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Tackling the Regressivity at the Top of the Italian Tax System: An Optimal Taxation Framework With Heterogeneous Returns to Capital

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ABSTRACT

In this work, we exploit the new data available from the European Central Bank's Distributional Wealth Accounts to reconstruct the distribution of capital income in Italy by accounting for heterogeneous returns to capital. We find stark disparities in returns to wealth: average rates rise from 2.5% for the bottom 90% to 5% for the top 10% of the Italian wealth distribution. With respect to previous estimates, our results show that capital income is more concentrated along the income distribution and the tax system is more regressive at the top, with lower tax rates hinging on the top 7% and declining more rapidly than previously reported. Finally, we simulate different tax reforms in an optimal taxation framework calibrated on Italian data with varying behavioral elasticities. Ceteris paribus, the results indicate scope for higher top tax rates on either income or wealth to reduce inequality while boosting tax revenues.

JEL Classification: D31, H2, H21

1 | Introduction

Income and wealth inequality has been incessantly increasing in most of developed economies since the 80s (Chancel et al. 2022; Guzzardi et al. 2024; Acciari et al. 2024). One of the key factors contributing to the increasingly right-skewed distribution of wealth observed over time and across different countries is heterogeneity in returns to capital (Benhabib and Bisin 2018). The existence of a self-reinforcing process of amplification of inequality via increasing returns at the top was first conjectured by Piketty (2014). Later, the seminal contributions by Fagereng et al. (2020) and Bach et al. (2020) did confirm the pattern of increasing rates of return on net worth and financial capital across the wealth distribution and kickstarted a fast-growing body of empirical works (e.g., Iacono and Palagi 2023; Ozkan et al. 2023; Smith et al. 2023).[1]

The issue of increasing returns to wealth at the top of the distribution has strong policy implications considering the recent trends in capital and labor income taxation. Indeed, while tax rates until the 1980s generally applied to a comprehensive definition of income, systems have since transitioned toward a dual approach; labor income usually remains subject to progressive rates, despite the recent trend of taxing self-employment under separate flat regimes. whereas capital income is taxed at significantly lower, often flat rates. As Piketty et al. (2023) argues, the resulting system fails to adequately tax high-net-worth individuals for two intertwined reasons. First, the distinction

between capital and labor income is often ambiguous. Second, top wealth holders frequently do not realize their income or consumption in ways that are easily measurable or taxable. These shortcomings have renewed interest in wealth taxation as shown by the proposal to introduce a global minimum wealth tax on ultra-high-net-worth individuals presented by Zucman (2024) at the G20 meeting in Rio de Janeiro.[2] Advances in international cooperation—particularly enhanced information exchange among tax administrations—have made such measures increasingly feasible (see recent efforts to establish a global minimum tax on multinational profits, OECD 2021).

In this paper, we provide a new estimation of capital income and heterogeneous rates of return along the Italian wealth distribution by leveraging newly released data from the Bank of Italy and the European Central Bank's Distributional Wealth Accounts (DWA). This dataset, which combines micro-level Household Finance and Consumption Surveys (HFCS) with macro-level Quarterly Sector Accounts (QSA), considerably enhances the representation of wealthy households, typically underreported in surveys.[3] Using these data, our estimates are able to capture the component of returns heterogeneity arising from differences in portfolio composition across households, while abstracting from within-asset return differences. We then obtain refined estimates of capital income, pre-tax national income (2010–2015), and effective tax rates (2015) in Italy along the income and wealth distributions.[4] We then apply the optimal taxation model with heterogeneous returns proposed by Saez and Stantcheva (2018) to evaluate the inequality-reducing and revenue-generating potential of alternative income and wealth tax reforms.

Our work contributes to the literature along three dimensions. *First*, we harmonize the Distributional National Accounts (Alvaredo et al. 2020) with data from DWA, by focusing on Italy. This approach enables us to improve the estimation of capital income by explicitly accounting for between-asset return heterogeneity—contributing to the growing empirical literature on unequal wealth returns. By integrating these data sources, we offer an alternative to top-tail adjustments based on rich lists, tax records, or leaked data (Waltl and Chakraborty 2022; Waltl 2022), which is applicable also to other European countries for which DWA are available.

Second, we use these improved estimates to assess the redistributive effect of capital income taxation in Italy. More specifically, we incorporate return heterogeneity directly into the optimal taxation framework (Saez and Stantcheva 2016, 2018), and model tax reforms that better align with equity and efficiency objectives. In doing so, we overcome the limitations of prior studies, which either ignore heterogeneity or model it indirectly, by allowing generalized social welfare weights to depend jointly on the distributions of wealth and returns.[5]

Third, we contribute to the academic and policy debate on the regressivity at the top of the Italian tax system. Unlike studies that focus narrowly on specific tax components (Gastaldi et al. 2017; Gastaldi and Liberati 2018; Di Caro 2020; Baldini 2021) or overlook systemic regressivity (Cammeraat and Crivelli 2020), we adopt a comprehensive perspective. We show how an optimal taxation framework, informed by the full distribution of income, wealth, and taxes, can yield actionable insights for tax reforms, including the potential introduction of a wealth tax.

Our findings uncover stark disparities in returns to wealth: average rates rise from 2.5% for the bottom 90% to 5% for the top 10% of the Italian wealth distribution. As compared to the results in Guzzardi et al. (2024), this implies stronger income concentration than previously estimated—in 2015 top 10% shares increase from 37% to 39%—and worsen the regressivity at the top of the tax system, which exhibit decreasing effective tax rates for the top 7%, with the top 0.1% paying average effective tax rates of 32.6% instead of 36%. As a result, the top of the income distribution faces lower average effective tax rates relative to the rest. In particular, average effective tax rates fall more sharply for the top 7% than previously documented, implying an even stronger violation of the Italian constitutional principle which prescribe that the overall tax system should be progressive. This shift is driven by a larger capital income share at the top and a consequent lower effective tax burden.

To tackle the regressivity at the top of the system, we simulate different tax reforms using the Saez and Stantcheva (2018) framework calibrated on Italian data with varying behavioral elasticities. The experiments focus on the top 7% as this is where we empirically observe regressivity in effective tax rates.

We find that increasing income tax rates for the richest—up to 61% for the top 0.1%—can successfully reduce inequality and raise revenues.[6] The same results can be achieved with a progressive wealth tax equivalent to optimal income tax rates ranging from 0.11% at the 93rd percentile to 1.5% at the very top. Such a tax could address income-deferring strategies among the wealthiest, aligns with proposals by Piketty (2014), Landais et al. (2020), and Advani and Tarrant (2021), and help mitigate regressivity at the top without exceeding efficiency bounds of optimal policy design.[7] Overall, our results highlight new pathways for revenue-increasing and inequality-reducing tax reform in Italy, grounded in improved data, robust empirical estimates, and a theoretically consistent policy framework.

The rest of this work is structured as follows: Section 2 details the data and methods used to reconstruct Italy's capital income distribution and perform simulations grounded on optimal taxation theory. Section 3 presents our new capital income distribution and estimates of wealth return heterogeneity for Italy, and it explores various taxation schemes to address tax system's regressivity at the top. Section 4 discusses the design of a gradual tax reforms and potential administrative and policy constraints. Finally, Section 5 concludes.

2 | Data and Methodology

In this Section, we outline the data and methodology used in this work. We start with Section 2.1 by presenting the data and the approach used to construct an improved distribution of capital income and total income in Italy which better accounts for heterogeneous rates of return on wealth. Next, we introduce our optimal taxation framework in Section 2.2.

2.1 | The Distribution of Capital Income

We begin by employing the dataset on Distributional National Accounts for Italy constructed by Guzzardi et al. (2024). This dataset comprises micro-data on personal income and wealth distributions which are constructed by combining various sources, including surveys, national accounts, and external administrative data from 2004 to 2015. Our baseline income concept is pre-tax national income, following the Distributional National Accounts framework. This measure includes all pre-tax and transfers labor income, namely salaries for dependent workers and income from self-employment, both net of social security contributions, as well as pension income. In addition, it includes all sources of capital income, such as imputed rents, actual rental income, dividends, interest, and other income from financial and non-financial investments before any taxes and transfers.[8]

As for the wealth data, Guzzardi et al. (2024) rely on the net-wealth distribution estimates from Acciari et al. (2024). The decomposition across wealth categories, however, is derived from the wealth composition observed in the Survey on Household Income and Wealth (SHIW). This information is subsequently used to allocate capital income at the individual level.[9]

In this work, we improve the estimation of the capital income distribution by aligning it with administrative data on wealth. More specifically, we use the official wealth composition from the Distributional Wealth Accounts (DWA), released by the Bank of Italy (Neri et al. 2024), which provide data starting from 2010. The DWA data, introduced in 2024 under the guidance of the European Central Bank, represent the first official estimates of household wealth distribution in Italy, fully aligned with the aggregate data on total household wealth regularly published by central banks.[10] DWA data are built by combining national accounts aggregates from balance sheets with harmonized European surveys on household finances, which incorporates Bank of Italy's SHIW. This represents a significant improvement, as previous wealth distribution data in most countries relied solely on surveys conducted by central banks (e.g., the Italian survey SHIW and the European Household Finance and Consumption Survey, HFCS) which not only struggled to accurately capture the wealthiest segments of the population, but also failed to align with the total aggregates reported in national accounts. This well-known bias in survey data (Blanchet, Chancel, and Gethin 2022; Blanchet, Flores, and Morgan 2022; Ravallion 2022), arising from the under-representation and unit non-response of the wealthiest, has usually been addressed in the literature through external sources, such as rich lists and tax evasion leaks, to estimate the parameters of the Pareto distribution and correct wealth distribution at the top (Waltl and Chakraborty 2022; Waltl 2022). However, these methods depend on data with limited reliability and availability, restricted to certain countries or periods. In contrast, the new DWA data offer a more comprehensive and systematic approach that ensures broader coverage and more consistency, representing a significant advancement in the accuracy of wealth distribution analysis across Europe.

Our methodology for estimating income distribution follows Guzzardi et al. (2024) for all income sources with one key exception: capital income categories are allocated at the individual level based on the wealth distribution of corresponding asset classes from the DWA.[11] Table A.1 in Appendix A details the wealth categories used for distributing capital income according to the distribution of corresponding asset classes. Furthermore, Figure 1 provides a visual representation of the wealth composition found in the DWA showing a significant change around the 90th percentile, where the concentration of business and investment assets, as well as debt securities, increases markedly at the top of the distribution.[12] In contrast, the bottom 90% primarily hold housing and deposits. Once we obtain

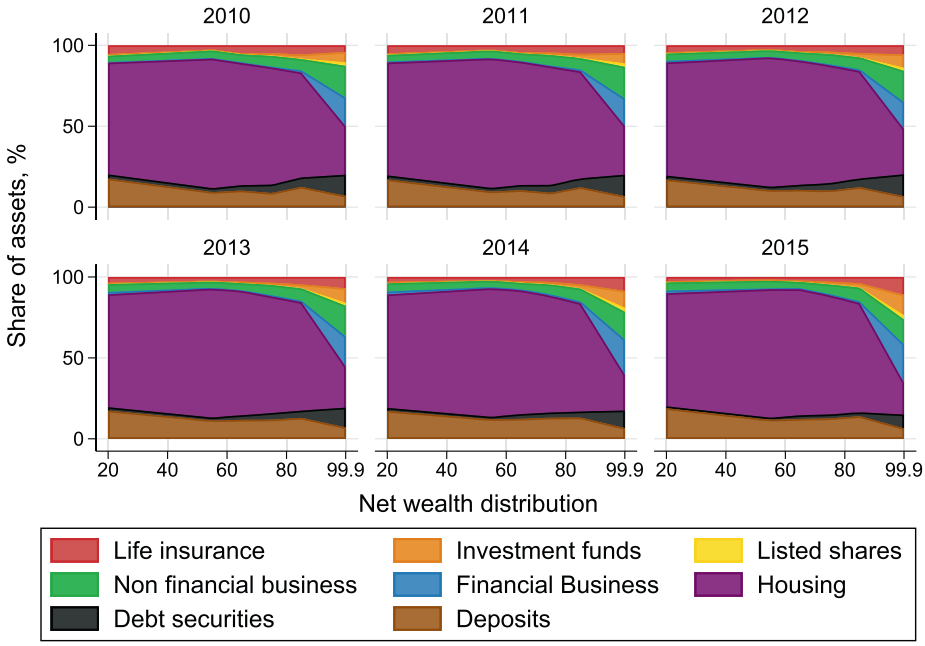

FIGURE 1 | Italian wealth composition from Distributional Wealth Accounts. Data provided by the Bank of Italy are aggregated for the bottom 50% and segmented into deciles for wealthier individuals. Using the original data shown in Figure E.1 in Supporting Information: Appendix E, we employ linear interpolation to retrieve estimates at the percentile level.

TABLE 1 | Methodological steps to build updated income distribution, returns and effective tax rates.

