



A new geography of inequality: top incomes in Italian Regions and Inner Areas

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Abstract

Detailed distributional estimates at finer geographical levels remain scarce, despite their critical relevance for household well being and policy intervention. This paper leverages Italian income tax records dating back to 1976, focusing on top income concentration and inequality across the country's regions, macro-areas, and the recently introduced classification of the National Strategy for Inner Areas (SNAI). Our analysis reveals a persistent rise in income concentration over the past few decades, particularly among the top earners, while also highlighting nuanced regional and sub-regional dynamics. Notably, city size plays a crucial role, with larger cities experiencing a more pronounced level of income concentration compared to smaller ones. Southern regions exhibit lower income concentration levels among the top income groups, emphasizing the need for disaggregated analyses to capture these complexities accurately.

Keywords Income inequality · Top income shares · Italy · Inner areas · Spatial inequality · Income tax data · National accounts

1 Introduction

The study of national income distribution and the evolution of inequality has a long tradition in economics. Yet, distributional estimates at disaggregated geographical levels are still rarely available, despite their growing importance in at least two key dimensions. First, the spatial dimensions of inequality are increasingly critical in shaping the well-being and life opportunities of citizens and families (Chetty et al. 2016; Connolly et al. 2019), as well as the social cohesion between and within territories. Such territorial economic disparities are also becoming increasingly influential in shaping voting behavior and political participation (Kanbur and Venables 2005; Rodríguez-Pose 2018; Dijkstra et al. 2020). Second, spatial

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dimensions of inequality are crucial for understanding the societal impacts of unfolding climate shocks and extreme climatic events, which are often highly localized and require more granular information at the local level (Waidelich et al. 2024; Errico et al. 2025). In this work, we make use of detailed tax tabulations at different levels of geographical disaggregation to compute income concentration measures in Italy from 1976 to 2021, at both the national and sub-national levels. The availability of municipal-level data made also possible, among other things, to derive income concentration measures for the geographical classification used in the National Strategy for Inner Areas, which classifies municipalities according to their distance from essential public services such as healthcare facilities, education, and transport.

Research works on the estimation of the evolution of income inequality have predominantly pursued three primary avenues, driven by the use of different methodologies and data sources. These include examining survey data (see Carranza and Nolan, 2022 for an up-to-date and thorough discussion), tax data (pioneered by Kuznets and Jenks (1953) for the US), and a recent method known as Distributional National Accounts (DINA), which integrates various distributional statistics with National Accounts data (see the seminal work of Piketty et al., 2018).

In the context of Italy, Alvaredo and Pisano (2010) pioneered the use of Italian tax return data. Since then, the use of taxable reported income has gained traction in Italy, and a few studies have also provided geographically disaggregated estimates of income inequality. However, these studies have focused on aggregate inequality indices, such as the Gini or Theil indices (not top income shares), and did not incorporate any adjustments for unreported income from individuals below the reporting threshold. Moreover, they have overlooked the need to account for the total adult population when examining the top of the income distribution (Acciari and Mocetti 2008; Di Caro 2017; Maranzano et al. 2025). Such estimates are therefore merely capturing a measure of inequality of reported incomes among tax filers, rather than inequality of total income among the entire adult population.

This paper diverges from conventional survey-based or DINA approaches (interested readers may refer to Guzzardi et al., 2024 for the case of Italy and Blanchet et al., 2022a and Ederer et al., 2022 for an EU perspective) and instead aligns with the income tax data literature, drawing parallels with prior studies such as Atkinson (2007) and Alvaredo and Pisano (2010).

Our work contributes to the literature on income distribution in several ways.

First, from a methodological viewpoint, it addresses several challenges associated with the Italian tax data to obtain coherent and meaningful measures of income concentration. Specifically, it corrects for the incomplete coverage of tax returns with respect to the adult population. Next, using data from the National Accounts, it estimates the unobserved portion of income not captured in tax data, applying tailored adjustments for wage, pension, self-employment, and capital incomes. Finally, while much of the existing literature on income inequality using tax data focuses primarily on the upper end of the income distribution (Atkinson, 2007; Atkinson et al., 2011; Alvaredo et al., 2016; Blanchet et al., 2022c; Blanchet et al., 2022b), this paper employs the generalized Pareto interpolation method (Blanchet et al. 2022c) to interpolate income ranges within tax tabulated data. This method enables the estimation of income shares, averages, and thresholds for precise percentiles, allowing users to leverage public data files for results on other fine-grained income groups.

As a second set of contributions, we refine the methodology of Alvaredo and Pisano (2010) to estimate income shares by constructing a fiscal income definition that aligns more closely with Italian income legislation. We also move beyond the concept of fiscal income to construct top income shares based on several income definitions, enabling a nuanced examination of income dynamics and distribution patterns. This paper adopts a *benchmark*

definition of income, which is gross income minus all social security contributions, akin to spendable income before taxes. Additionally, it explores three alternative income definitions to provide a comprehensive analysis: i) *Post-tax income*, derived by subtracting all personal income taxes paid from the benchmark definition; ii) *Market income*, which includes financial and rental incomes as well as labour incomes (inclusive of social security contributions and taxes), while excluding pension incomes and monetary benefits; iii) *Gross income*, comprising market incomes and government cash transfers such as old-age pensions. These varying definitions allow for a broader exploration of income concentration and distributional trends from different perspectives.

Most importantly, as a final contribution, this paper provides novel insights into the spatial dimensions of top income concentration and income inequality in Italy during the first two decades of the twenty-first century. It contributes to the growing interest in spatial income inequality (Bauluz et al. 2023; Disslbacher et al. 2024) and offers valuable information at both the macro-regional level (i.e., North, South, Center) and for each of the 21 Italian regions (NUTS-2 level). Using municipal tax tabulations and a coherent methodology, we compute inequality measures for the entire universe of Italian municipalities from 2000 to 2021. In particular, we present inequality statistics based on the novel institutional classification of the National Strategy for Inner Areas (*Strategia Nazionale Aree Interne* - SNAI), which categorizes municipalities according to their proximity to essential public services (e.g., healthcare, education, public transport). This taxonomy divides municipalities into six classes, ranked from A to F, with class A representing those closest to all fundamental public services, and class F representing those farthest away (see Section 3.3).

Our work complements recent efforts to apply this classification to income inequality studies (e.g., Mastronardi and Cavallo, 2020; Gallo and Pagliacci, 2020). Additionally, we produce data series on provinces and Italian municipalities, which are made publicly available. Finally, we construct new income concentration estimates for Italy as a whole, extending the analysis back to 1976 to provide a longer historical perspective.

Our main findings underscore a persistent increase in income concentration in Italy, irrespective of income definition, group, or geographical classification (see Figs. 1 and 3). The analysis reveals a substantial surge in real income for top earners, with the top 0.1% nearly quadrupling their real income since 1976, in stark contrast to the modest growth experienced by the bottom 90%.

Changes in income composition over time show a doubling of the relative importance of financial incomes for the top 0.1%. While the Southern macro-area is the most unequal when considering the top 10%, a different pattern emerges for the top 1% and top 0.1%, with Southern regions displaying lower levels of income concentration. These findings highlight the importance of analyzing upper-income groups individually to capture nuanced regional dynamics.

The application of the National Strategy for Inner Areas (SNAI), which classifies municipalities into six categories based on accessibility to essential public services, reveals additional insights. Although most municipalities show similar levels of inequality, city size plays a critical role: larger cities exhibit more pronounced income concentration than smaller ones, which tend to align more closely with other peripheral areas.

Our results are consistent with the broader literature documenting a rise in income concentration at the national level across various Western countries since the 1980s (Blanchet et al. 2022a; Bozio et al. 2024; Garbinti et al. 2018; Piketty et al. 2018). Furthermore, the observed local-level patterns align with studies showing that income inequality is higher in large cities, where most economic activities are concentrated (Briskar et al. 2023b), a trend similar to findings for other countries analyzing income concentration at the local level (Bauluz et al. 2023).

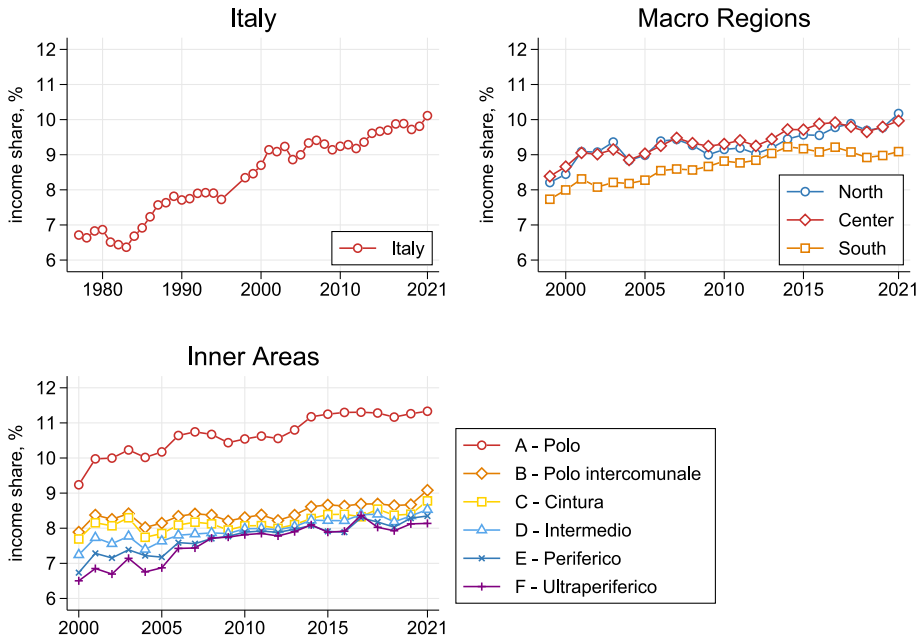


Fig. 1 Top 1% income share

It is important to note that examining the share of total income across macro-areas or aggregated municipalities obscures significant income differentials across geographic areas. For instance, the threshold to enter the richest 0.1% is €515,275 in the North, compared to €160,230 in the South and Islands. This territorial heterogeneity in average income persists even when accounting for differences in local price levels, implying that regions, macro-regions, and areas are not equally represented in upper-income brackets when defined at the national level. Northern regions and larger cities are disproportionately represented, while the South and peripheral municipalities are underrepresented.

The remainder of this paper is organized as follows. In Section 2 we discuss the details of the methodology (Section 2.2), the income concepts (Section 2.3), and the data used (Section 2.4). In Section 3 we show our results on top income shares at various geographical levels of detail, starting from the National level then the macro-regional estimates and finally the municipality estimates aggregated following the SNAI taxonomy. In Section 4 we move to analysing income growth incidence curves at the National and macro-regional level (Section 4.1) that influence the increase in income concentration. In Section 5 we analyse the income components by showing how they fit in the national and macro-regional context (Section 5.1). Finally, Section 6 concludes.

2 Methodology, income concept and data sources

2.1 Existing approaches

The literature on income inequality has largely followed three main streams of analysis, depending on the nature of methodologies and data available, namely tax data analysis,

survey data, and a newer approach called Distributional National Accounts (DINA), which leverages all distributional statistics available together with National Accounts information, offering a comprehensive approach to analyzing income distribution.

First, the most widespread research has focused on household survey data, which rely on information declared by respondents through structured interviews. This literature includes, for example, work by national and international institutions producing official statistics on inequality (Oecd 2015; Di Meglio et al. 2018; Istat 2019). In the Italian context, many empirical studies rely on the Survey of Household Income and Wealth administered by the Bank of Italy (Brandolini and Smeeding 2011; Cannari and D'Alessio 2002; Brandolini 2008; Brandolini et al. 2018; Jappelli and Pistaferri 2010; Checchi et al. 2024; Manna et al. 2012; Ciani and Torrini 2019; Aprea et al. 2025). The main advantage of this approach is the availability of a rich set of covariates, the coverage of the overall population, as well as the possibility to rely on a sound and theoretically grounded definition of income. As recalled in Carranza and Nolan (2022) studies of income inequality using survey data have generally focused on three main income concepts: market, gross, and disposable income. Market income represents all income flows before the State has made any intervention, typically including wages and capital income. Gross income adds transfers and benefits to market income, while disposable income deducts direct taxes and social insurance contributions from gross income. Nevertheless, all these works use only the income reported on the survey without any additional adjustment to account for the low response rates at the top of the distribution. In the presence of growing income inequality, this could be problematic (see Ravallion, 2022; Alvaredo et al., 2022; Blanchet et al., 2022b).

