sp. ad.	modern	tax base 2004	integrated	dyn	0.18	0.34	0.48	0.03	0.02	-0.05
	POTNI	eq-sp. ad.	modern	tax base 2008	integrated	CEQ	0.15	0.33	0.52	0.03	0.02	-0.05
	POTNI	eq-sp. ad.	modern	tax base 2008	integrated	dyn	0.18	0.33	0.49	0.03	0.02	-0.06
	POTNI	eq-sp. ad.	traditional	tax base 2004	integrated	CEQ	0.16	0.34	0.51	0.03	0.02	-0.05
	POTNI	eq-sp. ad.	traditional	tax base 2004	integrated	dyn	0.18	0.34	0.48	0.04	0.02	-0.06
	POTNI	eq-sp. ad.	traditional	tax base 2008	integrated	CEQ	0.16	0.33	0.51	0.03	0.02	-0.05
	POTNI	eq-sp. ad.	traditional	tax base 2008	integrated	dyn	0.18	0.34	0.48	0.04	0.02	-0.06
	POTNI	eq-sp. ad.	modern	tax base 2004	bfmcorr	CEQ	0.17	0.38	0.44	0.03	0.02	-0.06
	POTNI	eq-sp. ad.	modern	tax base 2004	bfmcorr	dyn	0.20	0.38	0.42	0.03	0.02	-0.06
	POTNI	eq-sp. ad.	modern	tax base 2008	bfmcorr	CEQ	0.17	0.38	0.44	0.03	0.02	-0.06
	POTNI	eq-sp. ad.	modern	tax base 2008	bfmcorr	dyn	0.20	0.38	0.42	0.03	0.02	-0.06
	POTNI	eq-sp. ad.	traditional	tax base 2004	bfmcorr	CEQ	0.18	0.39	0.44	0.04	0.03	-0.06
	POTNI	eq-sp. ad.	traditional	tax base 2004	bfmcorr	dyn	0.20	0.39	0.41	0.04	0.02	-0.07
	POTNI	eq-sp. ad.	traditional	tax base 2008	bfmcorr	CEQ	0.18	0.39	0.44	0.04	0.03	-0.06
	POTNI	eq-sp. ad.	traditional	tax base 2008	bfmcorr	dyn	0.20	0.39	0.42	0.04	0.02	-0.07

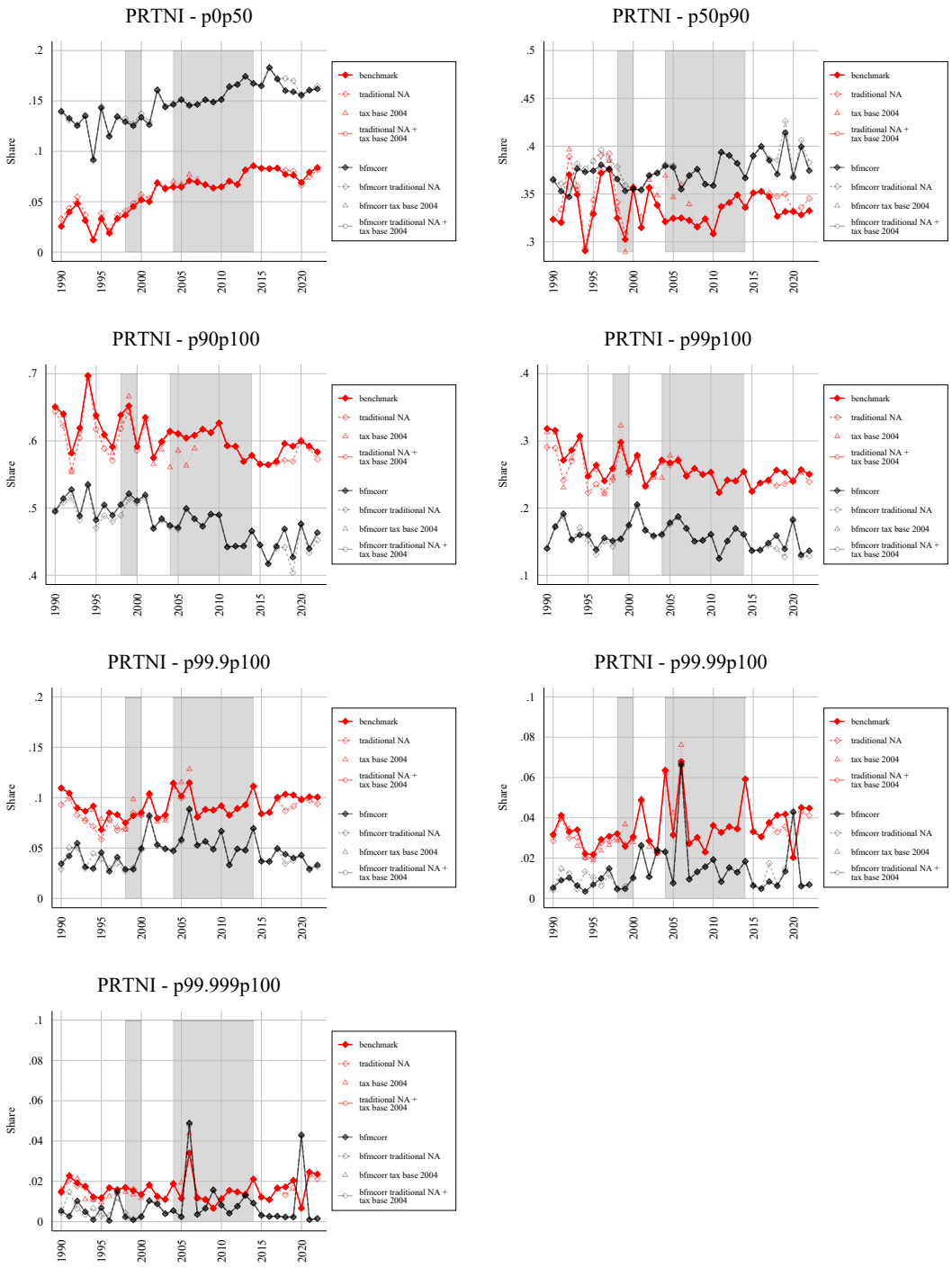
Note: This table synthesizes the average share (calculated for all years 1990-2022) and the differences of these shares between the last and the first year for different income groups across all scenarios.
Source: Own elaboration based on ENEMDU, SRI, BCE, and (Llerena-Pinto et al., 2015)

Figure B.1: Robustness checks: Gini



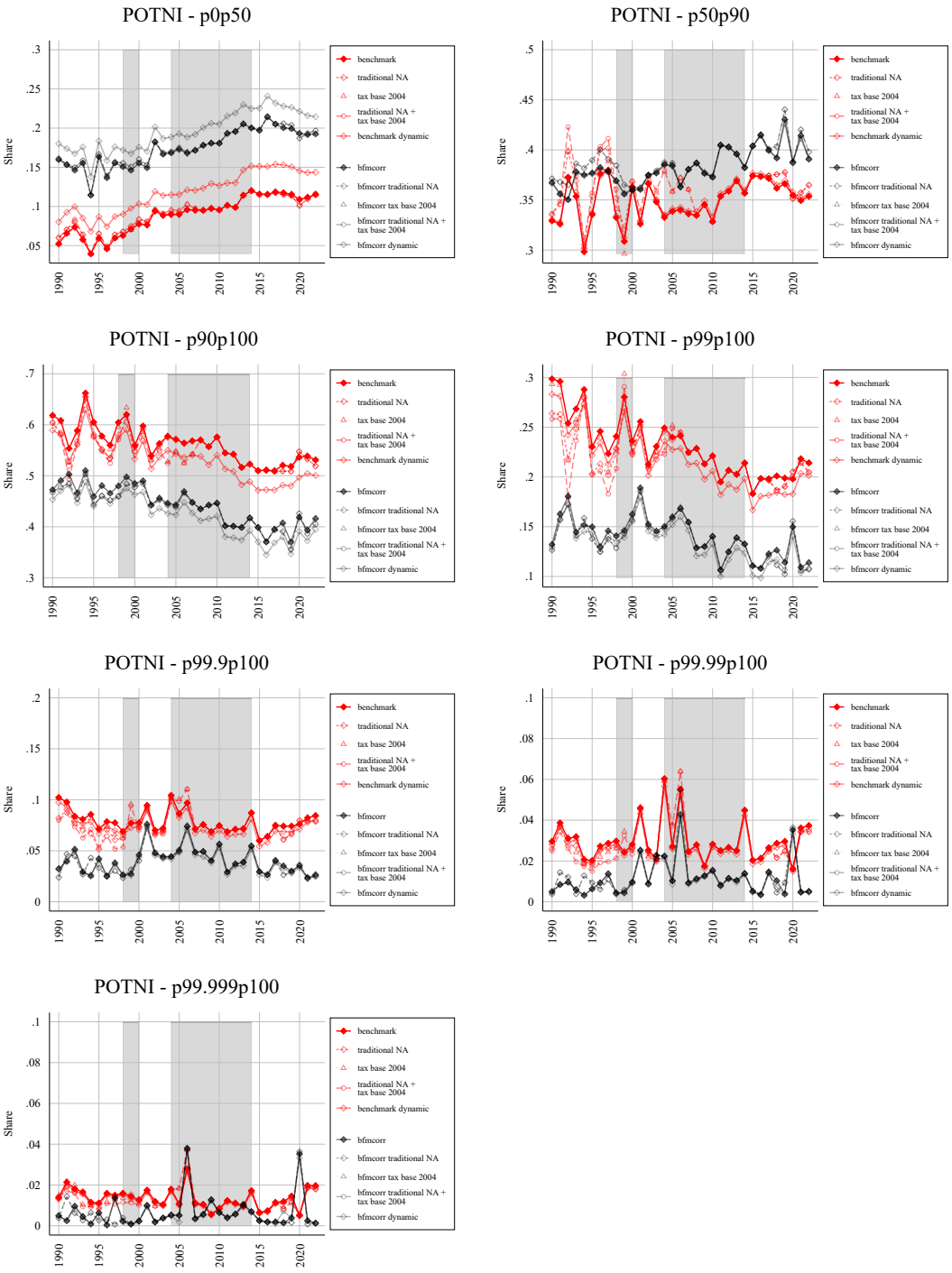
Note: Gini indexes for pretax household income, pretax factor income, pretax national income and posttax national income applying different assumptions and integration methods.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure B.2: Robustness checks: Pretax National Income