Step	Description	Data	Methodological details
1	Baseline Distributional National Accounts (DINA)	Guzzardi et al. (2024) dataset (2004–2015), combining IT-SILC, SHIW, tax data, Acciari et al. (2024) and national accounts	We rely on the existing DINA framework, which integrates survey and administrative data, reweights observations using tax tabulations, and scales all income components to national accounts totals
2	Improved allocation of capital income using DWA	Distributional Wealth Accounts (DWA) (Neri et al. 2024) (2010–2015)	DWA data are linearly interpolated to retrieve estimates at the percentile level. Capital income components are allocated at the individual level based on the distribution of corresponding asset classes in the DWA
3	Estimation of returns to wealth	Imputed capital income and DWA wealth aggregates	Rates of return are computed by dividing capital income by total net wealth at each percentile
4	Allocation of taxes and computation of effective tax rates	National accounts (77 tax categories)	All direct and indirect taxes are distributed across individuals following the incidence assumptions in Guzzardi et al. (2024), allowing the computation of effective tax rates along the income distribution

the capital income distribution, we calculate the implied rates of return by dividing capital income by total net wealth. This measure captures the income yield on wealth rather than total returns, since capital gains are excluded. This choice ensures consistency with the DINA framework, which relies on income components recorded in the National Accounts. Table 1 summarizes the main methodological steps used to construct the improved income distribution and to estimate rates of return and effective tax rates. The results for both returns, income distribution and the distribution of effective tax rates will be discussed in Section 3.1.

2.2 | Optimal Income Taxation

We now introduce the optimal taxation framework used to examine the effects of various tax regimes on progressivity. To carry out this analysis, we estimate the model using Italian income distribution data, which we have constructed following the methodology outlined in Section 2.1.

We focus on the framework developed by Saez and Stantcheva (2018) as it offers four key elements of flexibility. First, it enables the derivation of closed-form optimal capital and labor income tax formulas. Second, the generalized social marginal welfare weights introduce an important degree of freedom in incorporating the policymaker's objectives (Saez and Stantcheva 2016) by allowing to consider the widest possible ranges of social preferences. Third, by integrating preferences for wealth into the utility function—such as bequest motives or entrepreneurial incentives (Carroll 1998)—the Saez and Stantcheva (2018) model accounts for more realistic and finite reactions to capital taxation. Fourth, both the model and the calibration of social marginal welfare weights are adaptable to accommodate heterogeneous rates of return on wealth, which we aim to consider.

In the following Section 2.2.1, we briefly describe the optimal taxation framework we use. Then, in Section 2.2.2, we outline our choices regarding the calibration of the model based on our data.

2.2.1 | Optimal Tax Formulas

The key equation for our analysis is the optimal marginal tax rate formula for capital income $T'_{RK}(rk)$,[13] derived by Saez and Stantcheva (2018) for a non-linear income tax system that is separable in labor L and capital income RK:

$$T'_{RK}(rk) = \frac{1 - \overline{G}_{RK}(rk)}{1 - \overline{G}_{RK}(rk) + \alpha_{RK}(rk) \cdot e_{RK}}, \tag{1}$$

where the elasticity parameter e_{RK} represents the behavioral response of the tax base to changes in the tax rate; the local Pareto parameter α_{RK}, represents the shape of the tax base distribution; $\overline{G}_{RK}(rk)$ captures the average relative welfare weights, which reflect the policymaker's concern for redistributing capital income from individuals earning more than rk to those earning less. Note also that Equation (1) assumes that the distribution of incomes can be locally approximated by a Pareto distribution (Atkinson et al. 2011), an assumption already validated in Clementi and Gallegati (2005) that we further confirm within our dataset in Section 2.2.2 (see Figure 2).

In addition, we also calculate the optimal marginal tax rate on labor $T'_L(l)$, as well as a comprehensive income tax system, in which total labor income L and capital income RK are taxed

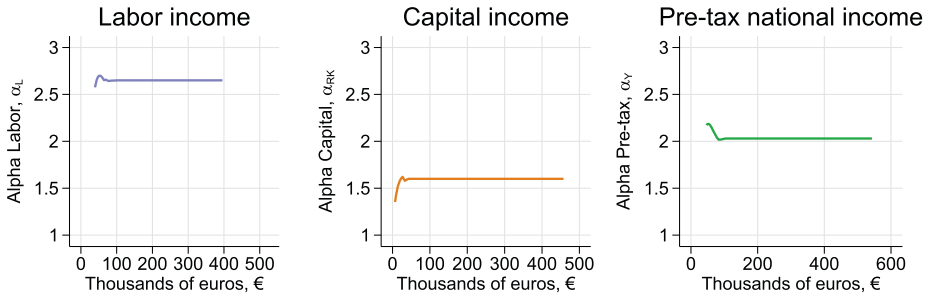

FIGURE 2 | Pareto parameters estimated on the Italian labor, capital and pre-tax national income following Equation (4).

jointly under a single optimal marginal income tax rate $T'_Y(y)$ on total income $Y = L + RK$:

$$T'_L(l) = \frac{1 - \overline{G}_L(l)}{1 - \overline{G}_L(l) + \alpha_L(l) \cdot e_L} \tag{2}$$

$$T'_Y(y) = \frac{1 - \overline{G}_Y(y)}{1 - \overline{G}_Y(y) + \alpha_Y(y) \cdot e_Y}, \tag{3}$$

where e_L and e_Y are the elasticity parameters for labor and total income; α_L, and α_Y are the local Pareto parameter for labor and total income; $\overline{G}_L(l)$, and $\overline{G}_Y(y)$ are the average relative welfare weights. Equation (3) corresponds to the most general scenario where the current personal income tax base includes income from all sources, including investments proceeds.

2.2.2 | Model Calibration

To determine the optimal marginal tax rates described in Section 2.2.1, we need to obtain values for all the three key elements of the optimal taxation formulas in Equations (1–3): (i) the elasticity parameters e, (ii) the local Pareto parameter α, and (iii) the average relative welfare weights $\overline{G}$.

For the behavioral elasticity parameter e, we need country-specific estimates. Unfortunately, to the best of our knowledge, country-level estimates for Italy are absent in the literature. We therefore rely on elasticity values that are broadly consistent with estimates reported for other countries (Saez et al. 2012; Advani and Tarrant 2021). Appendix C summarizes the relevant empirical literature, with Tables C.1 and C.2 reporting a range of elasticity estimates for total, labor capital, income across several studies and countries. Based on this evidence, we consider three benchmark values that lie within the range commonly found in empirical studies: a relatively low elasticity of $e = 0.2$ for labor income (L), an intermediate elasticity of $e = 0.3$ for total income (Y), and a higher elasticity of $e = 0.4$ for capital income (RK). These values reflect the empirical finding that capital income tends to be more responsive to taxation than labor income. In addition to these benchmark parameters, we conduct a broader sensitivity analysis by considering alternative elasticity values within the plausible range identified in the literature. The resulting estimates for labor income, capital income, and total income under different elasticity assumptions are reported in Figure A.2 in Appendix A.[14]

We directly estimate the local Pareto parameter from the Italian income distribution data constructed using the methodology described in Section 2.1. The parameter is calculated separately for capital income (α_{RK}), labor income (α_L), and total income (α_Y) by computing the ratio between the average income at percentile i and the average income above percentile i.[15] For any income type z, α_z is computed as a function of the income level of each percentile of that income type distribution:

$$\alpha_Z(z) = \frac{E(z|z > z^*)}{E(z|z > z^*) - z^*}. \tag{4}$$

Using this method, we find converging local Pareto parameters for the percentiles beyond the point where the Italian tax system has been found to be regressive (Guzzardi et al. 2024), namely 1.6 for capital income, 2.65 for labor income, and 2.03 for total income (see Figure 2).

Finally, we need to estimate the average relative welfare weights for all sources of income: $\overline{G}_{RK}(rk)$ for capital income, $\overline{G}_L(l)$ for labor income, and $\overline{G}_Y(y)$ for total income. These weights represent the policymaker's concern for redistributing income from individuals with higher earnings to those with lower earnings at each income level. They can be calibrated based on the distribution of each income type and computed separately for each income tax schedule, using the corresponding income distribution.

In order to include heterogeneous rates of return on wealth in our analysis, we extend the work of Saez and Stantcheva (2018) by calibrating the average relative welfare weights $\overline{G}$ under the assumption that the legislator is concerned with redistributing capital income by accounting for inequality on both the wealth K and on the returns R dimensions. For this reason, the definition of the average relative welfare weights on capital income $\overline{G}_{RK}(rk)$ is computed as a combination of the average relative welfare weights based on the rates of return $\overline{G}_R(r)$ and the wealth $\overline{G}_K(k)$ distributions:

$$\overline{G}_{RK}(rk) = \frac{\big(1 - H_R(r)\big)\big(1 - H_K(k)\big)}{1 - H_{RK}(rk)} \overline{G}_R(r) \overline{G}_K(k), \tag{5}$$

where $H_R(r)$, $H_K(k)$, and $H_{RK}(rk)$ represent the cumulative density of individuals with a specific value of the rates of return R, wealth K, and capital income RK, respectively.

Following Saez and Stantcheva (2018), we define the average relative welfare weights on labor $\overline{G}_L(l)$, returns $\overline{G}_{RK}(rk)$, and wealth

$\overline{G}_K(k)$ respectively as:

$$\overline{G}_L(l) = \frac{\int_{\text{is.t.}: l_i > l} g_{i,L}\, di}{P(l_i \geq l)} \tag{6}$$

$$\overline{G}_R(r) = \frac{\int_{\text{is.t.}: r_i > r} g_{i,R}\, di}{P(r_i \geq r)} \tag{7}$$

$$\overline{G}_K(k) = \frac{\int_{\text{is.t.}: k_i > k} g_{i,K}\, di}{P(k_i \geq k)}, \tag{8}$$

where the g_i are the generalized social marginal welfare weights for labor L, rates of return R, and wealth K, calculated separately on each distribution; $P(l_i \geq l)$, $P(r_i \geq r)$, and $P(k_i \geq k)$ represent the shares of the population with labor l_i, rates of return r_i, or wealth k_i, greater than l, r, or k, respectively. Our approach to calculating the social marginal welfare weights g_i follows the method in Saez and Stantcheva (2018), where redistributive preferences are inferred as the inverse of theoretical tax revenues across the distribution.[16] This choice embeds two crucial elements in policymakers' preferences. First, the weights are decreasing along each income type's distribution, thus embedding positive preferences for redistribution in the policymaker's objectives. Second, the weight at every income level is inversely proportional to the *theoretical* tax rate that is currently applied on that income type at that level. This means that the higher the current income tax rate at each level, the greater the policymaker's willingness to redistribute from above to below that income level. We then accordingly derive the legislators' preferences for redistribution from the current Italian income tax system (see Table A.3 in Appendix A for the tax rate values—which refer to the year 2015—used in the calculations).[17] Specifically, on the separate distributions of labor, rates of return and wealth, the generalized social marginal welfare weights g_i are computed respectively as:

$$g_{i,L} = \frac{1}{l_i \tau_{i,l}} \tag{9}$$

$$g_{i,R} = \frac{1}{\sum_j r_{i,j} \cdot \tau_{rk_{i,j}}} \tag{10}$$

$$g_{i,K} = \frac{1}{\sum_j k_{i,j} \cdot \tau_{rk_{i,j}}}, \tag{11}$$

where $\tau_{i,l}$ denotes the average tax rate corresponding to labor income level l_i, computed by applying the statutory tax schedule to the estimated labor income and dividing the resulting total tax liability by labor income. Similarly $\tau_{rk,j}$ denotes the average tax rate applied to source j of capital income, determined by the corresponding tax treatment of that income source in the Italian tax system.

Finally, we calculate the average relative welfare weights for total income $\overline{G}_Y(y)$ as:

$$\overline{G}_Y(y) = \frac{\int_{\text{is.t.}: y_i > y} g_i\, di}{P(y_i \geq y)}, \tag{12}$$

where $P(y_i \geq y)$ represents the share of the population with total income y_i greater than y, and the generalized social marginal welfare weights g_i are calculated as a weighted average of labor income and capital income. More specifically, the g_i are obtained from:

$$g_{i,Y} = \frac{1}{\lambda_i \cdot l_i \tau_{i,l} + (1 - \lambda_i) \cdot \sum_j rk_{i,j} \tau_{rk,j}}, \tag{13}$$

where λ_i represents the share of labor income for percentile i. The denominator thus represents the total incidence of statutory taxation on income, including both the portion taxed as labor income and the portion taxed as capital income.

The calibration on Italian data for the year 2015 yields the average relative welfare weights (G_Y, G_L and G_{RK}) depicted in Figure 3. Notably, while statutory labor income tax rates are progressive, the high concentration of capital income and the substantial differences in capital income between the top and lower percentiles results in a stronger preference for redistribution when capital income is considered in isolation (G_{RK}). Accordingly, the preference for redistribution of total income and, thus, the shape of G_Y, largely mirrors that of labor income across most of the distribution, reflecting the underlying income composition. Consistently, G_Y falls at the very top of the distribution, where incomes are predominantly composed of capital incomes (see the increasing gap between G_Y and G_L in Figure 3).