The second most widespread method to study income concentration stems from the use of income tax data pioneered by Kuznets and Jenks (1953) for the US, and, more recently, by Piketty (2003); Piketty and Saez (2003); Atkinson (2005) for France, the US, and the UK.¹ Subsequent studies across several countries have emerged in the field of inequality that use tax data to estimate top income shares (Piketty 2003; Saez and Veall 2005; Dell 2005; Atkinson 2005; Nolan 2007; Atkinson and Leigh 2007; Salverda and Atkinson 2007; Moriguchi and Saez 2006; Roine and Waldenström 2010; Alvaredo and Pisano 2010; Souza and Medeiros 2015; Advani et al. 2021; Krolage et al. 2022; Ciambezi and Pietropaoli 2025). The general approach of this methodology is to define the aggregate income from external statistics and compare it with the amount reported by top income earners (Atkinson 2007). Adjustments to reported incomes may also be applied. In this way, it is possible to calculate fiscal income shares for the top income earners. However, the differences in the fiscal system among countries make the cross-country comparison of these estimates more challenging (Morelli et al., 2015; Atkinson et al., 2011). The advantage of this methodology is that by focusing on tax data, it is possible to obtain inequality estimates for an extended period, often since the beginning of the taxation of income. Moreover, geographical information is often associated with tax records, enabling a more detailed geographic breakdown of income inequality metrics. However, this advantage comes at a cost. Tax data inherently cover only the income declared to tax authorities by individuals who file tax returns. Consequently, the total reported income may deviate from the total income stated in National Accounts, often by sizeable amounts. This disparity arises because not all incomes need to be reported on tax returns, not all individuals are obligated to file tax returns, and some might understate their income intentionally for tax evasion reasons.

¹ The approach was also used by Feenberg and Poterba (1993) in the US. Subsequently estimates of top income shares time series over the long run for more than twenty countries using income tax statistics were derived in a multi-country collaboration project described in the work by Atkinson and Piketty (2007) in Atkinson et al. (2011) and in the so-called World Top Income Database (WTID).

Thirdly and finally, the most recent strand of literature starts with the seminal paper of Piketty et al. (2018) proposing a new approach to income inequality measurement, the so-called Distributional National Accounts (DINA) approach. By using several data sources including tax data and surveys, this new methodology aims at deriving inequality measures which are fully compatible with the Net National Income (NNI) totals as available in the National Accounts (NA).² This implies distributing income at the individual level, encompassing not only the income directly earned by households but also the retained earnings of companies and other income components not earned directly by households. The primary advantage of this approach lies in the ability to compare income inequality across countries through the use of National Accounts (NA). NA data are constructed using consistent international standards, ensuring that any inequality statistics derived from them are inherently suitable for cross-country comparisons. Moreover, this method provides a higher degree of consistency in defining income across different countries and over time. As recalled in Carranza and Nolan (2022), the “DINA framework assigns a central role to the following income variables: Pre-tax national income: the sum of all factor income flows, before considering the operation of the tax and transfer system, but after considering the operation of the pension and unemployment insurance systems; Post-tax national income: pre-tax income after subtracting all taxes and adding all forms of government spending.”

2.2 Our methodology

Our paper neither adopts a survey-based approach, nor a DINA approach. Instead, the paper follows, broadly speaking, the income tax data literature. In particular, as in Atkinson (2007); Alvaredo and Pisano (2010) we identify the top income earners from tax tabulations and population statistics and divide it by the comparable income of the whole population (from external and independent sources) to calculate their income shares. There are four main challenges to overcome.

First, tax returns only cover a portion of adult individuals. Individuals may be left out because they have no income to declare (e.g. students, unemployed, etc.), have too little income to declare (e.g. individual earners with total income below the tax exemption threshold), their income is non-taxable (e.g. doctoral and postdoctoral researchers or recipients of education grants).³ Individuals who chose, unlawfully, not to declare any income will also not appear on income tax statistics. The difference between the number of Italian adults aged 18 years old or older, as recorded by the Italian Statistical Office (Istat), and the number of adult tax filers is approximately 10 million individuals. Hence, inequality statistics computed on the tax filers would be different from those computed considering the full adult population. For our exercise, we assume that this portion of individuals belongs to the bottom 90% of the population. We effectively treat the latter as our lowest income group.

The second challenge concerns the estimation of total income. To do so, we rely on sources that are mostly external to tax data, such as the National Accounts. This procedure would implicitly include the income from non-filers and a portion of the undeclared incomes of filers. As detailed in Appendix A, to derive a measure of total income, we first sum the

² As detailed in Alvaredo et al. (2020) the main difference between NNI and GDP lies in the fact that to obtain the NNI one has to subtract from GDP the income that is estimated to be lost due to the depreciation of the capital stock (i.e. consumption of fixed capital) and add the net foreign income (i.e. income generated abroad accruing to domestic residents, minus the income generated in the domestic economy accruing to foreigners).

³ Different sources of income, such as most of capital and investment incomes, are not subject to income tax but a separate proportional tax. Although this may be an unlikely hypothesis, adults may not appear in the statistics also if their sole source of income is subject to a withholding tax.

total wage, self-employment (without tax evasion), business, and pension incomes from the National Accounts. Note, however, that we do not rely on external data for capital incomes, but rather we use total capital incomes as reported on tax data (similarly to what is done in Alvaredo and Pisano, 2010). As explained in Appendix A, whereas wage, pension, and self-employed incomes declared on tax data are very close to National Accounts total, the coverage rate for capital incomes is lower than 10%.⁴ Such a low coverage rate, and absent other detailed information, would make any distribution of the unobserved portion of capital income very challenging and open to substantive objections.

The third challenge concerns the imputation of unobserved income. Regarding the imputation of unobserved capital income, relying solely on the distribution of capital income reported in tax returns would mechanically allocate roughly 90% of missing capital income, amounting to about 11% of total income, entirely to the top decile. This implies large corrections to top income shares, leading to estimates that appear to be implausibly high with respect to alternative existing estimates for Italy or in comparison to other countries. Hence, our approach preserves both the observed distribution of capital income and its total amount as recorded in the tax data.⁵ For other income sources we observe that the difference between the total income on tax records and the external income totals, as described above, has been very small in recent years. The gap is, however, wider in the earlier period up to 2000. In our exercise, we assume that the unobserved wage and pension incomes are assumed to originate from individuals within the bottom 90%. This assumption allows us to implicitly assign a non-zero income to the additional population that is not present in tax returns but is included in our analysis.⁶ We adopt the same assumption for the portion of self-employment income that is not included in tax returns but is not considered evasion by National Accounts. This is not a stringent assumption, since, unlike evaded income, it pertains to a portion of income likely concentrated among low-income individuals (i.e., incomes falling below the tax exemption threshold). This implies that evaded income, as well as the portion of capital income not taxed under personal income tax schemes, is entirely omitted from this analysis. Including such forms of income would require additional assumptions, and a full re-ranking of individuals, that cannot be credibly made using the tabulated income tax data at our disposal. However, interested readers can refer to Appendix D.2 for a comparison with the results obtained using the DINA methodology (Guzzardi et al. 2024), which includes estimates based on the distribution of all capital incomes and evaded incomes as detailed in National Accounts. In that case, income concentrations and fluctuations are indeed more pronounced compared to the results presented in this work, but the overall trends do not appear to be substantially affected.

⁴ This is due to the existing withholding tax on most capital and financial incomes which limit substantially what the tax data can say about these sources of income.

⁵ As a simple robustness exercise, we retrieved from Guzzardi et al. (2024) the distribution of total capital income within top groups only for the year 2015. Applying the relative distribution of capital income in that year to all other years, we find that the top 0.1% income share would increase by about 0.5 percentage points in more recent years, and by about 1.5 percentage points toward the beginning of our sample period. However, these are only tentative estimates that rely on the capital income distribution observed in a single year and, due to data limitations, cannot be extended to our full sample period. See also Appendix D.2, where we compare the results of Guzzardi et al. (2024) with our benchmark estimates. This comparison can be interpreted as an external estimate that includes all capital income sources, as well as other components such as undistributed profits.

⁶ Without this assumption, and instead allocating missing wages and pensions only in proportion to declared income, we would effectively add many individuals with zero income at the bottom of the distribution. This increases the top 1% income share by about 1 percentage point in the 1980s, and by progressively less, below 0.5 percentage points, in the final year of the analysis. This broadly corroborates our levels and trends in income concentration.

Finally, the last challenge, implies the interpolation of the income ranges within tabulated data to derive income shares, averages, and thresholds for precise percentiles we are interested in estimating. To this end we make use of the generalized Pareto interpolation method developed by Blanchet et al. (2022c). This method is based on calculating the inverted Pareto coefficient $b(p)$ as the ratio between average income above rank p and the p -th quantile, for each available bracket in tax tabulations. Then, it performs quintic-spline interpolation and a few other ad-hoc constraints to obtain a distribution that matches the quantiles and the means of the tax tabulations and at the same time allows for a smooth curve over the whole income distribution.

2.3 Income concept

As recalled in Carranza and Nolan (2022) the measurement of income inequality typically looks at three main income concepts: market, gross, and disposable income. Market income represents all income flows before the State has made any intervention, and generally include all labour and capital incomes. Gross income adds transfers and monetary benefits and pensions to market income, while disposable income deducts direct taxes and social insurance contributions from gross income.

The *benchmark* definition of income we use in our paper is gross income deducting all social security contributions (SSC). This would come closer to a definition of spendable income before taxes (or ‘pre-tax income’ according to the DINA methodological guidelines with the exclusion of the undistributed profits of corporations to household incomes). In our data no adjustments are needed for wages which are typically reported net of SSC and gross of taxes. However, ordinary self-employed income is reported gross of SSC, and since 2015 self-employed income in the preferential tax regime is reported net of both SSC and the proportional income tax paid. We thus adjust these income sources by estimating the SSC due in both ordinary and favourable self-employed income regimes and the proportional income taxes paid by those in the favorable tax regimes.⁷

We also consider four additional definitions of income. First, a ‘post-tax’ income is defined as the benchmark definition subtracting all personal income taxes paid (no other taxes are subtracted). Then a definition of ‘market income’ is constructed as the sum of all financial and rental incomes present in the income tax returns, the sum of all incomes from labour gross of all social security contributions and taxes paid, but excluding pension incomes and any monetary benefits received from the government. Third, we derive concentration measures based on a ‘gross income’ definition defined as the sum of all market incomes and including all government (taxable) cash transfers, such as old age pensions. Finally, we consider a ‘fiscal’ income definition that follows tax reporting closely (i.e. income that is or should be reported on income tax declarations before any specific deduction allowed by fiscal legislation). Such definition includes wages net of social security contributions (SSC), pensions, self-employed income gross of SSC, and the capital income declared through the personal income tax forms.

Figure 2 represents the difference in total incomes following all definitions used in the paper. Moreover, it shows the difference between all income concepts used in the paper and two important income indicators from the National Accounts, namely the Net National Income (NNI), and the Gross Domestic Product (GDP). Both totals of market income and the benchmark income are close to one another because SSC and pensions almost balance each other out. However, the distributional impact of these two income components is significantly

⁷ Further details are available in Appendix A.2.