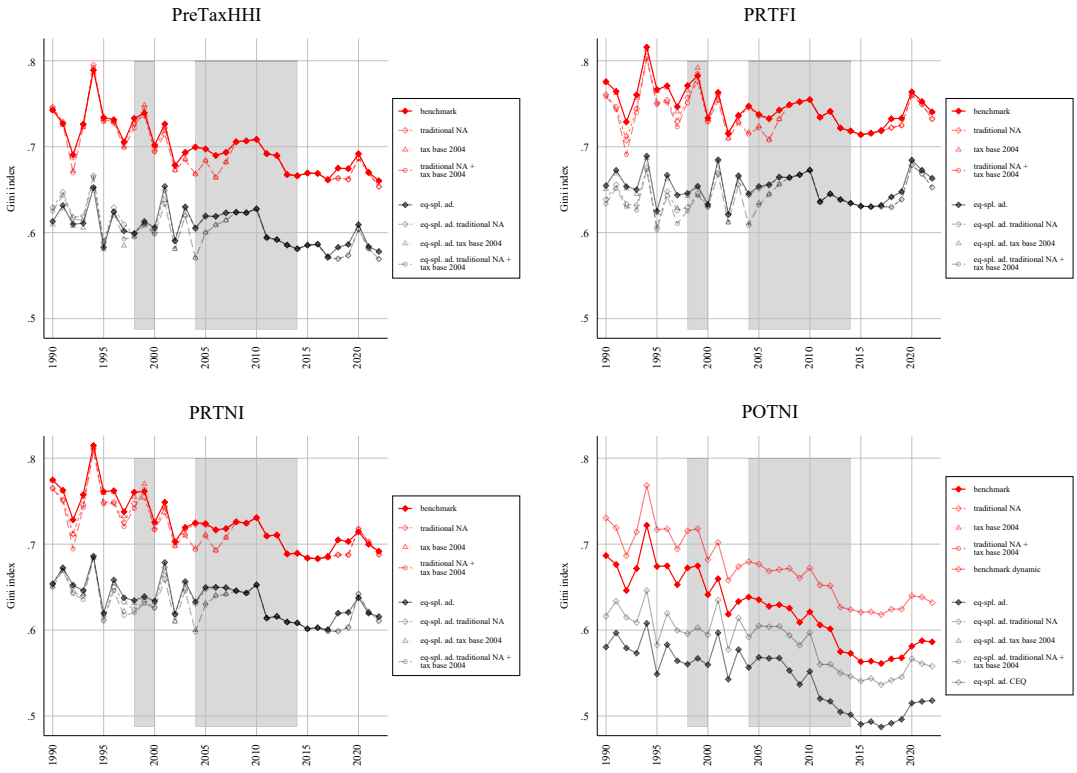
Note: Income shares of different groups for pretax national income applying different assumptions and integration methods.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure B.3: Robustness checks: Posttax National Income



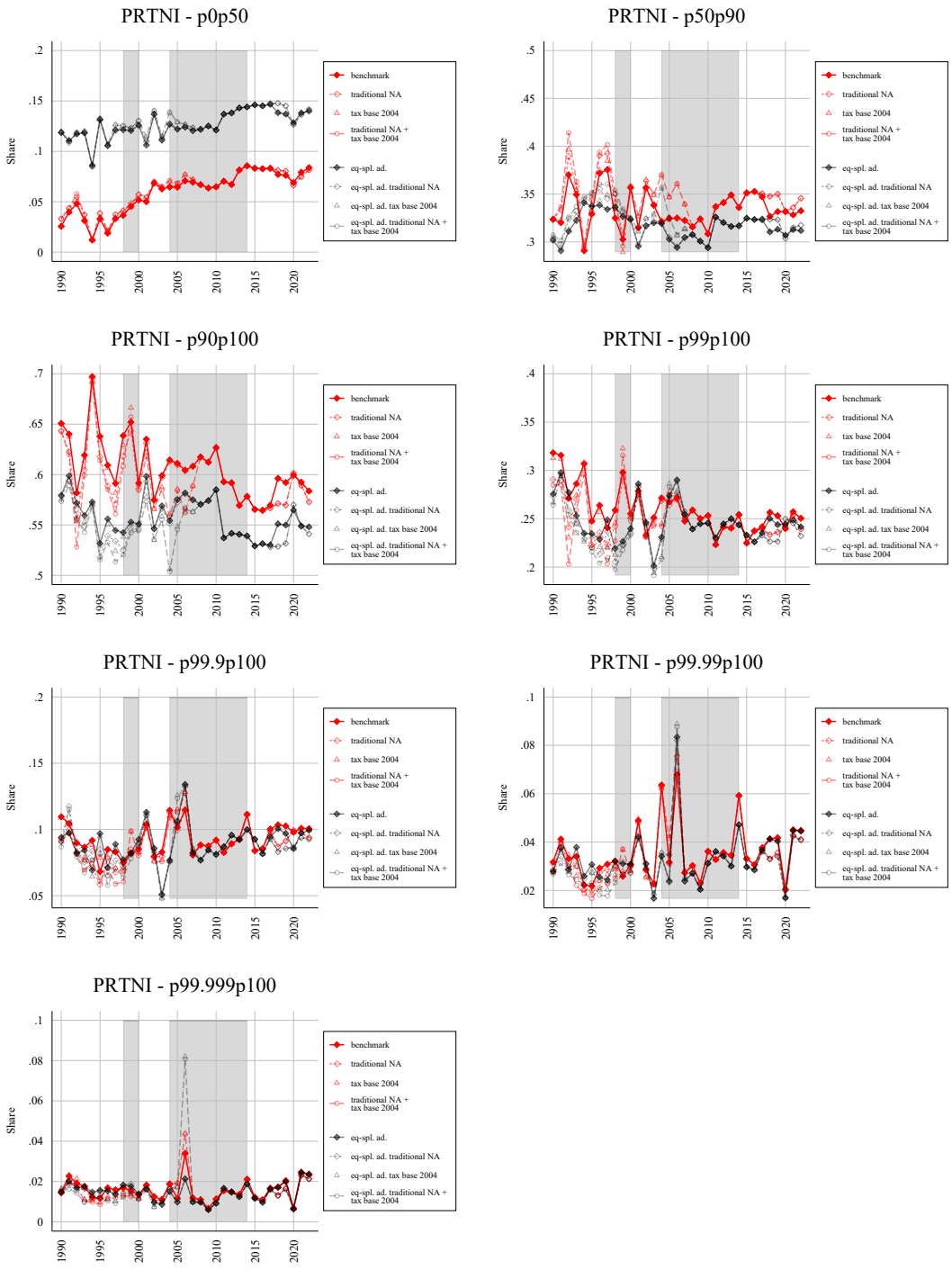
Note: Income shares of different groups for posttax national income applying different assumptions and integration methods.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure B.4: Robustness checks with equal-split adult: Gini