Finally, we note that the shape of G_{RK} is consistent with the hypothesis that the capital income distribution H_{RK} is thick at the top, following a Pareto distribution with a low shape parameter (see also Figure 2). According to Equation (5), the declining trend of G_{RK} arises from the fact that both G_R and G_K are lower for higher values of their respective variables. However, the rate at which G_{RK} declines—the sign of the second-order derivative—also depends on the behavior of the three distributions H_R, H_K, and H_{RK}, as defined in Equation (5). In particular, if H_{RK} follows a Pareto distribution with a thick tail, the ratio $\frac{(1-H_R)(1-H_K)}{1-H_{RK}}$ may decline rapidly, leading to a sharper decrease in G_{RK} at the top percentiles, as shown in Figure 3. This, in turn, implies that optimal marginal tax rates increase at the top of the income distribution. As in Brewer et al. (2010), this suggests that the abnormal concentration of incomes at the top is a key driver of progressive optimal tax provided the social welfare function displays some degrees of inequality aversion.

3 | Results

In this Section we present the main results of this work. First, we estimate an improved distribution of capital income in Italy and show its implications in terms of heterogeneity of returns to wealth and income inequality estimates (Section 3.1). Second, we perform a battery of simulation exercises to assess how progressivity can be restored at the top of the income distribution (Section 3.2). Third, employing the optimal taxation framework, we test the implications in terms of implied progressivity, redistribution and revenue potential of different taxation schemes (Section 3.3). Finally, we discuss the implications of our optimal tax analysis in terms of wealth taxation (Section 3.4). While equivalized income is a useful concept for studying inequality between

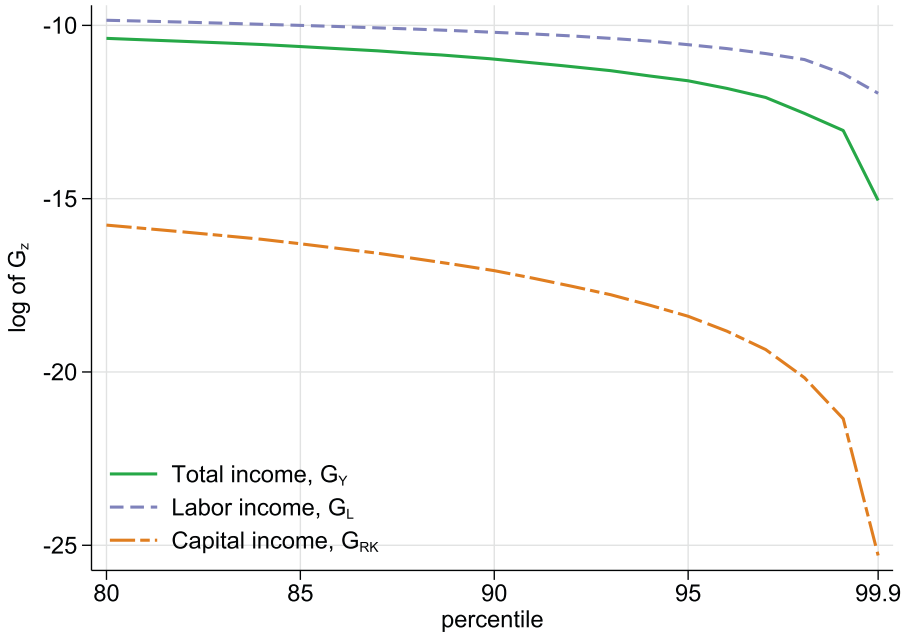

FIGURE 3 | Average relative welfare weights for capital, labor and total income.

households, the following analysis refers to individual income. This ensures consistency with Italian tax legislation, under which taxes are levied at the individual level.

3.1 | New Estimates of Returns, Income Distribution, and Effective Tax Rates for Italy

We estimate the implied rates of return across Italian wealth percentiles when capital income is distributed as in Guzzardi et al. (2024) for years 2004–2015, as well as when capital income is distributed following the wealth composition obtained from the official DWA released by the Bank of Italy for years 2010–2015 (Neri et al. 2024, cf. sec. 2.1). Our analysis reveals that using this more detailed wealth composition at the percentile level implies a larger degree of returns heterogeneity in every available year (Figure 4). Indeed, while the bottom 90% earns returns on wealth between 2% and 3%, the very top of the wealth distribution achieves returns that peak at 5%. This novel result uncovering such large heterogeneity of rates of return arises entirely from the wealth composition retrieved from the DWA. Indeed, Figure 1 shows that wealthier individuals tend to hold a larger share of their wealth in financial assets with higher returns, as opposed to housing or deposits, which typically earn lower interest rates and are more common at the bottom of the wealth distribution. In contrast, the original data from Guzzardi et al. (2024), which used a different wealth composition (i.e., the one in SHIW data), resulted in an overestimation of the rates of return among the middle part of the wealth distribution, specifically from the 30th to the 90th percentile. Note that by construction, our strategy retrieves capital income by allocating income proportionally across wealth components (Table A.1). As a result, the increasing relationship between wealth and returns stems entirely from household portfolio composition, as we cannot account for within-asset return gradients. Nevertheless, our novel results on rates of return are also more aligned with evidence from other countries where individual-level administrative data are available, such as Norway (Fagereng et al. 2020; Iacono and Palagi 2023) and Sweden (Bach et al. 2020). Importantly, differently from Fagereng et al. (2020), we do not include pension wealth in our estimation. While pension wealth plays an important role in studies of wealth inequality—typically compressing disparities due to the progressive design of public systems (Catherine et al. 2025; Bönke et al. 2020)—its implications for our estimates of returns in Italy are likely limited and, if anything, would reinforce our findings on return heterogeneity.[18]

These refined rates of return also influence the overall level of income concentration through the new distribution of capital income. In Figure 5, we present our benchmark income series—the pre-tax national income concentration series—from both the work of Guzzardi et al. (2024) and our new estimates, which use the refined distribution of capital income. Our findings show that using the updated wealth distribution from the DWA leads to higher income shares for both the middle 40% and the top income groups, while the bottom 50% experiences a reduction in income shares. This stems from the higher concentration of the most remunerative assets at the top of the wealth and income distribution. Despite these changes in the levels of income concentration, the trends for all income groups remain consistent, indicating that the new wealth distribution affects the level of capital income held by different groups but not their dynamics over time. While our empirical analysis focuses on the period 2004–2015 due to the availability of fully comparable micro–macro matched series, it is useful to briefly discuss developments over the subsequent decade. Recent evidence based on tax tabulations extending to 2021 suggests that top income shares in Italy have continued to increase moderately after 2015, while the overall composition of income within the top decile has remained relatively stable (Guzzardi and Morelli 2024). At the very top of the distribution (top 1% and 0.1%), however, capital income appears to have gained slightly in importance relative to labor income, although available tax data

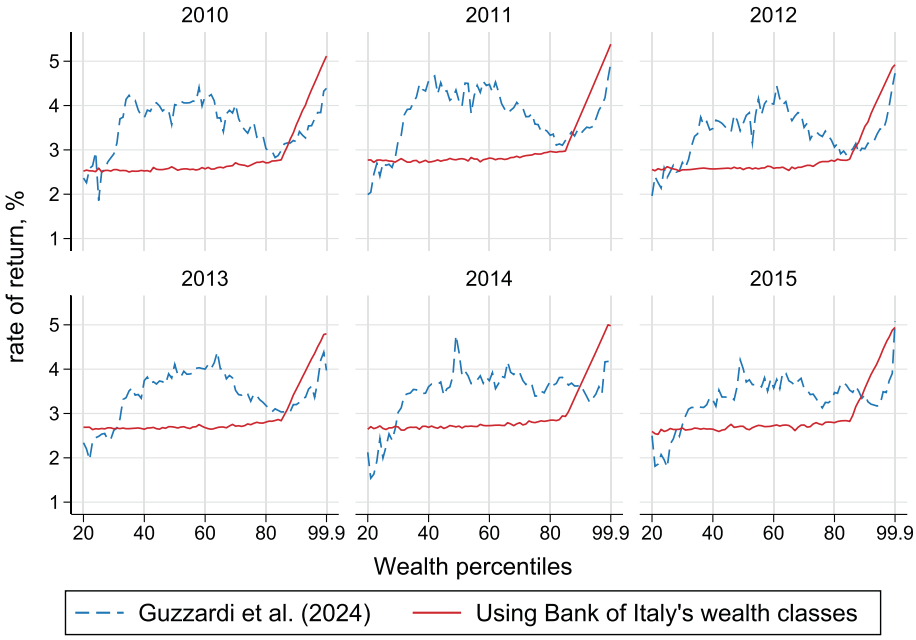

FIGURE 4 | New estimates of rates of return.

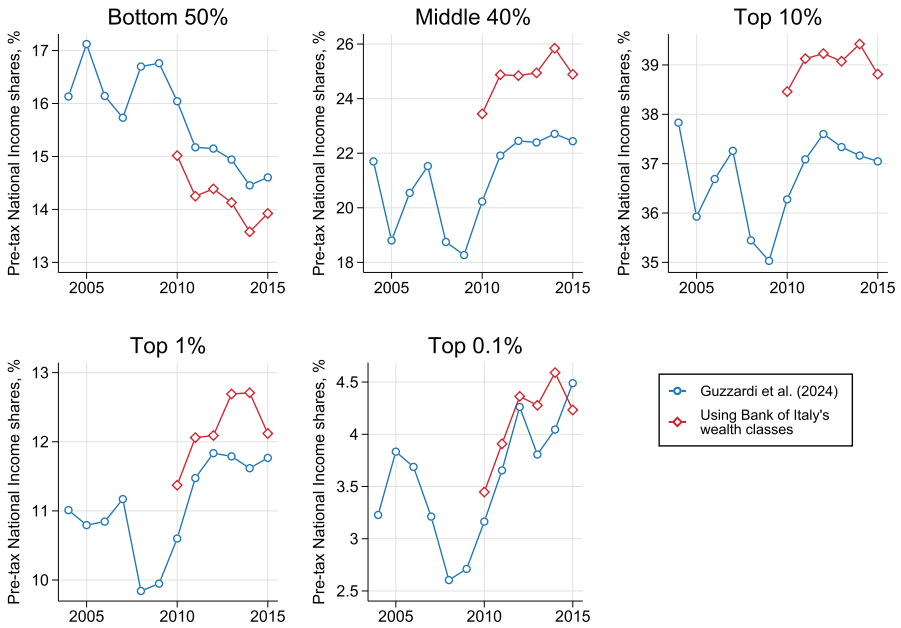

FIGURE 5 | New estimates of income concentration.

underestimate the true magnitude of capital income due to reporting limitations.

Regarding the progressivity of the Italian tax system, the main results of Guzzardi et al. (2024) remain largely unchanged: the Italian tax system is mildly progressive overall but becomes regressive at the top of the income distribution. The personal income tax is the only component that operates progressively, while other taxes contribute to regressivity at the top. This occurs mainly for three reasons. First, indirect taxes on consumption and VAT are regressive as individuals at the bottom of the income distribution consume a larger share of their income and therefore pay a higher proportion of such taxes. Second, social security contributions become regressive at the top due to the legislated contribution cap: above a certain labor income threshold, additional contributions are no longer required. Moreover, top-income individuals derive a larger share of their income from capital, on which social security contributions are not levied. Third, individuals at the top of the distribution receive a greater share of their income from capital, which is typically taxed at flat rates that are lower than the top marginal rates on labor income. Taken together, these mechanisms generate the regressivity observed at the top of the income distribution (see also Guzzardi et al. 2024, for a detailed description of such mechanisms). With respect to

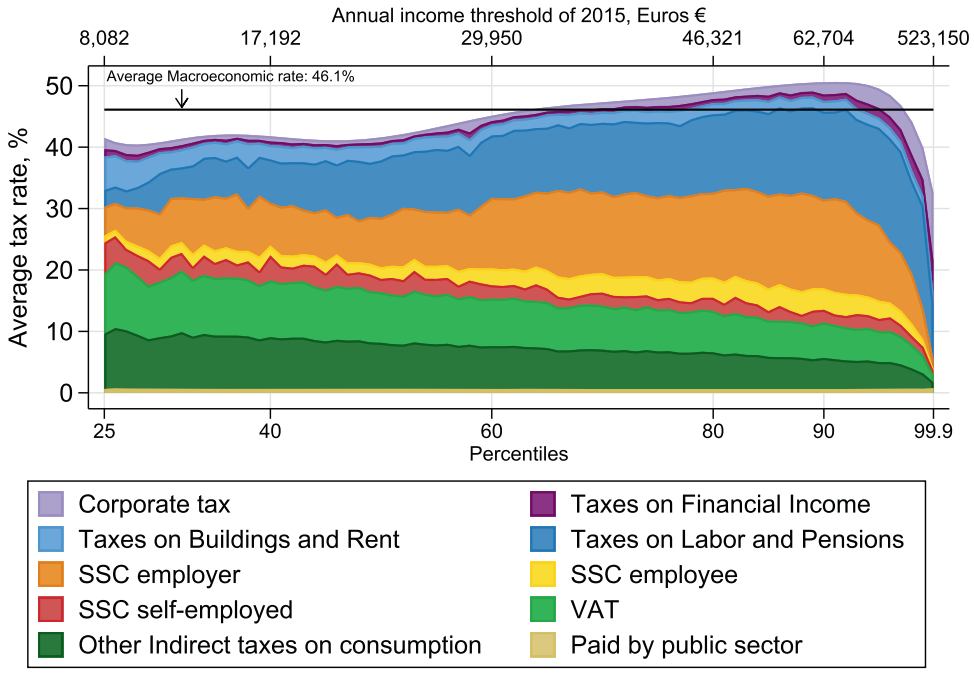

FIGURE 6 | Progressivity of the tax system.