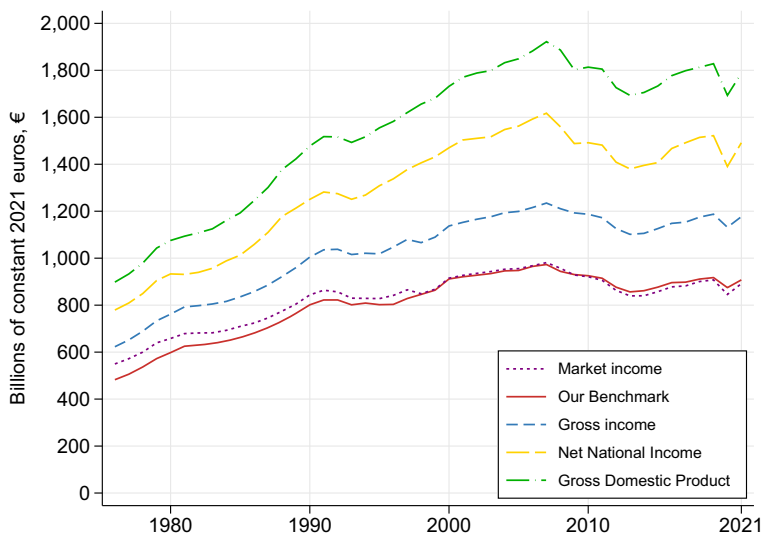


Fig. 2 Total income concepts

different as they depend on who earns SSC and who receives pensions. Total gross income is considerably higher than our market income and benchmark income totals since it includes both the SSC and the pensions. It is also worth dwelling on the large gap between NNI and total market income in view of the relevance that the NNI definition plays within the recent development of the so-called DINA literature (Alvaredo et al., 2016). Such gap has several explanations linked to conceptual income differences between tax records and National Accounts. First of all, the NNI definition includes an estimate of evaded incomes of the self-employed which is naturally unreported on tax records. Likewise, mostly due to the existence of a withholding tax on capital incomes, only between 3% to 8% of the financial income figures from NA are observed in the tax records (see Figure A.4 in the Appendix). These two components, the financial income and the evaded income of self-employed, account for 15% and 17% of the discrepancy with NNI, respectively.⁸ The estimate of imputed rents of the household sector (i.e. the figurative rental income accruing to home owner-occupiers), are also excluded from our definition of income whereas they appear within NNI and account for 3% of the total discrepancy. The rest of the gap between the market income and the NNI is due to income sources not earned directly by the household sector. In particular, in 2021, 35% of the gap was due to the retained earnings of the corporation sector, and the remaining 30% was due to income directly earned by the government sector (see Figure D.5).

2.4 Data sources

To construct our long-run income concentration series we rely on several data sources. Data on the adult population up to the municipality level is sourced from the Istat population census.

⁸ To avoid making rough assumptions about their distribution (even less convincing across all geographical breakdowns of the data), we decided to exclude the portion of financial income that is not present in the tax return (i.e. the external total we use relies on financial incomes that are reported on tax records). For similar reasons, we exclude from the analysis all the self-employed income that is estimated to be evaded.

Income distribution information is mainly obtained through detailed income tax tabulations for different geographical units of aggregation. Each tabulation includes information about the frequency of taxpayers and the total income declared for each income bracket. Information about the composition of income and the effective income liability is often available too.

Income tabulations at the national and regional levels are available from 1974 to 2021 and from 1999 to 2021, respectively, and present a relatively high number of income brackets, 33 or 34 depending on the year. Tabulations also provide a detailed decomposition of total reported income that we grouped into six main income categories for each income class: employed, self-employed, pension, actual rents, and financial incomes.⁹ At the national level, income composition is only available since 1976. The regional tabulations correspond to the official Eurostat NUTS-2 level of aggregation and report the income declared by individuals residing in a specific region, rather than the location where their job occurs.¹⁰ The income tabulations at the municipality level have been publicly available only for more recent years, since 2000, and differ significantly from national and regional ones in two important ways. First, to preserve a higher degree of data privacy of public records, only 7 or 8 income brackets are available, depending on the year. Consequently, the limited number of brackets available at the municipal level necessitates more extensive interpolation within the data. As a result, the focus of our analysis will never extend beyond the richest percentile (i.e. Top 1%) at the municipal level. Secondly, the municipality tabulations do not provide any breakdown of income sources within income ranges, which restricts our analysis on this dimension at fine geographical disaggregation (see Appendix B for further details).

In the estimation of our different measures of total income needed to estimate income shares (see Section 2.2) we rely on National and Regional Accounts released by the National Statistical Office, Istat, and retrieve information on wages, self-employment income, and social security contributions. Pensions and other taxable transfers are obtained from the National Institute for Social Security, INPS. As we do at the National and regional level, to obtain estimates of total gross income, market income, and our benchmark income definition at the municipality level, we require estimates of the missing incomes that is not present in tax declaration. Since we cannot obtain such estimates directly from external data at the municipality level, we rely on our estimate of total income at the regional level to estimate total incomes across municipalities within each region. In our baseline scenario, we assume that the difference between total income and declared income at the regional level is distributed among municipalities in proportion to the income declared at the municipality level. This implies that richer municipalities receive a higher share of the regional missing income, but the proportion between declared and total income remains homogeneous across municipalities within each region. In Appendix C.1, we also present results using an alternative approach that, in principle, introduces greater heterogeneity across municipalities. In this approach, the missing income for pensions, wages, and self-employment is distributed separately at the municipality level based on the declared income for each component. However, this alternative method yields virtually identical results, confirming the robustness of our base-

⁹ We generally refer to the IRPEF tax tabulations available on the Ministry of Economy and Finance website https://www1.finanze.gov.it/finanze/pagina_dichiarazioni/public/dichiarazioni.php. However, it should be noted that National tabulations from 1976 to 2002 were obtained from the publication of Alvaredo and Pisano (2010), while Regional tabulations from 1999 to 2015 were kindly provided by the Ministry of Economy and Finance.

¹⁰ The acronym NUTS (from French: Nomenclature des unités territoriales statistiques), identifies the breakdown of the territory of the European Union for statistical purposes devised by Eurostat in 1988 taking the local administrative unit as the basic reference for the territorial redistribution of EU structural funds.

line methodology. By aggregating municipalities data we are then able to obtain results for different level of geographical aggregation. Within this paper we focus on the municipality aggregation by the National Strategy for Inner Areas (SNAI) in Section 3.3, which classifies each municipality into 6 different categories according to the accessibility to essential public services such as health, education, and mobility. Furthermore, we also present results at the province level aggregation (NUTS-3) in Appendix D.1. Given the use of tax declarations by geographical units, it is worth recalling that it may be that some individuals work in one region but reside in another. Although this likely applies to a very small sample of individuals, the diffusion of remote working since the Covid-19 crisis in 2021 might increase the relevance of this phenomenon in shaping within-region income inequality. Similarly, income tax data at the municipality level reflect the income of residents in a given municipality, rather than the income earned through services and activities conducted there.

3 Top income shares at National and Sub-National level

In this section, following the methodology outlined in Section 2.2, we show our estimates on income concentration by first focusing on the national level in Section 3.1 showing results for our three main incomes discussed in Section 2.3. Then in Section 3.2 we split the nation into three main macro-areas, North, Center, and South & Islands, and show our results for the income concentration of our benchmark income definition at the macro-region level. Differences between income concentrations among regions are also discussed. Finally, in Section 3.3 we present our main results on income concentrations using municipality-level data aggregated according to a policy classification criteria used within the National Strategy for Inner Areas (i.e. *Strategia Nazionale Aree Interne*), identifying areas according to their accessibility to essential public services such as health, education, mobility, etc.¹¹

3.1 Top income shares in Italy

Our analysis begins with the estimation of top income shares at the national level. In Fig. 3, we present our key findings, depicting top income shares for three distinct income brackets: the top 10%, the top 1%, and the top 0.1%. While all subsequent analyses are based on our benchmark income definition, we begin by showing estimates for all the four main income concepts defined in Section 2.3: benchmark income, gross income, market income, post-tax income.¹² Estimates based on fiscal income (i.e. income as reported on tax records with minor adjustments) are not shown in Fig. 3 and are effectively an extension and update of the existing estimates from Alvaredo and Pisano (2010) and discussed separately within Appendix A.4.¹³

¹¹ The data files associated with this paper contain full income share estimates at the municipality, province, and regional levels for all years and many percentiles in the distribution.

¹² Recall that the market income concept encompasses all earned income and social security contributions while excluding received taxable pensions. The gross income concept adds taxable pensions to the market income, whereas our benchmark definition deducts social security contributions from the market income and includes all taxable pensions received. Our post-tax income series is obtained from our benchmark estimates from which we subtract all the effective income taxes paid.

¹³ Our findings show similar trends with Alvaredo and Pisano (2010), with the top 10% of income earners increasing their share of total income by almost 10 pp since 1980.

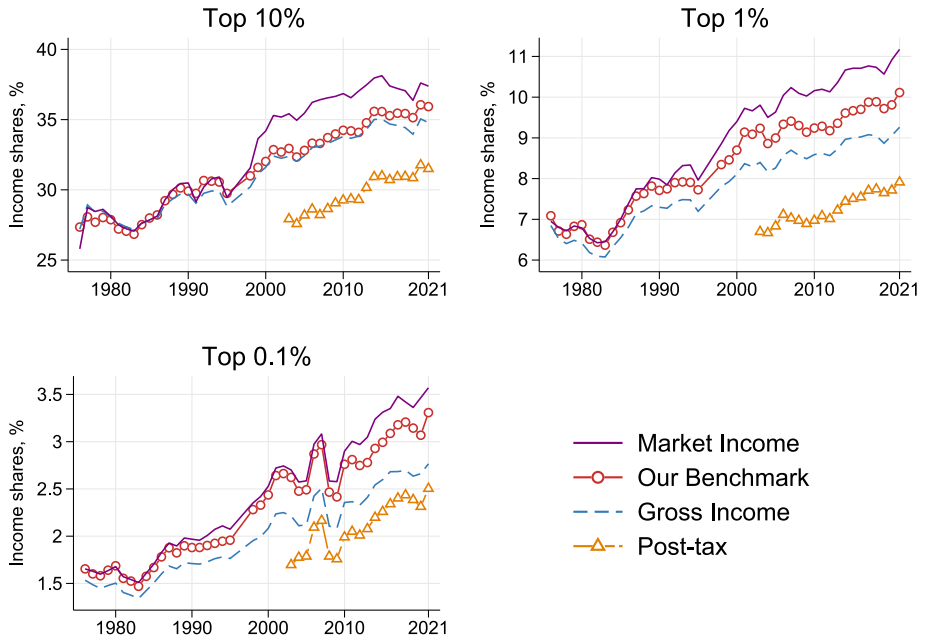


Fig. 3 Top Income shares. Note: “Post-tax” is calculated subtracting the personal income taxes paid from “Our Benchmark”

Our main findings reveal a persistent, long-term rise in income concentration in Italy, regardless of the income definition employed.¹⁴ The top 10% experienced a substantial rise, expanding their income share by at least 7 percentage points (pp) – climbing from 27% of total income to over 35% in 2021. Similarly, the top 1% saw their income share fluctuate, starting at 7% in 1976, dipping slightly in subsequent years, then steadily climbing to 10% of our benchmark income definition and reaching 11% when considering the market income concept. Examining the top 0.1%, a consistent upward trajectory is also evident, with their income share rising from just above 1.6% in 1976 to a historical peak after the Covid-19 pandemic in 2021, where they earned 3.3% of the total income (see Table D.1 for a precise tabulation). This trend underscores the sustained increase in income concentration within this top income group, only temporarily affected by significant income reduction during the dot-com bubble in 2001 and the Global Financial Crisis around 2008 (refer to Section 4 for additional discussion).

Notably, the market income definition reveals the highest concentration levels and the most marked rising trend, whereas the gross income definition shows lower top shares and less pronounced growth in the top shares. This contrast arises because in the market income definition, we exclude all types of pensions accruing to the oldest individuals, resulting in an important reduction of income for those at the lower and middle end of the income distribution where pensions are more common. This implies higher income concentrations

¹⁴ We also compare all our estimates to those obtainable with raw tax tabulations without any correction for the total population and without using an external total income (Figure E.3). In this case, estimates refer to the share of total reported income by a specific proportion of the tax-filers. This is not a meaningful population inequality statistic but it is worth noting the trend for top income shares derived with this approach would be comparable until the beginning of the century but will differ substantially for the last 20 years, with a flatter trend over time.

at the top of the income distribution where pensions are less relevant. On the other hand, the gross income definition includes pensions, thereby reducing the overall levels of income concentration. Our benchmark series of top income shares fall in between the income shares calculated using the market income definition and the gross income definition. The exclusion of social security contributions from the gross income definition is, indeed, increasing income concentration. This shift is driven by two factors. Firstly, individuals at the top of the income distribution obtain a larger portion of their income from sources like rents and financial assets, which are not subject to social security contributions. Secondly, there is an upper threshold on social security contributions, meaning that individuals earning labour income exceeding (approximately) €100,000 are no longer contributing.

The post-tax top shares estimates show the lowest levels of income concentration among all estimated series but similar trend dynamics. For instance, the top 1% is approximately 2 percentage points below the benchmark series. This is the result of the strictly progressive nature of the Italian personal income tax, implying higher effective tax rates as income rises.¹⁵ However, it's noteworthy that the degree of progressivity appears to have diminished over time. While such direct personal income taxes effectively reduced the top 10% income share by 5 percentage points (pp) in the initial available year of 2003, this reduction steadily decreased to 4.4 pp by 2021. Similarly, for the top 1%, the impact of personal income taxes on income share reduction declined from 2.5 pp in 2003 to 2.2 pp in 2021. The reduction was less pronounced for the top 0.1%, decreasing from 0.9 pp in 2003 to 0.8 pp in 2021.