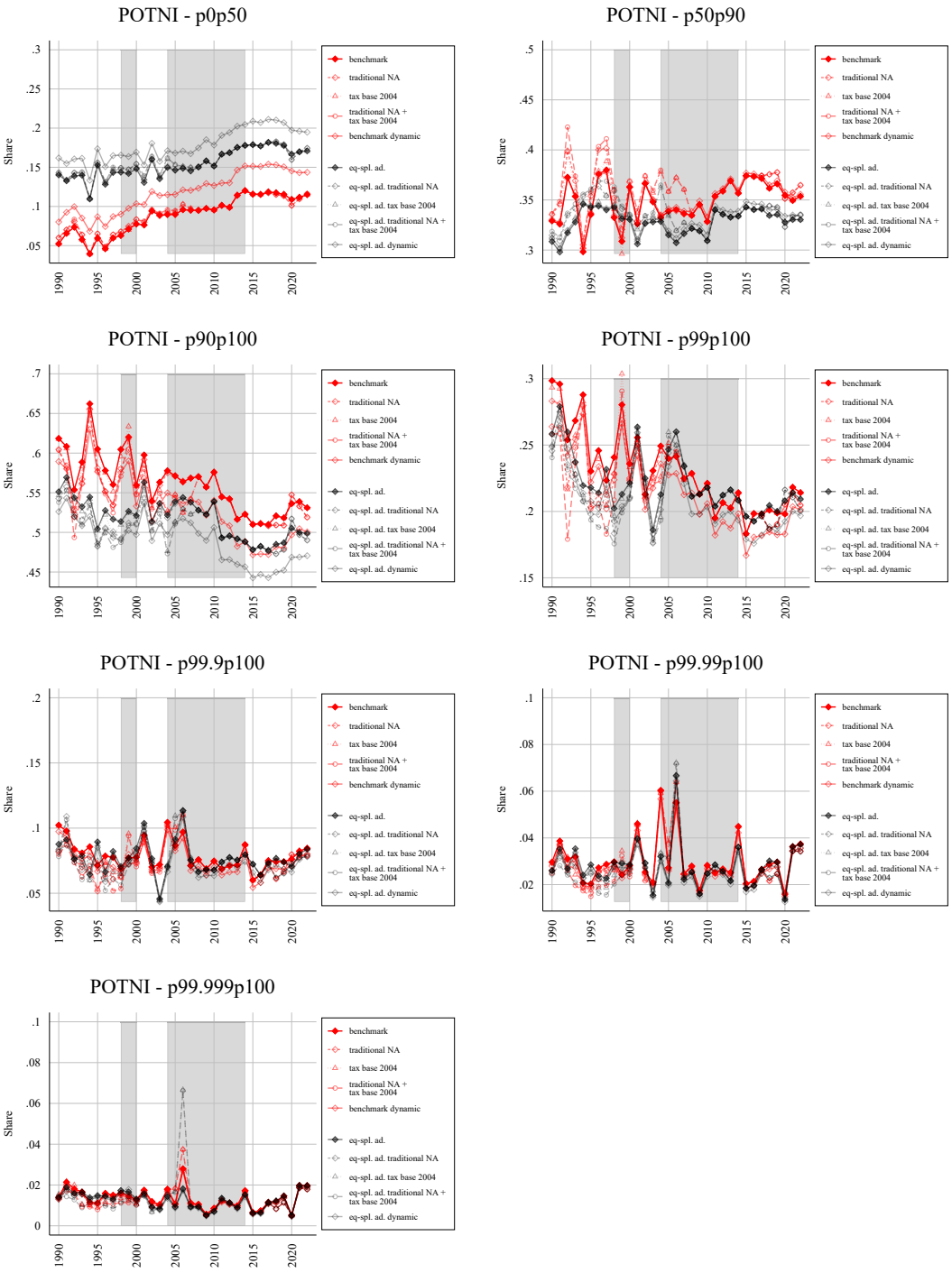
Note: Gini indexes for pretax household income, pretax factor income, pretax national income and posttax national income applying individualistic adult (benchmark, red) and equal-split adults (black) as unit of observation.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure B.5: Robustness checks with equal-split adult: Pretax national income



Note: Income shares of different groups for pretax national income applying individualistic adult (benchmark, red) and equal-split adults (black) as unit of observation.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure B.6: Robustness checks with equal-split adult: Posttax national income



Note: Income shares of different groups for posttax national income applying individualistic adult (benchmark, red) and equal-split adults (black) as unit of observation.
Source: Own elaboration based on ENEMDU, SRI, BCE.

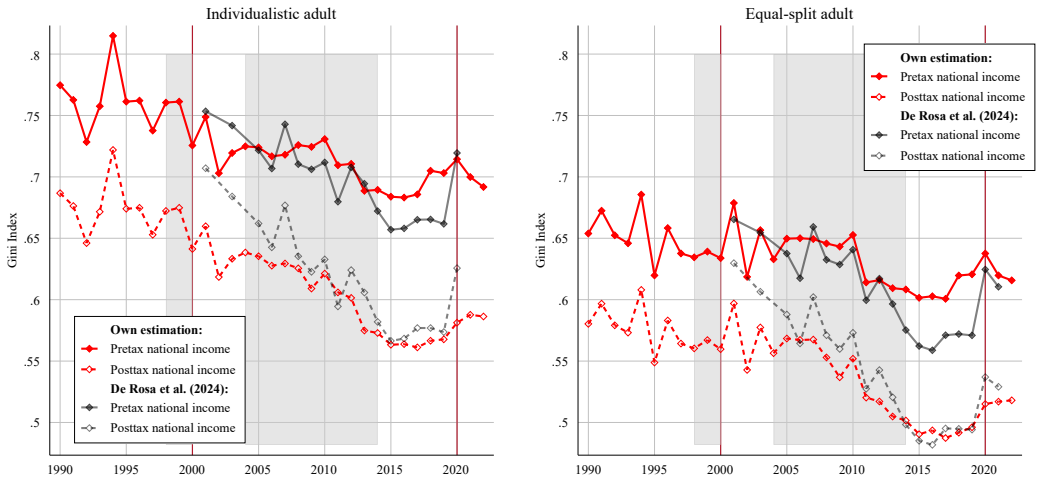
B.1 Comparison with existing DINA results

A recent study by De Rosa et al. (2024) produces DINA results for a group of Latin American countries between 2000 and 2020. The focus of the authors is to make the series as comparable as possible by applying harmonized surveys and homogeneous assumptions for all countries. For Ecuador, the most relevant differences to the study at hand are (i) the use of tabulations from secondary studies between 2008 and 2014 (Cano, 2015; Rossignolo et al., 2016) and the subsequent extrapolation to other years, instead of the use of annual tax microdata, (ii) the reweighting procedure (Blanchet et al., 2022) instead of the integration with tax microdata to correct for the upper income distribution tail, and (iii) the imputation method of imputed rents and the omission of remittances from the series.[42] Figure B.7 plots the evolution of the pretax and posttax income Gini index from the present study (red) and from De Rosa et al. (2024) (gray, from 2001 to 2020) for the individualistic adult in the left subfigure and for equal-split adults in the right subfigure. Again, the level differs for individualistic and equal-split adult, but tendencies are similar for both concepts. The starting point for pretax income in 2001 overlap in both studies, but De Rosa et al. (2024) estimate a stronger reduction of inequality up to the year 2019, while the posttax income Gini in De Rosa et al. (2024) starts at a higher level and also falls steeper than suggested in the present study. As a result, in 2019, the posttax income inequality in both studies overlap, but pretax income inequality is lower in De Rosa et al. (2024). Another outstanding difference is the sharp increase of inequality in the year 2020 in De Rosa et al. (2024), which is more moderate in the study at hand. A detailed look at income shares for different groups is presented for the benchmark scenario (individualistic adults) in figure B.8 in appendix C, and provides explanations for these differences in the Gini index. The share of the pretax income of the bottom 50% is higher in my estimations (which is mostly due to imputed rents), but the posttax income share of the bottom 50% coincides strongly over the whole period, suggesting that estimated redistribution policies are stronger in De Rosa et al. (2024) than in the present study. For the middle 40%, De Rosa et al. (2024) estimate considerable increases in their income share in combination with almost inexistent effects of redistribution, while the series at hand finds relevant increases in income shares only for the period between 2010 and 2016 (followed by a slight reduction), but with a stronger and increasing effect of redistribution policies. Consequently, the estimates of this study find decreasing but more stable shares of the top 10% than estimated by De Rosa et al. (2024).

[42] Imputed rents are not captured in the harmonized survey used by De Rosa et al. (2024) which implies that during the scaling to national accounts, the pretax income distribution is used to impute these fictitious rents. In the study at hand, I use the information on imputed rents collected by the income and expenditure survey series (ENINGHUR).

As expected, for the top 1% and top 0.1%, the series at hand suggest higher shares and also less volatility than the study by De Rosa et al. (2024), given the potential small sample bias of the reweighting procedure at this level of dissagregation. These differences can be explained by the inclusion of detailed tax microdata that better captures income at the top. Notably, the increase in inequality between 2019 and 2000 estimated by De Rosa et al. (2024) lifts the shares of the highest income groups to the levels presented in this study.

Figure B.7: Comparison with De Rosa et al. (2024)



Note: Comparison of Gini indexes for individualistic adults (left subfigure) and equal-split adults (right subfigure) from own estimations (red lines) and De Rosa et al. (2024) (black lines). Solid lines represent pretax national income Gini indexes, and dashed lines posttax national income Gini indexes. The series from De Rosa et al. (2024) is available for the years 2001 to 2022. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis, and the 2004-2014 commodity price boom.
Source: Own estimations based on ENEMDU, SRI, BCE; and De Rosa et al. (2024) obtained from `https://distribuciones.info/`.

B.2 Diverging trends between survey and DINA results

Appendix A explained the limitations for the construction of a DINA series before the year 2000: the lack of real tax data, exclusive urban coverage of the principal household survey, national accounts aggregates without details on components and sectoral disaggregations, and finally also unstable monetary units around the year 2000. These limitations require the extrapolation of national accounts aggregates with secondary information, the extension of survey coverage to rural areas by imputing rural income from secondary surveys, and the extrapolation of tax records distribution from 2008 (or 2004) to earlier years. The last assumption is the strongest, as it implies that variations in the income distributions stem mainly from changes in the aggregate structure of the economy, and changes in the distribution of income in the survey.