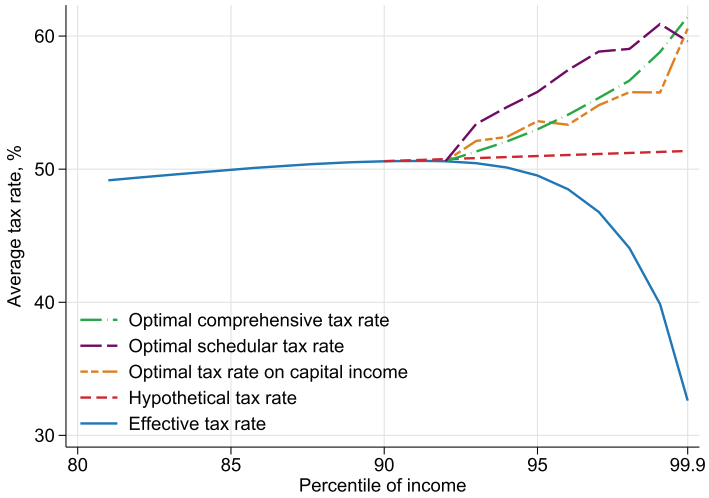

FIGURE 7 | Effective tax rates under different optimal taxation scenarios.

Guzzardi et al. (2024) we found two main changes: (i) the regressivity at the very top begins at the 93rd percentile instead of at the 95th; (ii) a lower effective tax rate for the top 0.1%, which falls to 32.6% from 36% (see Figures 6 and Figure A.1 in Appendix A for a comparison with Guzzardi et al. 2024). Both changes arise from the fact that in our new estimates, capital income, which is taxed at a low flat rate, is more concentrated at the top of the distribution (see Appendix D for a discussion on recent tax reforms).[19]

In the following Sections, we study potential reforms to address the regressivity observed at the top of the income distribution taking into account the potential behavioral effects that might alter overall taxable gross income in response to higher taxes, as well as their direct impact on public revenues and inequality.

3.2 | Restoring Tax Progressivity at the Top: Simulation Scenarios

We start with a battery of simulation exercises to determine the minimum effective tax rates required to address regressivity at the top of the Italian income distribution. More specifically, we extrapolate the effective tax rate of the last percentiles before regressivity begins. This approach implies mildly progressive tax rates for the top 10%, with an effective tax rate of 51.4% for the top 0.1%. This rate significantly exceeds the 36% found in Guzzardi et al. (2024) and the updated 32.6% rate we estimated using the new capital income distribution (see the Hypothetical tax rate scenario in Figure 7).

Assuming that the higher simulated tax rate applies only to the top 7% of the Italian income distribution, we calculate the overall

TABLE 2 | Change in public revenue and inequality indexes under different behavioral response.

Elasticity	e	Change in public revenue	Change in Reynolds–Smolensky index	Change in Kakwani index
Low	0.2	+3.95%	+0.01892	+0.01983
High	0.4	+3.14%	+0.01889	+0.01982
Very High	0.6	+2.32%	+0.01886	+0.01981

budget increase for the government resulting from such a reform. Government revenues might increase directly due to the higher tax rates at the top. However, accurately estimating changes in public revenues requires using different elasticity values that account for the behavioral responses of individuals at the top subject to higher tax rates, as they could work less, invest less, or engage in tax evasion, thus leading to a reduction in their gross taxable income. In turns, such a fall in gross taxable income may eventually lead to lower government revenues even with higher tax rates. Ideally, one would calculate elasticity values specific to the country and income level, but such estimates are not available for Italy. Therefore, in line with the approach followed by Saez and Stantcheva (2018) for the U.S., we consider three different scenarios by assuming three different elasticities of income with respect to the net-of-tax rate: a low level of behavioral response with an elasticity of 0.2, a high level with an elasticity of 0.4, and a very high level with an elasticity of 0.6. This range is chosen according to the available estimates for other countries (Saez et al. 2012; Advani and Tarrant 2021) and represents a plausible range for the elasticity parameter (See also Table C.1 for a detailed list).

Table 2 presents the results of our calculations for the additional public revenues gain under the three scenarios. It also includes the Reynolds and Smolensky (1977) index and the Kakwani (1977) index, which are used to assess the potential impact on post-tax inequality and the progressivity of the tax system, respectively.[20] Our findings show that with a low behavioral response, the budget increases by +3.95%. The improvement in tax revenues is still positive in the scenarios with high and very high behavioral response for individuals in the top 7%: the tax receipts increases by +3.14% in the first case, while by +2.32% in the second one, which is characterized by the highest reduction in taxable gross income. Such results show that the current empirical average effective tax rate in Italy is so low that higher tax rates at the top are always beneficial for public revenues. The positive values of the Reynolds-Smolensky and Kakwani indexes in columns 3 and 4 of Table 2 also indicate that, regardless of behavioral responses, post-tax inequality is reduced and the progressivity of the tax system is improved due to the increase in the tax rate at the top.[21] This simple simulation exercise demonstrates that correcting the regressivity of effective tax rates at the top of the income distribution would not only benefit the public revenues but also help reduce inequality, even when a strong behavioral response is assumed.[22] Importantly, these results are robust across the full range of elasticity values considered (0.2, 0.4, 0.6), which, although not estimated specifically for Italy, represent a plausible and credible set of parameters in line with international evidence (see Table C.1). The consistent positive effects on revenue and inequality across all scenarios support the robustness of our conclusions.

3.3 | Restoring Tax Progressivity at the Top: An Optimal Taxation Approach

The previous section already provides intuitive evidence of the redistributive potential of policies aimed at increasing progressivity at the top. Although the exercises in that section account for potential behavioral changes in the tax base, they entail neither preferences for redistribution of the policymaker nor efficiency considerations from the individual perspective. To address such issues, building on Saez and Stantcheva (2018), we employ an optimal taxation model calibrated on the Italian income distribution and income composition (see Section 2.2 for methodological details). In the following, we present the estimated effective tax rates under three simulation scenarios from the optimal taxation model: (i) the optimal comprehensive tax rate, where all income sources are taxed under a single optimal income tax rate; (ii) the optimal schedular tax rate, where labor and capital incomes are taxed at their respective optimal tax rates; (iii) the optimal tax rate on capital income, where only capital income is taxed at its optimal tax rate. These scenarios encompass policymakers' preferences for redistribution, as illustrated in Figure 3, where average relative welfare weights decrease across all three cases. The estimated effective tax rates under the three scenarios are reported in Figure 7, together with the hypothetical tax rate (cf. Section 3.2) and the effective tax rate of the current tax system.

As mentioned above, the optimal comprehensive tax rate scenario considers a tax system where the optimal marginal tax rates are uniformly applied to all incomes without differentiating among different sources. Implementing such a system would require significant structural reform of the Italian tax system, nevertheless it serves as a valuable comparative example. Our results show that applying the optimal top marginal tax rate to the top 7% of the pre-tax national income distribution would yield a much higher effective tax rate than the hypothetical tax rate required to correct the regressivity at the top of the tax system (see Section 3.2).[23] More specifically, the effective tax rate would be approximately 51% at the 93rd percentile and would grow to 61% at the top 0.1% (see Figure 7). Although higher tax rates are applied, behavioral responses may alter individuals' overall taxable income. Assuming an overall elasticity value of 0.3 on total income, Table 3 shows that the change in public revenue is positive, at +5.72%. Additionally, the Reynolds-Smolensky and Kakwani indexes both increase by approximately +0.03, indicating that such a reform would reduce post-tax income inequality and increase tax progressivity (cf. Tables 3 and Table A.2).[24]

Let us now proceed to analyze the results of the optimal schedular tax rates, where the current tax system is maintained, but the marginal tax rates on labor income and capital income for the top 7% are replaced with optimal marginal tax rates. In this scenario,

TABLE 3 | Change in public revenue and inequality indexes under different optimal tax rates simulations.

Simulated optimal tax rate	Change in public revenue	Change in Reynolds-Smolensky index	Change in Kakwani index
Optimal comprehensive tax rate	+5.72%	+0.0322	+0.0319
Optimal schedular tax rate	+6.98%	+0.0382	+0.0368
Optimal tax rate on capital income	+5.46%	+0.0299	+0.0299

Note: In the "Optimal comprehensive tax rate" scenario we set elasticity $e_Y = 0.3$. In "Optimal schedular tax rate" we set elasticity $e_L = 0.2$ for labor income, and $e_{RK} = 0.4$ for capital income. In "Optimal tax rate on capital income", we set elasticity $e_{RK} = 0.4$.

the behavioral responses to higher taxes on capital income are greater than those on labor income, as we assume that individuals can adjust their capital income more easily than their labor earnings. The elasticity used in modeling the optimal marginal tax rate is 0.2 for labor income and 0.4 for capital income (cf. Section 2.2).[25] The results in Figure 7 show that the overall effective tax rate in this scenario is higher than in the comprehensive case. This is due to two reasons. First, the marginal tax rate on labor income continues to rise throughout the top income distribution due to its lower elasticity. Second, the optimal marginal tax rate on capital income is relatively flatter, but it is set at a much higher level compared to the current tax system (i.e., it increases from about 27% to 60% for the top 7% of the income distribution, cf. Figure 7). As at the top of the income distribution, individuals earn higher level of capital income, their total effective tax rate increases, leading to greater progressivity in the tax system.[26] Taking into account behavioral responses, the change in public revenues is positive in this case as well, with an increase of 6.98%, due to the higher taxes paid by individuals at the top of the income distribution, who currently benefit from a regressive tax rate (cf. Table 3). The reform is also able to successfully raise the progressivity of the tax system, thus reducing post-tax income inequality.

In the third simulation scenario, we analyze the impact of modifying only the capital income tax by aligning it with the optimal marginal tax rate on capital income for individuals beyond the top 7% of the income distribution. Reforming capital income taxation, though not without its own challenges, can offer a more targeted approach to addressing wealth inequality and improving tax efficiency without directly impacting wages. Moreover, the policymaker might prefer avoiding changes to labor taxation, as these may be more politically sensitive than reforms focused solely on capital income taxation. Simulation results show that even with this sole adjustment, the tax system's regressivity at the top falls, as capital income is highly concentrated at the top. More precisely, after levying an optimal capital income marginal tax rate of 60% on just the top 7%, the overall effective tax rate would constantly rise up to the top 1%, with a sharp increase for the top 0.1%, reaching an effective tax rate of 60% (see Figure 7). In this scenario the change in public revenue is also positive, with an increase of 5.46% with respect to the current budget (cf. Table 3). Moreover, the progressivity of the tax system increases and the post income inequality falls as shown by the Reynolds-Smolensky and Kakwani indexes.

Finally, we perform a battery of robustness exercises that account for different elasticity parameters (see Figure A.2), and varying assumptions about the average relative welfare weights (see Supporting Information: Appendix E, Section E.2). The results show that our main findings are robust. In particular, we consider relatively high and uncommon elasticity values, $e = 0.6$ and $e = 0.8$, which lie at the upper end of the range of estimates in the literature. Even at $e = 0.6$, the implied optimal tax schedule remains qualitatively unchanged. For the more extreme case of $e = 0.8$, the estimated optimal tax rates at the very top remain above current levels and continue to imply more progressive taxation at the top than in the existing system.

3.4 | Equivalent Optimal Wealth Tax

Results from Section 3.3 implies a significant increase of the effective tax rate at the top 7% vis-à-vis that of the current tax system. This surge would boost public revenues, increase the progressivity of the tax system, and reduce post-tax income inequality. Nevertheless, reforming labor and capital income taxation at the top of the income distribution could not necessarily lead to the desired effect, as the richest individuals can more easily avoid taxes through income structuring, shifting, and indefinitely postponing their earnings (as stated by Piketty et al. 2023 and reported by the ProPublica leak, Eisinger et al. 2021). In such circumstances, a wealth tax can represent a valuable approach to spurring the progressivity of the tax system and ensuring fair contributions from the wealthiest. Being more difficult to manipulate than income, wealth has been recently proposed as a metric to calibrate a minimum standard for global taxation of the wealthiest at the G20 (Zucman 2024). The G20 report highlights that a broad wealth tax can help mitigating tax avoidance opportunities inherent in the current system while promoting a more equitable distribution of the tax burden. In this section, we explore the potential effects of a wealth tax, which we define as a tax levied on comprehensive net wealth, including all financial assets and real estate valued at market prices, net of all liabilities.[27] As discussed in Guzzardi et al. (2023), adopting a broad tax base for net wealth is crucial to minimize incentives for portfolio reallocation across asset classes in order to avoid taxation.