As highlighted in Section 2.1, using tax data to estimate inequality measures poses significant challenges for cross-country comparisons, as both the definition of total income and the unit of analysis often differ between countries. However, by comparing our results with those obtained in other countries and accounting for methodological differences, we can still draw some useful insights. In Figure D.6 in Appendix D.2, we compare our benchmark results with the Pre-tax National Income estimates obtained using the DINA methodology, as provided by the World Inequality Database (WID) for major EU countries such as France, Spain, and Germany, as well as the United Kingdom and the United States. The DINA methodology distributes the entire Net National Income at the individual level, including evaded income and capital income not subject to personal income tax, both of which are excluded from our analysis (as explained in Sections 2.2 and 2.3). Additionally, our benchmark analysis uses individual-level data, whereas WID data divide household income equally between members of a household couple. Despite these methodological differences, the overall trends in income concentration for the top 10%, top 1%, and top 0.1% are very similar across most countries, with all recording a sharp increase in concentration—except for Spain, which shows a peculiarly stable trend. Moreover, while all European countries display relatively comparable levels of income concentration, the United States stands out, with a starkly higher concentration—approximately 10 percentage points higher than that observed for EU countries at the top 10% and top 1% levels in 2021.

3.2 Top income shares at sub-national level

Regional economic disparities in Italy are large in terms of income levels, growth, capital accumulations, and welfare (Istat 2021a, b; Oecd 2019). North-South economic divides are a

¹⁵ There are two important caveats to this statement. First, many capital incomes are subject to a separate withholding tax and are often subject to a preferential tax regime compared to personal income tax rates. Second, as shown in Guzzardi et al. (2024), the overall effective tax rate (including all taxes and social security contributions other than the personal income tax) may well be regressive along the income distribution, especially above the 95th percentile of the personal income distribution.

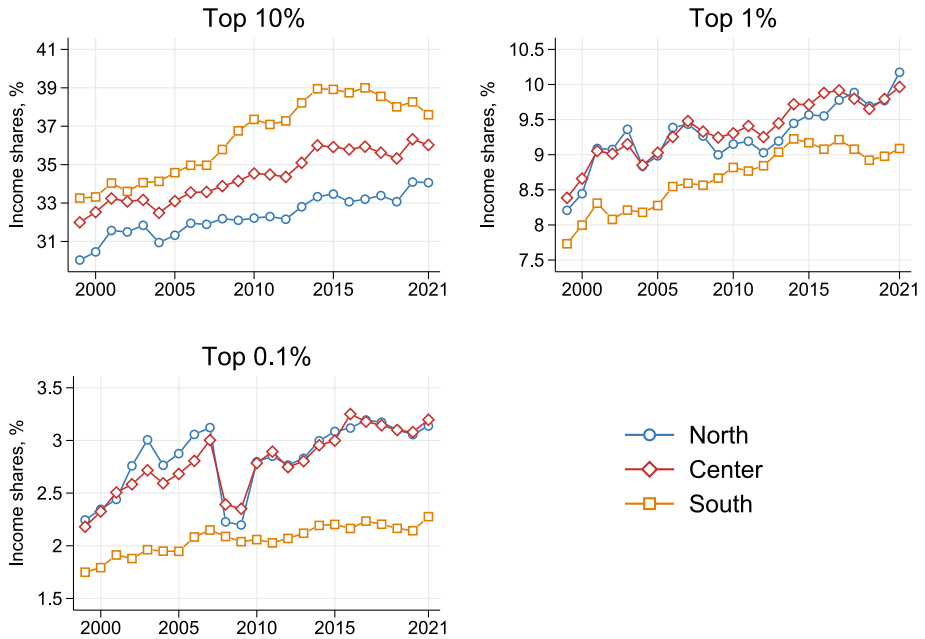


Fig. 4 Top income shares, by selected income group and Macro geographical area. *Note:* Top percentile are defined within the local population, and local income thresholds

widely researched topic even in economic history, as such divides date back even to the pre-unification period of the nation (Felice 2018; Federico et al. 2019). Our work also contributes to the literature on regional disparities by analysing the dynamics of income concentration at the top within disaggregated sub-national areas.

Figure 4 shows the main results representing the dynamics of income concentration for the South, the Center, and the North areas of the country. The figure shows, in different panels, our benchmark income concentration series for three groups, the top 10%, the top 1%, and the top 0.1%. Focusing on the top 10% alone, the Southern macro area appears the most unequal of the country. The share of total income held by the richest decile is more than 2 percentage points higher in the South compared to the North. This confirms previous findings in the literature such as those presented in Güell et al. (2018) which argued that income inequality is higher in Southern regions despite having a lower per-capita income than the Centre and Northern regions. This same line of reasoning can be applied when comparing our results with those highlighted by Ciani and Torrini (2019), where the authors show that low employment rates in the South contribute to higher inequality levels. However, their results are characterized by the use of aggregate inequality indices such as the Gini index. Using this aggregate index, we also confirm that the South appears more unequal with a similar pattern to the one shown by the top 10% income concentration (see Figure E.9 in Appendix E). As Ciani and Torrini (2019) stated, this might be due to lower employment rates in the South—48.5% compared to 71.4% and 67.2% in the North and Center regions, respectively, in 2021 according to Istat data—which result in a lower overall income level and a higher proportion of people with low incomes in these regions, thereby pushing the Gini index to higher levels in the South. A similar result was also highlighted by Boeri et al. (2021), who state that, due to institutional settings that keep nominal wages at similar levels

across regions in Italy, the low productivity of firms in the South forces them to maintain lower employment levels. This, in turn, results in a higher number of individuals without jobs and greater wage inequality in the South. However, in the present work, we not only look at aggregate inequality measures but specifically show the importance of studying the top of the income distribution more closely. By examining top income shares, we show that the overall picture changes substantially when zooming within the top 10%. Upon closer examination of the top 0.1%, we observe a consistent pattern, where the Southern regions displayed the lowest concentration among the three macro areas. This shows the importance of looking more closely within the upper income groups. In fact, when examining the top of the income distribution, the differences in employment rates across regions, which help explain both the higher Gini index and the greater top 10% income concentration in the South, are no longer sufficient to account for the disparities in income concentration beyond the top 10%. For the top 1% and top 0.1%, the ranking among macro-regions is reversed, with the Northern and Central regions exhibiting greater inequality than the South. This suggests that factors beyond employment rates, such as structural differences in income-generating mechanisms, play a more significant role at the very top of the distribution. These findings are consistent with those of Briskar et al. (2023a), who demonstrate that the sector of activity provides one of the strongest explanations for income differences between individuals. This observation underscores the importance of considering sectoral dynamics when analyzing inequality, particularly when discussing income concentrations at the municipal level, as we explore in Section 3.3. It is also worth stressing, that despite large differences in income levels across Italian regions and provinces, the place of residence does not explain much of the existing income inequality across individuals. The work by Briskar et al. (2023b) explains that more than 95% of total wage variance between 1985 and 2018 is explained by the within-province variation and not by the between-province component.

It is noteworthy that during the Global Financial Crisis, the top 0.1% experienced a decline in income share, but although this decline was attributed to a widespread reduction in all income sources of this income group, it was limited to the North and Center regions. In contrast, the Southern regions did not exhibit a comparable decrease in income share. This anomaly can be explained by the fact that even lower-income groups in those regions experienced a significant real income loss (refer to Section 4.1 for further details). This confirms the importance of looking within the top decile and documenting the dynamics for the upper income brackets (for complete income shares tables at the regional level see Appendix D Tables D.2, D.3, D.4).

Results are also derived for the two alternative income definitions, market income as well as gross income. All results are consistent with what derived for the benchmark income definition. One exception is worth noting. When considering measures based on gross income (i.e. market income plus pensions, including all social security contributions), the geographical heterogeneity of income concentration between North, Center, and South is attenuated. In the case of top 1% group, the shares are almost identical in levels and follow a similar trend (Figure E.4).

Looking at the share of total income within different macro-areas provides important information about the distribution of incomes across different areas. However, this exercise hides important income differentials across geographic areas. In Table 1 we show that while in the North of Italy, one needs at least €41,042 to enter the richest 10% group, such threshold is 25% lower of just €30,988 in the South & Islands. On average, the richest 10% of adults living in the North earn €74,753 compared to €48,818 in the South. Climbing further up on the income ladder would widen such disparities even more. To enter the richest 0.1% of adult income earners in the North one would need at least €515,275 compared to €160,230 in

Table 1 Thresholds and Average income for top income in Macro Regions in 2021

Income group	North		Center		South		Italy	
	Threshold	Average income	Threshold	Average income	Threshold	Average income	Threshold	Average income
Adult								
Population		21,944		19,121		12,984		18,249
Top 10%	41,042	74,753	38,635	68,878	30,988	48,818	36,516	65,567
Top 1%	112,836	223,257	102,547	190,537	77,041	118,010	98,120	184,562
Top 0.1%	515,275	688,472	403,028	611,265	160,230	295,627	374,803	603,627

Table 2 Distribution of Macro-regional population in National top income in 2021*

Income groups	National Threshold	North population shares	Center population shares	South population shares
Total population	-	46%	20%	34%
Top 10%	36,516€	58%	22%	20%
Top 1%	98,120€	62%	23%	15%
Top 0.1%	374,803€	70%	20%	9%

*Note: Thresholds are calculated based on National total income. The *Total population* figures in the first line indicate the actual division of the national population across macro-regions. These figures also serves as a reference to illustrate how top shares would be divided across macro-regions in the presence of perfect between-region inequality

the South of the country. These differences in income levels among the richest individuals in different parts of the country might be partially offset by variations in regional price levels. To account for such differences, we would need to use Purchasing Power Parity (PPP) estimates within the country. To adjust the thresholds and average income for the upper-end income groups, we made use of experimental statistics on PPP by regions released by the Italian National Statistical Office. These data only include a limited set of goods and services and exclude rents. The results are presented in Table F.2 in Appendix F, alongside the PPP values used for the adjustments in Table F.1.¹⁶ Our analysis shows that income disparities remain stark even after these adjustments. For example, the top 10% in the North has an average income of €75,092 in PPP, which is 33% higher than the €50,094 in PPP for the South. These differences widen further for the top 0.1%, where the average income in PPP in the North is 56% higher than that of the South. While Boeri et al. (2021) suggests that adjusting incomes within Italy using PPP values may be meaningful when comparing average incomes or income groups that are relatively close, our findings indicate that such adjustments are less effective in explaining disparities at the top of the income distribution. As a result, we opted to present our benchmark estimates without applying PPP adjustments.

A direct implication of such large territorial heterogeneity in average income is that different regions and macro regions cannot be equally represented in different upper groups of the income distribution when defined at the national level. Indeed, Northern regions are disproportionately represented in the upper income brackets compared to the Southern regions. To illustrate this point, let's take the richest national decile group, defined as adult income earners with at least €36,516 in 2021. Our data show that 58% of individuals in the top decile,

¹⁶ Note that regional PPP values are experimental statistics released by Istat and are subject to future revisions.

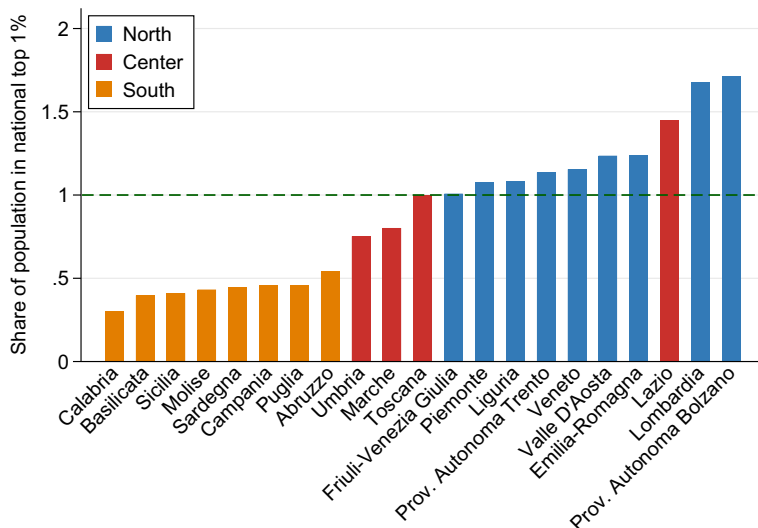


Fig. 5 Share of regional population part of the National top 1%

live in the North, and only 22% and 20% live in the Center and Southern regions, respectively. The share of people from the Northern Italy increases to 62% if we take the richest percentile of the national income distribution as the reference point. Zooming in even further, for the richest 0.1% of the national population (those earning at least €374,803 in 2021), we find that only 9% of them live in the South while 71% of them live in the North. Note, that if we were to define the top 0.1% group as the richest 0.1% adults living in the South, the threshold would be €160,230, more than halved compared to the national threshold. Conversely, the threshold would be much higher, €515,275 if the richest 0.1% would be defined taking the Northern adult population as the reference point. Interestingly, the share of top income living in the Center is on average constant at around 20% regardless of the percentiles we look at (Table 2).