The absence of comprehensive data has constrained empirical analyses of inequality in the pre-dollarization period. The only continuous series of income data available stems from the urban

ENEMDU survey, which is also utilized in the present study. Notably, the findings derived from this survey by Ponce (2011) contrast with the results presented in this paper. Ponce (2011) estimate increasing income inequality between 1990 and 2001, especially at the top where the share of the richest 10% raised by 10 percentage points between 1990 and 2000.[43] However, the author departs from a share of 35% for the top 10% that increases to 45% in these ten years, while the share in pretax national income in the present study departs from of 65%. To explain these differences, I decompose the incremental steps from survey based *per capita* distributions to tax-integrated pretax household sector income distributions for individualistic adults. This last distribution is close to the results of the benchmark scenario for the pretax series, albeit not including incomes from other institutional sectors. [44]Figure B.9 synthesizes the differences between exclusively survey based series and DINA series using the Gini index. The blue series indicate official survey-based Gini indexes from the ENEMDU series published by the INEC and homologized by the Socio-Economic Database for Latin America and the Caribbean SEDLAC (2003-2001), and the urban series from Ponce (2011) (1990-2010). Both series produce household income *per capita* distributions. The red series illustrate incremental steps in the DINA method, where the lightest red dashed line corrects the original survey for the missing rural population. The slightly darker dashed red line estimates the income for equal-split adults, thereby eliminating the population below the age of 20 years. The darkest dashed line represents the equal-split adult series for the tax-integrated distribution. Finally, the solid red line represents the individualistic adults series for the survey-tax integrated series (eliminating any intra-household distribution and dividing the income of the household sector only to the population older than 20 years).

Several insights can be derived from this graph: First, the inclusion of rural households increases inequality for years before 2003 as expected (without changing the increasing Gini index tendency until 2001), and the *per capita* series is almost identical to the official series from 2004 on. Second, taking into account only the adult population decreases the level of inequality as expected – as the same amount of income is distributed among less population –, but the reduction is stronger in later years. This effect may be due to a demographic change that occurred over the last decades in Ecuador: While total population growth slowed down (from a fertility rate of 3.82 in 1990 to a rate of 1.86 in 2022), the share of adult population increased from 50% in 1990 to 64% in 2022, and the average number of household members decreased from 4.6 to

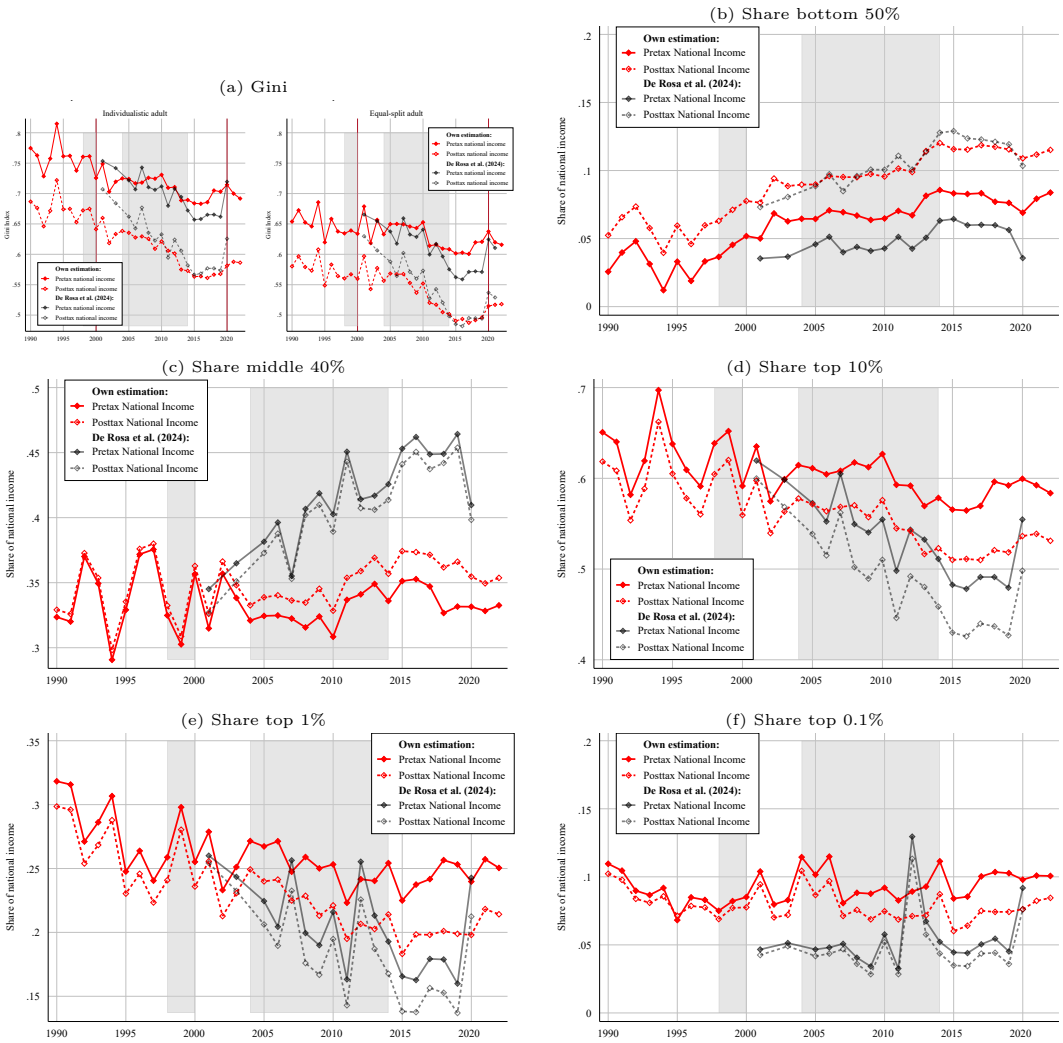
[43]While the series for the Gini index is presented for all years, the income shares for deciles in Ponce (2011) are only plotted for the years 1990, 1993, 1996, 2000, 2003, 2006, and 2010.
[44]For a detailed comparison revise table A.2 in appendix A.3.2.

3.3 over the studied period.[45] The combination of these three demographic evolutions implies that the average number of adult household members decreased stronger in low-income households, compared to higher-income households. Third, the integration of tax microdata in the equal-split scenario considerably increases the Gini index and eliminates strong fluctuations and smooths the strong increase and decrease observed exclusively in the ENEMDU survey. Most remarkably, the sharp increase between 1990 and 1994 disappears in this scenario (reducing the increase between 1990 and 2001 to only 2 percentage points), and the integration cushions the post-2000 trend of a robust and sustained decrease in pretax income inequality. Finally, eliminating intra-household distribution in the individual adult scenario produces a higher and more volatile series for the pre-dollarization period, in which the Gini index between 1990 and 2001 falls slightly.

Due to the lack of data for the upper part of the income distribution, establishing a reliable series for the period before 2000 exclusively with the data at hand remains challenging. While an increase in poverty can be observed from the ECV surveys between 1995 and 1998,[46], Ponce and Vos (2014) find that rural inequality was relatively stable over the same period. Comparing absolute inequality indicators in the 1990s, although the tendency of the Gini index is slightly decreasing in the benchmark scenario, the level of inequality was extremely high at an index of about 0.72. Figure B.10 in appendix C illustrate that in the benchmark estimation for pretax household income, shares for all groups fluctuated without a clear tendency: The shares for the bottom 50% fluctuate around 5%, instead of 15-20% in the survey, and the shares of the middle 40% lie 5 percentage points lower in the benchmark estimation. In addition, for the years with complete data in this study, the tendency of DINA series partially resembles the pure survey series, but the concentration at the top is more persistent. In conclusion, the income share of the economic elite was higher than suggested by the survey, but it was most likely also more stable. Consequently, the results from the DINA series of this study are as plausible as those from the survey, but conclusions have to be drawn with care.

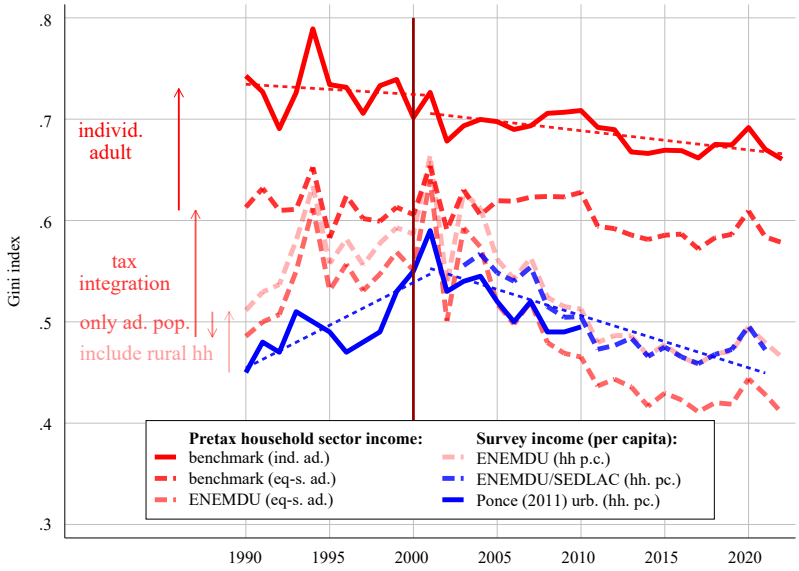
[45] https://www.ecuadorencifras.gob.ec/proyecciones-poblacionales/.
[46] https://www.ecuadorencifras.gob.ec/documentos/web-inec/ECV/ECV_2015/