To maintain progressivity in the Italian tax system in line with the hypothetical tax rate scenario shown in Figure 7 (see Section 3.2), one needs to levy a minimum marginal wealth tax rates of 1% on net wealth above €400,000 (in 2015 prices), 1.2% on net wealth above €1 million, and 1.3% on net wealth above €1.5 million (see also Appendix B.1, Tables B.1 – B.3). Naturally, optimal wealth tax rates, consistent with those found in Section 3.3, can also be determined. Accordingly, we design an equivalent optimal wealth tax that targets only the top 7% of the income distribution ensuring that it achieves the same overall effective tax rate as the optimal tax rates discussed in Section 3.3. The wealth tax rates are thus designed as an additional tax on top of the current tax system in

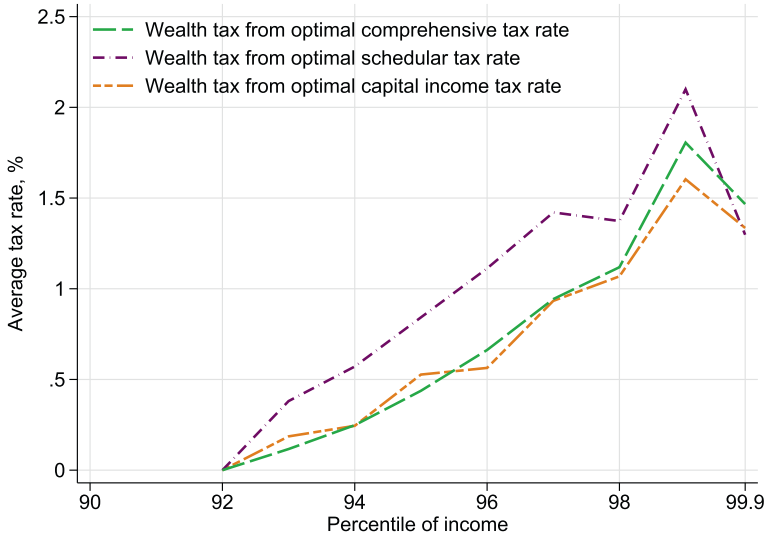

FIGURE 8 | Optimal wealth tax rates implied by the different optimal taxation scenarios.

order to match the effective tax rates depicted in Figure 7 and to generate the same additional public revenue as presented in Table 3. To do so, we derive the amount of additional taxes needed to be paid to reach the optimal effective tax rates in the different simulation scenarios and divide it by the total net wealth.

Figure 8 illustrates the equivalent optimal wealth tax in case of the optimal comprehensive tax scenario, the optimal schedular income tax scenario, and the optimal capital income tax scenarios. In the comprehensive income tax, the equivalent wealth tax would start at about 0.11% for the 93rd percentile, corresponding to an average net wealth higher than €400,000, and rise to 1.5% for the top 0.1%, where individuals have an average net wealth above €17 millions (in 2015 prices).[28] A similar pattern is observed with the optimal capital income taxes reaching a slightly lower tax rate of 1.33% for the top 0.1%. As expected from Section 3.3, if the policymaker aims to achieve the optimal schedular income tax rate, the equivalent wealth tax needs to be slightly higher than the other cases, ranging from 0.38% for the 93rd percentile to 1.3% for the top 0.1% of the income distribution. Finally, in Appendix B.2 (see Figure B.1) we study the revenue potential of taxing only the very top of the wealth distribution in Italy, consistent with top wealth tax rates obtained in this section and G20 proposals (Zucman 2024).

One common argument against implementing a wealth tax is the potential liquidity constraints taxpayers might face when making these payments (for a review, see Guzzardi et al. 2023). To examine this issue, Table B.1 (columns 5 and 6) in Appendix B presents for top wealth holders the share of "highly liquid assets," which include listed shares, life insurance, debt securities, deposits, and investment funds, as well as "total financial assets", which also encompass unlisted shares. The findings indicate that liquid financial assets account for 52%–65% of their net wealth. Even when unlisted shares are excluded, highly liquid assets still represent a substantial share, ranging from 36% to 42% of net wealth. This suggests that most top-wealth taxpayers would be able to meet their tax obligations either through their regular income or, if needed, by liquidating a relatively small portion of their assets.

Our results for the Italian tax system are consistent with several proposals for progressive wealth taxation at the European level.[29] For instance, Piketty (2014) suggests a tax schedule of 1% on fortunes between €1 and €5 million, 2% above €5 million, and potentially up to 5%–10% on fortunes exceeding €1 billion. Similarly, Landais et al. (2020) advocated for a progressive wealth tax across the European Union which involves applying a 1% tax on the top 1% of the wealth distribution, with an additional 1% on the top 0.1% and another 1% on the top 0.01%. Furthermore, our results are in line with the estimates from Advani et al. (2021) for the UK, who studied the potential revenue effects of a 0.17% wealth tax on individuals with a net worth exceeding £500,000.

4 | Discussion on Policy Design and Implementation

In the literature, the difference between optimal taxation and tax reforms is quite clear. Optimal tax design involves the selection of an optimal tax structure, subject to constraints on revenue, tax instruments and the behavior of economic agents; initial conditions are irrelevant. In contrast, the theory of optimal tax reforms considers the problem of reforming an existing tax system, as it focuses on the best way to move from an initially suboptimal equilibrium toward the tax design optimum (Zodrow 1992). In line with the latter theory, we consider a gradual optimal tax reform (cf. Section 4.1). We then discuss the possible administrative and policy constraints (cf. Section 4.2).

4.1 | Gradual Optimal Tax Reform

In the previous section we have calculated optimal tax rates abstracting away from initial conditions. However, in our application, the marginal tax rates on capital income would need to rise significantly—from the current 27% to approximately 60% for those in the top 7% of the income distribution. Mechanically, holding a constant elasticity, one could replace a one-shot large change with a series of gradual and small adjustments of rates, each for example of an additional 5%. Each of these changes could

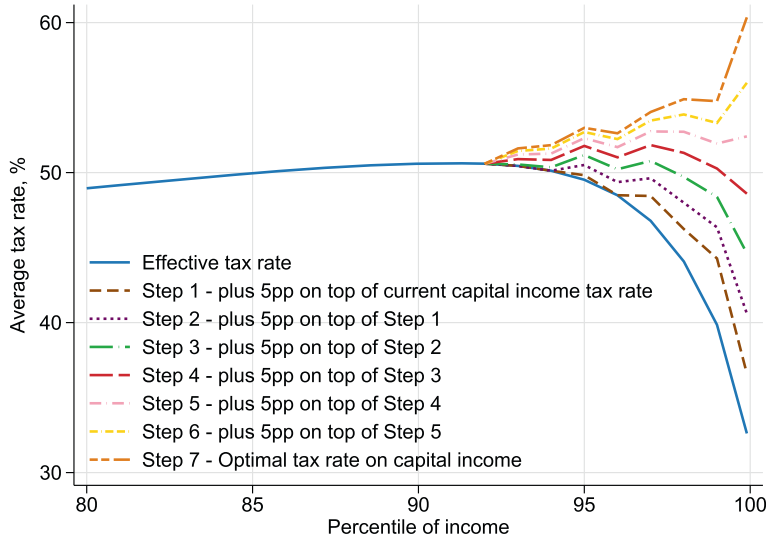

FIGURE 9 | Sequential effective tax rates to reach the optimal tax rates on capital income.

be interpreted as consistent with the envelope theorem so that first-order effects on welfare can be ignored.

Accordingly, in the scenario of optimal tax on capital income, we calculate how the overall effective tax rate evolves if the marginal tax rates are increased incrementally—by 5 percentage points (pp) at each step over six consecutive adjustments—eventually reaching the optimal tax rates in the final seventh adjustment. The results in Figure 9 show that each step contributes to an increase in the overall effective tax rates. Notably, the tax system loses its regressive characteristics at the top of the distribution only between Step 4 and Step 5, when the marginal capital income tax rate is increased by an additional 20 pp. and 25 pp.

Note that a policy reform that produces a series of subsequent changes in the tax rates will have a different effect on public revenues than what is shown in Table 3. This difference arises because each time the tax rate changes, the declared income decreases based on the underlying elasticity value of 0.4, as discussed in Section 3.3. This reduction in declared income will thus affect the estimated change in public revenue. Table 4 illustrates this mechanism by presenting the effects of each step on public revenue, as well as the Reynolds-Smolensky and Kakwani indexes. We find that such a reform with incremental changes in the tax rate has still a positive effect on both inequality and public revenue. However, since individuals adjust their income in response to each tax rate change, public revenue peaks at Step 3, resulting in a + 2.19% increase in public revenue compared to current revenue. Beyond this point, further tax rate increases lead to diminishing returns in terms of public revenue—though the increases remain positive—with Step 4 already producing a smaller increase of +1.98%.

4.2 | Administrative and Political Constraints

The implementation of the tax reforms we are considering here for Italy, although gradual, would involve changes that are difficult to implement administratively, let alone politically (Boadway 2012).

On the administrative side, a change in marginal rates on capital income is the simplest one, as it would allow the tax administration to maintain the current withholding system, where taxes on capital incomes are withheld by the financial institution (bank, insurance, and company) that distributes these incomes, and they are not reported in the taxpayer's tax declaration. However, even in this case, the financial institution should be able to apply the tax selectively, that is, only to taxpayers whose income or wealth is above a given threshold. This would entail a major change with respect to existing capital income tax rates, which are withheld uniformly on *all* taxpayers. To rule out easy-to-do avoidance schemes, such as fragmenting wealth between different sources, this would require every financial institution to coordinate with others in order to decide: (i) what is the total capital income or wealth of the individual; (ii) which institution is withholding the tax. Similar issues would arise with the implementation of a wealth tax.

Implementing an optimal comprehensive tax scheme would be even more complex and costly, as it would require taxpayers to report their capital incomes in the tax declaration and then deduct as a tax credit the amount of tax withheld by financial institutions. Within the modern framework of pre-filled tax declarations (that has been adopted in Italy since 2015), this tax credit should be already inserted in the pre-filled tax declaration, which implies an intense coordination (not only among financial institutions, but) also between financial institutions and the tax administration.

Political constraints are likely to arise, too. The traditional literature on tax reforms has stressed the importance of "losers". Even if the tax reform is implemented gradually, in general its losers will not fail to make their protests well heard by the politicians, which is the reason why "ideal" tax reforms should be Pareto-improving (Salanié 2002). However, Pareto-improving reforms are impossible as they would require compensation, which is the opposite of the redistribution such reforms are aiming at. Nonetheless, the political problems posed by a reform which clearly hits the richest part of the society cannot be disregarded. In the case of reforms we are considering here for Italy,

TABLE 4 | Change in public revenue and inequality indexes under different tax rates simulations.

Simulated tax rate	Change in public revenue	Change in Reynolds-Smolensky index	Change in Kakwani index
Step 1 — plus 5 pp. on top of current cap Inc. tax rate	+1.21%	+0.0056	+0.0062
Step 2 — plus 5 pp. on top of Step 1	+1.80%	+0.0099	+0.0108
Step 3 — plus 5 pp. on top of Step 2	+2.14%	+0.0142	+0.0152
Step 4 — plus 5 pp. on top of Step 3	+2.19%	+0.0182	+0.0191
Step 5 — plus 5 pp. on top of Step 4	+1.98%	+0.0216	+0.0224
Step 6 — plus 5 pp. on top of Step 5	+1.54%	+0.0243	+0.0249
Step 7 — Optimal tax rate on capital income	+1.00%	+0.0267	+0.0272

there is a huge disproportion between the large number of those who would benefit from it, via an increase of public goods or a decrease of other taxes, and the very small number of those who would be damaged. The latter, however, are likely to be very influential on the political process. This influence may leverage on the administrative difficulties described above, and even create more of them, for example, by calling for the application of a grandfather clause (Zodrow 1992).

To assess the political feasibility of the reforms considered, a key element is understanding how social preferences over redistribution are perceived and expressed. In the Italian context, these preferences are largely revealed through the structure of the personal income tax (PIT), which is explicitly progressive and widely regarded as the central instrument of redistribution. Both voters and policymakers tend to evaluate the fairness of the tax system primarily through this lens. However, this perception is incomplete. Recent evidence (Guzzardi et al. 2024) shows that, despite the progressivity of PIT, the overall tax system is regressive at the top. This feature, driven mechanically by the interaction of capital income taxation, VAT, and capped social security contributions, remains largely absent from public and political debate, although it has begun to receive some attention in the press.[30] As a result, there is a disconnect between perceived and actual redistribution: social preferences appear to favor progressivity, but this assessment is based on only a partial component of the system. Consistent with this interpretation, recent reforms have preserved the progressivity of PIT at the top, lowering marginal rates only at intermediate income levels while leaving the highest top rate unchanged.[31] This suggests an underlying political constraint to maintain, or at least not weaken, top-end progressivity in the most visible part of the tax system. Within this context, reforms that aim at making the overall tax system progressive throughout the income distribution, such as those proposed in this work, can be seen as aligned with existing revealed social preferences.

Summing up, the optimal tax calculations in the previous section should be considered as providing a direction for a possible reform to increase the progressivity of the Italian tax system, rather than exact parameter estimates. A credible policy reform might consider an increase of the marginal tax rate of only 5% or 10% (i.e., the first two steps considered above) that would boost revenues and decrease inequality, but it would not be large enough to offset the regressivity at the top. Even this reform, however, would require a large political consensus to counter the easily predictable cry of pain that would arise from the richest part of the population. This confirms that redistributive policies should be implemented along with predistribution policies to attain significant reductions in inequality, as recently suggested in the literature (Bozio et al. 2024).