We also compute the share of total adults within the regional-specific income distribution that is identified using the threshold of the upper $q\%$ group in the national income distribution. Following the discussion above we expect that the threshold of the national top 1% group would identify less than 1% individuals in southern regions and close to or more than 1% in the northern regions. In other words, as shown in Fig. 5, the monetary threshold needed to identify the richest percentile in the South would fall short of identifying the richest percentile in the North. Indeed, the monetary threshold identifying the richest national top 1% is only identifying the richest 0.5% in southern regions like Abruzzo or Puglia. The percentage is higher than 1% for most of the northern regions, where the richest percentile threshold at the national level identifies more than 1% of the richest adults in the region. Similar patterns also apply for the top 10% and the top 0.1% in the Appendix E, Figures E.5 and E.6.

3.3 Top income shares at sub-regional level

Following the methodology described in Section 2.2, we can estimate top income shares, average, and thresholds also at the municipality level consistently with National estimates. In particular, we construct inequality measures aggregating municipalities according to the

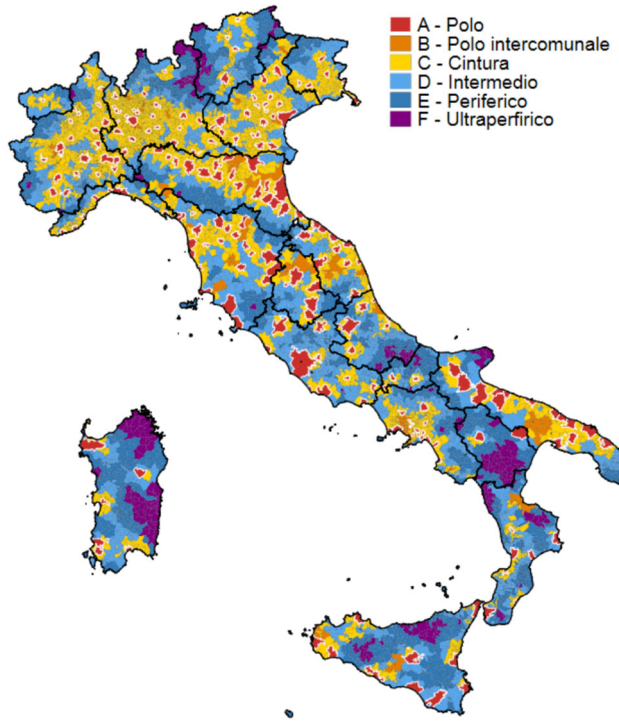


Fig. 6 Geographical location of municipalities by *Inner Areas* classifications

National Strategy for Inner Areas (SNAI) which classifies each municipality into 6 different categories according to the accessibility to essential public services available to the citizens.¹⁷

Existing works have used the SNAI classification to derive more standard inequality measures such as the Gini coefficient (Mastronardi and Cavallo 2020; Gallo and Pagliacci 2020). However, we believe that looking at more comprehensive income concentration measures in these groups of municipalities may enrich our understanding of these areas and give important insights into the relationship between area characteristics and income inequality, which can inform policy decisions aimed at reducing income disparities.

The First group of municipalities is the *A - Polo* category. These are municipalities that offer (i) a complete upper secondary education offer; (ii) at least one "spoke" hospital with emergency rooms and rooms for more complex pathologies;¹⁸ (iii) a railway station with at least 2.500 passengers per day. Then there is the *B - Polo intercomunale*. These are a group of municipalities that can offer the same level of public services as in *A - Polo* within their network of two or more municipalities. The other categories depend on the distance between the closest *A - Polo*. The *C - Cintura* municipalities are located within 20 minutes

¹⁷ <https://politichecoesione.governo.it/it/strategie-tematiche-e-territoriali/strategie-territoriali/strategia-nazionale-aree-interne-snai/>.

¹⁸ The use of the Hub & Spoke model in medicine starts from the basic assumption that for certain diseases and/or highly complex situations, it is necessary to have rare specialized expertise and/or expensive equipment, which cannot be widely available throughout the territory. The model therefore involves the provision of care for such situations by regional or macro-area centers of excellence, called "hubs", to which patients from peripheral centers, called "spokes", are referred when the complexity of the expected interventions exceeds what can be provided by peripheral centers.

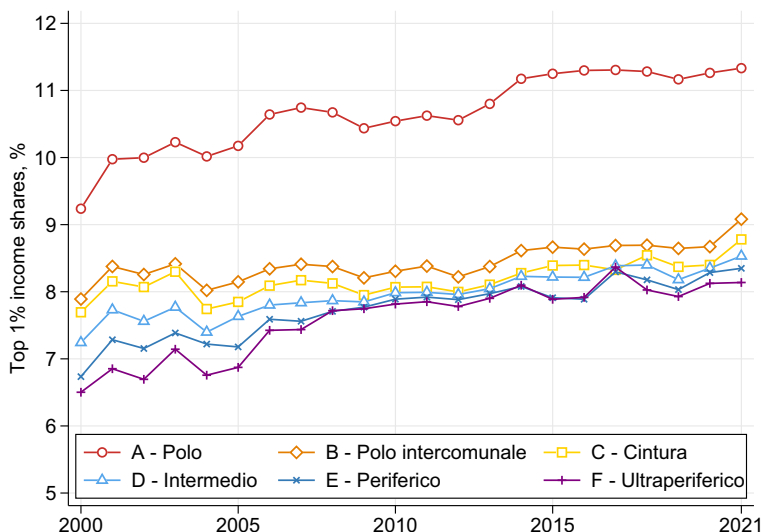


Fig. 7 Top 1% income share by *Inner Areas* classifications. *Note:* Top percentiles are defined within the local population, and local income thresholds

from the closest *A - Polo*. The other three classifications are *D - Intermedio*, *E - Periferico* and *F - Ultraperiferico*. These are respectively distant from the closest *A - Polo* between 20 and 40 minutes, between 40 and 75 minutes and above 75 minutes. Together, the latter three categories form the *Inner Areas*, while *A - Polo*, *B - Polo intercomunale* and *C - Cintura* groups, are called *Centers*.

In Fig. 6 we show the geographical distribution of these municipalities to underlying that it is, by construction, highly correlated with the ease of transportation within that area. The regions of the North with fewer mountains are more populated by *Centers* municipalities while in the South or extreme North, near the Alps, *Inner Areas* are more common.

As we mentioned, *Inner Areas* are characterized by a lower provision of public services. However, they are also characterized by a substantially lower total population, with only 22% of citizens living in those areas and a significantly lower level of income per capita. All the *Inner Areas* in 2021 had, in fact, an average income per capita of only €14,963, while in the *Centers* area, it was 28% higher. Our research revealed that income concentration is not necessarily higher in the most peripheral and poorer cities. In fact, five out of six groups of the municipalities showed similar levels of inequality, with the top 1% ranging between 7% and 9% in the past 20 years. However, there was a notable exception to this trend in the *A - Polo* municipalities. In 2000, the top 1% in *A - Polo* earned 9.7% of the total income and steadily increased to above 11% in 2021 marking an overall speed in concentration considerably faster than all other municipalities. On the other hand, we also found that the top 1% in *Inner Areas* showed a faster concentration rate from 2000 to 2006, which quickly reached a concentration share close to 8% of the overall income in these areas, similar to what we estimated for *B - Polo intercomunale* and *C - Cintura* (Fig. 7).

Nevertheless, not all municipalities in *A - Polo* share the same level of inequality. The size of the city is a key factor in determining inequality, with larger cities subject to higher levels of inequality. These cities experienced a more drastic increase in income concentration for the top 1% compared to the average, rising from 10% in 2000 to almost 12% in 2021. On

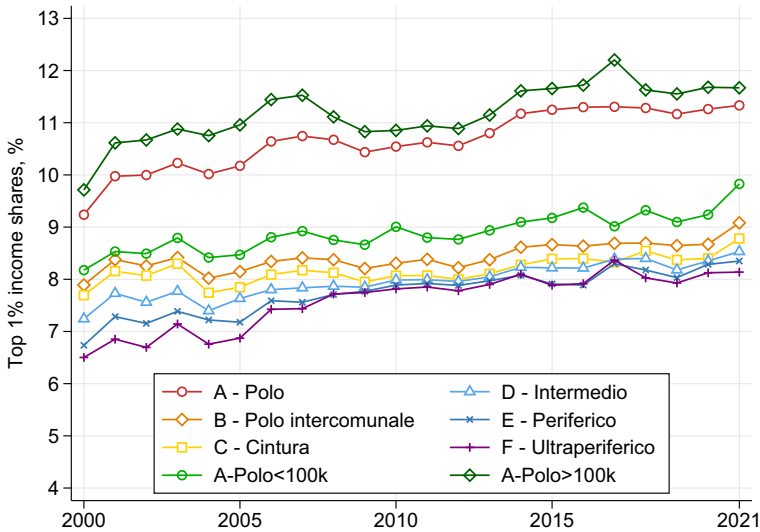


Fig. 8 Top 1% income share by *Inner Areas* classifications with larger cities. *Note:* Top percentiles are defined within the local population, and local income thresholds

the other hand, *A - Polo* municipalities with less than 100,000 inhabitants showed income concentrations levels and trend in line with the rest of the *C - Cintura* and *Inner Areas*, although with a slightly higher level of concentration (Fig. 8). To better understand the difference in income concentration between *A - Polo* and other areas an analysis of income composition at the municipality level would be useful. However, the tax data on municipalities do not allow for such a level of detail. Therefore, further research is needed to fully understand the factors driving income concentration and inequality in different municipalities.

By looking at the richest individuals living in *Centers* and *Inner Areas*, we found that differences in average income and thresholds are persistent throughout the whole income distribution suggesting that fewer earning opportunities affect everyone in those areas. In particular, we found that to enter in the top 1% of the *A - Polo* municipalities, it is necessary to declare at least €166,824 in 2021, in *F - Ultraperiferico*, instead, it suffices less than half of this amount (€69,850), which is not even enough to be part of the National top 1% (€98,120). Average income also differs substantially. *A - Polo* leads the group with an average declared income of €232,442 in the top 1%. In comparison, the average income in the *F - Ultraperiferico* areas is only €108,022 (See Table 3) pointing at the fact that income earned by the richest individuals living in those areas is relatively limited.¹⁹

This is further confirmed by examining where the country's top 1% income earners live. Most of these individuals reside in the *A - Polo* municipalities. Interestingly, the national income threshold that defines the top 1% isn't high enough to accurately identify the richest 1% within these municipalities; In fact, approximately 1.5% of the population in *A - Polo* earns more than the national income threshold that defines the top 1%, as shown in Fig. 9. In contrast, in all other municipalities, classified as *Centers* or *Inner Areas*, significantly less

¹⁹ In the context of comparing average incomes and thresholds among municipalities, the use of Purchasing Power Parity (PPP) differentiated at the municipal level is likely to yield more heterogeneous results compared to those presented in Section 3.2, which focus solely on differences between regions. Unfortunately, PPP data are currently available only as experimental statistics at the regional level. Consequently, a more granular comparison using PPP at the municipal level must be deferred to future assessment.