Figure B.8: Comparison with De Rosa et al. (2024)



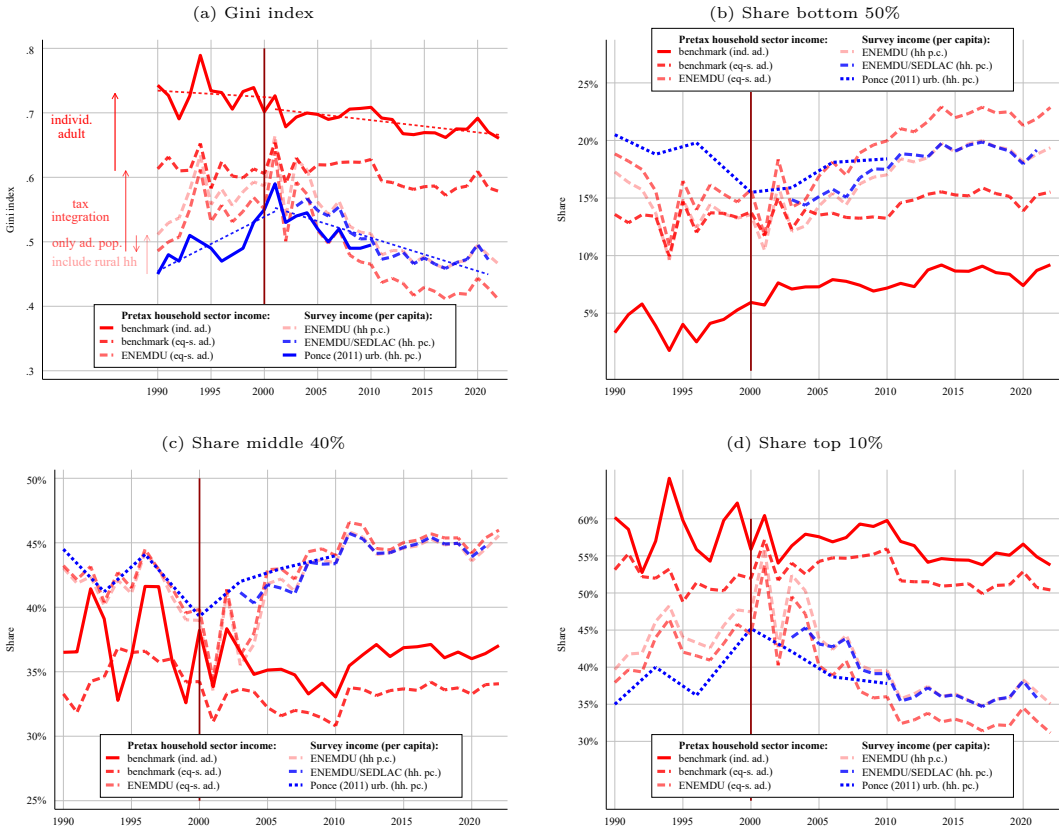
Note: Comparison of Gini indexes (subfigure (a)) and shares of different income groups (subfigures (b) to (f)) for individualistic adults from own estimations (red lines) and De Rosa et al. (2024) (black lines). Solid lines represent pretax national income series, and dashed lines posttax national income series. The series from De Rosa et al. (2024) is available for the years 2001 to 2022. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis, and the 2004-2014 commodity price boom.
Source: Own estimations based on ENEMDU, SRI, BCE; and De Rosa et al. (2024) obtained from `https://distribuciones.info/`.

Figure B.9: Comparison of pretax household sector income inequality with survey based income inequality



Note: The figure plots the Gini index from the official ENEMDU survey (dashed blue) and from the rural Gini estimates from the ENEMDU by Ponce (2011) (solid blue), along with the Gini estimates for pretax income of the household sector in incremental steps of the DINA methodology: First, estimates including rural households in the ENEMDU for household *per capita* observations (dashed lightest red); second, the former estimates excluding the population below 20 years of age (equal split adults, light red dashed); third, the tax-integrated estimates for the equal-split adult observations (dashed dark); finally, the tax-integrated estimates for the individualistic adult observations. The dotted lines indicate the linear fit between 1990 and 2001 for the original ENEMDU series (blue, combining Ponce (2011) and ENEMDU/SECLAC) and the benchmark series (red).
Source: Own estimation based on ENEMDU, SRI, BCE. Survey from INEC/SEDLAS, and Ponce (2011).

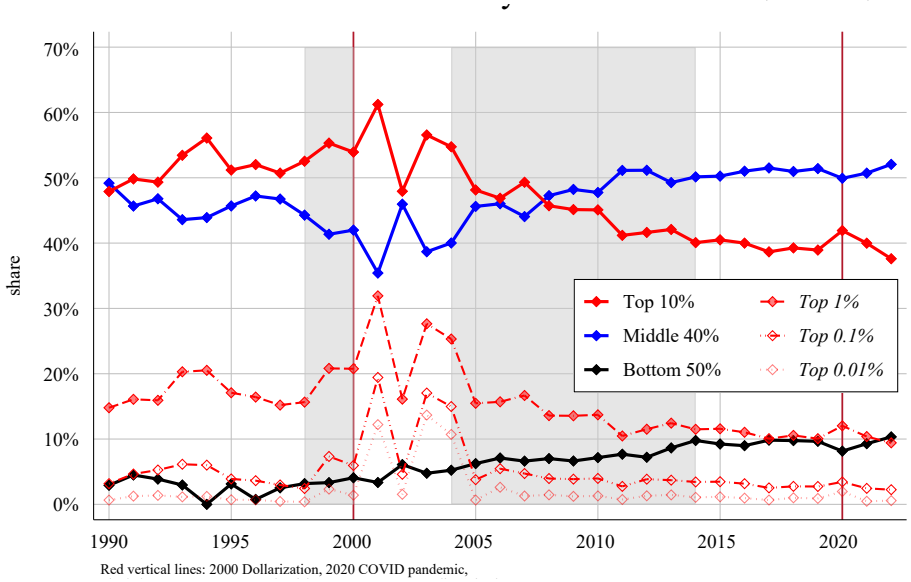
Figure B.10: Comparison of pretax household sector income series with survey based income series



Note: The figure plots the Gini index from the official ENEMDU survey (dashed blue) and from the rural Gini estimates from the ENEMDU by Ponce (2011) (solid blue), along with the Gini estimates for pretax income of the household sector in incremental steps of the DINA methodology: First, estimates including rural households in the ENEMDU for household *per capita* observations (dashed lightest red); second, the former estimates excluding the population below 20 years of age (equal split adults, light red dashed); third, the tax-integrated estimates for the equal-split adult observations (dashed dark); finally, the tax-integrated estimates for the individualistic adult observations.
Source: Own estimation based on ENEMDU, SRI, BCE. Survey from INEC/SEDLAS, and Ponce (2011).

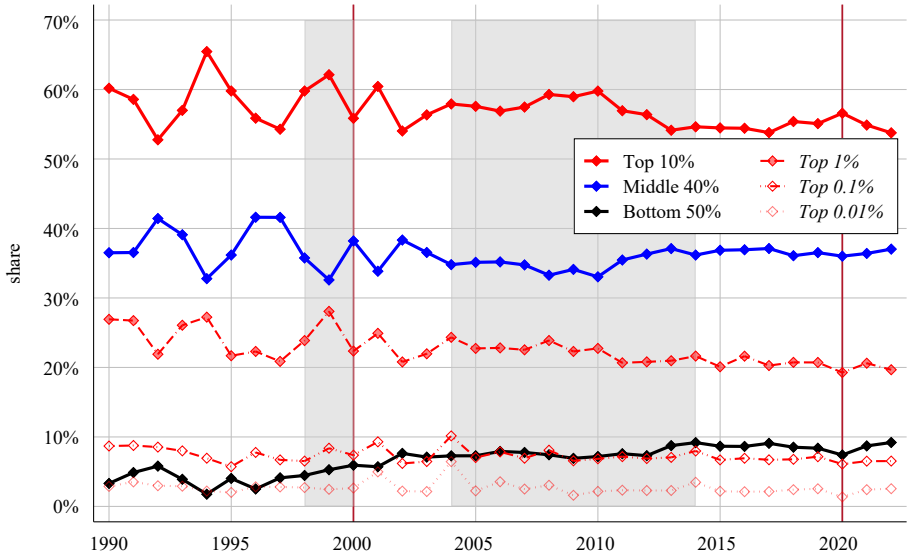
Appendix C Additional results

Figure C.1: Pretax household sector income shares from ENEMDU survey (1990-2022)