5 | Conclusions

Pivoting on the Distributional National Accounts dataset for Italy, constructed in Guzzardi et al. (2024), we employ the newly released Distributional Wealth Accounts from the Bank of Italy (Neri et al. 2024) to distribute capital income components from the National Accounts at the individual level. The enhanced detail in wealth categories, compared to previously available data, allows us to achieve a more precise distribution of capital income and implicit rates of return across the wealth distribution in Italy from 2010 to 2015. Although our empirical strategy for computing returns on wealth is constrained by data availability, which prevents us from accounting for within-asset return heterogeneity, we show that the resulting distribution of returns aligns with the evidence presented in previous literature based on other countries.

Our results show a significantly higher degree of returns heterogeneity and a more plausible distribution of the rates of return of capital within the Italian household sector. More specifically, the rates of return are weakly increasing around 2.5% within the bottom 90% of the distribution and accelerate significantly within the top 10%, reaching approximately 5%. This finding aligns with the international literature on the topic (Bach et al. 2020; Fagereng et al. 2020; Iacono and Palagi 2023), and represents, to the best of our knowledge, the first attempt to estimate such figures for the Italian economy.

Consequently, we find higher levels of income concentration, with a larger share accruing to both the middle 40% and the top 10% of the distribution, and a smaller share to the bottom 50%. Additionally, the refined income distribution series reveals that effective tax rates in the Italian economy are regressive starting from the top 7% of the distribution rather than the top 5%, as previously found in Guzzardi et al. (2024). This shift is due to the higher share of capital income accruing to the top, resulting in an even lower incidence of capital income taxation at the highest income levels.

We then study different reforms to tackle the regressivity at the top of the Italian tax system by extending the optimal taxation model proposed by Saez and Stantcheva (2018) to incorporate average relative welfare weights in the presence of heterogeneous rates of return on wealth. We consider a comprehensive optimal tax system that taxes all income sources at the same optimal tax rate; an optimal schedular tax system that taxes labor and capital income separately at their respective optimal tax rates; and a tax system that specifically targets capital income through an optimal capital income tax. All the examined policy reforms assume varying degrees of tax base elasticity to tax rate variations to account for behavioral responses.

All optimal taxation scenarios show that to tackle the regressivity at the top of the Italian tax system, the tax rates at the top of the income distribution have to increase. In the comprehensive optimal tax system, with a medium level of behavioral response (elasticity value of 0.3), the effective tax rate for the richest 0.1% must rise to 61%. Such policy interventions boost tax revenues by +5.72% and reduce inequality. In the case of the optimal schedular system, which adjusts labor and capital taxes separately (assuming elasticities of 0.2 for labor and 0.4 for capital) the results show an even higher effective tax rate at the top of the distribution, leading to a +6.98% increase in tax revenues. Rising only capital income taxation also results in a higher effective tax rate, reaching 60% for the top 0.1%, while boosting tax revenues by 5.46%.

The positive impacts of all taxation schemes on post-tax inequality and tax progressivity are reflected in improvements in the Reynolds-Smolensky index (ranging from +0.03 to +0.038) and the Kakwani index (ranging from +0.03 to +0.037), respectively. Furthermore, our findings are confirmed through robustness exercises, considering different levels of behavioral responses and varying values of the average welfare weights.

As the wealthiest individuals can defer income and, thus, avoid taxation through wealth holdings (Piketty et al. 2023), we explore the feasibility of introducing a wealth tax targeting individuals in the top 7% of the income distribution, that is, with a net wealth exceeding €400,000. We estimate that a wealth tax equivalent to the effective optimal income tax rates would range from 0.11% for the 93rd percentile to 1.5% for the top 0.1%, where individuals have an average net wealth of €17.6 million. Notably, these rates align with other proposals in the literature (Piketty 2014; Landais et al. 2020; Advani and Tarrant 2021). Using precise net wealth data from the Bank of Italy, we also address concerns about liquidity constraints for individuals subject to the wealth tax.

On the policy grounds, our results should be intended as providing a direction for tax reform, indicating that increases in marginal capital income or wealth tax rates at the top of the income distribution would contribute to tackle the regressivity at the top of the Italian tax system, boosting tax revenues and decreasing inequality, even when (second-order) behavioral effects are taken into account. However, the observed inequality at the top of capital income is so large that it cannot be fully addressed by means of implementable redistributive taxation policies.

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Ethics Statement

This article does not contain any studies with human participants or animals per- formed by any of the authors.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

In line with data and code availability policy, all computer codes will be made avail- able. We notify that the IT-SILC data cannot be shared, as indicated by the Italian Statistical Office (Istat) guidelines, although they may be obtained directly from Istat upon request. The same applies for regional tax tabulations released by the Ministry of Economy and Finance (MEF). All other data used will be made available upon publication.

Endnotes

[1] Returns heterogeneity has several potential explanations. It may stem from persistently higher earnings growth in highly skilled individuals (Gabaix et al. 2016) or differences in wealth composition, as richer households invest in more profitable assets. Additionally, wealthier individuals may achieve higher returns due to better information, consultancy, and investment opportunities (Bach et al. 2020). Moreover, Fagereng et al. (2020) suggest that returns heterogeneity is driven by a persistent individual component linked to both observable (e.g., education) and unobservable (e.g., financial literacy) traits.

[2] The proposal elaborated by Zucman (2024) aims to introduce a minimum global standard for ultra-high-net-worth individuals taxation, amounting to 2% of their wealth. Such a proposal would reduce the current observed rates of return from 7.5% to 5.5% post-tax.

[3] Information on DWA can be obtained at https://data.ecb.europa.eu/data/datasets/DWA/data-information.

[4] We define effective tax rate as the ratio between total taxes paid and our benchmark income definition as in Guzzardi et al. (2024).

[5] The consequences of heterogeneity in returns on capital income and wealth taxation have been previously explored in an overlapping generation framework (Guvenen et al. 2023), in models that explicitly consider the microeconomic phenomena of *type*- and *scale*-dependence

(Schulz 2021; Gaillard and Wangner 2022; Gerritsen et al. 2025; Aguiar et al. 2024) or correlation between heterogeneity in savings behavior and earnings ability (Ferey et al. 2024).

[6]This result holds under a comprehensive income tax, a capital income tax, or a schedular tax, as discussed in Section 3.3.

[7]The reader may refer also to Section 3.4 for a discussion on the liquidity constraints when applying wealth taxes.

[8]Similarly to Garbinti et al. (2018) and Guzzardi et al. (2024), we allocate actual rental income and imputed rents proportionally to housing wealth. This may overestimate imputed rents (and underestimate rental income) for landlord households, while producing the opposite bias for owner-occupiers; these effects are likely to partially offset each other in the aggregate. Given the high prevalence of homeownership in Italy (ISTAT 2026), this approach provides a reasonable approximation of the distribution of housing-related income.

[9]Wealth distribution data range from 1995 to 2016, while SHIW data range from 1991 to 2025.

[10]Previously, central banks released only aggregated data on household wealth, including financial assets (such as investments and deposits), real estate assets, and liabilities (like mortgages). Starting in early 2024, the DWA will provide quarterly data on the distribution of these assets among households.

[11]This methodology refines estimates of capital income distribution and rates of return using newly released official wealth data and has broader applicability beyond Italy. By applying our approach, Distributional National Accounts estimates (Blanchet, Chancel, and Gethin 2022; Blanchet, Flores, and Morgan 2022; Bruil 2023) can be made consistent with Distributional Wealth Accounts, ensuring a more accurate distribution of capital income.

[12]In Supporting Information: Appendix E, Section E.1, we test alternative interpolation methods to capture wealth composition at the top of the distribution, namely the Additive Log-Ratio and a Pareto-elasticity approach. In all cases, we find that the main results remain robust with little difference between the different methods.

[13]Note that we denote income categories in uppercase (e.g., RK), while lowercase letters refer to specific values in the support of the distribution of each income category (e.g., rk). Therefore, for example, $T'_{RK}(rk)$ denotes the marginal tax rate on capital income (RK) evaluated at the income level rk.

[14]See Appendix C for a detailed discussion of the elasticity values and their relation to the empirical literature.

[15]We follow the calculation method in Saez and Stantcheva (2018); see also Zenga (2007) for a conceptually similar approach.

[16]Supporting Information: Appendix E, Section E.2, shows robustness exercises encompassing alternative values for G.

[17]Sensitivity analysis using 2025 tax rates yields virtually identical results. Results are available upon request.

[18]Italy's public pension system is an unfunded pay-as-you-go scheme that provides annuity payments rather than a tradable or accumulable asset generating observable returns. Including the actuarial value of future pensions would lower measured returns in cases where financial assets are limited; however, it would also increase measured wealth at the bottom of the distribution. If anything, this would further reduce measured returns for low-wealth households and, given that the top of the distribution holds large financial assets, potentially reinforce our findings on return heterogeneity. This conclusion would not hold if pension income—and thus the actuarial value of pensions—were particularly relevant at the very top of the distribution. However, as shown in Guzzardi et al. (2024), Figure 9, this is not the case in the Italian context.

[19]This analysis uses 2015 income and wealth data due to the lack of recent comprehensive micro-data in Italy combining income, wealth, and taxes. Subsequent tax reforms (e.g., changes in PIT brackets, flat-tax expansion, and capital income taxation) are unlikely to materially affect the main results on top-end tax system regressivity, which may even be mildly reinforced.

[20]The Reynolds-Smolensky index (RS) is calculated as the difference between the Gini index of pre-tax income (G_Y) and the concentration coefficient of the post-tax income distribution (C_{Y-T}): $RS = G_Y - C_{Y-T}$. The Kakwani index (Kak) is computed as the difference between the concentration index of the tax burden (C_T) and the Gini coefficient of pre-tax income (G_Y): $Kak = C_T - G_Y$. A tax is considered progressive when $Kak > 0$. Further details can be found in Enami et al. (2017). For recent applications, see Splinter (2020) on the U.S. and Dicarlo et al. (2023) on the Italian income taxation system.

[21]See Table A.2 for a decomposition of the RS and Kak indices and for estimates of concentration of taxes paid (Gini 1912; Pietra 1915). The three hypothetical taxation scenarios decrease both pre-tax Gini and post-tax Gini with respect to 2015, while increasing the concentration index of taxes paid.

[22]Note that inequality could be further reduced through revenue recycling. Indeed, the additional resources could be used to lower the tax burden of lower-income households or to finance higher public spending. These resources could be directed toward filling financing gaps in healthcare and education, or even toward funding the green transition (see, e.g., Guzzardi et al. 2023). The inequality implications of alternative allocations of these additional resources represent a promising avenue for future research.

[23]In this work, we consider alternative tax regimes affecting the top 7% segment of the distribution, as this is where we empirically observe regressivity in effective tax rates.

[24]See Table A.2 for a decomposition of the RS and Kak indices and for estimates of concentration of taxes paid. The three optimal taxation scenarios decrease both pre-tax Gini and post-tax Gini with respect to 2015, while increasing the concentration index of taxes paid.

[25]Figure A.2 in Appendix A show the results with different values of elasticities of both labor and capital income. The general conclusions of the analysis hold even assuming high elasticity values for all income categories. Indeed, even in the high elasticity case, the regressivity at the top of the income distribution is corrected when applying optimal marginal tax rates.

[26]Notably, the top 0.1% faces a slightly lower effective tax rate than the previous income group (p99–99.9) due to differences in income composition. A larger share of the top 0.1% income comes from capital, which is taxed at a lower rate than labor, where the top marginal rate reaches 65%. Since capital income is more prevalent at the very top, the effective tax rate slightly declines between p99–99.9 and the top 0.1%.

[27]Our wealth data value real estate at market prices. This is an important point in the Italian context. In practice, real estate used for tax purposes is typically valued at cadastral values, which are on average about three times lower than market prices (Acciari et al. 2024). Therefore, implementing a wealth tax that produces results comparable to those presented here would require aligning cadastral values more closely with market valuations.

[28]Notably, the average net wealth held by the top 0.1% is considerably higher than that of the previous group (p99–99.9). This difference mechanically lowers the equivalent effective wealth tax rate depicted in Figure 8 for the top 0.1%, as they can rely on a much higher level of net wealth than the previous group.

[29]For a review of the wealth tax rates currently applied across Europe, see Scheuer and Slemrod (2021).

[30]See, for example, Il Fatto Quotidiano, 22/02/2022. La Repubblica, 12/01/2024.

[31]See, for example, Legge 30 dicembre 2021, n. 234, and Legge 30 dicembre 2025, n. 199.

[32]See also Parrinello et al. (2025) for similar estimates for Italy by the EU Tax Observatory.

[33]Incomes above €50,000 now fall under the top MTR, corresponding approximately to the pre-tax income threshold of the top 15% of the income distribution (see Figure A.1 in Guzzardi et al. 2024). Previously, incomes between the 85th (≈ €50,000) and the 95th (≈ €75,000) percentiles were subject to a marginal tax rate of 41%.

[34]*Il regime forfetario e la flat tax incrementale dopo la Legge di bilancio per il 2023*, Rivista Inarcassa (Rivista Inarcassa 2023).