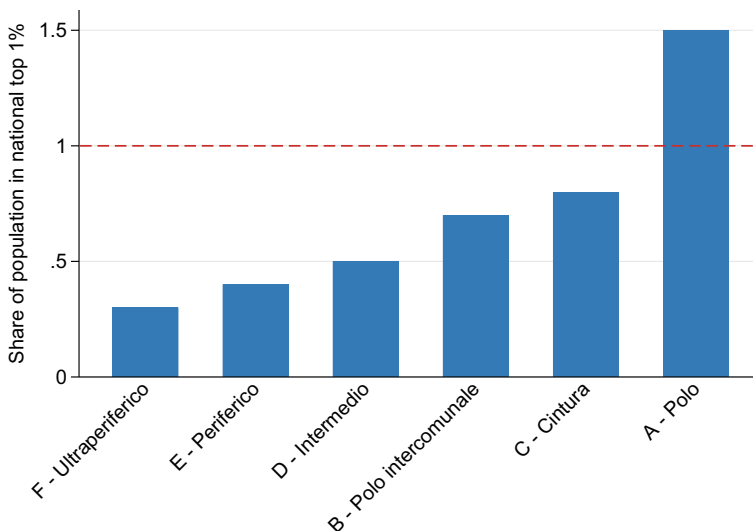
Table 3 Thresholds and Average income for top 1% in Inner Areas in 2021

Inner Areas	Threshold	Average income
A - Polo	166,824	232,442
B - Polo intercomunale	82,693	152,700
C - Cintura	84,046	160,137
D - Intermedio	78,277	132,226
E - Periferico	73,982	116,996
F - Ultraperiferico	69,850	108,022

than 1% of the population earns more than the national income threshold that defines the top 1%. For example, in the *E - Periferico* and *F - Ultraperiferico* municipalities, only about 0.3% of residents earn enough to be part of the national top 1%.

These findings, showing that income concentration is higher in areas where most economic activities are concentrated, align with the work of Briskar et al. (2023a, b), who demonstrate that in Italy, the role of geography in determining individual wages is less significant compared to the influence of the industrial sector in which individuals are employed. While our analysis includes not only wages but also self-employment and pension income, the fact that the best-paying firms and most industrial activity are concentrated in larger cities explains why we also observe greater income concentration in these cities compared to smaller municipalities. This pattern of higher income concentration in larger, more industrialized cities is also consistent with trends observed in other countries. By analyzing wage inequality within Local Labour Markets (LLMs) in Canada, France, Germany, the UK, and the US, Bauluz et al. (2023) show that wage concentration tends to be higher in richer and more densely populated areas, as opposed to more peripheral areas where inequality is relatively lower.

More broadly, the higher concentration of top incomes observed in larger municipalities is consistent with evidence from Glaeser and Resseger (2010), which shows that cities are

**Fig. 9** Share of regional population part of the National top 1%

associated with higher productivity, with gains that are disproportionately larger in more educated urban environments. Related work documents that firms operating in denser areas achieve higher revenues and performance, reflecting agglomeration externalities linked to market access, knowledge spillovers, and the concentration of high-skilled activities (see, among others, Jacob and Mion (2024) and the meta-analysis by Melo et al. (2009), which reports heterogeneous estimates). From this perspective, our findings suggest that while agglomeration externalities are stronger in large cities, they may be captured disproportionately by individuals at the very top of the income distribution, thereby amplifying top-income concentration rather than translating into broadly shared income gains.

Finally, the differing trends in income concentration across various types of municipalities may be partly explained by internal migration. One indication of this is provided by Accetturo et al. (1951), who, using population data, show that since 2011—the last year of their analysis—there has been internal relocation of individuals from smaller to larger locations within the LLMs examined in their study. The authors further note that this migration trend was more pronounced during the post-war period but continued, albeit at a slower pace, in the later decades of their analysis, which partly overlap with our data. Using a similar method to the one proposed by Accetturo et al. (1951) we thus calculate, for each type of municipality, the deviation of their population growth from the national average to better understand how migration might influence the results shown in this section (see Figure E.10 in Appendix E). We found that at the beginning of our analysis, from 2000 to 2010, most municipalities experienced below-average growth rates in population, and only the *C-Cintura* municipalities showed a considerable positive growth rate. This might partly explain the results where the peripheral municipalities (*E-Periferico* and *F-Ultrapерiferico*) and *A-Polo* municipalities exhibit a larger trend in income concentration up to 2010. It is possible that poorer individuals moved to other cities in the *C-Cintura* municipalities, reducing the lower-income population in these peripheral and *A-Polo* municipalities. This, mechanically, may have increased income concentration at the top in those municipalities with a declining population because income concentration measures, such as the share of income held by the top 1%, are calculated relative to the total income within the municipality. With fewer low-income individuals contributing to the overall income, the share of income held by the top earners automatically increases, even without significant changes in their own earnings. We also find that the positive trend in population growth observed in *C-Cintura* municipalities starts to slow down after 2010, becoming almost equal to the national average by 2020. During this last decade of analysis, the peripheral areas continued to exhibit below-average population growth, while *B-Polo Intercomunale* and *C-Cintura* municipalities remained around the national average. Thus, in this last decade, only *A-Polo* municipalities experienced above-average population growth, implying that internal migration likely benefitted these municipalities. In this case, as more individuals moved into these municipalities, more income was earned by individuals below the top 1%, which mechanically reduces or stabilizes the income concentration at the top. This is consistent with the observed trend in *A-Polo* municipalities after 2015, where the income concentration share for the top 1% stabilizes just above 11%.

4 Income growth

We have shown the trend in income concentration, but what can be said regarding the reason of this increasing trend in income concentrations? Our analysis can also shed further light on this topic. By constructing anonymized growth incidence curve by income percentiles

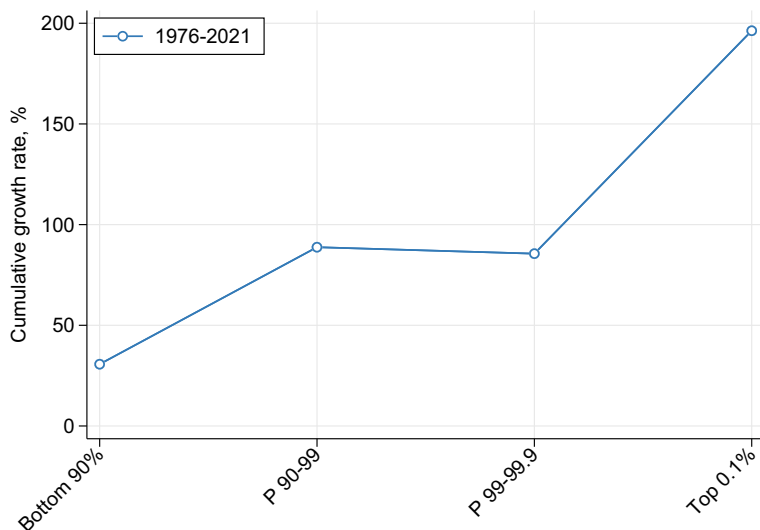


Fig. 10 Cumulative growth of real income from 1976 to 2021 for selected income groups. *Note:* Real growth is calculated in 2021 prices using NIC indices released by the National Statistical Office

we can show that the rise in income shares for the top income group is determined by a spectacular increase in real income for these income groups since 1976. In Fig. 10 we show the cumulative growth of real mean income for the 4 different income groups. We start with the bottom 90% of the population, which experienced a limited overall growth of 25%. This income group had an average income of €10,414 in 1976 (in 2021 prices) and reached an average of just €12,991 in 2021. Real income growth has been much stronger for top income groups. People between the 90th percentile and the 99th percentile (P90-99) had a real income of €27,707 in 1976 and to €52,344 in 2021, implying an increase in real income of 89%. The next percentiles between the top 1% and the top 0.1% (P99-99.9) had a similar real income growth of 85% from €74,358 to almost €138,000 in 2021. Finally, the very top of the income distribution, the top 0.1%, achieved an income growth of 196%, increasing their real income almost 3 times compared to its level of in 1976, from an average of €203,731 to €603,627 in 2021. We can further expand this analysis by examining the cumulative growth for different years to determine whether there have been any specific years in which the sustained real income growth for top earners has been reversed.

We selected 5 different intervals in line with choices of Brandolini et al. (2018) (Fig. 11): i) From 1976 to 1993 when Net National Income (NNI) per-capita steadily grew to about 3.6% per year. Until the currency crisis in September 1992 forced Italy to leave the European Exchange Rate Mechanism; ii) From 1993 to 2006, when the NNI per-capita growth slowed down to an average of 1.8%; iii) From 2006 to 2013, when the Global Financial Crisis (2008-2009) and the Sovereign Debt Crisis (2001-2013) led Italy to a yearly income per-capita loss of -2.2%; iv) From 2013 to 2019 when Italy reached again a moderate income per capita growth of about 1.7%; v) and finally, we add the 2019-2021 period to capture exceptional and contrasting trends emerging from the recent Covid-19 pandemic.

Our analysis reveals that the top 0.1% income group experiences the highest average income growth during periods of overall income growth. However, during the financial and sovereign debt crises between 2006 and 2013, all income groups experienced a loss in real income. In this period, the top 0.1% and bottom 90% were hit the hardest, with an average

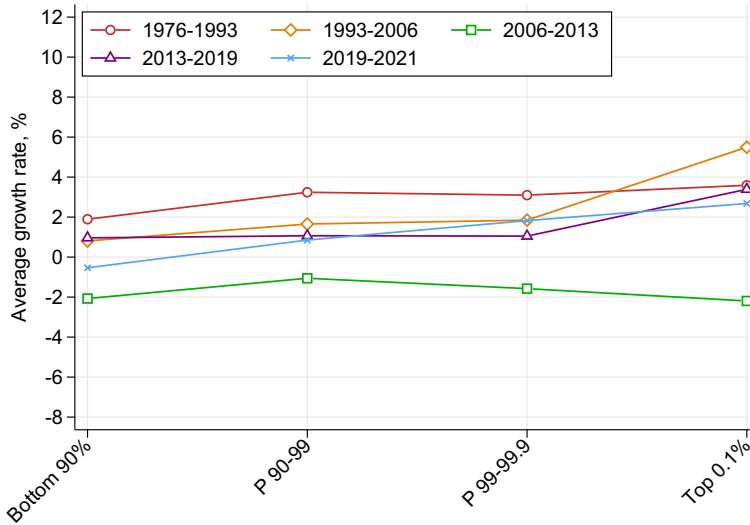


Fig. 11 Average annual growth of real income from 1976 to 2021 for selected income groups. *Note:* Real growth is calculated in 2021 prices using NIC indices released by the National Statistical Office

yearly loss of about 2% of real income. As described by Morelli (2018) for the US, this was a temporary reduction of growth for the top 0.1% group, which subsequently returned to a substantial increase in real income, averaging 3.38% per year between 2013 and 2019. In contrast, the real income of the bottom 90% increased by less than 1% per year, at a similar pace to the next 9% (P99-99.9).

The Covid-19 pandemic shock hit the Italian economy hard as the lock-down measures to contrast the spread of the disease implemented in March 2020, “suspended or reduced activity in sectors that absorbed, in the last quarter of 2019, 44% of self-employed workers and 33% of employees (about 34% of total employment)”, as reported in Carta and De Philippis (2021). National income, dropped by approximately -9% between 2019-2020 before bouncing by 7.3% between 2020-2021, with an overall cumulative real income loss of 2% in the 2019-2021 period. However, the overall effect of the pandemic shock on income concentration appears different than the effects of more standard recessions if we consider the overall two-year period from 2019 to 2021.