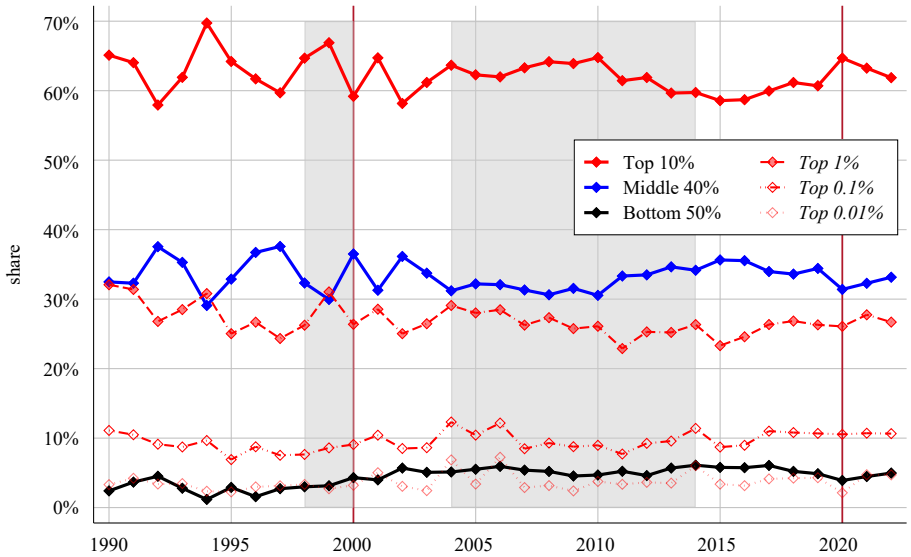
Note: Evolution of pretax household income shares for different groups, based exclusively on the ENEMDU household survey. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis, and the 2004-2014 commodity price boom.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure C.2: Pretax household sector income shares (benchmark scenario) in Ecuador (1990-2022)



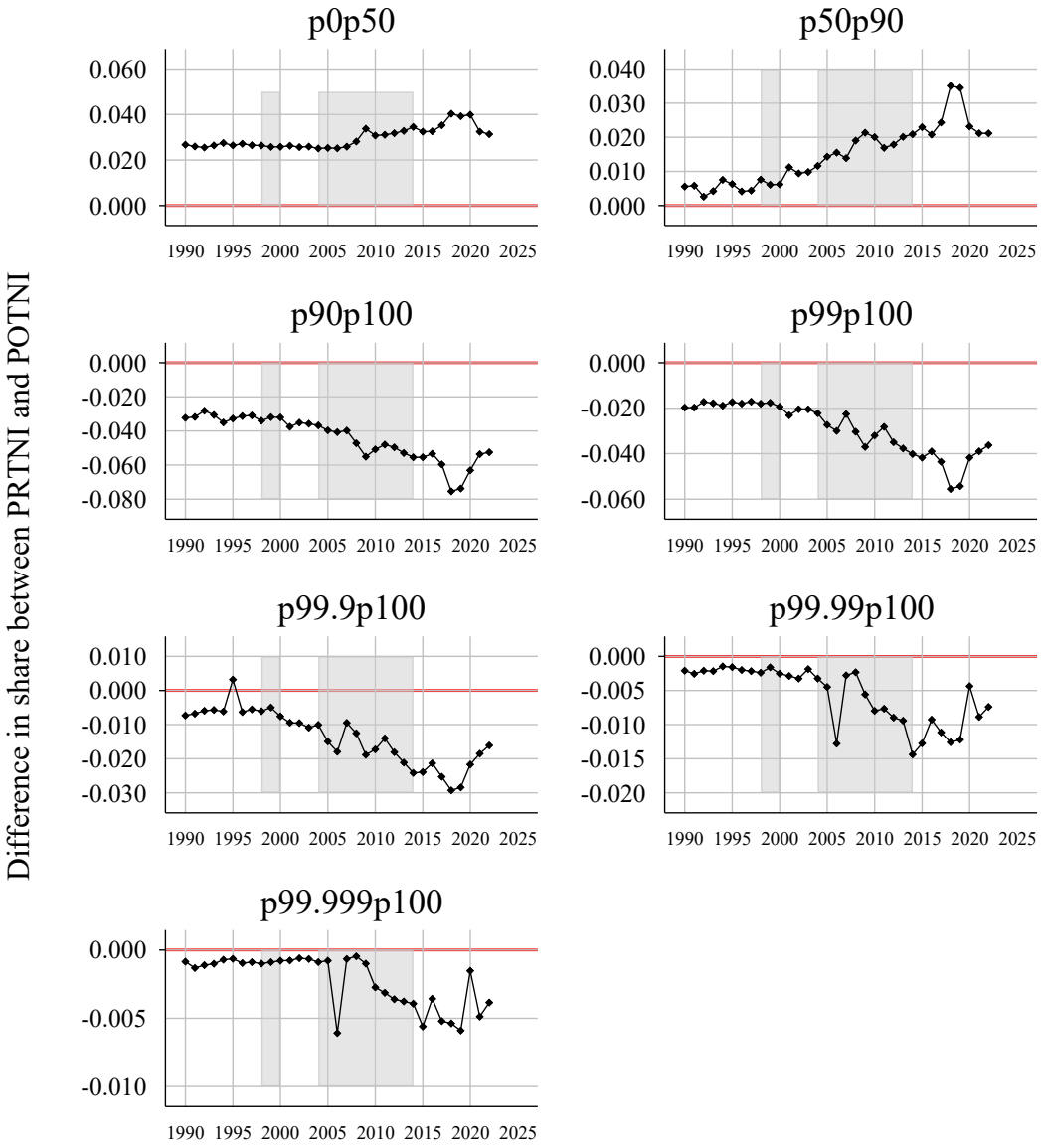
Note: Evolution of pretax household income shares (only household sector S14) for different groups in the benchmark series. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis, and the 2004-2014 commodity price boom.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure C.3: Pretax factor income shares in Ecuador (1990-2022)



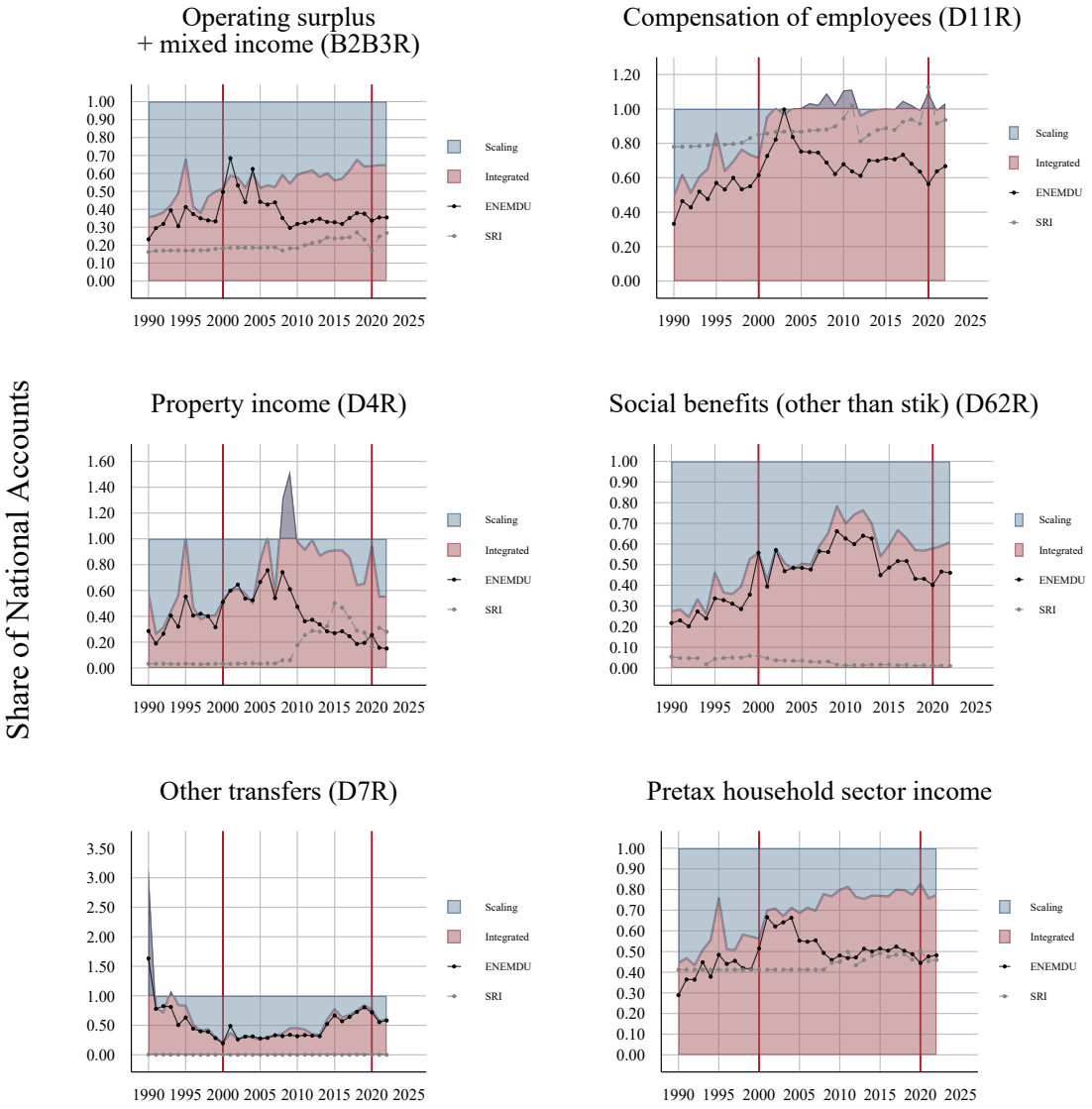
Note: Evolution of pretax factor income shares for different groups in the benchmark series. Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis, and the 2004-2014 commodity price boom.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure C.4: Incidence of taxes and transfers