[35]*Legge 27 dicembre 2017, n. 205 (Legge di Bilancio 2018)* (Repubblica Italiana 2017).

[36]This regime can only be applied by foreign individuals who have not been tax residents in Italy for the ten years preceding relocation.

[37]*DL 146/2014 (*Repubblica Italiana 2014*), conv. L. 11/2015.*

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Figure E.1** Bank of Italy wealth composition. **Figure E.2:** Different interpolation and extrapolation method for full percentile wealth composition. **Figure E.3:** Different Pareto coefficient for different interpolation and extrapolation method for full percentile wealth composition. **Figure E.4:** Different optimal tax rate for different interpolation and extrapolation method for full percentile wealth composition. **Figure E.5:** Different rate of returns for different interpolation and extrapolation method for full percentile wealth composition. **Figure E.6:** Optimal effective tax rate on capital income with varying *c*. **Figure E.7:** Optimal effective comprehensive tax rate with varying *c*. **Figure E.8:** Optimal effective schedular tax rate with varying *c*.

Appendix A: Further Details and Robustness

TABLE A.1 | Distributional assumptions for capital income based on wealth categories.

Capital income	Distributed in proportion of wealth assets
Rental income	Housing
	Debt securities
D41 C-D Interest	Deposits
	Investment funds
D421 C-D Profits distributed by companies	Listed shares
D422 C-D Income withdrawn by members of quasi-corporations	Financial Business (unlisted shares)
	Non financial business
D423 C-D Other profits distributed by companies	Listed shares
D44 C-D Other investment income	Life insurance
	Investment funds

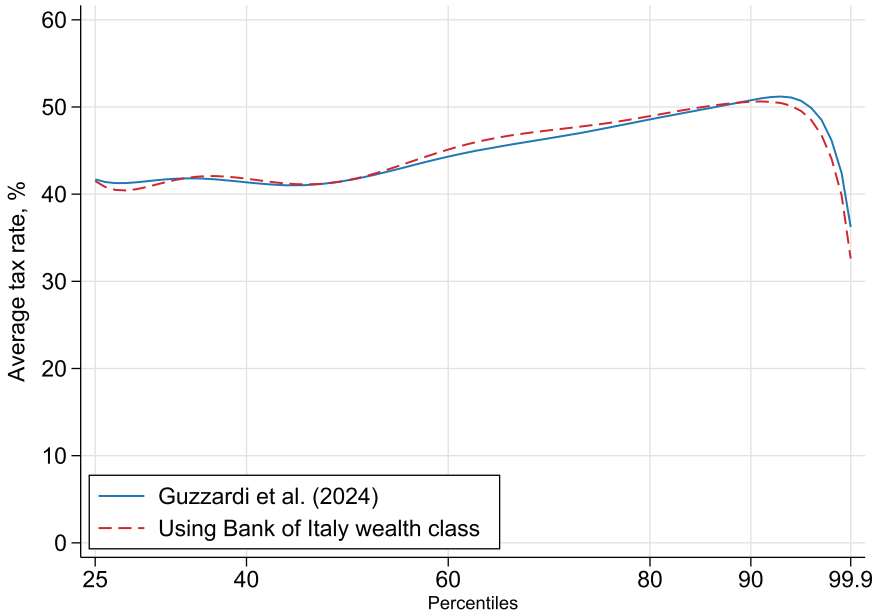

FIGURE A.1 | Progressivity of the tax system in Guzzardi et al. (2024) vs. our benchmark.

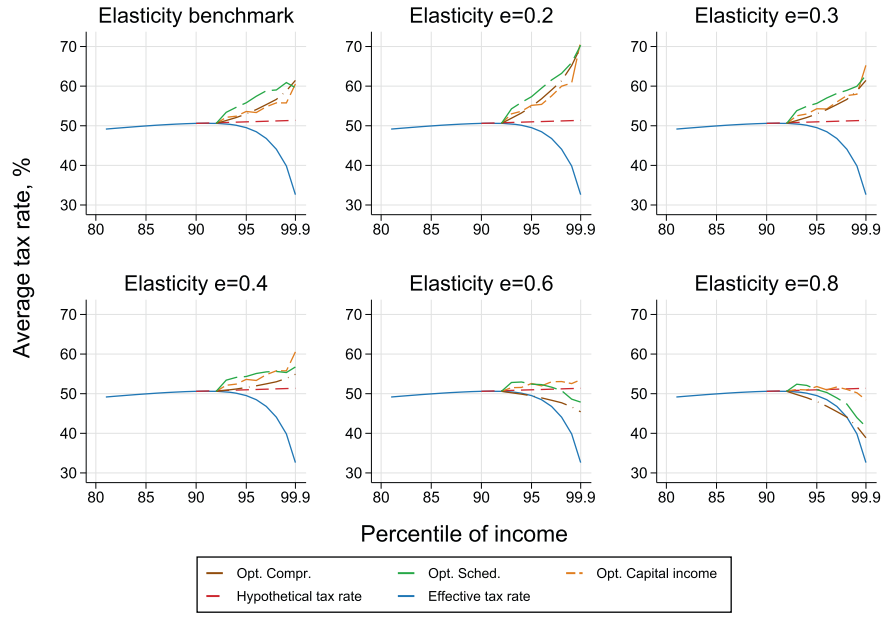

FIGURE A.2 | Optimal effective tax rate with different elasticity values.

TABLE A.2 | Concentration indexes under different optimal tax rates simulations.

Simulated optimal tax rate	Gini index Pre-tax income	Gini index Post-tax income	Concentration index taxes paid
2015 current estimate	0.5373	0.5313	0.5443
Hypothetical tax rate with $e = 0.2$	0.5340	0.5091	0.5609
Hypothetical tax rate with $e = 0.4$	0.5308	0.5059	0.5576
Hypothetical tax rate with $e = 0.6$	0.5274	0.5026	0.5543
Optimal comprehensive tax rate	0.5289	0.4907	0.5679
Optimal schedular tax rate	0.5281	0.4839	0.5720
Optimal tax rate on capital income	0.5295	0.4936	0.5665

Note: In the "Optimal comprehensive tax rate" scenario we set elasticity $e_Y = 0.3$. In "Optimal schedular tax rate" we set elasticity $e_L = 0.2$ for labor income, and $e_{RK} = 0.4$ for capital income. In "Optimal tax rate on capital income", we set elasticity $e_{RK} = 0.4$.

TABLE A.3 | Tax rates used for calculating the social marginal welfare weights g_i (year 2015).

labor income		Capital income		
Income threshold	**Tax Rate**	**Tax rate investments**	**Tax rate rents**	**Tax rate undistributed profits**
< 15,000€	23%	26%	21%	27.5%
15,000–28,000€	27%	26%	21%	27.5%
28,000–55,000€	38%	26%	21%	27.5%
55,000–75,000€	41%	26%	21%	27.5%
> 75,000€	43%	26%	21%	27.5%

Appendix B: Wealth Taxation

In this appendix, we present estimates of the revenue potential from a wealth tax. In Appendix B.1, we show simulations that apply the minimum tax rates to wealth needed to restore progressivity, as shown by the red line in Figure 7. In Appendix B.2, we present estimates based on applying optimal wealth tax rates to the very top of the distribution.

Wealth Tax Simulations to Fill the Regressivity Gap

If a wealth tax were introduced in Italy to close the gap between current tax rates and the tax rate needed to eliminate regressivity at the top, as estimated in Section 3.2, it would require a minimum effective tax rate of 0.23% for individuals with net wealth exceeding €400,000, 0.58% for those with over €1 million, and 0.92% for individuals with more than €1.5 million. Various approaches can be used to achieve these effective rates, one of which aligns with the progressive wealth tax schedule proposed by Landais et al. (2020). We introduce three tax brackets with marginal rates of 1% for net wealth above €400,000, 1.2% for net wealth above €1 million, and 1.3% for net wealth above €1.5 million. Table B.1 presents the results in terms of effective tax rates, assuming a high level of elasticity ($e_W = 0.4$) with respect to net wealth (see Tables B.2 and B.3 for low, and very high elasticity levels, $e_W = 0.2$ and $e_W = 0.6$, respectively). Under this system, the resulting effective tax rates, assuming a high level of elasticity concerning net wealth, would be 0.26% for the first bracket, 0.70% for the second, and 1.22% for the third. These effective rates closely align with the minimum levels required to close the regressivity gap.

Potential liquidity constraints that high-net-worth individuals may face when paying the tax represent an argument against the implementation of a wealth tax. To evaluate this concern, an analysis of asset composition among these individuals was conducted. Table B.1, columns 5 and 6, shows that highly liquid assets—such as listed shares, life insurance, debt securities, deposits, and investment funds—constitute between 36% and 42% of their total net wealth. When including total financial assets, which also account for unlisted shares, this proportion increases to 52%–65%. These figures indicate that a significant portion of net wealth is held in liquid or near-liquid assets, suggesting that most taxpayers would not face significant difficulties in covering their wealth tax obligations. If taxpayers were to fund their tax payments by selling liquid assets, the effective tax burden on these assets would be 0.73% for those with net wealth exceeding €400,000, 1.76% for individuals with more than €1 million, and 2.93% for those with net wealth over €1.5 million.

Optimal Top Wealth Taxation

Building on Section 3.4, we evaluate the revenue potential of concentrating the wealth tax on the very top of the net wealth distribution—specifically the top 1%, top 0.1%, and billionaires—assuming an elasticity parameter of 0.4. The results are summarized in Figure B.1. The figure illustrates that applying an effective optimal tax rate of 1.33% exclusively to the top 1% (approximately 500,000 Italians holding at least €1.7 million of net wealth) could generate an additional €30 billion in revenue in 2022 prices. Narrowing the scope to the top 0.1% (the 50,000 wealthiest individuals in the country, with average assets exceeding €20 million) would yield nearly €13.5 billion in additional revenue in 2022 prices. Finally, based on Forbes 2022 data on billionaires residing in Italy, we estimate the revenue from a wealth tax applied solely to billionaires—representing the wealthiest 0.0001% of Italian adults. Applying the 1.33% tax rate suggested by the optimal taxation model to the 49 billionaires residing in Italy in 2022 (each with an average net worth above €3 billion) would generate €2 billion in additional revenue. Raising the effective tax rate to 2%, as proposed by Zucman (2024) at the G20, would increase the additional revenue to €3 billion.[32]

TABLE B.1 | Wealth tax rates with high behavioral response.

Net wealth threshold Thousands of €	Minimum effective wealth tax	Marginal tax rate	Effective tax rate	Share of highly liquid assets	Share of total financial assets
€400	0.23%	1%	0.26%	36%	52%
€1000	0.58%	1.2%	0.70%	40%	60%
€1500	0.92%	1.3%	1.22%	42%	65%

TABLE B.2 | Wealth tax rates with low behavioral response.

Net wealth threshold Thousands of €	Minimum effective wealth tax	Marginal tax rate	Effective tax rate	Share of highly liquid assets	Share of total financial assets
€400	0.30%	1%	0.26%	36%	52%
€1000	0.74%	1.2%	0.70%	40%	60%
€1500	1.12%	1.3%	1.22%	42%	65%

TABLE B.3 | Wealth tax rates with very high behavioral response.

Net wealth threshold Thousands of €	Minimum effective wealth tax	Marginal tax rate	Effective tax rate	Share of highly liquid assets	Share of total financial assets
€400	0.16%	1%	0.26%	36%	52%
€1000	0.41%	1.2%	0.69%	40%	60%
€1500	0.72%	1.3%	1.22%	42%	65%

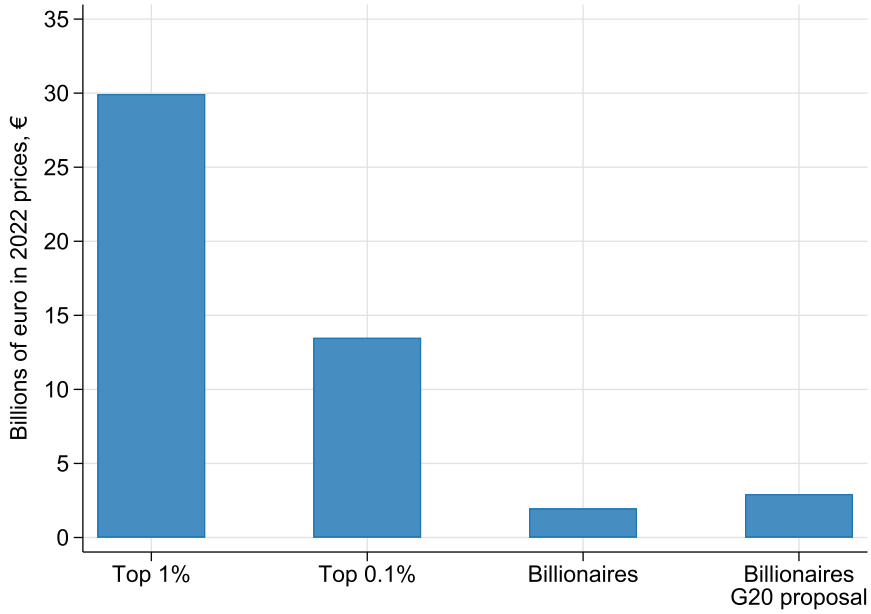

FIGURE B.1 | Revenues from a wealth tax on the super-rich.