As shown in Fig. 11, only the bottom 90% group experienced negative income dynamics between 2019 and 2021. The pandemic shock shares similarities with the Global Financial Crisis in terms of their impact on incomes across the distribution only when looking at the income changes between 2019 and 2020, separately from that between 2020 and 2021. Figure E.2 in the appendix shows that all income groups have experienced a loss of real income between 2019 and 2020, but the bottom 90% and top 0.1% have been hit particularly hard, while the P90-99 and P99-99.9 groups have experienced a relatively smaller reduction in real income. In contrast, the income dynamics between 2020 and 2021 show substantial and historically high records of positive real income growth for the bottom 90% as well as the top 0.1% of the distribution, although only for the top 0.1% the real income growth was high enough to compensate for the losses experienced between 2019 and 2020. As a result, 2020 and 2021 mark the period with the fourth-highest increase in income ever recorded for the top 0.1% (Figure E.1). Interestingly, the results are also robust to the inclusion of income tax paid (Figure E.2). It is nonetheless worth noting that our analysis cannot take into account

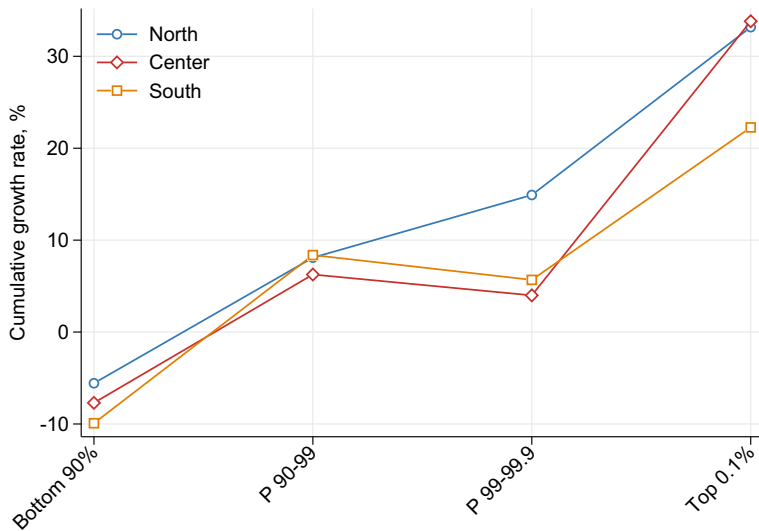


Fig. 12 Cumulative real growth by Macro Regional distribution, 2000–2021. *Note:* Real growth is calculated in 2021 prices using NIC indices released by the National Statistical Office

the large-scale social insurance and protection interventions rolled out by the government to protect households from large income losses. As discussed in Carta and De Philippis (2021) reliefs and social insurance benefits played a large role in effectively dampening the income losses of workers and the resulting increases in income inequality.

4.1 Income growth: macro area

These differences in concentration trends can also be analyzed through cumulative income growth by macro-regions. Notably, the bottom 90% in all regions experienced a reduction in real income between 2000 and 2021, with the South facing the steepest decline at -10%, nearly double that of the North (Fig. 12). In contrast, the top 10% saw positive growth across all regions, with the North's P99-P99.9 group reaching a cumulative growth of almost 15%, compared to 4% and 5.6% in the Center and South, respectively. The top 0.1% recorded the highest growth, exceeding 33% in the North and Center. Average income for this group grew from €456,798 to €611,264 in the Center, and from €516,979 to €688,472 in the North. In the South, the increase was lower, from €241,795 to €295,627, amounting to 22.26%. Income trends by selected years (Fig. 13) highlight that the largest losses for the bottom 90% occurred during the Global Financial Crisis and Sovereign Debt Crisis (2006–2013). Since then, their growth has been nearly zero, failing to recover from the decline. For P90-99 and P99-99.9, gains in 2000–2006 and 2013–2019 offset crisis losses, particularly in the North's P99-99.9 group, which saw strong post-crisis growth. During the Covid-19 crisis (2019–2021), the bottom 90% in the North and Center faced small losses of -0.98% and -0.5%, respectively, while the South saw a 2% gain, largely due to adjustments for self-employed workers under favorable tax regimes. This result, however, is mainly determined by our adjustment of the self-employment income earners in the favorable tax regime. These workers report their income net of flat taxes, but in our adjustments, we estimate their gross income. Since we cannot re-rank their position in the income distribution, they remain in the

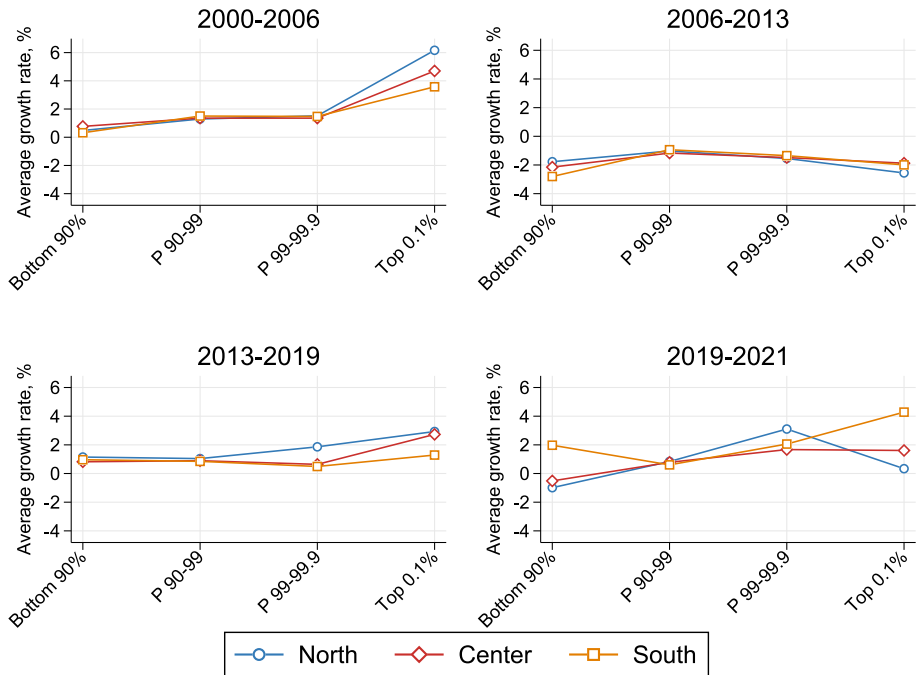


Fig. 13 Average annual real growth by Macro Regional distribution. *Note:* Real growth is calculated in 2021 prices using NIC indices released by the National Statistical Office

bottom 90%, even if their gross income would place them in higher groups, thus inflating the bottom 90%’s overall income. Without such adjustments, the raw fiscal income distribution shows that the bottom 90% in the South experienced income losses similar to other macro-regions (Figure E.7). The P90-99 group had similar growth across regions, while P99-99.9 in the North outpaced others with a 3.1% gain, compared to 2% in the South and 1.7% in the Center. For the top 0.1%, the South experienced the highest growth (4.2%) during 2019–2021, compared to 1.6% in the Center and 0.33% in the North. In summary, despite initial losses during Covid-19, top income groups saw substantial gains in 2020–2021, resulting in overall positive growth across all regions in the period 2019–2021.

5 Income composition

This section delves into the income composition of the top income groups, examining the various types of income earned by these groups using the income categories assembled from income tax reports at the national and regional level. At the national level the results show that self-employment incomes become increasingly important as income grows. In 2021, it is worth approximately 40% of total income for the top 0.1% group and it drops to 20% approximately for the top decile (Fig. 14). Also the observable components of rents and financial incomes grow in importance as we move up in the income ladder. Both sources of rents and financial incomes are worth approximately 20% of total income of the top 0.1% group in 2021. Conversely, and as expected, pensions become less relevant for the very top of the income distribution. This source of income is worth less than 1% of total income

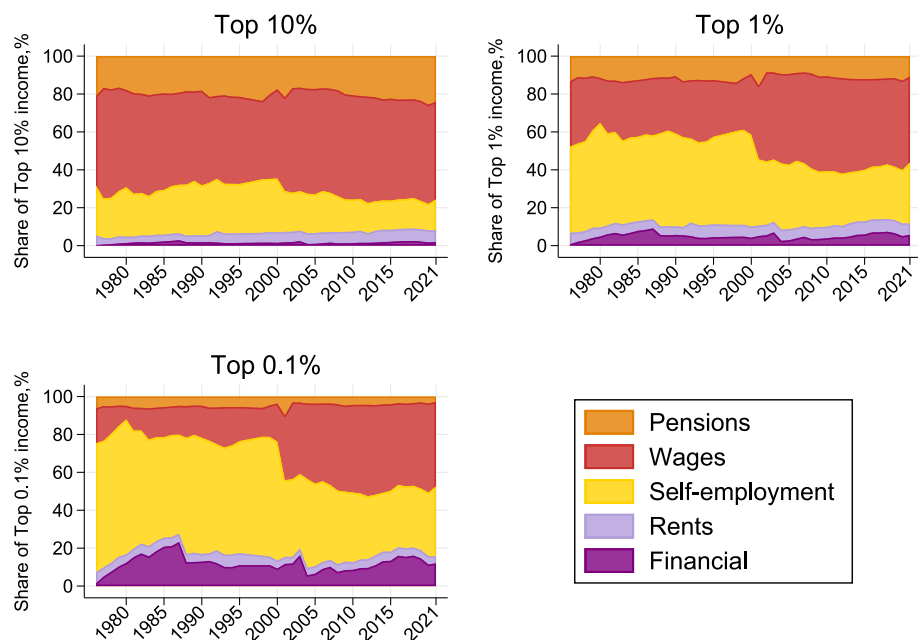


Fig. 14 Income composition for Top income as a share of total income

for the richest group observed (top 0.1%) and up to almost 40% for the bottom 90%. The case of wages appears more nuanced as the relative weight of wages appears rather constant throughout the distribution, and only marginally lower for the very upper income groups.

Looking at how income composition has changed over time we observe an overall stability of relative income components across the income distribution throughout the period, with the exception of financial income that gained relative importance in income composition rising from 10% of the overall earned income of the top 0.1% group to about 20% in 2021.

Another important exception is shown by the abrupt change in income composition occurred around 2000.

In particular, between 1976 and 2000, self-employed income was the primary source of income for the top 1% of earners. After 2000, wage income becomes the most relevant source of income even at the top of the distribution. We speculate that this change was mostly driven by a change in the legislation, carried out in 2000 (law n 342). This legislation required that income stemming from project-based contracts has to be reported as wage income and no longer as self-employed income.²⁰ This change in legislation resulted in a clear break in the self-employed income series, which was almost entirely offset by an increase in employee income. Although these types of contracts are commonly used for low income earners at the beginning of their careers, they are also frequently utilized to formalize the earnings of CEOs and other high-level managers, which explains why the legislative change is particularly evident among the top 1% of earners. The relevance of the different income sources changes when we zoom with more precision on the very top of the income distribution. In fact, for the top 0.1%, there have been several changes through time. In 1976 almost all of the income was earned through self-employment income. Then, similar to the top 1% group, the change

²⁰ Known as ‘contratto di collaborazione coordinata e continuativa’ in Italian.

in legislation of 2000, brought employee income to the level of self-employed income and started to drive most of the income growth of this group (Fig. 15). In Figures E.11 and E.12 in Appendix E we also show the income composition that separately classify the project-based contracts if they were keeping the same relevance through time as they had between 2000 and 2001. By doing so we graphically show the importance of these form of remuneration for the top 0.1% of the income distribution for which in 2021 their regular wage income were as important as the remuneration from project-based contract.

5.1 Income composition at the macro area

In this section we investigate how income composition differs among income groups through time and among macro-regions.

The composition of income of the top 0.1% presented in Fig. 16 reveals that the decrease in income share for the Center and Northern regions during the Global Financial Crisis was not solely due to a reduction in financial income, but rather a combination of financial, employee, and self-employment income. However, these income sources have since grown, particularly financial income, which has driven most of the increase in income share for these regions up until 2016, after which it has gradually declined. Another important finding is the role of pension income, which is largely absent from the top 0.1% in the Center and Northern regions but it is significant in the South. In fact, pension income is also the main determinant of the increase in income share for the top 10% and top 1% in the South. Conversely, financial income plays a much smaller role in the South compared to its relevance in the North and in the Center, where it contributes significantly to the income share of the top 0.1%.