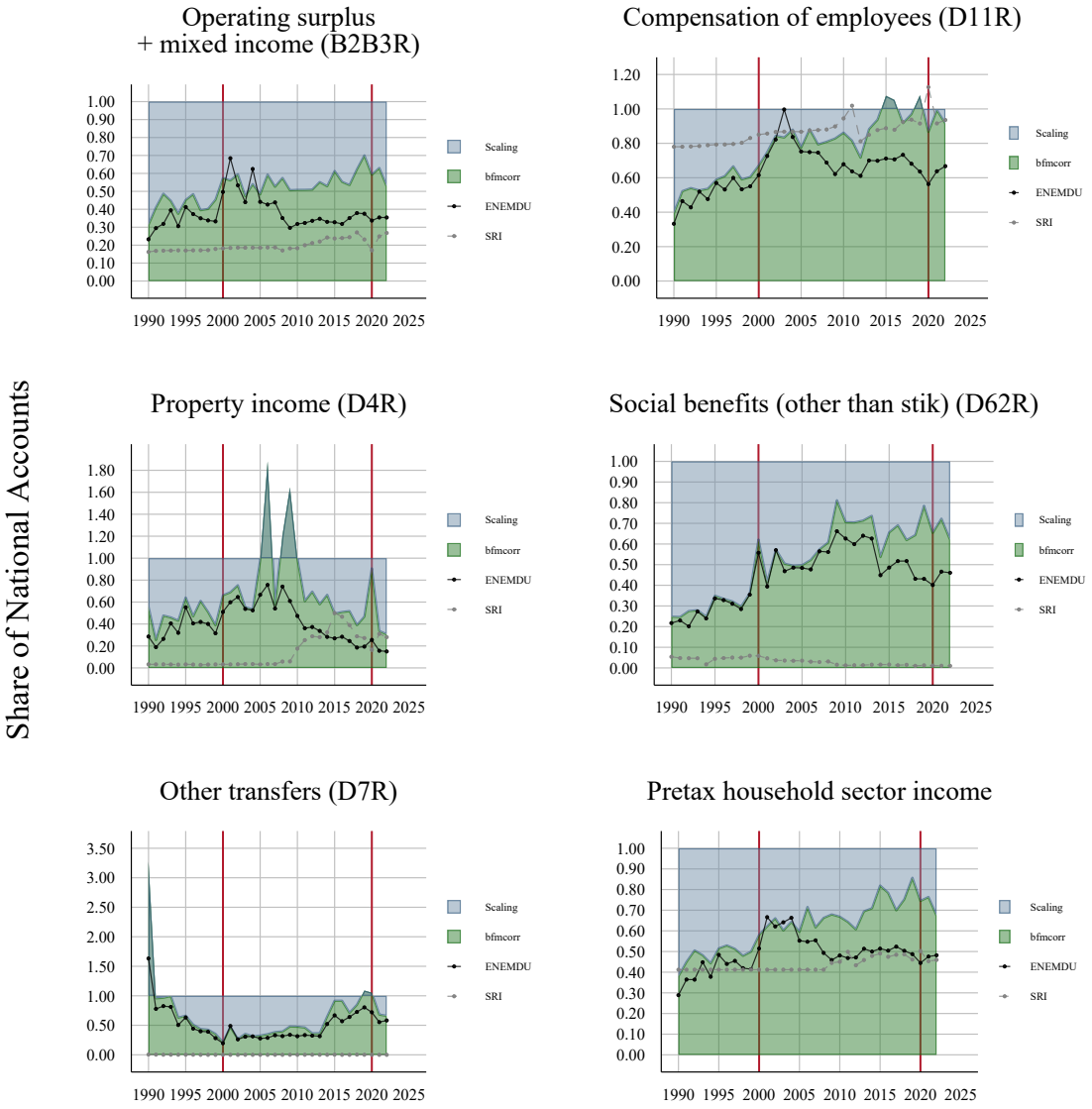
Note: The figure indicates the difference in the share between pretax and posttax national income that goes to each income group.
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure C.5: Coverage of pretax household sector income for different income source with integration (benchmark scenario)



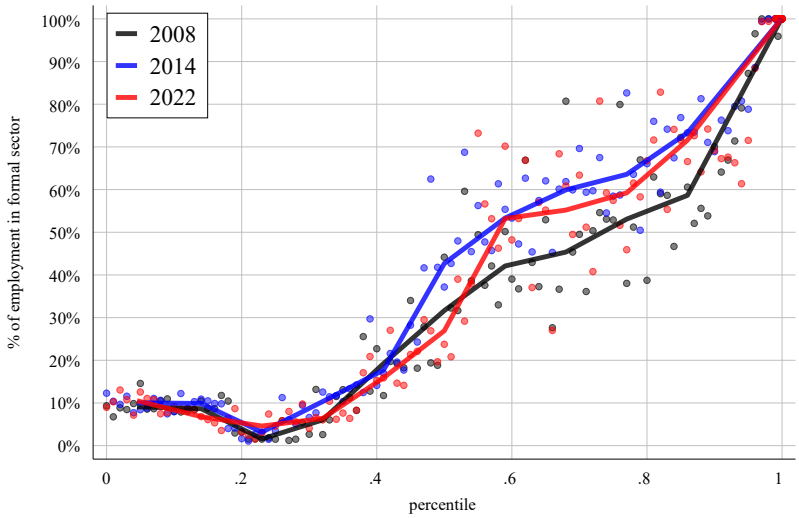
Note: The figure indicates the coverage of different income items by source and year in the benchmark scenario (micro-integration).
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure C.6: Coverage of pretax household sector income for different income sources with bfmcorr



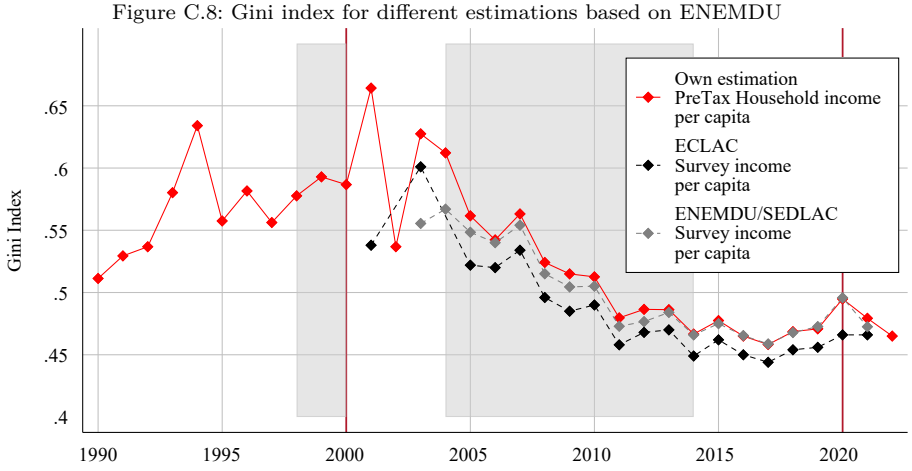
Note: The figure indicates the coverage of different income items by source and year in the reweighting scenario (bfmcorr).
Source: Own elaboration based on ENEMDU, SRI, BCE.

Figure C.7: Employment in the formal sector 2008-2022



Note: Dots represent the share of employment in the formal sector for each percentile for the years 2008, 2014, and 2022. Lines are smoothed averages (twoway median-band plots).
Source: Own elaboration based on ENEMDU, SRI, BCE.

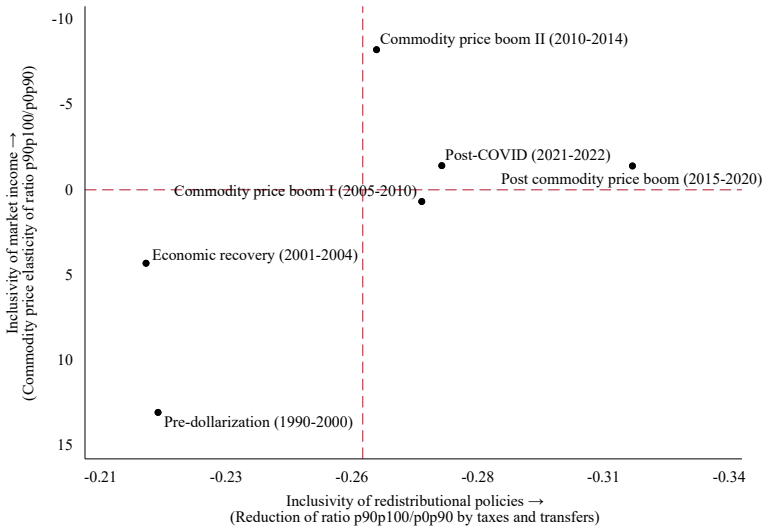
Figure C.8: Gini index for different estimations based on ENEMDU