Appendix C: Closed-Form Elasticities Estimates: A Review

In Saez and Stantcheva (2018), plausible confidence values for income tax base elasticity are taken exogenously, ranging between 0.25 and 1. To refine this range, we conducted an extensive literature review of closed-form estimates. The elasticity values we reviewed for total income, labor income, and capital income are reported in Tables C.1 and C.2, respectively. Notably, to the best of our knowledge, there is no evidence of estimation attempts using Italian data. Therefore, we rely on extrapolations from the available literature covering various countries.

Regarding total income, we surveyed all the references listed in Table C.1 and ultimately selected an elasticity value of 0.3, which falls within the range of the "best available estimates" reviewed by Saez et al. (2012) (between 0.12 and 0.4).

Regarding labor supply elasticity to taxes, the early survey by Pencavel (1986) was the first to distinguish between the labor income elasticity of primary earners (male workers, when married) and that of secondary earners (often female workers). It highlighted the stylized fact that male workers' income tends to have lower elasticity than that of female workers. A significant strand of the literature on labor income sensitivity to taxes focuses on the numerous reforms of the U.S. Earned Income Tax Credit (EITC) program, which targets low-income families with children. Empirical studies often estimate labor income tax base responses in specific contexts rather than seeking a universally applicable value. Ultimately, we choose an elasticity value for labor income of 0.2, which, with few exceptions, lies at the upper bound of the values proposed in the literature cited in Table C.2.

Estimating capital income elasticity to tax rates is challenging due to the heterogeneity of possible capital tax bases. Early estimates even suggested values well above one (Feldstein et al. 1980), at which point raising marginal tax rates would reduce tax revenue. However, more recent studies have significantly revised these estimates downward, with ranges between 0.3 and 0.5 Agersnap and Zidar (2021). Some studies also estimate the elasticity of the corporate income tax base, finding values between 0.2 and 0.5. Since our definition of capital income includes undistributed profits, we also consider these estimates, ultimately selecting an elasticity value of 0.4. This value is above many of the most recent direct estimates while it remains within the upper range of the reviewed literature.

Overall, our baseline elasticity values align well with the most recent literature. Furthermore, we conduct robustness exercises using different elasticity values in Appendix A.

TABLE C.1 | Summary of available estimates on elasticity of total taxable income.

Total income				
References	**Income tax base**	**Country**	**Estimated elasticity**	**Additional notes**
Goolsbee (1999)	Income	U.S.	≈ 0	No significance
Neisser (2018)	Taxable income before and after deductions	—	0.05–0.12 before deductions; 0.07–0.83 after deductions	Meta-study on taxable income elasticity
Conroy (2021)	Income	Ireland	0.168	—
Sillamaa and Veall (2001)	Income	Canada	0.14 (age 25–61); 0.27 (> 61)	Highlights role of age
Holmlund and Söderström (2011)	Income	Sweden	0.1–0.3	Nearly zero elasticity on women's income
Giertz (2006)	Income (broad, taxable)	U.S.	0.20–0.26 (1990s); 0.25–0.30 (1979–2001)	0.13 to 0.20 for broad income
Chetty et al. (2009)	Income	Denmark	0.25	Top 20% elasticity ∼ 2–3 times larger than bottom 20%
Blomquist and Selin (2009)	Total income/Labor income	Sweden	0.2 to 0.4	0.53 in top 1%
Kopczuk (2005)	Income (deductions)	U.S.	0.003 to 0.727; 0.123 to 1.063 (taxable income)	Emphasizes exemptions; not very robust
Saez (2003)	Income	U.S.	0.18 to 0.31; 0.42 to 0.31 on itemizers	Non-legislative tax changes (bracket creep)
Heim (2009)	Income	U.S.	0.32	0.22 not statistically significant at $50,000 cutoff; 1.2 at very top
Hansson (2007)	Income	Sweden	0.37–0.43	—
Auten et al. (2008)	Income	U.S.	0.39	0.2–0.7 on different specifications, fairly robust
Gruber and Saez (2000)	Income	U.S.	0.4	0.12 broad income; 0.647 taxable income
Goolsbee (2000)	Top incomes	U.S.	0.4	0.16–0.67 depending on cutoff
Brewer et al. (2010)	Top incomes	U.K.	0.5–0.9	—
Auten and Carroll (1999)	Income	U.S.	0.55–1.13	Same sample as Feldstein (1995) but larger
Gottfried and Schellhorn (2004)	Income	Germany	0.58	Short time span after reform; high value reflects transitory effects
Looney and Singhal (2006)	Income	U.S.	0.75	Hardly significant; inflated due to elasticity definition
Navratil (1995)	Income	U.S.	0.78–0.84	Non-uniform across income distribution: 0.37 bottom, 1–1.38 top
Lindsey (1987)	Income (deductions)	U.S.	1.6–1.8	Growing with income; large values due to steep 1981–1984 income growth
Bruce et al. (2006)	Income (long run)	U.S.	1.8	—
Feldstein (1995)	Income	U.S.	1 to 3	Small sample

TABLE C.2 | Summary of estimates on elasticity of taxable labor and capital income.

References	Income tax base	Country	Estimated elasticity	Additional notes
Labor income				
Saez (2003)	Wage income	U.S.	≈ 0	Tax brackets sliding is inconsistent with absence of bunching
Looney and Singhal (2006)	Wage income	U.S.	≈ 0	Small significance also on total income
Tazhitdinova (2020)	Labor supply	Germany	0.025 to 0.06	Study on secondary jobs elasticity.
Imbens et al. (2001)	Wage income	U.S.	0.05 to 0.10	Estimate income effects through lottery winner surveys
Kleven and Schultz (2014)	Labor income/Self-employment	Denmark	0.05 (wage)/0.10 (self-emp)/0.12 (reform)	Values pool many tax reforms; smaller ones lower total due to frictions
Blundell et al. (1998)	Wage income	U.S.	0.07–0.11	—
Blomquist and Selin (2009)	Total/Labor income	Sweden	0.2	—
Chetty and Saez (2009)	EITC subsidy	U.S.	0.25	—
Killingsworth and Heckman (1987)	Labor supply	U.S.	0.1 (men)/0.5 (women)	—
Blomquist and Selin (2009)	Hourly wage rate	Sweden	0.14–0.16 (men)/0.41–0.57 (women)	—
Kleven et al. (2023)	Labor income (job switchers)	Denmark	0.4–0.5	—
Capital income				
Kleven and Schultz (2014)	Total capital income	Denmark	0.10–0.14	Symmetric for both positive and negative capital income
Gruber and Rauh (2007)	Corporate income	U.S.	0.2	—
Burman and Randolph (1994)	Capital gains	U.S.	0.22	First to polish estimate from transitory effects
Auerbach and Siegel (2000)	Capital gains	U.S.	0.25	—
Gravelle (1991)	Capital gains	U.S.	0.25	—
Agersnap and Zidar (2021)	Capital gains	U.S.	0.3–0.5	Formally reject $e_K = 1$; tax rise would be detrimental for revenue
CBO (2010)	Capital gains	U.S.	0.39	From Congressional Research Service (2021)
Riedl and Rocha-Akis (2012)	Corporate income	OECD	0.4	—
Minas et al. (2018)	Capital gains	Australia	0.47	—
Dwenger and Steiner (2008)	Corporate income	Germany	0.5	—
Eichner and Sinai (2000)	Capital gains	U.S.	0.5	—
Bogart and Gentry (1995)	Capital gains	U.S.	0.65	—
JTC (U.S.)	Capital gains	U.S.	0.68	From Congressional Research Service (2021)
U.S. Treasury	Capital gains	U.S.	0.72	From Congressional Research Service (2021)
Auten and Joulfaian (2009)	Capital gains	U.S.	0.6–0.8	—
Dowd et al. (2015)	Capital gains	U.S.	0.9	—

Appendix D: The Evolution of the Italian Tax System, 2015–2026

One caveat of the analysis presented in this paper is the use of income series and wealth distribution data referring to 2015. In this Appendix, we describe the main changes to the Italian tax system that have taken place since 2015. Four major developments can be identified: (i) changes in statutory rates and thresholds of the personal income tax; (ii) the introduction of a flat-tax regime for self-employed workers; (iii) changes in the taxation of capital income; and (iv) the introduction of an optional tax regime on foreign investment income for new residents.

We first consider the personal income tax system (IRPEF), which applies mainly to labor income and pensions. Since 2015 the system has undergone several reforms to marginal tax rates, aimed at reducing the number of tax brackets. This process was completed with the transition to a three-bracket system under the 2026 Budget Law. The top marginal tax rate has remained unchanged at 43%, but it is now applied at a lower income threshold than in 2015.[33] These changes have reduced the average tax rate in the middle of the distribution (and mechanically above it), but since the top marginal tax rate remained unchanged, they do not alter the regressivity we observe at the top of the income distribution.

The second major change concerns self-employed workers, who represent roughly 10% of the tax-payers in Italy. Since 2015 they have benefited from the introduction of a flat-tax regime (*regime forfettario*). This regime applies to taxpayers with turnover below sector-specific thresholds, allowing them to apply a flat tax rate of 15% (or 5% in specific circumstances) to their presumptive income instead of the ordinary progressive PIT rates. These thresholds ranged from €15,000 to €40,000 in 2015, and from €25,000 to €50,000 in 2016. In 2019 the threshold was increased to €65,000 for all self-employed workers regardless of sector, and it was further raised to €85,000 in 2023.[34] The *regime forfettario* has therefore lowered the tax burden for many self-employed individuals across the income distribution and has broadly benefited those taxpayers who are able to restructure their income in the form of self-employment.

The third change concerns the taxation of capital income. The corporate income tax rate was reduced from 27.5% to 24% in 2017. Prior to 2017, dividends received by individuals holding qualified shareholdings (above 5% of capital in listed companies and 25% in private companies) were partly taxable under the IRPEF. Since 2018, however, dividend taxation has been harmonized under a flat tax of 26%.[35] These changes have reduced the overall tax burden on capital income and have particularly benefited owners of profitable firms receiving dividends. Given that many individuals at the top of the income distribution derive a large share of their income from capital, these reforms are likely to have further reduced the tax burden at the very top.

Finally, in 2017 Italy introduced an optional tax regime on foreign investment income for individuals relocating their tax residence to Italy.[36] Eligible individuals may opt to pay a lump-sum tax of €100,000 on all foreign-sourced investment income, with an additional €25,000 for each family member who chooses to benefit from the regime. The lump-sum amount was increased to €200,000 in 2024 (while remaining €25,000 for family members), and was further raised to €300,000 in 2026, with €50,000 for each family member. Despite the clearly regressive nature of this measure, it was introduced with the objective of attracting capital and high-net-worth individuals to Italy. To date, however, there are no official estimates of its effects on tax revenues, investment, or inequality. Moreover, data on individuals benefiting from this regime are not publicly available for research purposes. Given its limited scope, it is unlikely to materially affect our results.

Overall, these changes may have slightly reduced the tax burden for individuals at the top of the income distribution, those for whom our estimates identify regressivity in the tax system, since they are more likely to rely on capital income. If such individuals also derive income from self-employment, their effective tax burden could be further reduced if they are able to remain below the €85,000 threshold and benefit from the flat-tax regime. In any case, no reforms have substantially altered the taxation of top incomes where we observe regressivity.

Finally, it is important to note that the regressivity at the top of the Italian tax system is also driven by social security contributions, whose structure has not changed substantially in recent years, and by the strong overall regressivity of consumption taxes, which have likewise remained largely unchanged. Taken together, these developments suggest that the tax system has experienced only relatively minor changes across the income distribution and that the structural features generating regressivity at the top have not been addressed, and may even have been reinforced.

Voluntary Disclosure Programs (2015–2019)

Voluntary disclosure (VD) programmes introduced after 2015 allow taxpayers to regularize previously undeclared foreign assets by self-reporting. Participants must pay the evaded taxes but benefit from sharply reduced administrative penalties (around 3%–15% instead of 90%–240%) and are generally shielded from criminal tax charges.[37] The 2015 programme and its reopenings (2017, 2019) disclosed about €60 billion in foreign assets and generated several billion euros in revenue. Around 70% of declared assets originated from Switzerland, indicating strong participation by high-wealth individuals with offshore holdings (Ministero dell'Economia e delle Finanze 2017; Agenzia delle Entrate 2020). From a distributional perspective, VDs offer a discounted path to compliance that disproportionately benefits taxpayers with internationally mobile wealth. Compliant taxpayers, and those with primarily domestic income, remain subject to the full statutory regime. Repeated amnesties may also weaken deterrence: if future programmes are anticipated, the expected cost of evasion falls, potentially reducing ex ante compliance among high-wealth individuals. While the large volume of disclosed assets might suggest responsiveness of wealth to taxation, VDs primarily reflect responses to enforcement conditions rather than to statutory tax rates. By temporarily lowering penalties and increasing legal certainty, these programmes change the expected cost of evasion, not the underlying tax burden. Accordingly, VD evidence is more informative about enforcement capacity than about the elasticity of capital with respect to taxation. The scale of disclosures points to significant enforcement constraints at the top of the wealth distribution and highlights the potential compliance risks associated with repeated amnesties.