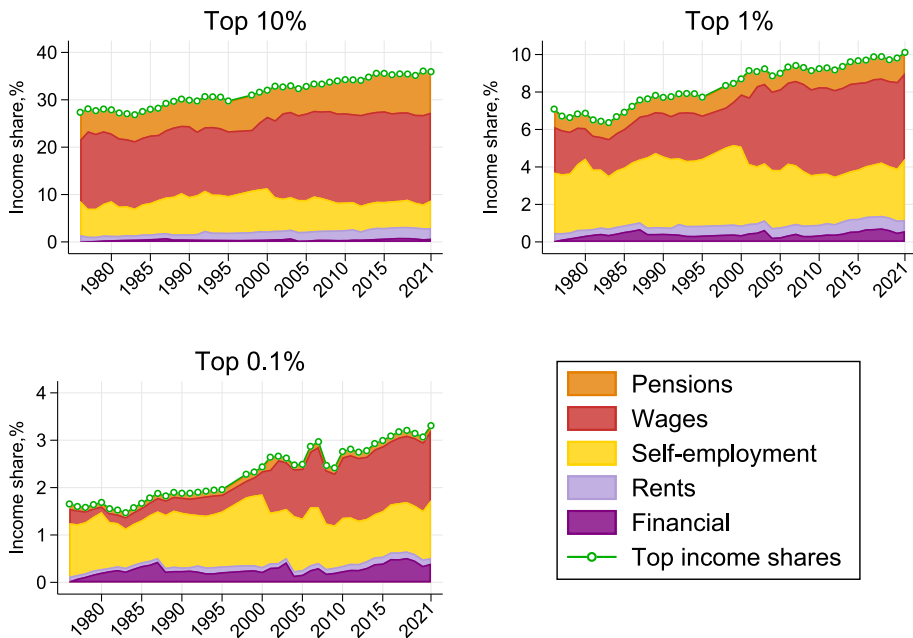


Fig. 15 Income composition for Top income : 1976-2021

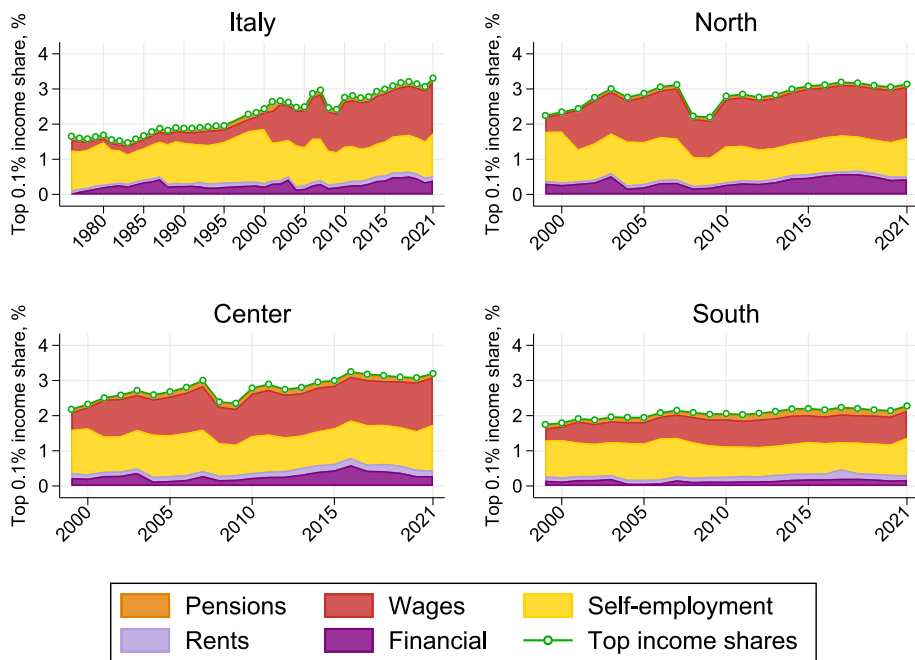


Fig. 16 Top 0.1% Income composition across macro-regions as a share of total income

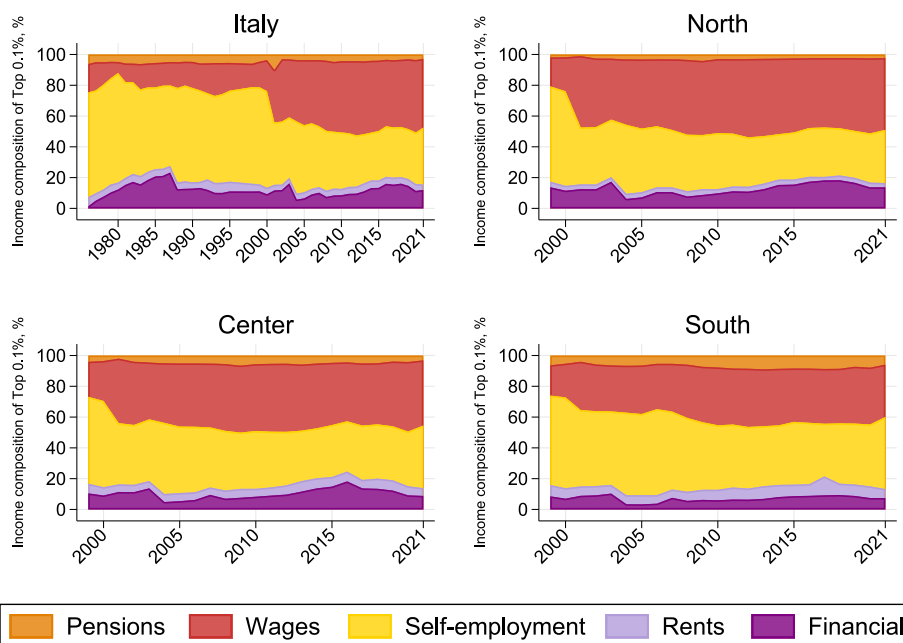


Fig. 17 Top 0.1% Income composition across macro-regions as a share of total income

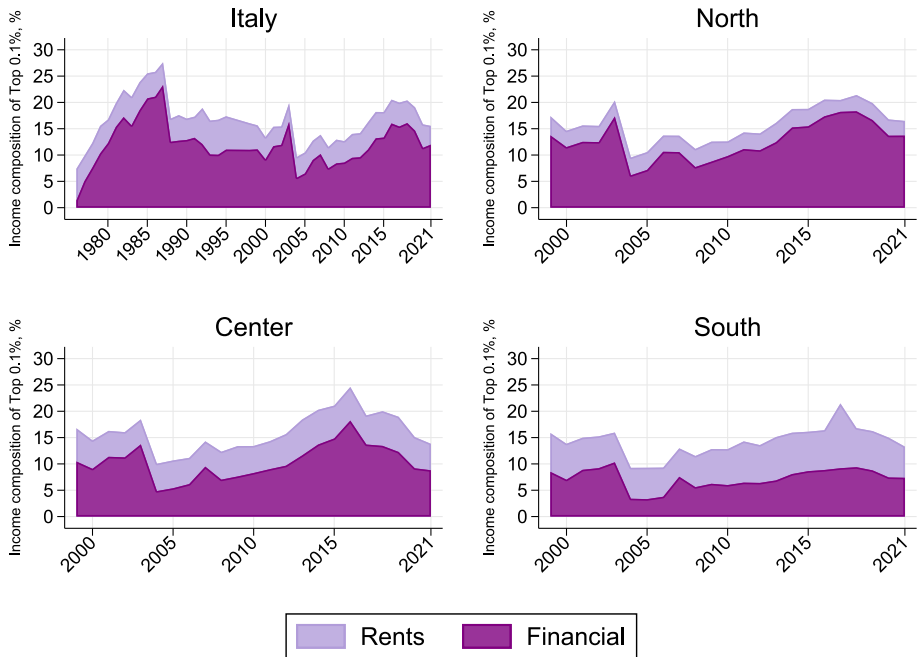


Fig. 18 Top 0.1% Income composition across macro-regions as a share of total income

Figure 17 provides further clarity on the composition of income for the top 0.1% across different macro-regions as a share of their total income. In particular, the data reveal some key trends in income composition across these regions. First, there is a slight increase in the share of wages for the top 0.1% in all macro-regions. Moreover, after excluding project-based contracts, as described in Section 5 (see Figure E.13 in Appendix E), we observe a noticeable decline in the relevance of business and self-employment income for the top 0.1% across all macro-regions, particularly in the South, where self-employment income decreased from 53% in 1999 to 40% in 2020.²¹ Nevertheless, this decrease in self-employment income is almost entirely offset by an increase in financial income in the North and Center regions. By contrast, in the South, the share of financial income for the top 0.1% increased only slightly and did not compensate for the reduction in the share of self-employment income.

With specific regard to financial income, a significant decline can be observed in all three macro-regions in 2004. This was due to a new tax reform in Italy that changed the rules for declaring a certain type of financial income (for more information, please refer to Appendix A.3). While our methodology can only partially adjust for this change, most of the financial income recorded in National Accounts is still missing from this analysis. Nonetheless, an increasing trend in the accumulation of financial income by the top 0.1% can still be observed in all macro-regions, although it is much lower in the South. As shown in Fig. 18 this increase is mainly due to an increase in concentration of financial income that is more relevant for the Northern and Center regions. On the other hand, actual rents, are as important as financial income in the South accounting together about 15% of the total income of the top 0.1%, but didn't exhibit any particular trend remaining stable over the considered period.

²¹ Note that the share of self-employment income rises to 47% in 2021 due to the Covid-19 crisis.

6 Conclusion

How are incomes, wealth, and tax burdens distributed in the population? Answers to such important questions are fundamental to informing, among other things, serious and credible tax policy interventions.

In this paper, we use detailed income tax tabulations in Italy to derive a set of income concentration measures as well as growth incidence curves across different income groups, income definitions, and geographical areas. Similar to previous studies (Alvaredo and Pisano 2010), we confirmed a surge in income concentration towards the upper end of the income distribution beginning in the 1980s, driven by a spectacular real income growth of the top income groups, which was considerably larger than that of the bottom 90% of the population. By building up-to-date income concentration measures, we also highlighted that in 2021, in the aftermath of the Covid-19 crisis, the top 1% and the top 0.1% held the highest share of income ever recorded, at 10.11% and 3.31%, respectively. Focusing on regional and macro-regional analyses, we show the importance of studying income concentration measures at a finer geographical disaggregation and with different metrics. We show that exist large heterogeneity between regions and macro-regions both in terms of income composition and income concentration measures. In particular, we found that although the Southern regions appear to be the most unequal when considering the top 10% income concentration, the Northern and Central regions appear more unequal when focusing on the top 1% and top 0.1%.

The availability of municipal-level tabulations made it possible to derive income concentration measures for the geographical classification used in the National Strategy for Inner Areas, which classifies municipalities according to their distance from essential public services such as healthcare facilities, education, and transport. Despite the policy relevance of this classification, no systematic evidence on top income concentration existed for such a granular geographical unit in Italy until now. In this regard, we highlighted that municipalities with less accessibility to public services do not necessarily have higher inequality. Instead, we found that among municipalities with the highest level of accessibility to public services, larger municipalities with populations above 100,000 inhabitants have the highest levels of inequality.

Ultimately, one of the goals of this work is also to produce publicly available data files including series and estimates of income inequality across a set of geographical units.

However, despite the contributions we laid out in this work, the paper continues to offer only a partial and unsatisfactory representation of income distribution in Italy and across different Italian geographical units. We highlight a number of challenges calling for substantial investments in the statistical capacity, to better represent income distribution in Italy using income tax files.

First of all, the coverage rate for capital incomes in the tax records remains very low (i.e. lower than 10%). This limitation severely undermines our capacity to estimate the real distribution of income in Italy as well as the effective rankings of individuals in the income distribution. The separate taxation of investment incomes does not prevent tax authorities from requiring these incomes to be reported on tax returns or even pre-filled in part, using third-party information-sharing requirements in effect for financial intermediaries acting as tax withholding agents for individual investors. Such information would be crucial to improve the current information on the income distribution of Italian adults.

Secondly, a larger role for tax audits, both random and targeted to high-income and high-net-worth individuals may reveal precious information about how income tax evasion can be

imputed along the income distribution, especially the largest component of income tax evasion linked to self-employed income. Adequate funding, specialized personnel, and scheduling of random and targeted assessments are also fundamental to credibly combat tax evasion. Indeed, a deterrence effect of audits leads audited individuals to report more incomes in the ensuing years. A study by Boning et al. (2023) estimated that 1\$ spent on audits by the U.S. Federal tax authority, the IRS, has a return that is higher the wealthier the audited person is. Whereas audits of low-income taxpayers bring in \$5 for each \$1 spent, the return is \$12 for each \$1 spent for high-income taxpayers. Growing body of evidence on the deterrence effect is also found for Italian tax payers (i.e. see the work by Battaglini et al., 2019).

Lastly, despite the focus of this paper on individual measures of income concentration, a household-based perspective on income distribution remains a crucial dimension to analyse. The latter dimension, however, cannot be presently assessed using income tax tabulations. Information on household structure is already available to tax authorities and tax tabulations should also be provided aggregating incomes within the household units. This would allow researchers to use equivalization scales to control for household size and composition when estimating income inequality measures.

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Author Contributions D.G. and S.M conceived the study, developed the methodology, conducted the analysis, interpreted the results, and wrote the manuscript. D.G. was in charge of data management and coding.

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Data Availability All computer code and publicly available data used in the analysis will be made available after publication. Only the regional tax tabulations prior to 2016 cannot be published but can be obtained from the Ministry of Economy and Finance for research purposes.

Declarations

Competing interests The authors declare no competing interests.

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