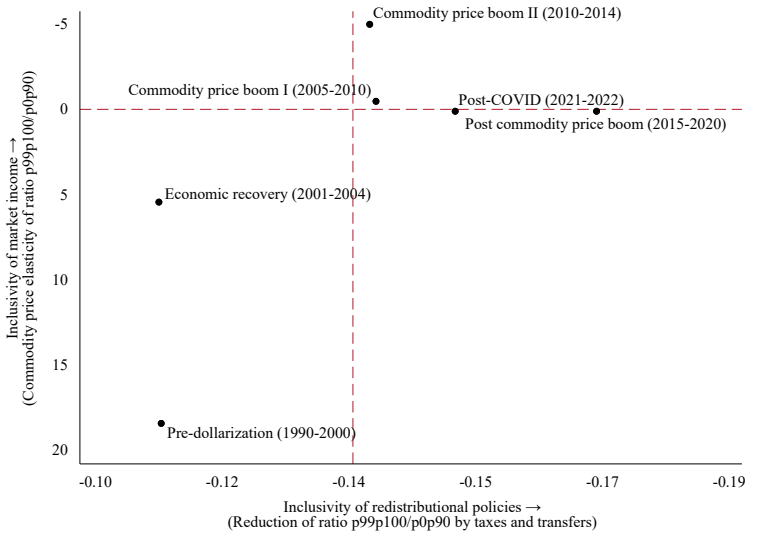
Note: The figure compares the Gini indexes for per-capita income from own estimations and the homologized estimates from ECLAC and SEDLAC (which are equivalent to the official ENEMDU series published by the INEC). Red vertical lines indicate dollarization in 2000 and the COVID-pandemic in 2020. The shaded areas represent the 1998-2000 banking crisis, and the 2004-2014 commodity price boom.
Source: Own elaboration based on ENEMDU, SRI, BCE; ECLAC, SEDLAC

Figure C.9: Institutions (ratios)

(a) Ratio Top 10%/Bottom 90%



(b) Ratio Top 1%/Bottom 90%

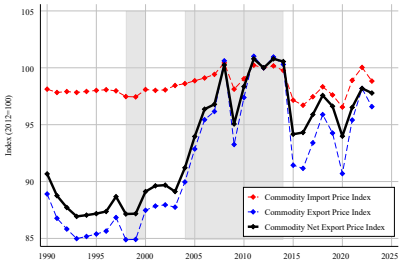


Note: Each point represents a period on the two dimensions of institutional arrangements following Acemoglu and Robinson (2019): The vertical axis represents the inclusivity of the market institutions in the economy, measured by how the pretax ratios react to changes in the terms of trade for Ecuador. Negative values suggest that increases in the terms of trade (caused by increases in international commodity prices) decrease market income inequality. The horizontal axis represents the redistributional capacity and therefore the inclusivity of public policies, measured by the average difference between the posttax and pretax income ratio. Higher negative values suggest stronger income redistribution. The figure is divided into four quadrants: On the vertical axis at zero, indicating inequality reducing or enhancing effects of commodity price increases; and on the horizontal axis at the average difference between the pretax and posttax income ratio. Inclusive institutions are situated in the upper right quarter.
Source: Own estimation based on ENEMDU, SRI, BCE, and IMF.

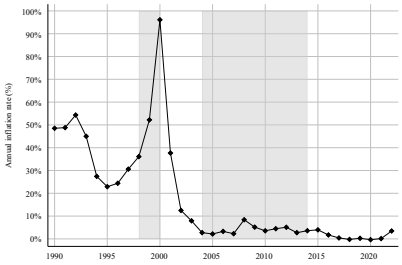
Appendix D Supplementary figures

Figure D.1: Supplementary figures

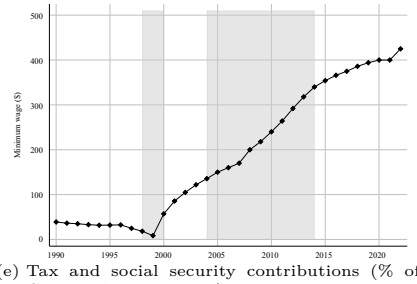
(a) Terms of Trade



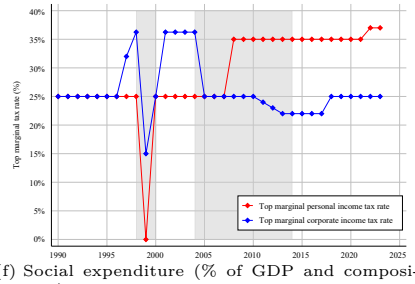
(b) Inflation rate



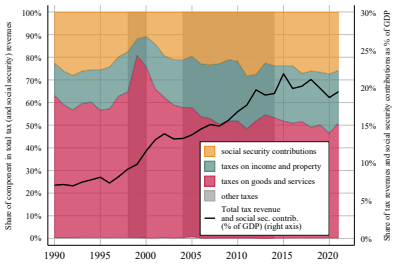
(c) Minimum wage



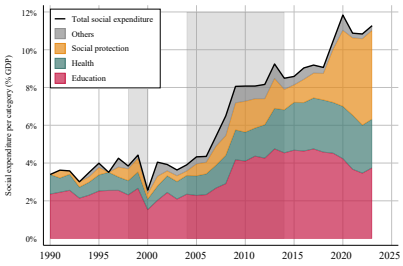
(d) Marginal tax rate



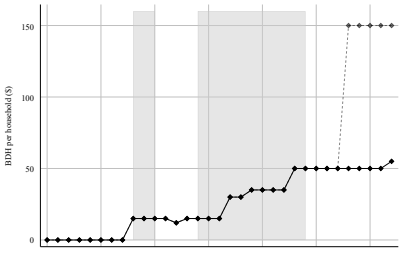
(e) Tax and social security contributions (% of GDP and composition)



(f) Social expenditure (% of GDP and composition)



(g) Bono de Desarrollo Humano (monetary transfer in current US$)



Source: Own elaborations based on (a) https://www.imf.org/en/Research/commodity-prices,
(b) https://www.ecuadorencifras.gob.ec/indice-de-precios-al-consumidor,
(c) https://contenido.bce.fin.ec/documentos/Administracion/bi_menuSalarios,
(d) https://taxfoundation.org and https://www.sri.gob.ec
(e) https://data-explorer.oecd.org
(f) http://www.cepal.org
(g) https://www.inclusion.gob.ec/bono-de-desarrollo-humano1/.

References

Acemoglu, Daron and James A Robinson (2019). "Rents and economic development: the perspective of Why Nations Fail". *Public Choice* 181, pp. 13–28.

Alvaredo, Facundo, Lydia Assouad, and Thomas Piketty (2019). "Measuring lnequality in the Middle East 1990–2016: The World's Most Unequal Region?" *Review of Income and Wealth* 65.4, pp. 685–711.

Arias, Diana, Edwin Buenaño, Nicolás Oliva, and José Ramírez (2008). "Historia del Sistema Tributario Ecuatoriano 1950-1999". *SRI: Fiscalidad, Edición 2*.

Banco Central del Ecuador (2001). ""Las remesas de ecuatorianos en el exterior"". *Cuaderno de Trabajo No. 130*.

– (2012). ""Retropolación de las Cuentas Nacionales 1965-2007"". *Presentacion*.

– (2023). "Metodología de cálculo de los índices de volumen encadenados de las cuentas nacionales de Ecuador". *Banco Central del Ecuador: Cuaderno de Trabajo No. 138*.

Blanchet, Thomas, Lucas Chancel, Ignacio Flores, and Marc Morgan (2020). "Distributional National Accounts (DINA) guidelines: Concepts and methods used in the World Inequality Database". *updated and extended version of the DINA Guidelines first published as WID Working Paper 2016/2*.

Blanchet, Thomas, Ignacio Flores, and Marc Morgan (2022). "The weight of the rich: improving surveys using tax data". *The Journal of Economic Inequality* 20.1, pp. 119–150.

Cano, Liliana (2015). *Income mobility in Ecuador: New evidence from individual income tax returns*. Vol. 2015. UNU-WIDER.

De Rosa, Mauricio, Ignacio Flores, and Marc Morgan (2024). "More unequal or not as rich? Revisiting the Latin American exception". *World Development* 184, p. 106737.

Flachaire, Emmanuel, Nora Lustig, and Andrea Vigorito (2023). "Underreporting of Top Incomes and Inequality: A Comparison of Correction Methods using Simulations and Linked Survey and Tax Data". *Review of Income and Wealth* 69.4, pp. 1033–1059.

INEC (2015). "Metodología de la Encuesta de Condiciones de Vida ECV". *Documento Metodologico*.

Ledić, Marko, Ivica Rubil, and Ivica Urban (2024). "Using tax records to correct for underrepresentation of top income sources in surveys". *Fiscal Studies* Contributed Paper, pp. 1–21.

Llerena-Pinto, Freddy, M Cristhina Llerena-Pinto, and M Andrea Llerena-Pinto (2015). *Social Spending, Taxes and Income Redistribution in Ecuador*. Tech. rep. Tulane University, Department of Economics.

Ponce, Juan (2011). "Desigualdad del ingreso en Ecuador: un análisis de los años 1990s y 2000s". *Documento de trabajo. Quito, Ecuador: FLACSO-Sede Ecuador*.

Ponce, Juan and Rob Vos (2014). "Redistribution without structural change in Ecuador: rising and falling income inequality in the 1990s and 2000". *Falling Inequality in Latin America. Policy Changes and Lesson, Oxford, United Kingdom*.

Ramírez, José and Paul Carrillo Maldonado (2020). "Indicator of the efficiency of value added tax and income tax collection in Ecuador". *Revista CEPAL* 131.

Rossignolo, Dario, Nicolas Oliva, and Nestor Villacreses (2016). "Cálculo de la concentración de los altos ingresos sobre la base de los datos impositivos". *CEPAL: Serie Macroeconomia del Desarrollo* (184).

United Nations (2009). *System of National Accounts 2008*. United Nations, European Communities, International Monetary Fund, Organisation for Economic Co-operation, Development, and World Bank: New York.